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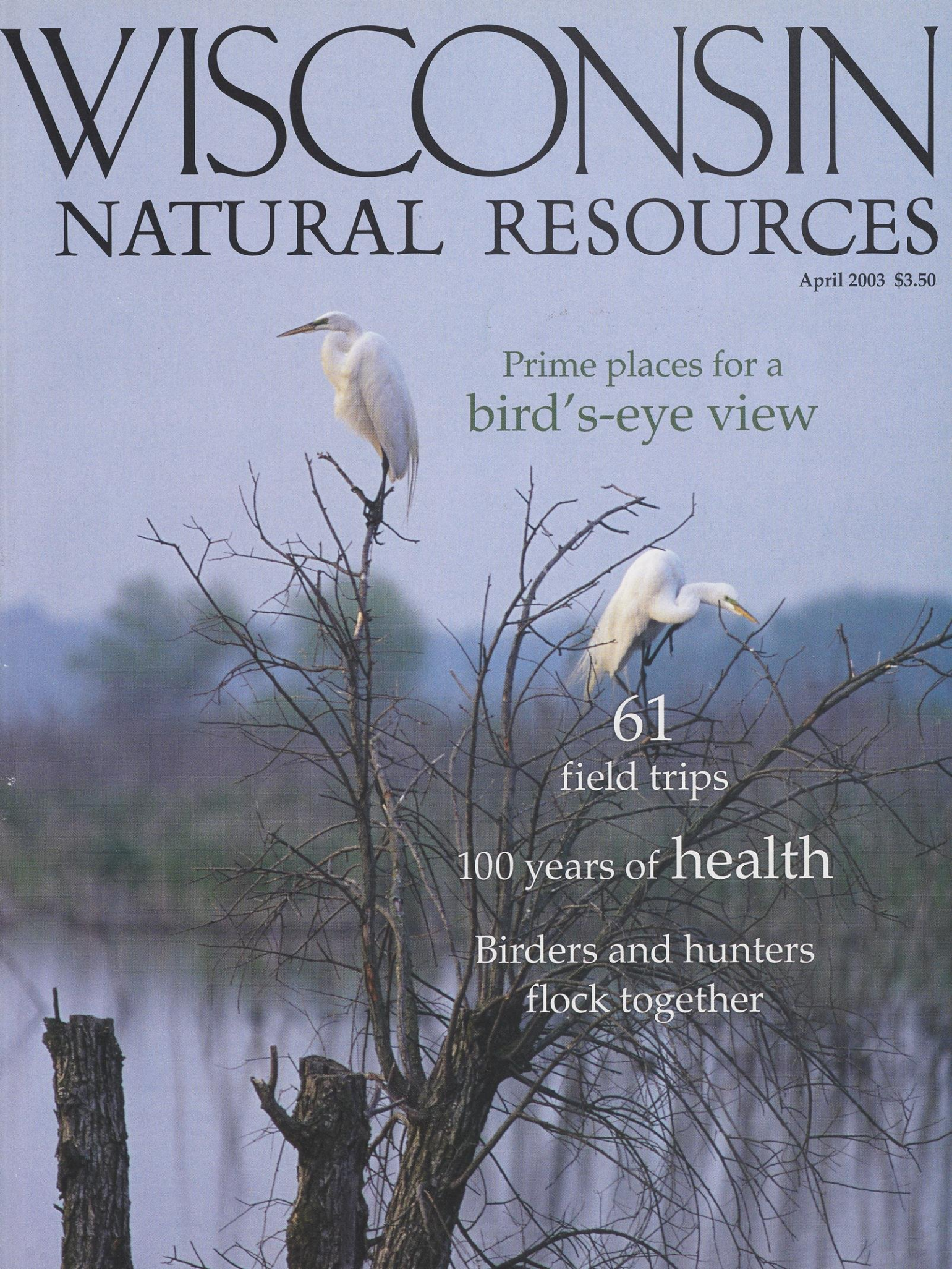
WISCONSIN NATURAL RESOURCES

April 2003 $3.50



Prime places for a bird's-eye view

61 field trips

100 years of health

Birders and hunters flock together

Stellar bloomer

A flower named for Greek gods fires across the prairie.

Anita Carpenter

In the nighttime sky, shooting stars, so fleeting, unreachable and unpredictable, stir my imagination. In May, shooting stars of another kind and dimension grace Wisconsin's prairies. They share the rich soil with puccoons, prairie smoke, violets, wood betony and blue-eyed grass. In this colorful mix of blooms, shooting stars stand tall.

Young shooting stars first appear in the warming April soil sprouting strap-like leaves from a basal rosette. The three- to eight-inch leaves hug the ground hidden among the dried prairie grasses. Soon the plant sends up a stiff flowering stalk that may grow 24 inches tall. The stalk, or scape, is topped with a small cluster, or umbel, of enlarging buds that point upward. When the flower opens, its five white, deeply-cut petals twist and fold over giving each blossom a swept-back appearance. The stalk bends over and the flowers point down. When the bloom is fully open, it is tipped with a yellow pointed beak. Looking at the 4 to 25 delicate drooping flowers on each plant, it's easy to see their resemblance to shooting stars.

continued on page 28

WISCONSIN NATURAL RESOURCES

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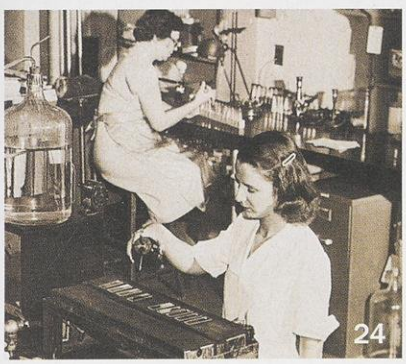
CHRISTINE TANZER



STATE LABORATORY OF HYGIENE

FRONT COVER: Great egrets at Vernon Marsh, Waukesha County. On p.12–15, read about a new trail of auto tours and amenities for watching wildlife.
RICH PHALIN, Mukwonago, Wis.

BACK COVER: Skunk cabbage, spring cress, and sedges emerge from the wet ground of Martin's Woods State Natural Area. For a map or 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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Birders of

a feather

Bird watchers, hunters and scientists flock together to share a common interest in conserving birdlife.

Greg Butcher

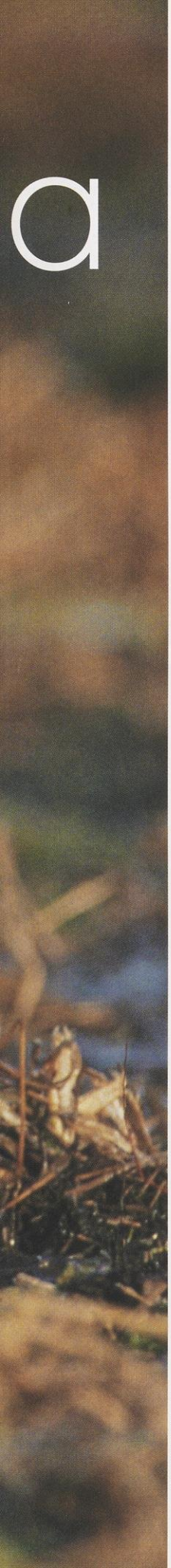
Through my spotting scope, I watched several birds jump up, run at each other, stamp their feet and flap their wings. Though I wasn't close, I could hear a mix of moaning, clucking and an occasional screech. The chicken-sized birds with ear tufts over their tiny heads darted about as their orange breast sacks puffed and deflated in sync with the moaning sounds.

I was at Buena Vista Marsh in Portage County in late April watching Wisconsin's largest population of greater prairie-chickens. It's a great place to be as the lengthening days create a surge of testosterone in the males and estrogens in the females, compelling both sexes to visit the booming grounds. About a dozen males were fighting for dominance and for the attention of the few females present at the time.

Prairie chickens have been breeding in Wisconsin for thousands of years. That they remain here is due primarily to the vision and energy of wildlife researchers like Fran and Fred Hamerstrom, hunters and other conservationists who worked together to preserve and manage the central Wisconsin grasslands that sustain these remaining birds. Nonetheless, their future remains in doubt. A recent study sponsored by the Society of Tympanuchus Pinnatus Cupido shows that the genetic diversity of our prairie chickens is declining. Scientists fear this may lead to lower reproduction and survival for these birds.

Still, there is hope for Wisconsin's prairie chickens and other rare birds with declining populations. That hope is a coalition like the one that helped save prairie chickens in the first place.

The Wisconsin Bird Conservation Initiative



GERARD FUEHRER

MICHAEL J. GUZY

The WBCI partnership promotes bird appreciation, conservation and research to sustain such species as greater prairie-chickens *(left)* and the more common vesper sparrow *(right)*.

(WBCI) is a partnership of more than 100 game, nongame, and all-purpose conservation organizations working collectively to assess bird populations, restore bird habitat, promote breeding bird populations, protect migrating species, and help more people enjoy watching birds. WBCI is governed by a 24-member coordinating council that works through 10 committees and subcommittees. To date, most funding has come from State Wildlife Grants, a new federal program to fund state activities to conserve declining species and sustain important bird habitat.

WBCI was launched in September of 1999, patterned after a national group formed in 1998 to promote bird conservation across Canada, the United States and Mexico.

Feeding the bird watching bug

Bird watching is one of the fastest growing outdoor activities in the United States. Fifty to sixty million adult Americans watch birds, primarily near their homes, but about 20 million adults also take at least one birding trip a year.

Why bird watching? Many people find their 8–5 jobs keep them stuck indoors all day, working in offices, retail or services, working at a computer screen, scanning the news, or talking on the telephone. Bird watching gets you outdoors, gives you a little exercise, and puts you in touch with nature. It is easy and as hobbies go, inexpensive to get started. All you need is a pair of binoculars ($100–$350), a bird identification book ($10–$30), and preferably a knowledgeable companion. Most communities in Wisconsin have local birding clubs, Audubon chapters, or nature centers that offer field trips and welcome new birders.

At home, bird watching can start modestly with a birdfeeder or two and some black oil sunflower seeds. Soon you might add a shallow birdbath, plant some flowers, shrubs or trees that attract birds, and you are on your way. Garden centers, birding clubs and field visits provide ideas to expand your birding horizons.

If you get hooked, you can find others at meetings and on the Net who will gladly share some of the great places for bird watching in Wisconsin. Two books provide detailed advice on where to go: The *Wisconsin Wildlife*

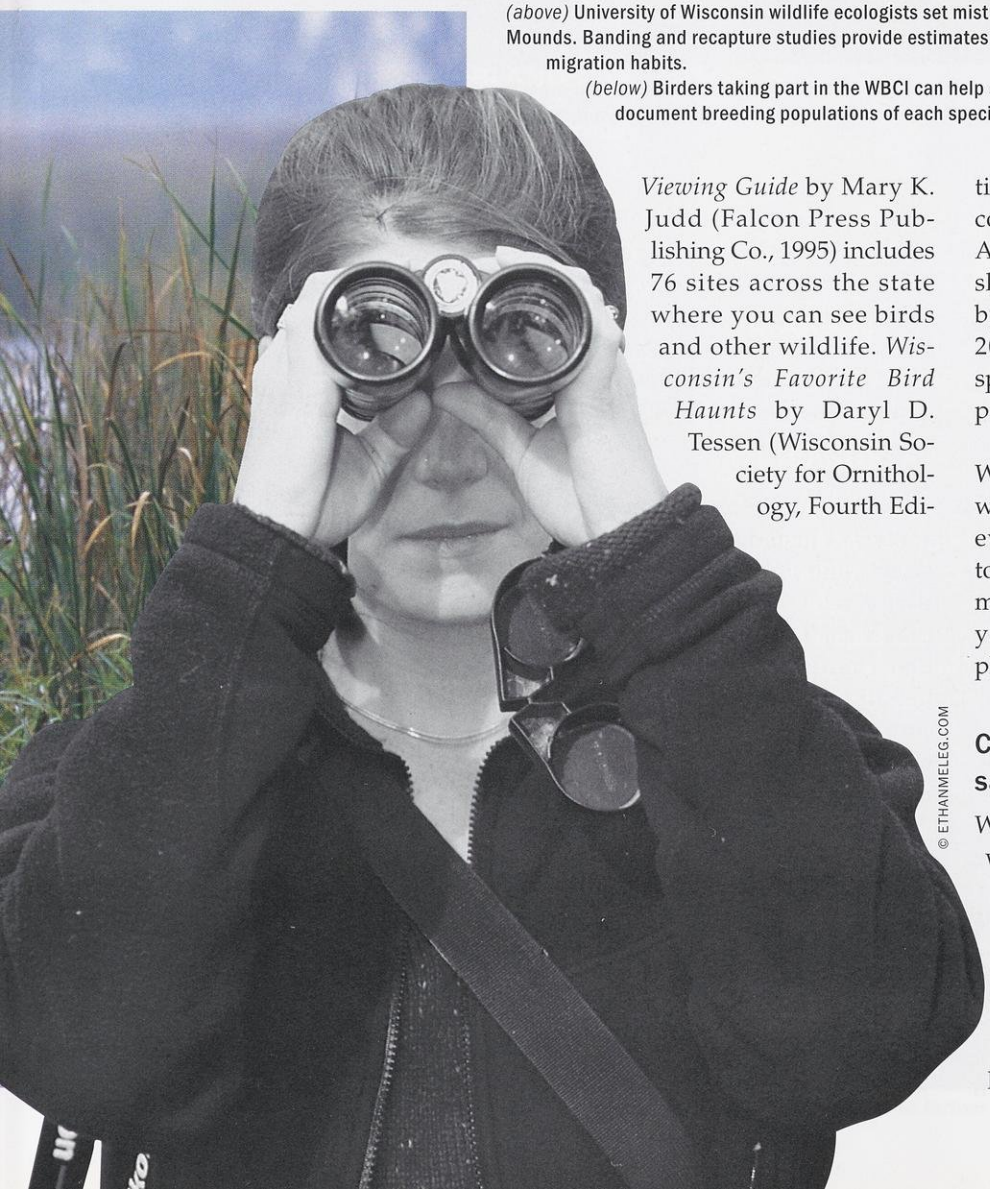
Amateur birders are often willing to provide their time and expertise as researchers to map bird territories, note bird ranges and census populations in different seasons. Like hunters, birders volunteer both time and money to restore and buy bird habitat.

RICH PHALIN

SUSAN VOS

(above) University of Wisconsin wildlife ecologists set mist nets to catch and band songbirds at Blue Mounds. Banding and recapture studies provide estimates of bird abundance, habitat preferences and migration habits.

(below) Birders taking part in the WBCI can help survey designated Important Bird Areas to document breeding populations of each species.



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Viewing Guide by Mary K. Judd (Falcon Press Publishing Co., 1995) includes 76 sites across the state where you can see birds and other wildlife. *Wisconsin's Favorite Bird Haunts* by Daryl D. Tessen (Wisconsin Society for Ornithology, Fourth Edition, 2000) includes 135 write-ups that cover sites in every Wisconsin county. Another tool for honing your birding skills, "Bird Song Ear Training Guide" by John Feith (Independent Records, 2003) provides song clips from 189 species of Wisconsin birds on one compact disk.

One of the WBCI projects, the Great Wisconsin Birding and Nature Trail, will soon make birding information even easier to find. A series of auto tours and contacts will lead you to premier birding spots at peak times of the year to see birds, other wildlife and plants.

Conserving grasslands and savannas

With all this enthusiasm, you might ask why birds need conservation. Just as there are more and more bird watchers every year, there is growing development that changes the natural habitats the birds need to thrive. All birds have specific habitat preferences; migratory birds need different habitats in summer, in winter, and

Banding studies tell us how far birds migrate and also quantify how human activities can decrease or expand wildlife habitat. Several species are vulnerable as grassland, wetland, forest, shrubland and savanna are developed and fragmented. Restoration projects show that land and birds are resilient and can recover as natural cover is re-established.
(inset) An eastern meadowlark.

during migration. If these habitats disappear or are degraded, then the birds that depend on them will disappear as well.

Grassland birds have been especially hard hit in Wisconsin and neighboring states. The tallgrass prairie that used to cover most of southern Wisconsin also proved to be excellent farmland. When Wisconsin's family dairy farms developed, most fields were used for light grazing or haying, and birds still did relatively well. As farm sizes grew larger, haying and grazing became more intense, and many pastures were planted edge to edge in corn or soybeans. Then, the grassland bird populations started seriously declining.

For instance, two species of meadowlarks — eastern and western — remain relatively common, but have dropped steadily for at least 35 years. These declines are documented since 1967 in an annual Breeding Bird Survey (BBS) (see our April 1998 story) throughout Canada and the United States. Each summer highly skilled bird watchers drive 25-mile routes, stopping every half-mile to count all the birds they can see or hear during every three-minute stop. Most observers cover the same route year after year, counting at the same time of day, the same time of year, and at the same stops to ensure comparable results. WBCI aims to ensure the BBS continues to collect this information.

Several other declining grassland species — including sedge wrens, dickcissels and bobolinks — remain relatively widespread. Others, like the prairie chicken, are in danger of extirpation. One dramatic example, the loggerhead shrike, was once common in shrubby grasslands, but is now reduced to perhaps a half-dozen breeding pairs per year.

To help grassland birds, a WBCI subcommittee for prairie, savanna, and agricultural habitats will work with an Important Bird Areas committee to identify and rank the most important grassland habitats that need to be conserved. Grassland birds already benefit from a fantastic plan — *Managing Habitat for Grassland Birds: A Guide for Wis-*

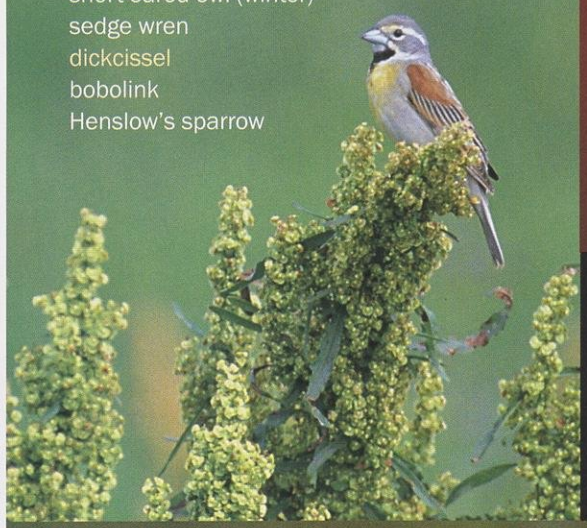
WBCI goals

- Keep common birds common
- Promote bird-based recreation and the enjoyment of birds
- Develop broad partnerships
- Manage communities of birds at a regional and landscape scale
- Conserve and restore endangered, threatened, and rare bird species and their habitats
- Identify and rank opportunities to manage birds and habitats in Wisconsin
- Coordinate existing bird conservation efforts in Wisconsin
- Provide private landowners and land managers with the best available ecological information
- Use voluntary approaches when working with landowners
- Develop plans that consider the social and economic effects on people

What Wisconsin birds in which habitats currently need protection?

GRASSLANDS

greater prairie-chicken
upland sandpiper
short-eared owl (winter)
sedge wren
dickcissel
bobolink
Henslow's sparrow



STEPHEN J. LANG

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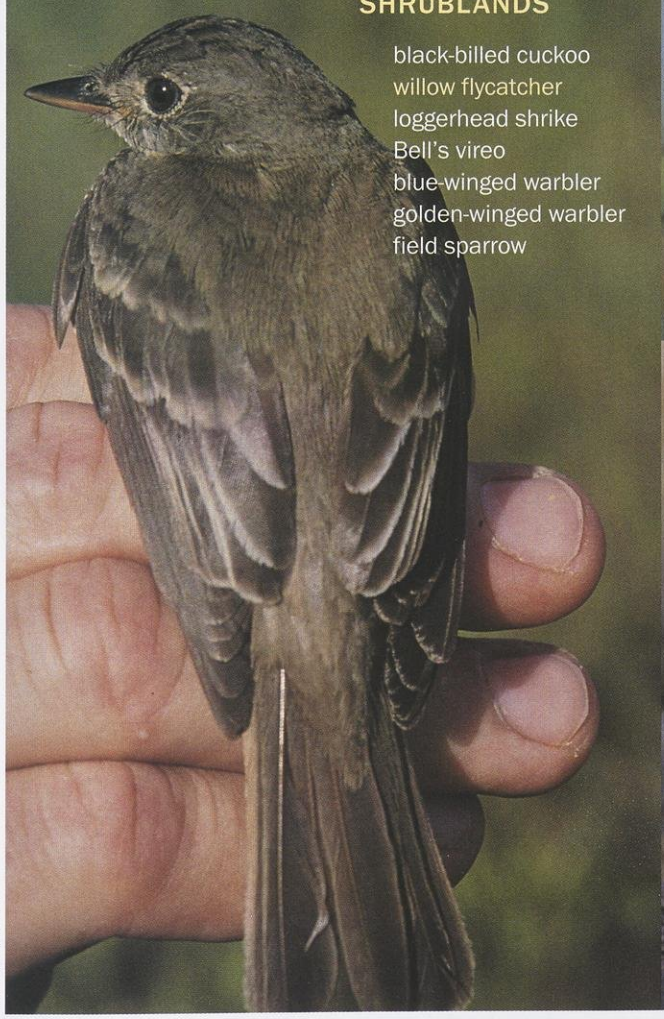
FORESTS

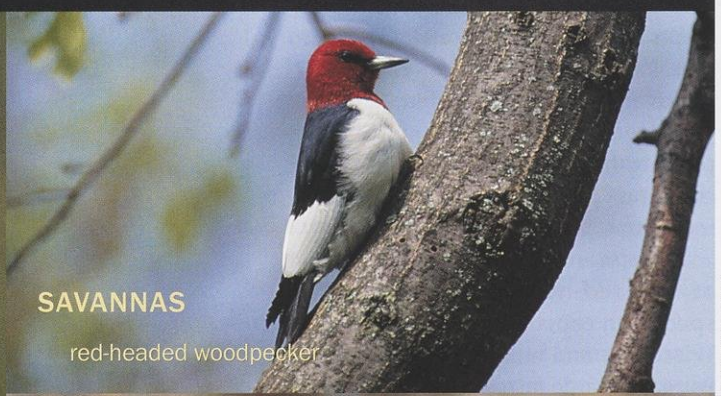
American woodcock
Acadian flycatcher
bay-breasted warbler
black-throated blue warbler
wood thrush
prothonotary warbler
Canada warbler
cerulean warbler
Cape May warbler
Kentucky warbler
Connecticut warbler
veery

SHRUBLANDS

black-billed cuckoo
willow flycatcher
loggerhead shrike
Bell's vireo
blue-winged warbler
golden-winged warbler
field sparrow



MICHAEL J. GUZY



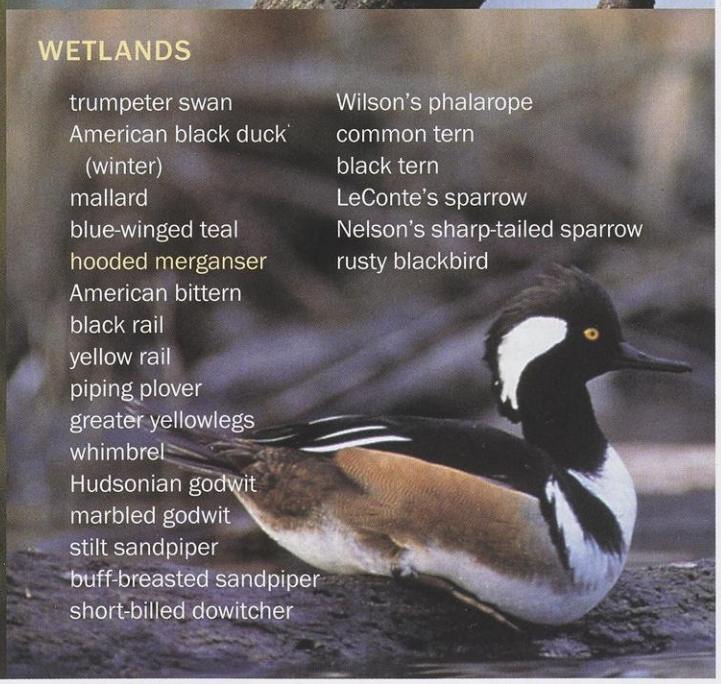
SAVANNAS

red-headed woodpecker

STEPHEN J. LANG

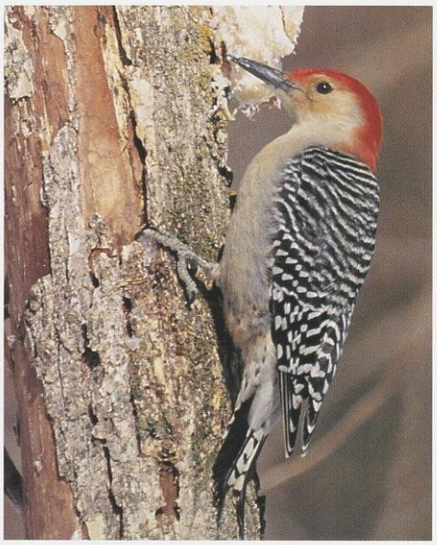
WETLANDS

trumpeter swan
American black duck (winter)
mallard
blue-winged teal
hooded merganser
American bittern
black rail
yellow rail
piping plover
greater yellowlegs
whimbrel
Hudsonian godwit
marbled godwit
stilt sandpiper
buff-breasted sandpiper
short-billed dowitcher
Wilson's phalarope
common tern
black tern
LeConte's sparrow
Nelson's sharp-tailed sparrow
rusty blackbird



GERARD FUEHRER

Pictured species shown in yellow. Compiled from Birds of Conservation Concern of the U.S. Fish and Wildlife Service, Partners in Flight, the U.S. Shorebird Conservation Plan, Waterbirds for the Americas, and the North American Waterfowl Management Plan



STEPHEN J. LANG

When oak savannas are fragmented, red-bellied woodpeckers move in. WBCI projects can lessen these losses.

consin (1997) crafted by DNR ecologists David Sample and Michael Mossman. The book describes habitat requirements and landscapes for all Wisconsin grassland birds.

Savanna habitats, dominated by oak trees, were even more common than prairies in pre-settlement Wisconsin, covering 15–20 percent of the land. Almost none remain.

Oak savanna is the preferred habitat of the red-headed woodpecker, a species in especially steep decline in Wisconsin and neighboring states. Savannas became farms and scenic hilltop homes. Controls on wildfires allowed tremendous growth of underbrush. Then red-bellied woodpeckers moved in displacing the redheads.

At Necedah National Wildlife Refuge, Rich King and colleagues have embarked on an ambitious program to rehabilitate five different savannas (90–230 acres each) to improve prospects for red-headed woodpeckers and other savanna-dependent species. Restoring savannas is tough and physical. Smaller trees on slopes need to be thinned out, so oaks better than 16 inches across and pines bigger than 14 inches in diameter remain. Other underbrush needs to be repeatedly burned. It's worth the effort. Last summer, only seven years into the project, 32 red-headed woodpecker nests were found. This cooperative project was funded by

KEVIN R. SPATT

Helping people appreciate birds is an important step in building support to conserve wildlife. A visit to a heron rookery is both fun and memorable.

How to support bird conservation in Wisconsin

- Join state and local nature and conservation groups.
- Learn to identify the high priority species and learn where they nest near you. (Check the website for the Wisconsin Breeding Bird Atlas, www.uwgb.edu/birds/wbba to see maps for each species.)
- Learn about the Important Bird Areas near you and volunteer to survey those areas to count birds.
- When you go bird watching, buy from local businesses and let them know why you're in the area to show the economic impact of bird watching.
- Improve your backyard for birds: reduce the size of your lawn; plant native wildflowers, shrubs and trees; provide water; reduce or stop use of pesticides; leave dead wood as snags or brushpiles.
- Attend the Midwest Birding Symposium in Green Bay, September 11–14; all proceeds will support prairie chicken conservation. Call 1-800-533-6644 and press 6 for more information.
- Urge state legislators to support Wisconsin's Land Legacy program and Stewardship Fund to purchase important conservation lands in the state.
- Support natural parks, nature preserves, and wise land-use planning in your community.
- Organize a bird walk or give a bird talk for your church, local school, or another organization not normally involved with birding.
- Drink organic or shade-grown coffee — coffee grown in the shade provides habitat for our songbirds on their wintering grounds.
- Buy a Migratory Hunting and Conservation Stamp (http://duckstamps.fws.gov) to support national wildlife refuges.
- On May 10th celebrate International Migratory Bird Day (http://birds.fws.gov/IMBD or call 1-866-334-3330).
- Celebrate the centennial of the National Wildlife Refuges this year. (http://refuges.fws.gov/centennial).
- Keep your cat indoors to not only protect it from injuries and diseases, but to prevent the deaths of wild songbirds. (http://www.abcbirds.org/cats/catsindoors.htm).
- Urge your favorite nature organization to endorse and take part in WBCI. Contact Andy Paulios, Coordinator, DNR Wildlife Management, P.O. Box 7921, Madison WI 53707, or call 608-264-8528.

the U.S. Fish and Wildlife Service (USFWS), the National Fish and Wildlife Foundation and the Sand County Foundation. Most of the work was done by USFWS employees and University of Wisconsin-Stevens Point students.

Counting forest birds

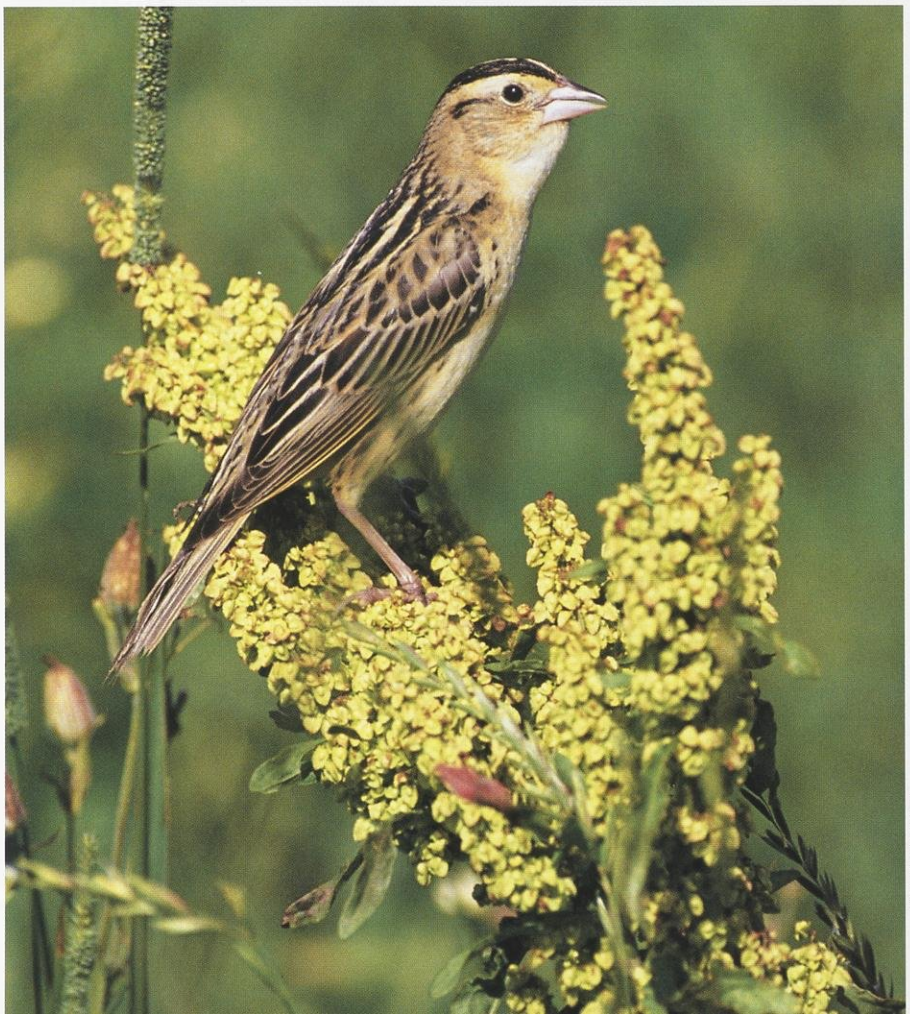
Forest bird conservation is a top priority in delicate balance with a need for wood and wood products. One ornithologist, Professor Bob Howe of the University of Wisconsin-Green Bay, has mustered the skills of an army of citizen scientists to help. For the past 15 years, he has organized a breeding bird survey in Nicolet National Forest in northern Wisconsin. More than 200 bird watchers have surveyed more than 522 sites. Sixty to 100 of these birders survey 250–300 sites each year. The resulting census is used to manage this vast forest and predict bird population trends under different management scenarios.

Watching the wetlands, grasslands, ducks and meadowlarks

Waterfowl hunters have long been conservation leaders. Their license fees, stamp fees, memberships and equipment surcharges financially support the national wildlife refuges and buy other wetland habitats that support duck populations.

RICH PHALIN

Whether you hunt geese or not, buying a Migratory Hunting and Conservation Stamp underwrites the cost of restoring wetlands and grasslands that are equally important to geese, the hunting public, birders and bobolinks *(below)*.



STEPHEN J. LANG

Internationally, waterfowl hunters organized back in 1986 to pass the North American Wetlands Conservation Act (NAWCA) that manages flyways from northern Canada through the states into Mexico. Vital habitat along the upper Mississippi River and the Great Lakes are beneficiaries of that planning. One of the landmark wetlands projects, the Glacial Habitat Restoration Area (GHRA) in parts of Columbia, Dodge, Fond du Lac and Winnebago counties aims to restore 11,000 acres of wetlands and 38,000 acres of grasslands in a 530,000-acre landscape. After 12 years and more than $17 million, 70 percent of the wetland goal and 60 percent of the grasslands goal have been reached.

The GHRA has targeted three groups of species for conservation: ring-necked pheasants, waterfowl (especially mallards and blue-winged teal), and grassland songbirds (especially meadowlarks, bobolinks and Henslow's sparrows). Just to demonstrate the power of working together, partners in this project include the Wisconsin Department of Natural Resources, U.S. Fish and Wildlife Service, Wings Over Wisconsin, Pheasants Forever, The Nature Conservancy and many others. Funds have come from the Wisconsin Stewardship Program ($11.9 million), four NAWCA grants ($3.3 million), license fees from Wisconsin hunters and anglers ($1.8 million), and many of the partners.

Such a long-term commitment is exactly the kind of partnership that WBCI looks to duplicate in the coming years. In many areas all over Wisconsin, the interests of hunters and bird watchers overlap, and they need to work together to preserve the habitats on which Wisconsin's birds depend. WBCI expects to be the coalition that can get the job done.

Author, editor and avid bird watcher Greg Butcher works for the National Audubon Society's Science Office in Ivyland, PA.

The Great Wisconsin Birding and Nature Trail will guide you on journeys of discovery.

A map for all

Susan Foote-Martin

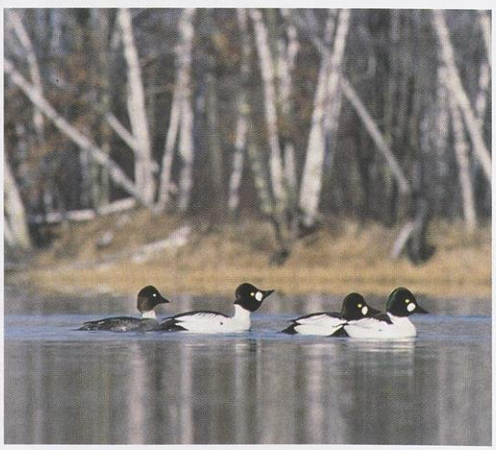
I woke early, not to take a shower, but to see one. As I drove a forested gravel road at 5:30 on a dark, clear November morning, the Leonid meteor shower broke through. Tails of light streaked across the sky, tracing fiery lines in the darkness above. I stopped and got out of my car, hoping to hear the howl of a distant timber wolf. Silence. I thought a bit about what meteor showers might have meant to the ancient peoples who once lived in this Northwoods country of Bayfield County, but it was too cold to mull it over long. I shuddered and got back into my warm car. Time to move on.

I was on a journey of discovery, traveling the region and taking notes about special places along the way for viewing birds, other wildlife and nature. The information will be incorporated into the first of five regional maps that collectively will be called the Great Wisconsin Birding and Nature Trail. The trail — actually a series of auto tours —will lead visitors to Wisconsin's prime wildlife watching spots.

To catch Wisconsin's natural peaks — peak hawk migrations, peak fish migration, peak times when wildlife are swarming, staging and courting in public view — you need to know where to go, and when to go there. The Great Wisconsin Birding and Nature Trail maps will indicate where those kinds of natural thrills can best be seen, and couple those highlights with useful travel information suggesting food, lodging and other points of interest. Visitors can use the maps to plan a trip, explore a part of the state and revel in the great outdoor experience that nature provides.

I had a list of potential sites or "waypoints" to place on the map. Through a series of public meetings and contacts, people have suggested "must-see" places. I'm the lucky one: I get to travel the state, judging the entries and connecting the dots to form a route for enjoyable travel.

Heading north on County Highway A to the Lake Superior community of Port Wing, I watched a northern harrier hunt over a frozen hayfield. The hawk flipped in a sharp turn midair and dropped like a rock to the



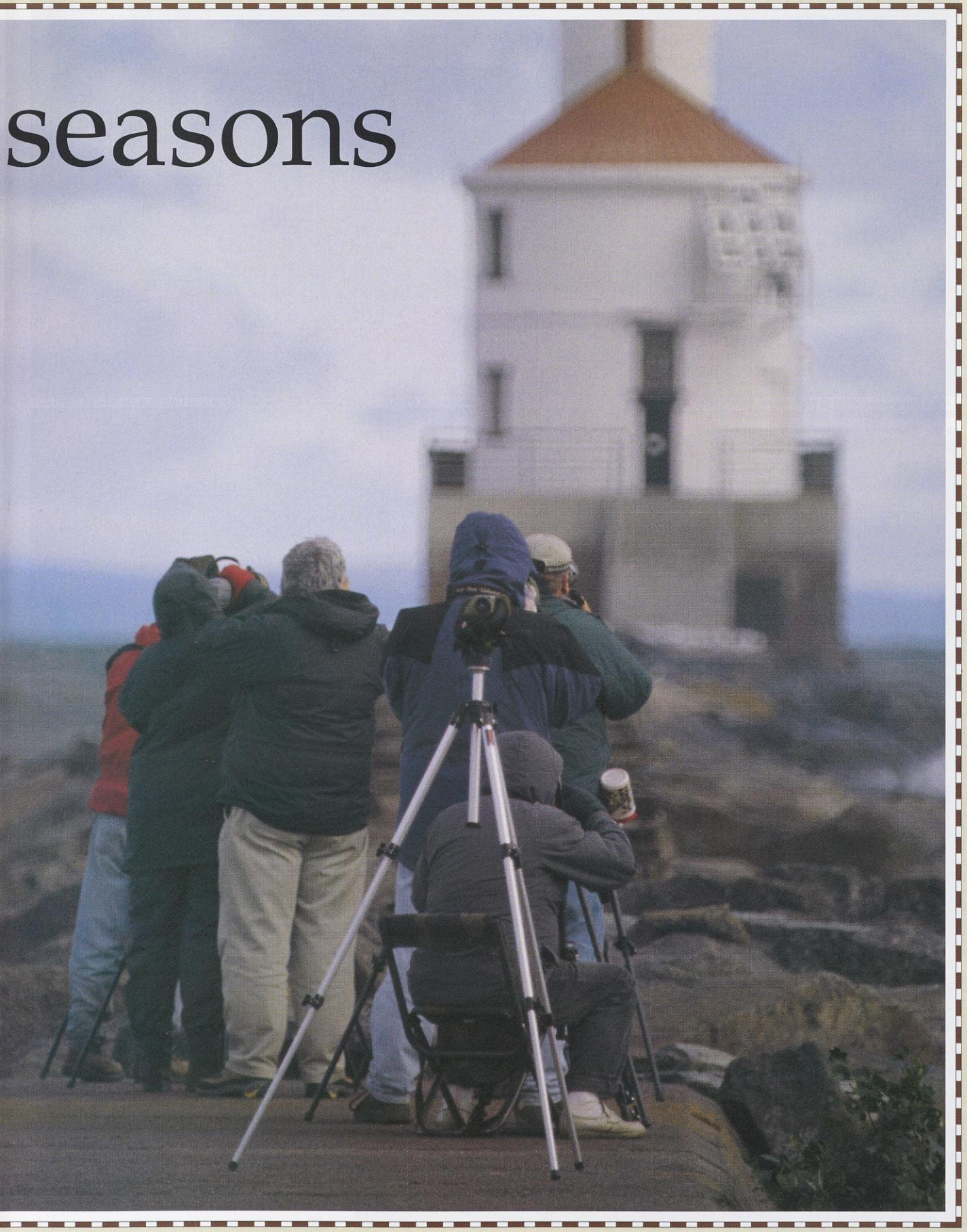
SCOTT NIELSEN *(TOP)* SCOTT NIELSEN

(left) **Guided to the right place at the right time, you can see goldeneyes drift past a Northwoods forest and** *(right)* **catch the hawk migration at Wisconsin Point in Superior.**

Look for the sandhill crane

Highway signs, maps and roadside markers will use this logo designed by wildlife artist Kenn Kaufman to mark each waypoint on the Great Wisconsin Birding and Nature Trail.

seasons



STEPHEN J. LANG

SCOTT NIELSEN

(above) **Waypoints can help you watch eagles feed on the Wisconsin River or** *(right)* **see ring-billed gulls dive on the Lake Superior coast.**

ground, probably in search of an unsuspecting meadow vole.

As I drove into town, I saw the rusted hulls of fishing boats, workhorses of the Great Lakes fishing industry that once supported many families of this community. I wondered what these people do for work now? I took some photos and drove on to the sloughs along Lake Superior in search of birdlife.

Flotillas of hooded mergansers and goldeneye ducks drifted away as I slowly drove the dike road splitting the slough in half. I surveyed the goldeneyes using binoculars, searching for the rare Barrow's goldeneye. None here today.

Sheets of ice already had built up on the rocks along the lakeshore. A bald eagle watched from its post on the breakwater wall as I pulled into a parking lot. Ancient white pines shaped by the wind stood along the inner beach, where it seems the wind never stops.

Twenty years ago, on the same beach, I visited a tract of ancient conifers just north of here. I have photos of my family standing on the road, framed by a backdrop of old growth boreal forest. I parked and got out of the car. The smell of pine needles and the sound of distant waves crashing onto the shore delighted my senses. Back then the property was for sale. Today, "my" special place has a new owner. The sign reads "Port Wing Boreal Forest State Natural Area" and I'm grateful that 20 years from now, others can have the same experience. Here, just a few hundred feet from Lake Superior, I am completely sheltered from the wind and it is very still. Looking straight up to the sky, I can see the tops of the ancient trees sway in the wind. Above them, clouds and gulls sail by. I take more pictures and mark this spot as another waypoint, then head north on Highway 13.

Up the road, the town of Herbster provides fuel for my car and me. After enjoying a piece of homemade pie and a cup of hot coffee at a local café, I continue down Bark Point Road, past the Bark Bay Bed and Breakfast and the Cabin Fever Quilt Company. With lovely views of Lake Superior, this area will surely be my future destination for a summer weekend stay.

A new starting point for birding adventures

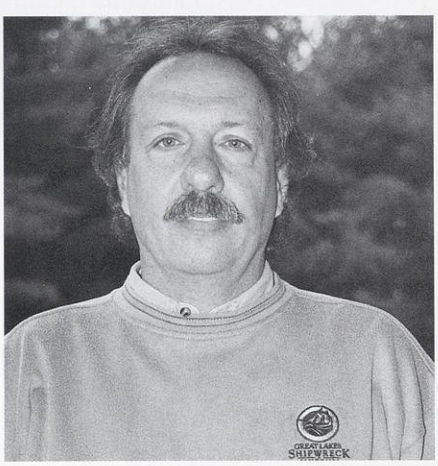
Wisconsin's bogs, grasslands, old growth forests, lakes, streams and rivers offer tremendous opportunities for watching wildlife. Natural diversity draws a variety of spectators who would go to even greater lengths to see it — if they only knew when and where to hit the wildlife peaks. State and federal parks are well known and thoroughly enjoyed, but locals have discovered their own natural gems over the years.

In forming the Great Wisconsin Birding and Nature Trail, we hope to marry information from people who lead bird counts, organize nature field trips, and write field guides with practical tips from the communities that provide the services travelers need. To plan your itinerary, waypoints on the easy-to-fol-

low maps will include phone numbers, addresses and web addresses for chambers of commerce, nearby food, lodging and other fun experiences.

This type of map fits well with current travel trends. Today's traveler is more likely to consider taking shorter (three- to four-day) trips and travels in-state. Using the information provided on the maps, a visitor can find a motel, book a room and make a dinner reservation at a local supper club. Having all the necessary information close at hand allows more time for exploring the great outdoors.

Promoting bird-based recreation is a goal of the Wisconsin Bird Conservation Initiative. Similar Great Birding and Nature Trails are being developed in 14 states nationwide. Many are following the successful ecotourism model Ted Eubanks of Austin, Texas developed for his home state. In 1996 the Great Texas Coastal Birding Trail tapped into a growing market: people who came to Texas's Coastal Bend area to see the whooping cranes, migrating species and shorebirds congregating along the ocean shore and bays. Birding has joined fishing, golf and hanging out at the beach as a major winter and spring tourism draw along the Texas Coast.



TED EUBANKS PHOTO BY TIM EISELE

"Developing a nature-based tourism industry is a worthy goal because Wisconsin is blessed with exceptional natural resources. People want to experience nature as an active, not an idle, participant on their nature adventure."

Ted Eubanks

"Developing a nature-based tourism industry is a worthy goal because Wisconsin is blessed with exceptional natural resources," Eubanks says. "People want to experience nature as an active, not an idle, participant on their nature adventure. Personal enrichment, the chance to be outdoors, to see something new and to learn some new skills are some of the motivations for nature tourism."

Ecotourism is the tourist industry's most rapidly expanding sector and a number of states and communities in the United States view it as a significant part of their economic strategy. By collecting and connecting nature destinations to local tourist services, the Great Wisconsin Birding and Nature Trail maps can add economic value to natural resources. This approach can build an even larger constituency to support conservation work and help people see the value of maintaining healthy ecosystems for future generations.

Bald Eagle Days in Sauk City is one example of how a community can welcome bird watchers. The eagles find good fishing conditions and congregate

Bird-based recreation builds wildlife appreciation. Here, a rehabilitated bald eagle is released during Bald Eagle Days in the Sauk Prairie area.

RICH PHALIN

in large numbers in the trees along the open water of the Wisconsin River below the Sauk City power dam, while quality lodging, good cafés and restaurants provide excellent habitat for human visitors. The festival features talks on raptor behavior and offers other programs of interest to birders. The income generated from this single event is impressive. The local Chamber of Commerce estimates a million dollar impact on the Sauk Prairie area bringing in 1,500 cars of visitors each week in winter. Pancake breakfasts, bus tours, restaurant specials, corporate sponsors and educational programs were spawned by this natural event. The community recognizes the importance and value of Bald Eagle Days and looks forward to the event each year.

(above) As the seasons warm up, the trail may lead to viewing birds, mammals or these painted turtles. *(below)* Places like Park Falls want to draw visitors to see ruffed grouse and explore other sites in town.

Banding likely supporters

Our first step was to catch up with Wisconsin communities that had already created birding trails or were in the process of developing them. National Audubon's Great River Birding Trail located along the Mississippi River, Milwaukee County Park's Oak Leaf Birding Trail, the Horicon Wildlife Refuge Trails, and the Ozaukee County Interurban Trail all signed on to the project.

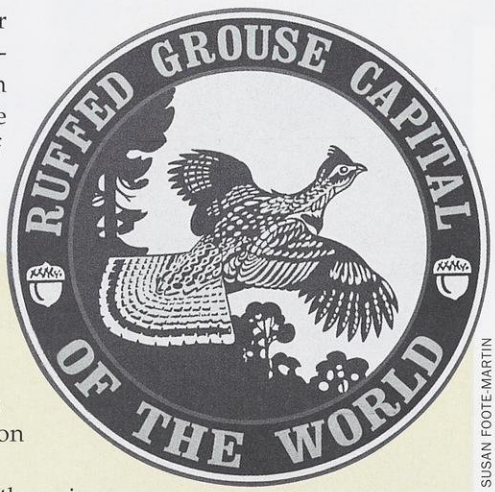
Next, we asked birders and other wildlife watchers to recommend waypoints. At statewide meetings held in November 2002, hundreds of people generously forwarded the locations of their favorite bird and animal haunts.

We also heard a lot of enthusiasm from communities that felt ecotourism would be a healthy, wholesome addition to their region.

Area residents in northwestern Wisconsin seemed especially ready to get involved in such a project, so our pilot project began with the Lake Superior / North Woods Birding and Nature Trail.

The Village Board of Grantsburg in Burnett County passed a resolution supporting the trail, and felt the new Visitor Center at nearby Crex Meadows would be a natural "portal" to welcome visitors to the region. The mix of wetlands, flowage, brush-prairie and forest at Crex attracts an array of wildlife — migrating waterfowl starting in March, sharp-tailed grouse in April, rails, cranes, wrens, warblers, osprey, eagles, geese, pelicans and owls throughout the year. Mammalian inhabitants include deer, bear, ground squirrels, badgers, beaver, mink and muskrats. Frogs, turtles and salamanders are easy to see here as well. We expect to have this first segment of the trail mapped out and ready in Fall 2003. Ribbon-cutting ceremonies are scheduled for October 2003 at Crex Meadows.

Eubanks sees great potential for statewide nature travel. The auto tours along the Great Birding and Nature Trail can bring nature "within arm's reach and a day's travel of every resident in the state," he says. Here, travelers can enjoy spectacular hawk migrations, thousands of staging waterfowl, spawning sturgeon, wildflowers in profusion, heron rookeries and dancing sharp-tailed grouse. By following the Great Wisconsin Birding and Nature Trail with the map as a guide, we hope more people will find a congenial route to outdoor adventures.



SUSAN FOOTE-MARTIN

Getting involved

Nominate your favorite bird and wildlife-watching site by visiting www.fermatainc.com and clicking on the Wisconsin icon.

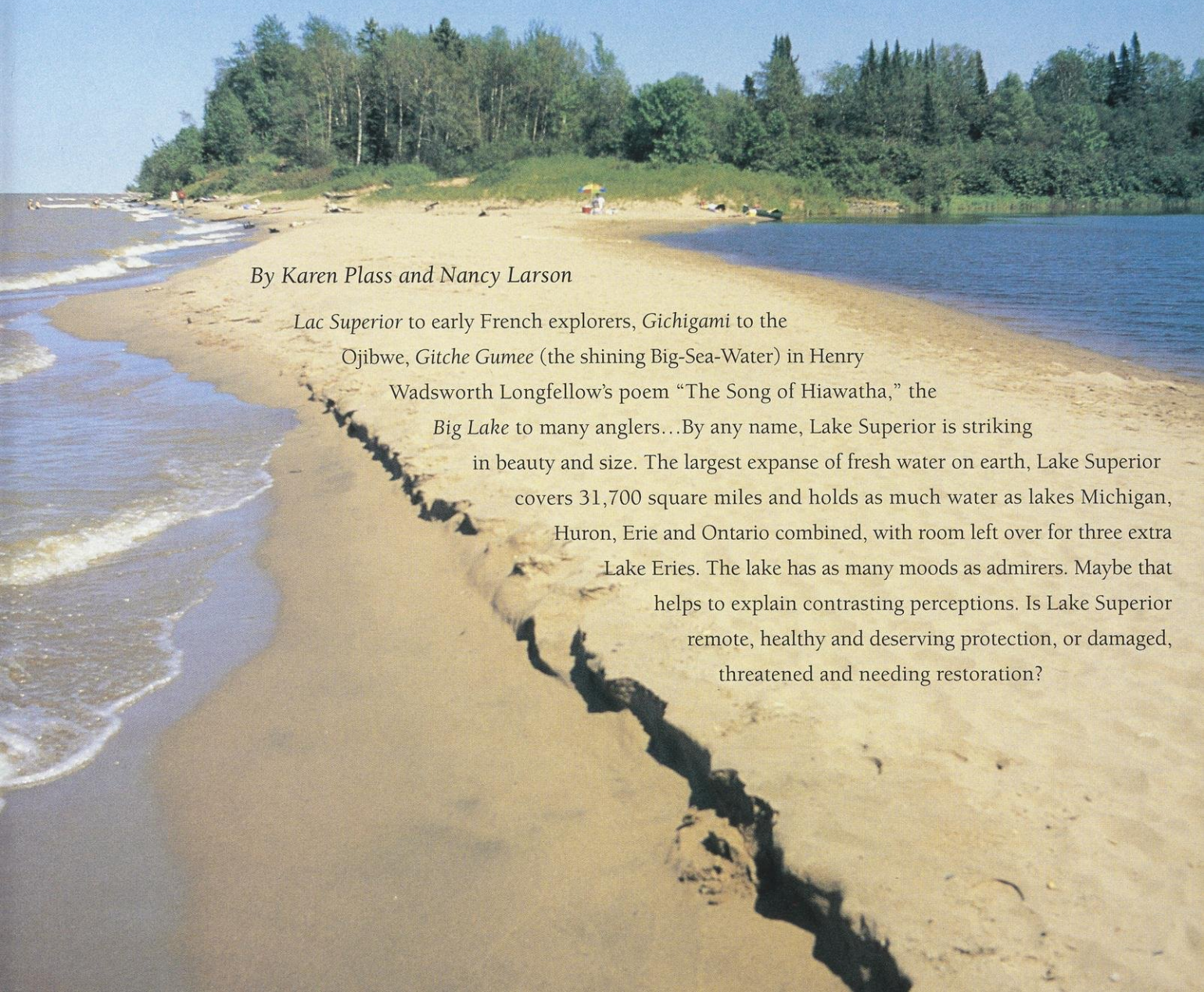
Maps and information will be forthcoming for each of these ecological regions:

- Lake Superior/North Woods Birding and Nature Trail: Spring 2004
- Lake Michigan Birding and Nature Trail: Spring 2005
- Mississippi River Birding and Nature Trail: Fall 2005
- Central Sand Prairie Birding and Nature Trail: Spring 2006
- Southern Savanna Birding and Nature Trail: Fall 2006

Susan Foote-Martin is the coordinator of the Great Wisconsin Birding & Nature Trail program for DNR's Bureau of Endangered Resources.

TEAMWORK *on* WISCONSIN'S NORTH COAST

PROGRESS *in* PROTECTING *the* MASSIVE, *yet* FRAGILE LAKE SUPERIOR



By Karen Plass and Nancy Larson

Lac Superior to early French explorers, *Gichigami* to the Ojibwe, *Gitche Gumee* (the shining Big-Sea-Water) in Henry Wadsworth Longfellow's poem "The Song of Hiawatha," the *Big Lake* to many anglers…By any name, Lake Superior is striking in beauty and size. The largest expanse of fresh water on earth, Lake Superior covers 31,700 square miles and holds as much water as lakes Michigan, Huron, Erie and Ontario combined, with room left over for three extra Lake Eries. The lake has as many moods as admirers. Maybe that helps to explain contrasting perceptions. Is Lake Superior remote, healthy and deserving protection, or damaged, threatened and needing restoration?

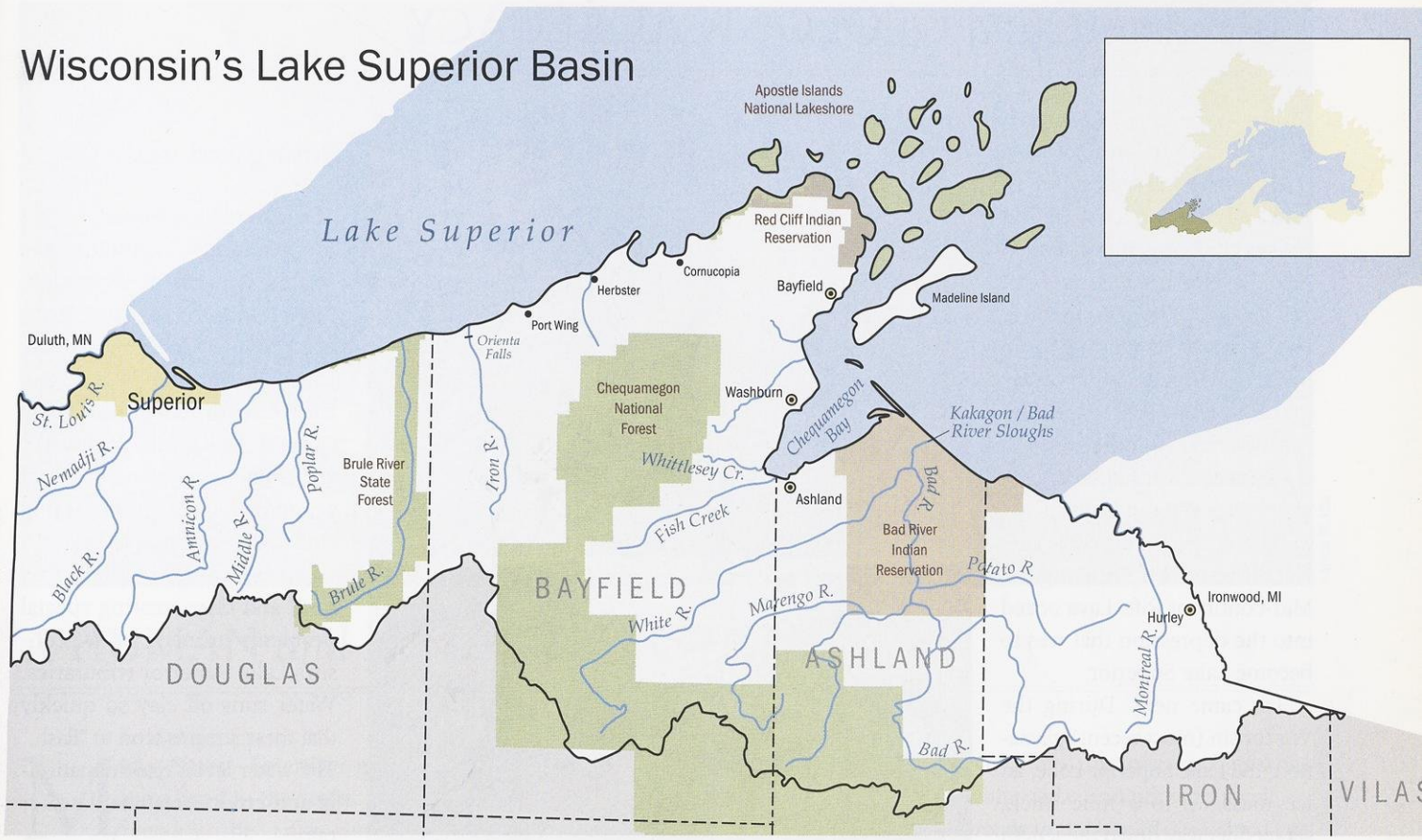
LAKE SUPERIOR: *a* PLACE APART

More than a third of Wisconsin's residents live in a Great Lake county, but less than four percent of Wisconsin's coastal residents live along Lake Superior. The Lake Superior region is seeing increasing recreational development, but it doesn't approach the heavy use on Lake Michigan. Lake Superior is far from the state's population centers, and sometimes from public consciousness, yet six percent of Lake Superior's surface area and 153 miles of its mainland shore lie in Wisconsin. Its waters form a beautiful and environmentally valuable part of the state's northern boundary.

Forces that degraded the environment in other Great Lakes in the last century spared Lake Superior to some extent. The basin's poor soils, cool temperatures and short growing season limited agriculture and intensive industrial and commercial development. Timber, mining and transportation have been the region's economic mainstays. Looking ahead, the region struggles to promote economic development, recreation and tourism without sacrificing its unique environment.

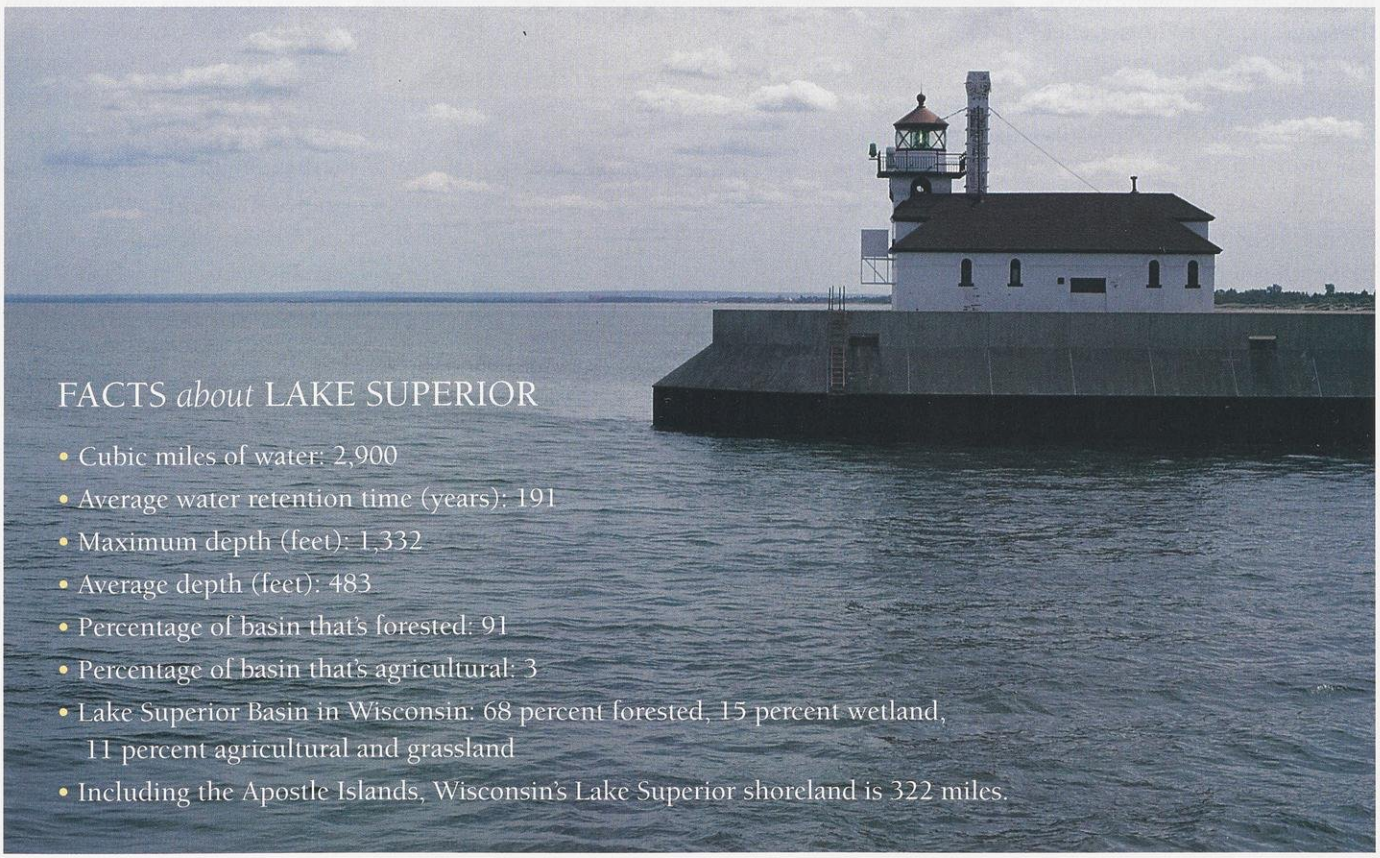
Lake Superior's tributaries and watersheds have not yet recovered from the intensive logging era of the late 19th and early 20th centuries. Many industrial facilities that employed basin residents have closed. As undeveloped land and shoreline is sold into smaller parcels and developed for recreational uses, valuable habitat is fragmented. The emotional connection basin residents feel for Lake Superior is a catalyst for environmental stewardship, but the lake's destiny is also tied to actions taken elsewhere.

Wisconsin's Lake Superior Basin



MAP PRODUCED BY JANEL PIKE AND MOONLIT INK

(left) **A Lake Superior view from Bayfield.** *(below)* **This lighthouse guards the entry to Superior Bay.**



FACTS *about* LAKE SUPERIOR

- Cubic miles of water: 2,900
- Average water retention time (years): 191
- Maximum depth (feet): 1,332
- Average depth (feet): 483
- Percentage of basin that's forested: 91
- Percentage of basin that's agricultural: 3
- Lake Superior Basin in Wisconsin: 68 percent forested, 15 percent wetland, 11 percent agricultural and grassland
- Including the Apostle Islands, Wisconsin's Lake Superior shoreland is 322 miles.

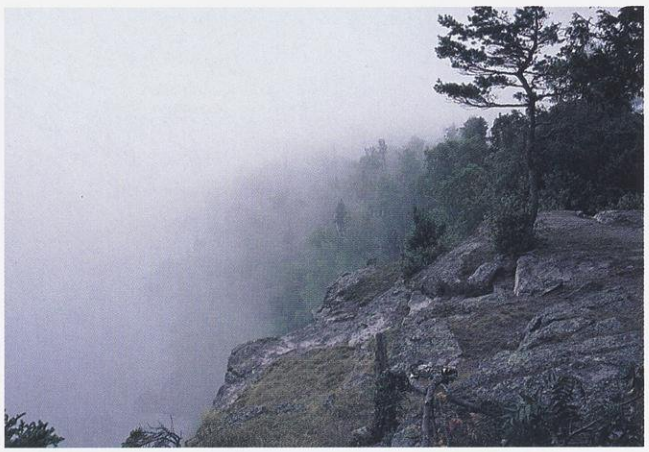
DNR FILE PHOTO

FIRE *and* ICE: *a* GEOLOGICAL LEGACY

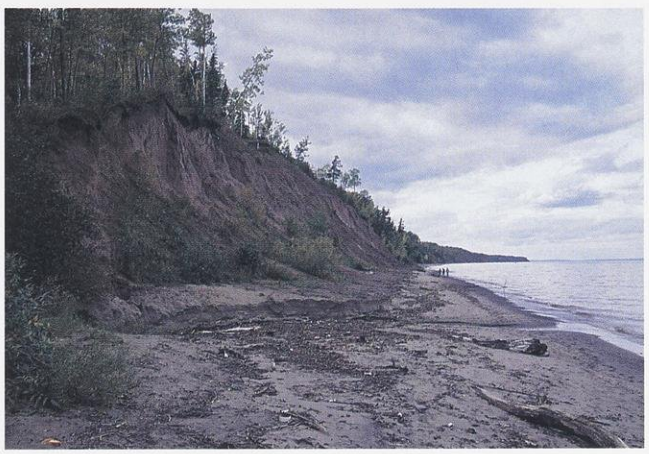
The major forces of Lake Superior's geological past — fire and ice — reflect physical diversity. Broadly speaking, the North Shore in Minnesota and Ontario features exposed lava, while the South Shore in Wisconsin is sandstone, sand and clays. East into Michigan, the South Shore displays clay, shales, exposed lava, conglomerates and sandstone.

About 1.1 billion years ago, North America split along the Mid-continent Rift. Lava oozed into the depression that was to become Lake Superior.

Ice came next. During the Wisconsin (most recent) glaciation, the Lake Superior Lobe, an ice mass up to a mile thick, scraped its way down the length of the valley that was to become the Lake Superior basin. Twelve thousand years ago, this glacier melted, leaving behind Glacial Lake Duluth, roughly 600 feet higher than modern Lake Superior.



KAREN PLASS



KAREN PLASS

(top) **The north shore in Minnesota and Canada features Precambrian lava that resists erosion.** *(above)* **Clay banks at Saxon Harbor in Iron County, Wis. eroded more quickly.**

While Lake Superior's North Shore is rich in dramatic beauty, its South Shore abounds with aquatic and wetland habitat. The South Shore, especially in Wisconsin, features most of Lake Superior's coastal wetlands. The Lake Superior basin still is rebounding from the weight of the glacier, rising faster at Wawa, Ontario, than at Duluth-Superior (by almost 15 inches per century). This rising water level along the southwest shore is creating estuaries and coastal wetlands.

Visitors to Minnesota's North Shore see the results of the ancient Precambrian lava flows in spectacular landforms such as Shovel Point in Tettegouche State Park, and nearby Palisade Head. In Wisconsin, Apostle Islands National Lakeshore visitors delight in the colors and sculpted shapes of weathered sandstone. The islands are actually the tops of submerged sandstone hills, which run up the spine of the Bayfield Peninsula. Pictured Rocks National Lakeshore in Michigan's Upper Peninsula also features a spectacular sandstone shoreline.

The Wisconsin waters of Lake Superior include a healthy slice of the shallower "littoral" zone, which is more productive than the cold, deep water that characterizes most of the lake. The Apostle Islands area, in particular, provides high quality spawning grounds and nursery habitat for fish.

Young and old

The eastern Lake Superior basin in Wisconsin contains the rugged remains of an ancient mountain range — the Penokees, home of Copper Falls State Park. The Bad River begins here. Closer to the lake (along the spine of the Bayfield Peninsula), and extending westward, glacial action left a geologically young landscape: sand and red clay.

Stream valleys cut deep into sand and clay, creating special problems in many of Wisconsin's Lake Superior tributaries. Water runs off clay so quickly that these streams tend to "flash." The water levels rise dramatically and erode streambanks after rain.

Human activity, from extensive early logging to today's road building has dramatically increased runoff and flashiness. Turbid water colored by suspended clay may be seen along wave-pounded clay shores and in post-rainstorm plumes flowing from rivers such as the Nemadji in Superior, Fish Creek entering Chequamegon Bay, the Bad east of Ashland, and the Ontonagon in Michigan. Although deposits of eroded sand are less obvious, fish biologists consider sand a greater problem, because it can bury fish habitat.

KAREN PLASS

A HUMAN *and* NATURAL HISTORY

Many Native American groups have lived in the region, most recently the Lake Superior Chippewa (Ojibwe or Anishinabe). The treaty of 1854 opened the region to industrial mining and logging and set up reservations. Today, Chippewa tribal governments manage natural resources from several reservations around Lake Superior and maintain their interests in off-reservation resources assisted by organizations such as the Great Lakes Indian Fish and Wildlife Commission.

In the late 1800s and early 1900s, fishing, mining and logging interests exploited the Lake Superior basin. Logging companies clear-cut their way across Lake Superior's South Shore. Historic photos show a denuded landscape. Streams were straightened and "cleaned out" for log drives, and further damaged by runoff. Sawmill waste and sunken timber remain in some rivers and bays.

Wildfires raged across parts of the basin. Although fire, a natural process, is necessary for creating and maintaining some habitats, slash left behind by lumberjacks fueled unnaturally hot and vast wildfires, which raged across parts of the basin. Fire consumed the forest's organic duff layer — the natural litter that had covered the forest floor and had prevented erosion by slowing water during rain storms and snowmelt, and storing water like a sponge. Fire also changed forest composition, sometimes eliminating the seed source for native trees such as white pine, white cedar and other conifers.

DNR FILE PHOTO

(top) **Commercial fishing.** *(above)* **Ake-winzie, nicknamed Old Patch, signed three treaties with the government in the mid-1800s, including one in Superior.**

Railroads in the late 1800s helped create spectacular population growth. The Twin Ports of Duluth and Superior grew from 4,000 in 1870 to 120,000 by 1910. Resources from the Lake Superior region — timber, fish, ore and stone — flowed to distant markets over the rails and via ship. "Brownstone" quarried from the Bayfield Peninsula and Apostle Islands graces many buildings in Chicago and New York.

The region is rich in minerals. During the 1800s, copper, iron and, to a lesser extent, silver and gold mines developed around the lake. Iron ore shipped from Ashland came from mines throughout the Gogebic-Penokee ranges in Michigan's Upper Peninsula and Wisconsin. Because many of these deposits were narrow and deep, early operations were underground, and 11,000 miles of underground tunnels created a huge demand for timber. The Gogebic Range was most active in the 1880s, with the last iron mine closing in the 1960s. Copper mining in Michigan's Upper Peninsula continued into the 1990s. Some open-pit

EXOTIC SPECIES

One cost of shipping is that vessels unintentionally transport exotic (non-native) species in ballast water tanks. These exotics spread to new locations when ballast water is discharged. Several of these exotic species from distant parts of the world now call Lake Superior home, including the ruffe, round goby, zebra mussel and spiny water flea (a tiny crustacean). Nearly 70 percent of ballast water discharges on the Great Lakes occur on Lake Superior, many in Duluth and Superior.

Of the many exotic species in the Great Lakes, the sea lamprey, which entered the Great Lakes through shipping canals, poses the greatest fishery threat. Now controlled at about 10 percent of their all-time high, lamprey barriers must continue for the Great Lakes fisheries to survive.

Sea lamprey attach to fish using their sucking-disk mouths. Their toothed tongues rasp holes in fish and they feed on body fluids. Growing as long as a 17 inch garden hose, adult sea lamprey can live 12 to 20 months and consume 30 to 40 pounds of fish.

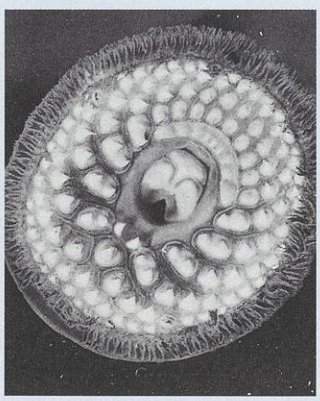
The sea lamprey population exploded in the early 1950s, decimating Lake Superior's lake trout harvest, which dropped from 1,813 metric tons in 1953 to 188 in 1961. During the 1950s, control included electrical barriers and then the chemical TFM (3-trifluoromethyl-4-nitrophenol), which kills larval sea lamprey in streambeds. The chemical cut sea lamprey catches on Lake Superior, from a record high of 50,975 in 1961 to 7,303 in 1962. Chemical treatment can be effective in all but the largest rivers, but is labor intensive, expensive, and can harm desirable species.

Wisconsin's Bois Brule River, a renowned trout stream, is also a great sea lamprey producer. Between 1973 and 1978, 30 to 50 percent of all sea lamprey captured on U.S. tributaries to Lake Superior were caught there.

As an alternative to chemical treatment, barriers were constructed in the 1980s to keep sea lamprey out of two Wisconsin tributaries: the Bois Brule and Middle rivers.

A low-head lamprey barrier was also constructed on the Iron River in 2001, during removal of the Orienta Dam. The Brule barrier includes a fish ladder with an underwater viewing window. In 1986, its first year of operation, 7,017 sea lamprey (2,142 in one day!) were trapped and removed from the Brule.

(left) **Sea lamprey invaded from the St. Lawrence Seaway through the Great Lakes. Sucking-disk mouth shown here.** *(right)* **A lamprey barrier on the Bois Brule river.**



DNR PHOTO FILE

ROBERT QUEEN

taconite (low-grade iron ore) mines continue today on Minnesota's Mesabi Range.

Shipping

Shipping has long been a part of life and legend on Lake Superior. Some 350 shipwrecks attest to the lake's power. The Duluth-Superior Harbor, the largest Great

COPIED BY STABER W. REESE

A steam hauler in 1910 is loaded with hemlock logs taken from northern Wisconsin.

Lakes port, shipped 36.5 million metric tons of cargo in 2001. Top bulk commodities are taconite (bound for steel mills on the lower Great Lakes), low-sulphur western coal (arriving by rail for power plants on the lower lakes) and grain (arriving by truck and train for overseas markets).

Ted Smith, retired DNR's Lake Superior Basin Water Team Supervisor, cited the Twin Ports as a model of peaceful coexistence between commercial navigation and environmental interests, partly because dredging to maintain shipping channels has been greatly reduced.

DNR FILE PHOTO

Iron ore docks at Superior. Shipping is a way of life here.

RESTORING LAKE TROUT: SUCCESS, *with a* CAVEAT

Lake trout, lake whitefish and lake herring are sold commercially, and lake trout are fished for sport.

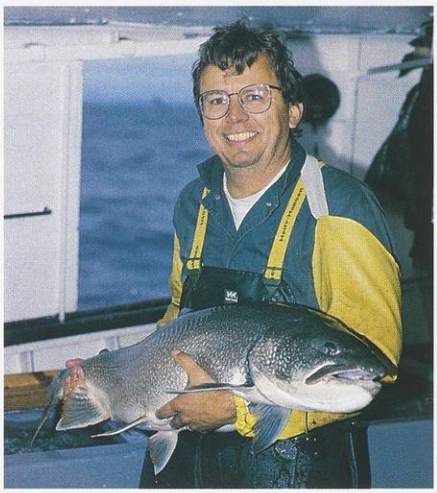
Commercial fishing began in the 1830s and increased in intensity over the next century. Lake whitefish were heavily fished in the Wisconsin waters in the 1870s and 1880s. Over-fishing had already taken its toll on lake trout, lake whitefish and lake herring populations by 1938, when sea lamprey reached Lake Superior.

"Lake whitefish, the most sought-after species, were more shore-oriented than lake trout," said DNR fish biologist Dennis Pratt. "When whitefish numbers got low, fishermen turned to lake trout. When sea lamprey arrived, they nearly eliminated the depressed lake trout populations. Lake herring sustained the commercial fishery into the 1950s, but by the 1960s, herring numbers were down, too."

The 1960s were a low point for the lake's fishery.

Special effort was put into restoring the lake's top native predator — the prized lake trout. Since the 1960s, management efforts have reduced lake trout mortality by managing lamprey predation and human harvest. Wisconsin created two fish refuges where limited lake trout fishing is allowed: Gull Island Refuge (1976) and Devils Island Refuge (1981). Gull Island Reef is one of the few places where a remnant lake trout spawning population survived the lamprey invasion.

While reducing lake trout mortality, biologists increased fish numbers by stocking fish and eggs. They placed some fertilized eggs inside Astroturf bundles on Devils Island shoal, hoping the fish would return as adults to spawn.



SCOTT HULSE

Steve Schram holds this large lake trout netted during fish surveys.

"We are beginning to see the results of that work, as the fish reach spawning age," said DNR fish biologist Steve Schram. These lake trout are slow growing, and can reach a ripe old age.

"We have caught 42-year-old trout," he said, "and we suspect others are even older."

Lake Superior lake trout have recovered sufficiently enough that stocking is no longer necessary in most locations. Lake whitefish and lake herring also rebounded. Two relatively new species originally stocked in Lake Superior by the State of Michigan — coho and chinook salmon — have become naturalized and are reproducing on their own. Coho salmon are the second most commonly caught sport fish in the Wisconsin waters of Lake Superior.

Lake trout, coho salmon and chinook salmon grow faster and larger in Lake Michigan, but they don't reproduce there.

"In Lake Michigan, all the major game species are stocked. With so much natural reproduction here, we have different management challenges," Schram said.

Lake trout have recovered on Lake Superior, but there is a catch. There are two primary strains of lake trout: lean lake trout and siscowet, which can be 70 percent fat by weight. Historically, there were more lean lake trout than siscowet, but we now have more siscowet.

While fat helps fish regulate buoyancy in deep water, people don't want oily fish. Jim Kitchell, a fishery ecologist and Director of the Center for Limnology at the University of Wisconsin-Madison, called this Superior's blessing and curse.

"The blessing is that the lake is almost 'full up' with lake trout. The curse is they aren't the kind people want," Kitchell said. "Siscowet are long-lived and grow at half the rate of lean lake trout, so there is a huge mortgage to pay, with the currency being the lake's forage species: smelt, herring and sculpin."

That's a big price to pay in a lake where fish reproduce and grow so slowly.

NANCY LARSON

POLLUTION PROBLEMS: *from* MERCURY *to* PCBs

Though relatively undeveloped, Lake Superior has its share of pollution problems. Although the fishery is much improved, fish consumption advisories attest to Lake Superior's vulnerability to persistent toxic substances.

These pollutants ride the atmosphere, sometimes over great distances, and settle in Lake Superior. Slowly, they move through the food chain. PCBs and pesticides persist in part because water moves very slowly through the lake. The average water molecule remains in the lake for 191 years.

Lake Superior is the cleanest of the five Great Lakes in terms of nutrients, and Lake Superior fish typically have lower PCB and pesticide levels than fish from the other Great Lakes. Nevertheless, researchers are discovering that mercury may pose a greater problem in Lake Superior.

KAREN PLASS

(top) **A storm rolls in over Chequamegon Bay.** *(above)* **Shipping coal. Both water drops and pollutants can reside for centuries in this lake, which flushes out very slowly.**

Mercury — an environmental threat

"It's surprising," said Jim Hurley, a former DNR mercury researcher and now Assistant Director for Research/Outreach at the University of Wisconsin Aquatic Sciences Center. "You would perceive Lake Superior as a pristine lake and watershed, and yet, you have higher levels of methyl mercury accumulating in these fish than in urban areas, such as rivers and bays at cities on Lake Michigan."

Mercury is a heavy metal that can exist as a gas, liquid or solid, but its environmental consequences depend on whether it's inorganic or organic. Bacteria transform the metal into methyl mercury that accumulates in the food chain. Lower levels are found in algae and invertebrates, while higher levels build up in fish and other predators.

Mercury enters the environment from coal-fired power plants, metal ore processing, incinerating mercury-containing products, old paints and chemicals and, to a lesser extent, from natural sources. Recent trends show slight declines in global airborne mercury, but mercury emissions from developing countries are a concern. A fraction of mercury from a particular source is deposited locally and a fraction enters the global mercury pool.

Bacteria in Lake Superior's extensive forests and wetlands transform inorganic mercury into methyl mercury, which can build up in the food chain, he said. Reducing toxic pollutant emissions locally, statewide, nationally and internationally will be important for protecting Lake Superior from substances like mercury that build up in fish and wildlife.

BINATIONAL PROGRAM *puts* LOFTY GOALS *into* PRACTICE

When the governors of Wisconsin, Michigan and Minnesota signed the Binational Program to Protect and Restore the Lake Superior Basin agreement in 1991, they recognized that this lake deserved special attention. For 12 years, the Lake Superior states have worked with the U.S. and Canadian governments, the tribes and others to design and carry out a strategic plan for Lake Superior and its drainage basin. The Lake Superior Forum, a citizens' group from the United States and Canada, has been an important partner.

"It hasn't always been easy," said Chuck Ledin, DNR Great Lakes Section Chief, who served as the first U.S. Co-chair of the Binational Program's workgroup, "but from the start, our goal was to develop and share common goals. We all have slightly different authorities, approaches and issues, but we are trying to protect the same resource."

In the 1980s, the aim of many Great Lakes environmental activists was "zero discharge" of toxic substances. The Lake Superior Binational Program includes a zero discharge goal for nine pollutants dubbed the "nasty nine" because they are toxic and accumulate over time.

Many communities and industries around the basin are working on ways to prevent these pollutants, particularly mercury, from entering Lake Superior. Consumer and commercial products such as thermometers, thermostats, switches, button batteries, fluorescent bulbs and dental amalgam can be a significant source of mercury. Industrial raw materials can also contain unwanted mercury.

It's more efficient and economical to keep these materials from entering the waste stream, rather than remove them later, at the end of pipe or top of the smokestack.

Community-based education and outreach activities are the foundation of the Zero Discharge Demonstration Program. By educating communities, working with industrial wastewater customers and offering hazardous waste collections, Duluth's Western Lake Superior Sanitary District markedly reduced its mercury discharges in the 1990s.

Their "Blueprint for Mercury Elimination" (1997) provided guidance for other wastewater treatment plants. In Wisconsin, Superior's wastewater treatment plant is a regional leader in pollution prevention outreach, providing support to other communities around the lake. Ashland, Superior and Duluth prohibit the sale of many mercury-containing products.

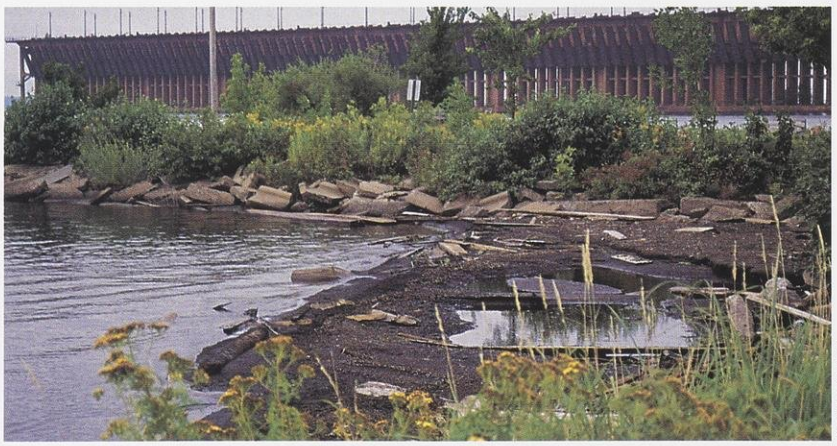
Contaminated sediment

Lake Superior's nearshore areas and shallow bays — the most biologically productive part of the lake's ecosystem — are crucial to the lake's aquatic life. At several sites around the basin, sediments remain contaminated from past industrial practices, degrading valuable shallow water habitat and acting as a continuing source of contaminants to fish and wildlife.

Because of contaminated sediments and other problems, the International Joint Commission designated eight areas around the lake, including the lower St. Louis River between Duluth and Superior as Areas of Concern. Cleaning up contaminated sites is expensive, but vital to the lake's health.

(left) **Welcoming you to the Lake Superior Watershed. Partners in Canada and the United States agree that protecting the lake is a worthy joint effort.** *(right)* **Cleaning up the Ashland Superfund site would restore habitat and recreation uses.**

NANCY LARSON



KAREN PLASS

PROJECT REDUCES MERCURY

"We looked at the ways mercury in our community could get into our treatment plant or into the environment, and worked on educating and giving people alternatives," said Diane Thompson, Superior's Pretreatment Coordinator.

With federal and state funding, staff held workshops for health care workers, teachers and building contractors. In 1999, they surveyed municipalities around the basin and sponsored a pollution prevention workshop that spurred basin-wide collaboration.

CITY OF SUPERIOR

Students learn about ways to reduce mercury by collecting mercury-containing products from their schools and homes.

Energy efficiency is an important goal, since burning coal to produce energy is a major source of mercury. Fluorescent tubes are energy efficient, but contain enough mercury to cause environmental problems if they aren't recycled. Superior's wastewater treatment plant and local businesses initiated a fluorescent tube recycling program for county residents.

The Northwest Wisconsin Regional Planning Commission (NWRPC) Northwest Cleansweep Program offers collection opportunities for mercury-containing products and other household hazardous wastes. Residents have given more than 7,000 mercury-containing items such as thermometers and thermostats to Superior and Northwest Cleansweep. Thompson estimates they have removed over 350 pounds of mercury since 1999.

Schools and students have been important allies. Thirty schools participated in the Northwest Wisconsin Mercury Free Schools Project in 2001.

Pledging to get mercury out of buildings, schools conducted audits to locate mercury and other hazardous materials on site. Students developed skits, essays, songs and posters, and organized a thermometer exchange.

A Maple, Wis., high school turned in, from their science labs, almost a dozen Boyle's Law apparatuses. These outdated pressure-measuring devices contained two pounds of mercury each!

"We were happy to remove so much mercury from circulation," said Bill Welter, NWRPC administrator for Northwest Cleansweep.

A HOME *for* DIVERSE HABITAT *and* ECOSYSTEMS

Home to five national parks, lakeshores and marine conservation areas, as well as several state and provincial parks, Lake Superior is renowned for its beauty. A significant portion of the basin is publicly owned. On private land, however, big changes are taking place. Previously undeveloped shoreland is being divided and sold for homes. Forests are being fragmented by rural sprawl. Since land use planning and decisions are made locally, ecosystem protection rests largely with local citizens and governments.

ROBERT QUEEN

Development is a critical issue facing communities like Bayfield.

Just as on inland lakeshores, development pressure is growing along the basin's rivers and Lake Superior shore. Large tracts are being carved up, causing habitat fragmentation, said DNR Lake Supe-

rior Water Supervisor Duane Lahti.

"The old lake cabin had minimal cut vegetation. You hardly knew it was there. Those cabins have given way to $250,000 to $500,000 homes with big garages and large, cleared areas. The lake cabin is no longer a cabin," he said.

The problem with such development is the cumulative effects of clearing shoreland, losing shoreland habitat and increasing runoff rates.

Protecting and restoring quality habitats in the basin, is an important Binational Program goal. The first step has been to identify important habitat sites.

Lake Superior resource agencies are using computers to map habitat areas and evaluate ecosystems basin-wide. Wisconsin's intensive surveys in the mid-1990s documented the biological richness and functions of our coastal wetlands and other important wetlands in the basin, and the state places a high priority on protecting them.

Eric Epstein, an ecologist with the DNR's Bureau of Endangered Resources, describes the estuaries, sandscapes, and wave-carved sandstone cliffs of the southwestern Lake Superior shore as among the rarest and biologically richest environments in Wisconsin. Many highly specialized plants and animals only live in these habitats and locales. The extensive wetlands provide critical stopovers for migratory birds, safe havens for fish and other aquatic organisms, and matchless opportunities for biological study.

"Our surveys in the 1990s found marsh, meadow, and fen, each with interesting and sometimes dazzling plant and animal communities," Epstein said. "Even the coastal features in and around the City of Superior that are often overlooked. These perched wet meadows and shrub swamps so common on the red clay soils can harbor a wealth of biological diversity found at few other locations."

The lowland forests of the lower Bad, Brule, and Nemadji river corridors also contain unique plant communities. The spring-laced cedar swamps of the Brule support one of the region's most notable concentrations of rare plants and animals.

Valuable habitat: opportunities

"There is an amazing amount of relatively undisturbed native ecosystems, both terrestrial and aquatic," said Tom Duffus, Northeast Minnesota Program Director for The Nature Conservancy (TNC).

On the U.S. side of the basin, TNC has identified 11 priority conservation areas for biological diversity. These include the St. Louis River estuary, the Brule River State Forest, and a conservation area encompassing the Kakagon/Bad River sloughs, Fish Creek sloughs, the Bibon Swamp, the Apostle Islands and key areas of the Bayfield Peninsula.

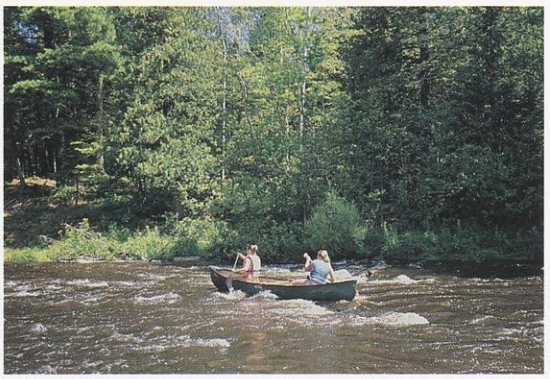
"The Lake Superior basin has opportunities for managing large

Bicyclists and gulls are among those attracted to Bayfield.

ROBERT QUEEN

ROBERT QUEEN

tracts of forest that haven't been irreversibly damaged," said Pat Collins, Lake Superior habitat coordinator with the Minnesota DNR and former co-chair of the Binational Program's Habitat Committee. "A lot of the land in the basin is forested. It's altered, converted from mostly conifers to hardwood and aspen-dominated forests, but it's not all farmland; it's not urban. This gives us a chance to manage resources at a scale that a lot of places don't have. What it requires is a level of cooperation across ownerships and among governments that's difficult to achieve."



ROBERT QUEEN

Canoeists maneuver the Brule River. Large tracts of forested, undeveloped shoreline provide opportunity to limit human intrusions.

A TEAM EFFORT *for* RECOMMENDING SPECIAL DESIGNATIONS

"Lake Superior is special, sensitive and unique and deserves a special designation."

This was the first consensus of a group invited in 1998 by former DNR Secretary George Meyer to develop recommendations for Lake Superior, and advise state government and help implement the Lake Superior Binational Program.

NANCY LARSON

Partners come to the table as part of the Lake Superior Public Advisory Team.

The 40-member Lake Superior Public Advisory Team represents a broad cross section of locals, including elected officials and tribal representatives, business, industry and environmental groups. The team started by exploring mercury reduction and priorities for Wisconsin's share of the Great Lakes Protection Fund before moving on to look at even bigger issues.

In August 2002, the group presented then DNR Secretary Darrell Bazzell with a recommendation to give the Lake Superior basin in Wisconsin a special designation equivalent to Lake Superior's designation by Minnesota and Michigan. The group coined the name "International Lake Superior Resource Waters." This would set special conditions to prevent increased point source discharges of toxic pollutants. The team also recommended extending Wisconsin's Outstanding Resource Water designation into areas of the lake. While the lake itself is not classified as an Outstanding Resource Water, some tributaries to the lake are Outstanding Resource Waters. As such, they are afforded the state's highest level of environmental protection with the objective to not allow any lowering of water quality.

The team recommended extending ORW classification into pockets where the lake meets tributaries such as the Brule River, and the Apostle Islands.

The Advisory Team stressed its interest in land use, watershed management and tributary health. Their emphasis is on pollution prevention, protecting critical habitat, and maintaining and restoring the water quality.

"Lake tributaries are in trouble," said Ruel Fleming, a Wisconsin Conservation Congress member from Herbster, and Advisory Team member. "We need to do something about streambank erosion."

"After more than three years and 30 meetings, the group reached consensus on special designations," said facilitator Mike Kroenke, University of Wisconsin-Extension Lake Superior Basin Educator.

"The Lake Superior special designation issue has a long and difficult history, but the team worked hard and made great individual compromises in order to achieve consensus for the greater good of the lake," Kroenke said. "Team members have such strong emotional connections to Lake Superior that they continue to work together, despite differences."

LONG-TERM CHALLENGE: RESTORING TRIBUTARIES

One reason we can restore lake-spawning species like lake trout, lake whitefish and lake herring is that their habitat stayed generally unaltered, said DNR fish biologist Dennis Pratt. It won't be that simple for stream-spawning species such as walleye, northern pike, brook trout and lake sturgeon.

"Restoring the stream fishery is tougher due to tremendous damage that's been done to the watersheds. Compared to the lake, the tributary and river-mouth estuary habitats have been highly degraded," Pratt said.

Stream watersheds were changed by logging, forest fires and ditches to drain agricultural lands and road construction.

"We had a forest-protected watershed. The problem is that we have changed the land so it sheds water more quickly to the streams, creating erosion and increasing channel size. Stream channels in clay don't snake back and forth. Now they cut down, or incise. As they straighten out, they remove wood and increase their slope, becoming culverts of fast moving water," Pratt said. "The upper Fish Creek channel has incised nine feet since 1947, and the lower stream channel is three feet higher because of sand deposited there."

Tight clay soils and loss of original ground cover allow rapid runoff into tributary streams. This increased flow carves at streambanks and bluffs, which accelerates erosion. Rapid runoff can damage bridges and culverts, and can seriously degrade instream habitat, including gravel beds where brook trout spawn.

Brook trout, the only native stream trout in the Great Lakes, are a good indicator of coldwater stream health. Years ago, legendary Chequamegon Bay brook trout, large sized and easily caught, were depleted by anglers. At one time, brook trout in Wisconsin's South Shore streams could connect to the lake, but today they thrive mostly in disconnected stream headwaters, Pratt said.

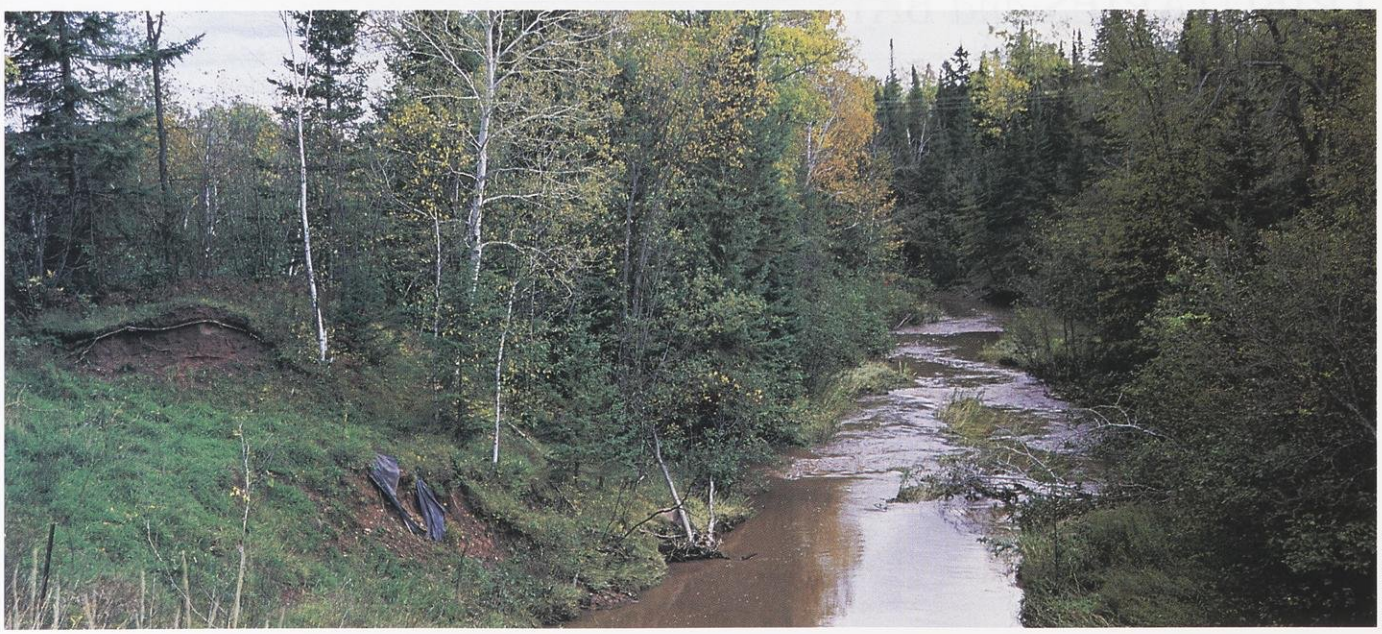
There is much interest in trying to restore "coaster" brook trout, formerly found along some areas of the Lake Superior shore. Recent research suggests that coasters are not a unique variety of brook trout, but are fish that move out of streams and live along the shore, where they grow more quickly. At maturity, they return to their home stream to spawn. "If this is the case, we would need to significantly improve our watersheds that drain to brook trout streams before they could export many 'coasters' to the lakeshore habitat," Pratt said.

He adds that we can improve the watersheds, but there are no quick fixes.

"Restoration may be a very long-term goal," Pratt said. "We need to work together, improving watershed conditions, to restore the quality stream habitat that brook trout require. We can identify important spawning areas and work with upstream landowners to avoid harvesting too much timber at once from critical watersheds."

(below) **Sturgeon stocked in the St. Louis River.** *(bottom)* **Fish Creek is a victim of stream bank erosion. Fish habitat has been filled in.**

DENNIS PRATT



KAREN PLASS

RECLAIMING ORIENTA FALLS

In 2001, Xcel Energy (formerly Northern States Power) removed an old power dam from the Iron River, about 1.5 miles above where it enters Lake Superior. What had become a warmwater flowage as large as 144 acres became, once again, 1.2 miles of trout stream.

"This was a major victory for the environment," said Duane Lahti, DNR Lake Superior basin water supervisor, who has worked on this project on and off since 1985. "A river system has been reconnected here. An ugly barrier was removed from the sandstone outcrop known as Orienta Falls, which old newspaper articles called the most scenic site in Bayfield County."

At the falls, water drops 15 to 20 feet over a distance of 200 feet.

The original hydropower dam, constructed in 1923, was destroyed by a flood in 1946. A replacement dam 56 feet high operated until 1985, when it was severely damaged by a flood. Before final dam removal, the DNR and Great Lakes Fishery Commission constructed a low-head barrier to keep sea lamprey and migratory fish out of the 56 miles of trout stream in the Iron River watershed.

ROBERT QUEEN

Orienta Falls got a new life when the crumbling hydrodam was removed.

Many people favor returning the Iron River to a migratory stream, but there are also concerns about potential impacts of migratory fish on resident fish and on the Iron River National Fish Hatchery on Schacte Creek, a headwaters tributary. Until a management plan is developed, fish migration from Lake Superior will remain blocked. In the meantime, the river is returning to a more natural state. Below the old dam site, lake-run salmon and trout are reproducing once again.

WATERSHED PARTNERSHIPS: BRINGING NEW LIFE *to* TRIBUTARIES *and* BAYS

Broad-based watershed groups are making a difference on Lake Superior tributaries. Groups include the Knife River Forest Stewardship Committee in Minnesota, Miller Creek Task Force and Joint Powers Board in Minnesota, St. Louis River Citizens Action Committee and Nemadji River Basin Project in Minnesota and Wisconsin, Sioux River Watershed Council and Bad River Watershed Council in Wisconsin, Central Lake Superior Watershed Partnership in Michigan, and the Ontario Heritage Coast project in Canada.

St. Louis River Estuary

In 1989, the Minnesota Pollution Control Agency and Wisconsin DNR organized the St. Louis River Citizens Advisory Committee (CAC), representing resource management agencies, harbor industries, environmental groups and the public. The CAC helped develop the St. Louis River Remedial Action Plan to restore, protect and enhance the St. Louis River. The CAC evolved into a nonprofit organization that continues to advocate for the river.

Many remember when people didn't eat fish from the lower river because they had a bad smell and taste from wastewater discharges. Several contaminated sediment hot spots exist in the estuary, including two Superfund sites in Duluth, and Newton Creek/Hog Island Inlet in Superior. Despite localized problems, water quality has improved tremendously over the last two decades, from wastewater treatment improvements in Superior and Duluth.

The results have been impressive.

"We've recovered 11,000 acres of fish

habitat as a result of the Clean Water Act. Because we cleaned up our industrial and human waste, fish populations are recovering," said DNR fish biologist Dennis Pratt. "The improvement in water quality in the St. Louis River is probably northern Wisconsin's largest fisheries restoration project. More people know about recovery of the Wisconsin River, Fox River, Green Bay, Lake Erie — this is the same thing. This is 'the other one.'"

He considers wastewater treatment workers "fish guardians."

The St. Louis River is famous for walleye. The fishery is self-sustaining except for muskie and lake sturgeon. Fish biologists hope to restore lake sturgeon. Stocked sturgeon have survived, but won't spawn until about age 25. The biologists will have to wait a few more years.

The St. Louis River estuary has tremendous ecosystem value.

"The estuary is surprisingly natural," said Tom Duffus, Northeast Minnesota program director for The Nature Conservancy. Lynelle Hanson, executive director of the St. Louis River Citizens Action Committee (CAC), stresses that the St. Louis River is not only the largest U.S. tributary to Lake Superior, it is the headwaters of the Great Lakes system. Hanson, an avid birder, notes that 226 bird species and 53 native fish species use the river and estuary. "Also, 138,000 people live in the lower watershed and 92 industries rely on the river."

Pat Collins, Lake Superior habitat coordinator with the Minnesota DNR, attributes the significance of the St. Louis River to its huge size, great diversity of plants and habitats, and fine quality.

"The numbers and diversity of all the species that use the estuary is pretty amazing," Collins said.

Hanson, Duffus, Pratt, Collins and others helped develop the CAC's new Lower St. Louis River Habitat Plan. Biologists from both states pooled their knowledge of the estuary, noting which areas are important to various species at different life stages.

(below) **An aerial view of the St. Louis River at Oliver.** *(bottom)* **A wastewater treatment plant in Superior.**

DNR FILE PHOTO

KAREN PLASS

Land acquisition

Two land acquisition projects in the 1990s aimed to protect the St. Louis River for the future:

- The Wisconsin DNR purchased about 6,200 acres in the St. Louis River Streambank Protection Area, which includes 14 islands, extensive wetlands and roughly five miles of shoreland in the upper estuary. The project protects almost the entire steep, clay watershed of the Red River, a trout stream. The land adjoins habitat in the St. Louis River where 99 percent of the walleye from the western arm of Lake Superior are believed to spawn and where it is believed lake sturgeon will spawn.
- Minnesota Power, the St. Louis River Board and the Minnesota DNR permanently protected some 22,000 acres along the upper St. Louis River in Minnesota.

PROTECTING *the* BAYS, STREAMS *and* EVERGLADES *of the* NORTH

KAREN PLASS

Northern Great Lakes Visitors Center in Ashland.

NANCY LARSON

Kayaking the wetlands on the St. Louis River.

Chequamegon Bay, adjoining Ashland and Washburn, covers 53 square miles with an average depth of 28 feet, and maximum depth of 61 feet. Its watershed, fed by more than 2,100 miles of streams, covers 1,440 square miles, making it the largest single watershed on Lake Superior's South Shore.

Coastal wetlands ring the bay at the mouths of several streams, notably Fish Creek Sloughs near Ashland, and the Sioux and Onion rivers between Ashland and Bayfield.

The 16,000-acre Kakagon and Bad River sloughs on the Bad River Indian Reservation form the largest undeveloped coastal wetland complex on the upper Great Lakes. These "Everglades of the North," the only remaining location where wild rice is abundant on Lake Superior, produce nearly 20,000 pounds of rice each year. The U.S. Department of the Interior designated Kakagon Sloughs as a National Landmark because it is home to many threatened and endangered species such as the trumpeter swan, yellow rail, bald eagle and wood turtle.

The U.S. Fish and Wildlife Service, which created the 540-acre Whittlesey Creek National Wildlife Refuge in 1999, is working with local landowners to protect and restore another 1,240 acres. Studies of Whittlesey Creek, Fish Creek and other streams are helping resource management agencies understand the unique characteristics of red clay streams and understand how (and how much) land uses have accelerated streambank erosion and sand deposition in streambeds.

The Northern Great Lakes Regional Visitor Center opened near Whittlesey Creek in 1998. The center offers environmental education programs to address critical natural resource issues in the Lake Superior basin.

A positive imprint

The good work being done in Wisconsin is just part of work being done by agencies and organizations all around the basin. Lake Superior has many moods, many colors, many friends. Its renowned size, awesome power and striking beauty impress those who visit the lake. Those lucky enough to live near it resist leaving, although the economy usually seems greener elsewhere. The challenge is to do as little harm and as much good as possible: to recognize and preserve the things that sustain this remarkably intact ecosystem, and to restore key environmental functions that have been damaged by human activities. Our best hope is to learn to coexist with the lake and its watershed, so future generations will inherit Lake Superior in all its glory.

Produced by the Wisconsin Department of Natural Resources

Authors: Nancy Larson is Wisconsin DNR's Lake Superior program coordinator. Karen Plass is a former Lake Superior specialist with the Wisconsin DNR and former executive director of the St. Louis River Citizens Action Committee. Plass currently works for the University of Minnesota-Duluth.

Design: Moonlit Ink

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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.

Also funded in part by the Wisconsin share of the GREAT LAKES PROTECTION FUND.

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Cover photo: Robert Queen

Choose and enjoy these 61 field trips from spring through fall.

Travel in good company

Story and photos by Christine Tanzer

The Natural Resources Foundation of Wisconsin again offers you the opportunity to join DNR staff on field trips this year. From spring to fall you can come along on guided hikes, paddles and boat rides to explore the outdoors. Trip leaders enjoy the chance to explain how resources are managed and to point out special features of the properties you will visit.

Note that the 61 trips are arranged chronologically from early May through late October. Assume that the trips fall on Saturdays unless otherwise noted in the listings. Also note that the physical demands of each trip are listed. Just follow the color tint behind each trip number to judge its difficulty: blue — accessible to people with walking disabilities; green — an easy, short hike on level terrain; yellow — an average hike with some hills; orange — steeper terrain, a longer hike or a canoe trip with rapids; red — more strenuous conditions.

Space is limited, and we expect to fill trips quickly, so register as soon as possible. There's a limit of only one canoe trip per family or group, please. Clip out the form to the right or photocopy it. List the trip number, the number of people in your group and any per person trip costs. An annual tax-deductible registration fee for these trips of $25 per group or family should also be included. The fee includes a one-year membership to the Foundation.

Calculate your costs and please mail one check for all trips payable to the Natural Resources Foundation of Wisconsin. Mail completed forms and checks to NRF Field Trips, P.O. Box 2317, Madison, WI 53701. Trips that can accommodate fewer than 20 people are indicated in the listing. Details and directions will be sent to registrants two weeks before each trip. All trip fees are non-refundable, but parties on waiting lists who cannot be accommodated will receive refunds in July or October.

Questions? Call me on Wednesdays at (608) 264-8548 or send e-mail to christine.tanzer@dnr.state.wi.us.

Field trip registration form

Name _____

Street address _____

City/state/zip _____

Phone (daytime) _____ (evening) _____

I would like to attend the following trip(s):

trip# _____ # of people _____ x trip cost _____ = $ _____

trip# _____ # of people _____ x trip cost _____ = $ _____

trip# _____ # of people _____ x trip cost _____ = $ _____

Annual trip registration fee: $ 25

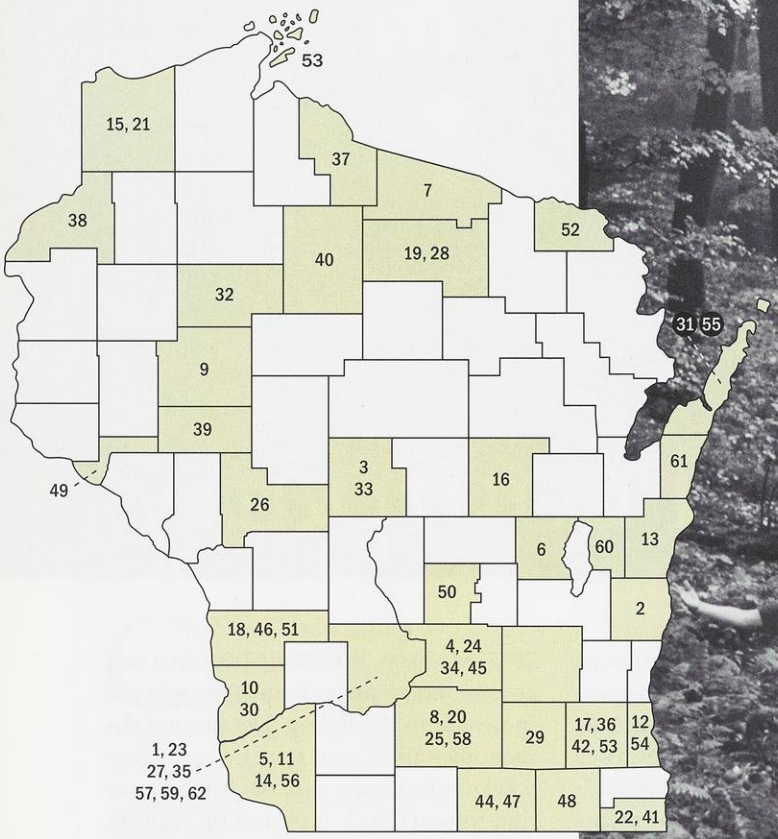
NRF donation ($15, $25, $50, $100, $150) _____

TOTAL ENCLOSED $ _____

Make checks payable to Natural Resources Foundation of Wisconsin

Mail completed form and check to: NRF Field Trips, P. O. Box 2317, Madison, WI 53701

Field Trip Locations



Spring wildflowers bloom quickly to set seed before leaves shade the canopy. Join one of our hikes to see them #3, 10, 11, 16 or 17.

1 Parfrey's Glen State Natural Area
Explore a beautiful 100-foot gorge cut into the Baraboo Hills.
• May 3, 9–11:30 a.m. • Baraboo, Sauk Co. • David Bouche, leader

2 Willow Creek — a forgotten fishery
This small stream in town has a thriving fishery, including trout!
• May 3, 8 a.m.–noon • Kohler, Sheboygan Co. • Victor Pappas, leader

3 Powers Bluff spring wildflowers
Enjoy a fantastic display of spring wildflowers on a primitive trail through mature maple woods.
• Friday, May 9, 9–11 a.m. • Arpin, Wood Co. • Randy Hoffman, leader

4 Ice Age Trail through Lodi Marsh
Hike a segment of this 1,200-mile trail and learn about wetland restoration, geology, marsh wildlife and trail history.
• Friday, May 9, 9 a.m.–noon • Lodi, Columbia Co. • D. Valvassori, B. Brown, G. Werner & T. Malzhan, leaders • Limit: 15

5 Effigy mounds of the Wisconsin River Valley
Travel back in time and visit bird mounds, an ancient terraced field, a Ho-Chunk mound group, a bison herd, and a high hill with a 360° panorama of the river valley.
• May 10, 10 a.m.–2 p.m. • Muscoda, Grant Co • Robert Salzer, leader • Cost: $10 per person

6 Canoe Rush Lake
Explore bulrush beds, native prairies and see terns, grebes, herons and bitterns. Bring your own canoe or kayak.
• May 10, 6–11 a.m. • Oshkosh, Winnebago Co. • Tim Lizotte and Tom Zeibell, leaders

7 Owls of the Nicolet Forest
Discover the darker side of the Nicolet National Forest, a night filled with owls and whip-poor-wills.
• May 10, 7:30–11 p.m. • Eagle River, Vilas Co. • Andy Paulios, leader • Limit: 12

8 Effigy mounds of Mendota
Learn about Native American culture and see conical mounds and a long panther effigy at Governor Nelson State Park.
• May 10, 10 a.m.–noon • Waunakee, Dane Co. • Donna Schmitz and a Ho-Chunk Nation preservationist, leaders

9 Frogs and toads of the Northern Chippewa
Learn to identify frogs and toads by their chirps and chortles while exploring several sites in the Northern Chippewa. (Cost includes field guide and a tape.)
• Friday, May 16, 8–11:30 p.m. • Eagleton, Chippewa Co. • Bruce Neeb and Rob Strand, leaders • Limit: 12 • Cost: $25 per party

10 Spring flora of Mississippi River Bluff prairies
See spectacular views of the Mississippi River valley from atop 400-foot bluffs and flowers on steep "goat" prairies of Rush Creek State Natural Area.
• Friday, May 16, 9:30 a.m.–1 p.m. • Ferryville, Crawford Co. • Gretchen Heaser, leader

11 Wyalusing tug-a-suckle
Discover how to eradicate honeysuckle from your property while enjoying the spring beauty of Wyalusing State Park.
• May 17, 1–3 p.m. • Wyalusing, Grant Co. • Scott Johnson, leader

12 Spring bird hike — Havenwoods
Blaze a trail in Havenwoods State Forest in search of bluebirds, warblers, snipe, soras and other spring migrants.
• May 17, 7:30–9:30 a.m. • Milwaukee, Milwaukee Co. • Susan McLarty, leader

13 Paddle through Manitowoc
Paddle through Manitowoc to the mouth of Lake Michigan and learn about air and water pollution. Enjoy a free homemade chili lunch. (Bring your own canoe or rent a kayak for $30 per person.)
• May 17, 10 a.m.–2 p.m. • Manitowoc, Manitowoc Co. • Jim and Carol Crawford, leaders

14 Unusual trees of Wisconsin
Kentucky coffee trees, chinquapin oaks and honey locust are rare in Wisconsin, but we have them at Roe Preserve SNA. Hike up the bluff to see these trees, a large effigy mound, spring wildflowers and a gorgeous view of the Mississippi River.
• Monday, May 19, 9 a.m.–1 p.m. • Cassville, Grant Co. • Armund Bartz, leader • Limit: 15

15 Wisconsin's highest waterfall
Hike to Big Manitou Falls in spring. Learn about its natural and human history.
• May 24, 1–4 p.m. • Superior, Douglas Co. • Jen Punzel, leader

(below) Lady's slippers brighten up a summer walk. *(right)* Guided canoe trips can take you past rocky shores, forests and seas of grass in search of animals, plants and a little solitude.

16 Spring ephemerals of northern old-growth
Discover spring flowers like the downy yellow violet and Dutchman's breeches as you hike through the old-growth northern mesic forest of Tellock's Hill SNA.
• May 24, 9–11 a.m. • Iola, Waupaca Co. • Darcy Kind, leader

17 Spring birds and flora of Scuppernong
Hike a portion of the Ice Age Trail through the Scuppernong River Habitat Area, birding and botanizing along the way.
• May 31, 9 a.m.–noon • Eagle, Waukesha Co. • Mike Bourquin and Dan Doebereiner, leaders

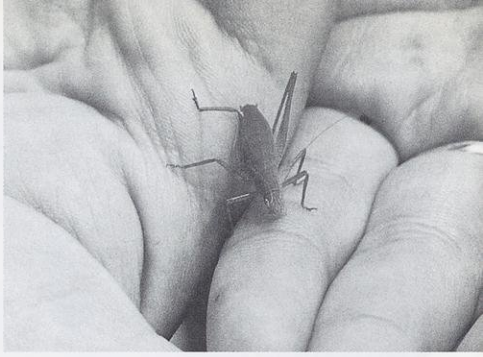
18 Montana of the Midwest
Brook trout now swim in streams they have not inhabited for 100 years. Come to the "Montana of the Midwest" and see the electro-shocking truth of trout.
• May 31, 10 a.m.–noon • Coon Valley, Vernon Co. • David Vetrano, leader

Try out trip 17 for a close look at birds, bugs *(top right)* and butterflies at the Scuppernong portion of the Southern Kettle Moraine in southwestern Waukesha County.

19 One fish, two fish
Discover the wonders of fish, from incubation through adulthood at Art Oehmcke, one of Wisconsin's renovated state hatcheries.
• May 31, 1–3 p.m. • Woodruff, Oneida Co. • Bruce Underwood, leader

20 Women's hike on the Ice Age Trail
Explore the Brooklyn Wildlife Area by hiking the Ice Age Trail.
• Friday, June 6, 10 a.m.–2 p.m. • Belleville, Dane Co. • Danielle Valvassori, Tracey Teodecki and Cheryl Housely, leaders • Limit: 15 women

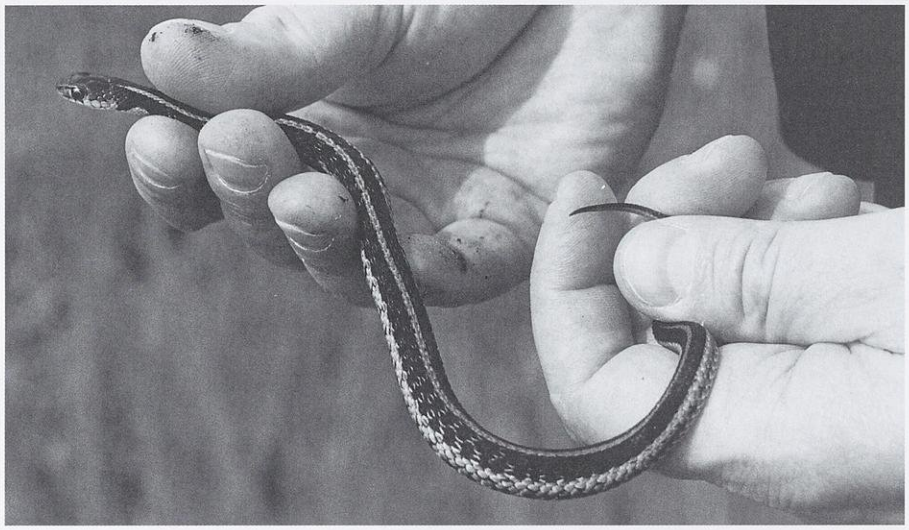
21 Sea kayak through a Lake Superior estuary
Enjoy a six-mile paddle past steep wooded shores, unique wetlands and meandering tributary bays in the remote St. Louis River Streambank Protection Area. Sea kayaks and instruction will be provided by outfitter. Beginners welcome!
• June 7, 9 a.m.–4 p.m. • Superior, Douglas Co. • Frank Koshere, leader • Limit: 14 • Cost: $55 per person kayak rental; $25 per person with your own kayak and gear



22 Chiwaukee Prairie SNA
Explore a prairie with over 400 plant species. The shooting stars should be at their peak. Learn about prairie ecology and management techniques.
• June 7, 9–11 a.m. • Kenosha, Kenosha Co. • Kelly Skaife and Marty Johnson, leaders

23 Stream monitoring at Devil's Lake
Sample water quality and collect aquatic critters from a small stream at Devil's Lake State Park.
• June 7, 9 a.m.–2 p.m. • Baraboo, Sauk Co. • Kris Stepenuck, leader • Limit: 12

24 Kid's Day at MacKenzie
Spend a day at MacKenzie Environmental Center learning about lunar phases, wood-cutting, orienteering, stream study and bird adaptations. Kids ages 10+, with adult.
• June 7, 9 a.m.–4:30 p.m. • Poynette, Columbia Co. • Heidi Conde, leader



Many hikes offer a hands-on, up-close look at nature. Here, at a young common garter snake.

25 Sugar River fish and restoration
Explore fisheries and stream restoration on the west branch of the Sugar River.
• Friday, June 13, 9 a.m.–noon • Mt. Vernon, Dane Co. • D. Valvassori, K. Welke, P. Sutter and M. Wagner, leaders • Limit: 17

26 Karner blue butterflies and lupine
Enjoy a day filled with blooming lupine. Learn about Karner blue ecology and barrens restoration.
• June 14, 10 a.m.–2 p.m. • Black River Falls, Jackson Co. • Tim Beyer and Eric Epstein, leaders

27 Mirror Lake pontoon ride
Cruise about beautiful Mirror Lake for a half-hour and learn about its unique natural history. Intended for people using wheelchairs with an attendant.
• June 14, 10 a.m. • Baraboo, Sauk Co. • Gerald Drumm and Paul Zajackowski, leaders • Cost: $5 per person

28 Majestic old-growth forests
Discover the majesty of old-growth forests in Northern Wisconsin. Learn about their natural history, distribution and management.
• June 14, 10 a.m.–3 p.m. • Woodruff, Oneida Co. • Ron Eckstein, leader

29 Ancient Aztalan
Travel back in time to explore this ancient civilization that was a thriving settlement.
• June 14, 1–2 p.m. • Lake Mills, Jefferson Co. • Tom Davies, leader

30 Canoe the Kickapoo Wildlife Area
Canoe through the Kickapoo Wildlife Area — an impressive river segment many have not paddled. Bring your own canoe/kayak.
• Friday, June 20, 10 a.m–4 p.m. • Wauzeka, Crawford Co. • D. Valvassori, T. Watkins, K. Hansen and R. Lopez, leaders • Limit: 8 canoes

31 Paddle to Horseshoe Island
Paddle to a remote island off the shores of Peninsula State Park in Door County. Learn history and ecology in a hike around the island.
• Friday, June 20, 10 a.m.–1 p.m. • Fish Creek, Door Co. • Kathleen Regnier, leader • Cost: $15 per person for canoe rental

32 Canoe camping on the Flambeau
Venture out on a two-day paddle along the North Fork of the Flambeau River. Experienced canoeists can expand their horizons, learn the basics of canoeing rapids as well as canoe/tent camping. (Canoe rentals available.)
• June 21, noon–Sunday June 22, 5 p.m. • Ladysmith, Rusk Co. • Dave Birren, leader • Limit: 4 canoes

33 Griffith State Nursery
Travel by wagon over this beautiful 100-acre tree nursery to learn about propagating 25 species of native trees and shrubs.
• June 21, 10 a.m.–noon • Wisconsin Rapids, Wood Co. • Jim Storandt, leader

34 Canyons and savannas of Rocky Run
Explore the diversity of Rocky Run—gently rolling slopes next to sheer-walled box canyons! Rare plants, savanna ecology, and geology.
• June 28, 9 a.m.–2 p.m. • Wyocena, Columbia Co. • Craig Anderson, leader • Limit: 15

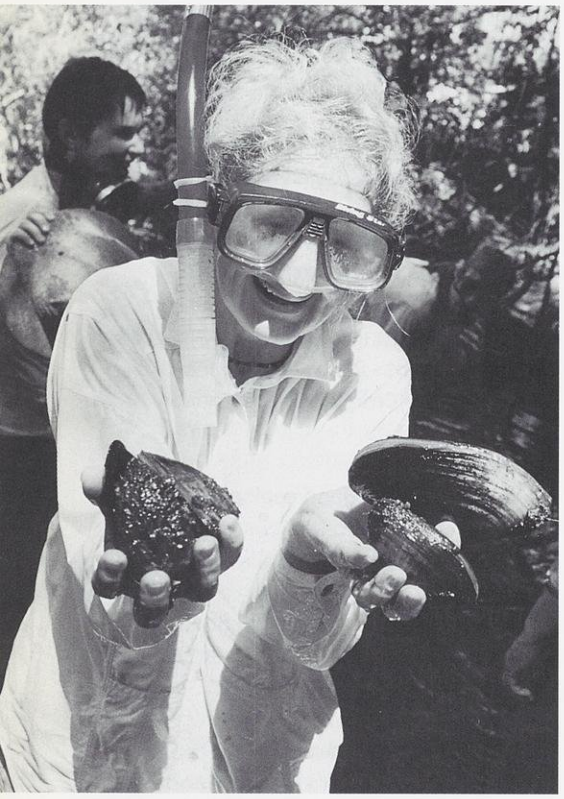
35 Lichen diversity and ecology
Discover the world of lichens growing in different habitats in Devil's Lake State Park.
• June 28, 1–4 p.m. • Baraboo, Sauk Co. • Martha Makholm, leader • Limit: 15

36 Canoe Lulu Lake
Paddle from Eagle Springs into scenic Lulu Lake and learn about the wonders of aquatic plants. Some canoes available for free use.
• June 28, 9 a.m.–noon • Mukwonago, Waukesha Co. • Shelley Garbisch, leader • Limit: 8 canoes

37 Osprey banding and Turtle Flambeau Flowage tour
Visit osprey nests and help band nestlings. Take a scenic boat ride through the flowage to see wildlife and a patterned bog. Gourmet lunch included. This trip is a fundraiser for the osprey-monitoring program.
• July 12, 8:30 a.m.–4 p.m. • Mercer, Iron Co. • Bruce Bacon and Roger Jasinski, leaders • Cost: $65 per person

38 Froggin' around at Crex
Get hands-on experience learning about the frog ecology and identification in Crex Meadows Wildlife Area.
• July 12, 9 a.m.–noon • Grantsburg, Burnett Co. • Steve Hoffman, leader Limit: 15

39 Landfills in the modern world
Discover the Superior Seven Mile Creek Landfill and examine the demise of your discards.
• July 12, 10 a.m.–noon • Eau Claire, Eau Claire Co. • Dave Lundberg, leader



Water trips are fun whether you are wading for freshwater mussels or paddling down bays and rivers.

40 Wolf howl
Learn about wolf biology and forest ecology during a hike and drive through wolf territory. Conduct an evening wolf howl survey. Cost includes dinner and bus ride.
• July 12, 3 p.m.–midnight • Park Falls, Price Co. • Adrian Wydeven, leader • Cost: $25 per person

41 Incredible insects
Delve into insect biology and identification by capturing specimens at Bong Recreation Area.
• July 12, 1–3 p.m. • Kansasville, Kenosha Co. • Beth Goeppinger and Donna Mosca, leaders

42 Rare fish and mussels of the Mukwonago River
Wade into the clear waters of the Mukwonago River SNA to discover the underwater world of freshwater mussels and rare fish found in this shallow, clean river.
• July 19, 10 a.m.–3 p.m. • Mukwonago, Waukesha Co. • Lisie Kitchel and Kurt Welke, leaders

43 Sea kayak the Pokegama Bay Wetlands
See a variety of wetlands, wildlife and a stand of wild rice as we paddle the Pokegama Bay Wetlands near Lake Superior. Beginners welcome! Sea kayaks and instruction provided by outfitter.
• July 2, 9 a.m.–4 p.m. • Superior, Douglas Co. • Frank Koshere, leader • Limit: 14 • Cost: $55 per person kayak rental; $25 per person with own kayak and gear

CANCELLED

44 Rock River prairie
Explore this dry prairie on a rolling terrace above the Rock River that harbors over 50 native prairie species, including the endangered wild petunia.
• July 19, 9–11 a.m. • Beloit, Rock Co. • Darcy Kind, leader

45 Peak bloom on a summer prairie
Enjoy the peak of summer bloom at Goose Pond Sanctuary — a 25-year-old prairie restoration. The diversity is breathtaking!
• July 26, 9:30 a.m.–noon • Arlington, Columbia Co. • Mark Martin, leader

46 Mississippi River restoration
Boat to two islands that were constructed to replicate past habitat lost due to lock and dam construction. They now provide quiet areas for fish, birds and plants to flourish.
• Friday, August 1, 10 a.m.–2 p.m • Stoddard, Vernon Co. • Gretchen Benjamin, leader • Limit: 16

47 Get your feet wet at Swenson Prairie
Discover rare plants, reptiles and birds and explore the diverse wet-prairie and sedge meadows of Swenson Wet Prairie in the Sugar River floodplain.
• August 2, 9:30 a.m.–noon • Avon, Rock Co. • Matt Zine, leader • Limit: 15

48 Lulu Lake — diversity galore
Venture through oak savannas, woodlands, sedge meadows, calcareous fens, shrub carrs and emergent marsh while enjoying summer blooms.
• August 9, 9:30 a.m.–noon • East Troy, Walworth Co. • Matt Zine, leader • Limit: 15

49 Train ride to Tiffany Bottoms Prairie
Ride in an antique open-air train with stops to hike into blooming prairies, hardwood forests, wetlands and sloughs near the mouth of the Chippewa River. Great birding!
• August 16, 9:45 a.m.–3:30 p.m. • Durand, Pepin Co. • K. Voss, D. Linderud, Dr. Weiher, J. Potter and Dr. Molldrem, leaders • Cost: $5 per person

50 John Muir's boyhood haunts
Discover the lake, wetlands, prairie and savanna where John Muir grew up. Lunch at Observatory Hill atop a cedar glade with a spectacular view.
• August 23, 9:30 a.m.–1 p.m. • Montello, Marquette Co. • Mark Martin, leader

51 Canoe the Kickapoo

Water-carved sandstone cliffs line the banks as we paddle this winding waterway. Enjoy a hike through the hemlock forest of Mt. Pisgah. (Limited canoes available for free use. Indicate if you need one)

• Friday, September 5, 11 a.m.–4:30 p.m. • Ontario, Vernon Co. • Hank Kuehling and Dave Siebert, leaders • Limit: 18

52 Pine-Popple wild river

Explore the beauty and interesting history of the wild Pine and Popple rivers. Eat lunch next to Big Bull Falls.

• September 6, 9 a.m.–1 p.m. • Florence, Florence Co. • Stu Boren and Paul Bruggink, leaders

53 Retrace the steps of pioneers

Go back in time and retrace the steps of pioneers as we explore several restored pioneer cabins and out-buildings. Experience the sense of place that formed the character of the Kettle Moraine.

• September 6, 9 a.m.–noon • Eagle, Waukesha Co. • Ron Kurowski, leader

54 Hank Aaron State Trail and Menomonee River

Hike part of the trail next to Miller Park and learn about changes (like native plantings) that are bringing it back to life. Discover the history and future of this urban waterway.

• September 13, 9 a.m.–noon • Milwaukee, Milwaukee Co. • Melissa Cook, leader

55 Bike Door County's Niagara Escarpment

Peddle through Peninsula State Park enjoying fall colors. See dramatic displays of this geologic curiosity.

• Friday, September 19, 10 a.m.–noon • Fish Creek, Door Co. • Kathleen Regnier, leader

56 Fall raptor migration and Mississippi prairies

Observe raptors migrating overhead as we hike a bluff prairie overlooking the Mississippi River full of rare plants.

• September 27, 9 a.m.-noon • Cassville, Grant Co. • Richard and Amy Staffen, leaders • Limit: 15

57 Geology of the Baraboo Hills

Hike the picturesque bluffs at Devil's Lake, the canyons of Parfrey's Glen, and join a rock hunting expedition at North Bluff Quarry.

• September 27, 9 a.m.–4:30 p.m. • Devil's Lake, Sauk Co. • Phil Fauble, leader

58 Lower Wisconsin River by voyageur canoes

Paddle in a 25-foot voyageur canoe and learn about cultural, historical and watershed issues. Hike atop Ferry Bluff to see amazing views and lunch on a sandbar.

• Sunday, September 28, 10 a.m.–4 p.m. • Mazomanie, Dane Co. • Wayne Schutte and Ken Wiesner, leaders • Limit: 14 • Cost: $5 per person

On some trips, you need to bend low and search to find gems like wild irises.

59 Autumn Dells hike

Spectacular gorges, mossy glens and rare plants await. Take a 3.5-mile trek through the Dells of the Wisconsin River SNA not normally accessible to the public.

• Sunday, October 5, 9 a.m.–2 p.m. • Wisconsin Dells, Sauk Co. • Thomas Meyer, leader

On other trips, you'll huff and puff a bit up a trail to enjoy a vista and a rest!

60 High Cliff forest autumn color

Hike through the autumn color at High Cliff State Park on the shores of Lake Winnebago and learn about forestry management practices. Great information for private forest landowners.

• October 11, 9 a.m.–noon • Sherwood, Calumet Co. • Ron Jones, leader

61 Chinook salmon

Watch the chinook salmon on their last journey in life. Learn about Great Lakes history, salmon life cycles and egg collection at the Besadny Fisheries Facility.

• October 11, 10–11:30 a.m. • Kewaunee, Kewaunee Co. • Kathy Dax, leader

62 Landscape photography

Enjoy the autumn color at Devil's Lake State Park as you learn about landscape photography in a lecture and a photo-taking hike.

• October 25, 1–5 p.m. • Baraboo, Sauk Co. • Dave Edwards, leader

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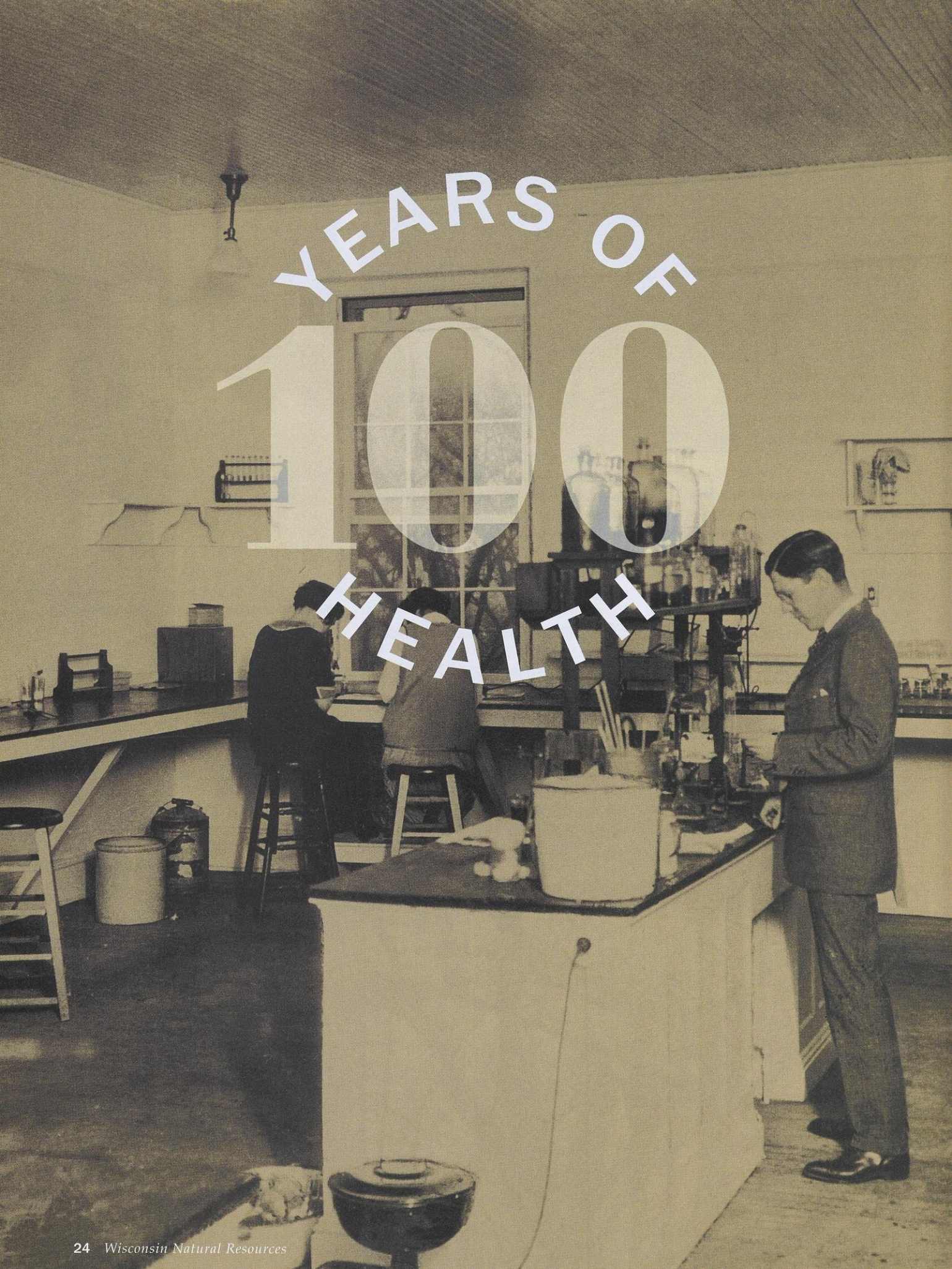
Christine Tanzer coordinates field trips for the Natural Resources Foundation of Wisconsin.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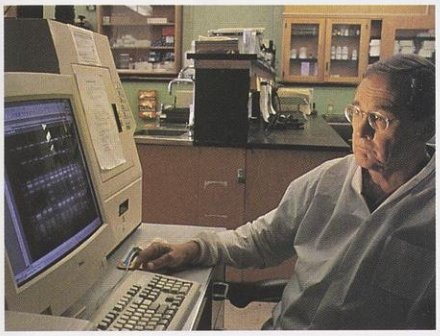

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Terry Kurzynski prepares Pulsed-Field Gel Electrophoresis testing, a DNA fingerprinting technique to identify bacterial strains in modern disease investigations.
(left) Dr. William D. Stovall (standing at bench) in the lab in the 1920s. He was instrumental in increasing the range of public health tests and the number of samples that State Lab of Hygiene staff could analyze.

Drawing on a century's worth of experience, the State Lab of Hygiene prepares to sample the future.

Jason Loughrin

The golden yellow liquid in the clear plastic bottle was unlike any drinking water sample George Bowman had seen in more than 30 years of service at the Wisconsin State Laboratory of Hygiene (WSLH).

Drawn from a north-central Wisconsin well, the sample looked and smelled more like it should have been sent out for urinalysis rather than a contaminant screening.

The water chemistry supervisor wasn't quite sure what to make of it. "It looked like someone tried to sabotage the sample," Bowman said, referring to its obvious physical characteristics. "It didn't look like the typical sample."

The first battery of tests on the sample turned out OK — it was relatively free of typical contaminants like nitrates and bacteria. So Bowman delved deeper. He initiated more tests, consulted with WSLH colleague Sharon Kluender, contacted DNR water supply specialist Chuck Fitzgerald to learn more about the sample's origin, and even contacted the state crime lab to find out if the sample could have been …man-made.

"The goal was to find what was wrong, because it clearly was not something people should be drinking," Bowman said. His dogged quest to protect public health has been shared by scores of researchers, technicians, doctors and scientists during the 100-year history of the WSLH.

The first century

"When the Wisconsin State Laboratory of Hygiene was created 100 years ago, the mission was very simple: control infectious diseases, and provide a safe water supply," said Dr. Ronald Laessig, WSLH Director since 1980 and professor of population health sciences at the University of Wisconsin-Madison. "One hundred years later, our mission is to control infectious diseases, and provide a safe water supply."

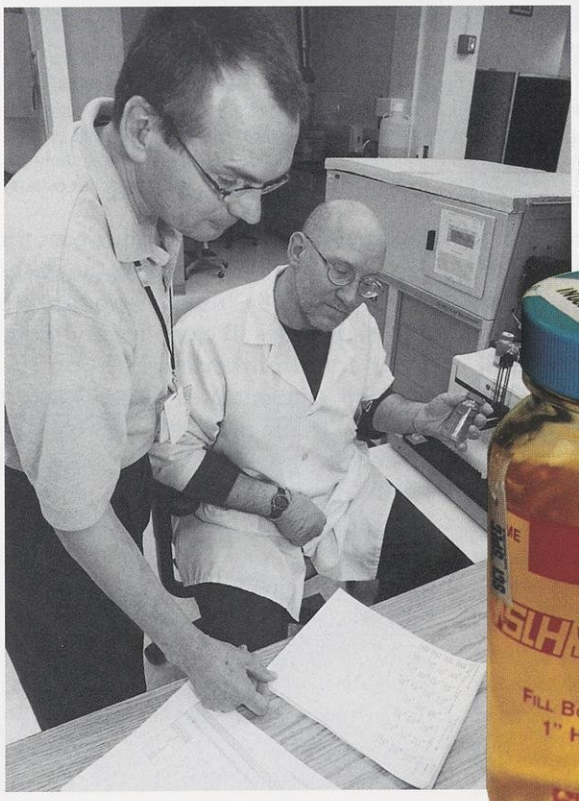
The WSLH began humbly enough. Inspired by a visit to the Hygienishe Institute of Germany, Dr. Harry L. Russell conceived of a laboratory that would serve the needs of the university and the state, advancing the cause of pure scientific research and improving the overall health of Wisconsin's citizens. Working under a mandate from the Wisconsin State Board of Health, the laboratory would be a valuable teaching resource for the University of Wisconsin and address the growing need for a facility capable of analyzing communicable diseases and other public health risks.

The concept was popular with state physicians and the university, in part because it advanced the "Wisconsin Idea," conceptualized in the late 1800s by Senator Robert M. La Follette and University President Charles Van Hise. The Wisconsin Idea seeks to build partnerships between the university and the state's citizens — or as Van Hise put it, make "the beneficent influence of the University available to every home in the State."

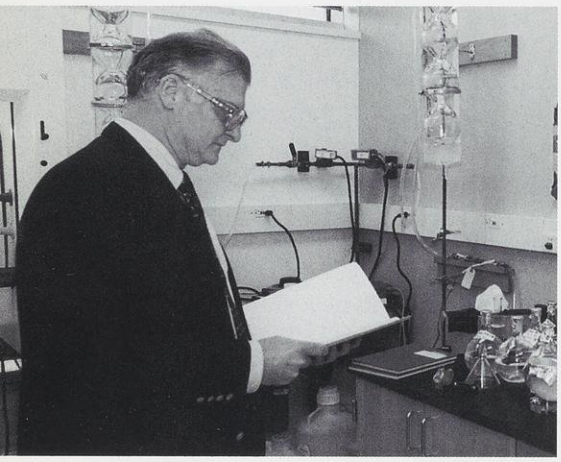
Russell and his allies appealed to the legislature, and on October 1, 1903 the State Hygienic Laboratory opened for business in the basement of Agriculture Hall on the UW-Madison campus. Russell was named its first director, charged with disbursing an annual budget of $1,500.

Under the leadership of Dr. William D. Stovall, the

(left to right) Water Chemist Supervisor George Bowman and Advanced Chemist DeWayne Kennedy-Parker look over results from a spectrometer that can analyze water samples for 24 elements at the same time in three minutes. The State Lab analyzes the healthfulness of water from about 15,000 private wells annually.



ROBERT QUEEN



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STATE LABORATORY OF HYGIENE FILES

The State Lab is a place for innovation. About 1952, Norma Arvold (foreground) was among the first to be trained to analyze pap smears. The Wisconsin State Lab was one of the nation's first to provide early warning signs of cervical cancer.
(left) Dr. William Sonzogni directs the lab's Environmental Health Division where water, air, sediment and animal samples are analyzed for a range of environmental contaminants. This equipment extracts tiny amounts of PCBs from resins that filter water.

"I think we've got a first-class facility. In fact, we've had visitors from all over the world specifically come to see our design and layout because it has become a model for other laboratories."

Dr. William C. Sonzogni

State Lab's third director, the WSLH went from analyzing some 9,000 samples annually in 1915, to more than 500,000 when he retired in 1958. By 1953, the WSLH moved into a new building, named in Stovall's honor.

"Dr. Stovall changed the face of medicine, public health and the environmental health in Wisconsin almost single-handedly," Laessig said. "He continuously worked to improve the WSLH's capacity and capabilities, but Stovall's accomplishments reached far beyond the laboratory. He taught at the UW Medical School, served as acting superintendent of Wisconsin General Hospital and co-founded the Wisconsin Division of the American Cancer Society."

The lab continued to expand its range of services and in 1998 added a second building on Madison's east side to house its burgeoning Environmental Health Division (EHD).

"I think we've got a first-class facility," said Dr. William C. Sonzogni, EHD Director and professor of civil and environmental engineering at UW-Madison. "In fact, we've had visitors from all over the world specifically come to see our design and layout because it has become a model for other laboratories."

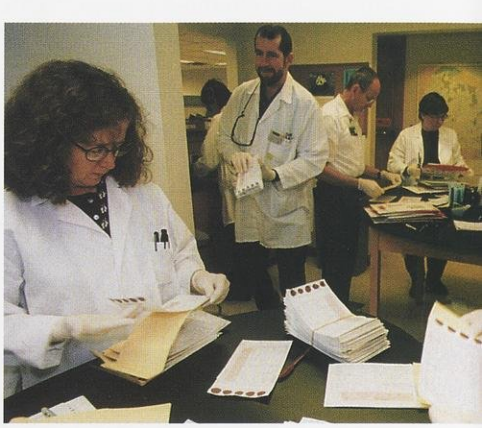
Today, the Wisconsin State Laboratory of Hygiene employs 320 people and conducts hundreds of tests each day in diverse areas such as newborn screening, cancer detection, drug and alcohol analysis, heavy metals, asbestos, toxic mold, and, of course, water testing and communicable diseases.

Evidence of achievement

Water quality was a far graver concern for Wisconsin residents in the early 1900s than it is today. Through the 1920s, diseases like cholera, typhoid fever and diphtheria caused by microbes in contaminated drinking water were the leading causes of death in the United States.

"The first big dent public health agencies put into this problem came from chlorinating water supplies for people who were using surface waters," said Jon Standridge, a microbiologist and researcher at the WSLH in Wisconsin. "In Wisconsin, you determined whether or not your chlorination worked by the tests we did at the laboratory."

Chlorination had an immediate impact. By the 1950s, death from diseases contracted from drinking water nearly had been eliminated. People who drew their drinking water from wells also benefited from updated construction codes, which required wells to be dug deeper and to be cased. This step helped keep surface contaminants from reaching well water. Agricultural standards of cleanliness — including the water used on the farm — were raised; cleaner operations earned "Grade A" status, allowing those farmers to sell their milk at premium prices. "Water testing at the State Laboratory encouraged the move from unsafe water sup-



plies to safe water supplies in the rural sector, particularly in the farming industry," Standridge said.

Rapid industrialization along Wisconsin's rivers in the first half of the 20th century brought new public health concerns, most notably pollution from industrial contaminants and the damaging effects of polychlorinated biphenyls, or PCBs. The federal Clean Water Act of 1972 sought to address these concerns, and the WSLH did its part.

"Back in the early '70s, we were one of the first public health labs in the country to do environmental analysis," Sonzogni said. "Worldwide, some of the pioneering research on PCBs was done here at the University of Wisconsin. The WSLH was there to develop analytical techniques because we had the good fortune of being around some of the top people in the country. We became a center for PCB analysis."

Around the same time, the WSLH was charged with providing laboratory research and testing services for the Wisconsin Department of Natural Resources. "In the long term, the partnership has worked out very well," Sonzogni said. "While state statutes require the WSLH to furnish a complete laboratory service to the Department of Health and Family Services and the DNR, the relationship between the WSLH and the state agencies is based on effective coordination and cooperation. I think our field staff and lab technicians feel they are very close partners with agency staff and are dedicated to helping the departments do their jobs."

The WSLH-DNR partnership is paying dramatic dividends in the cleanup of the Fox River. Considered to be virtually a dead river in the 1950s, the Fox has become, in the words of avid angler Dr. Sonzogni, "a world-class walleye fishery."

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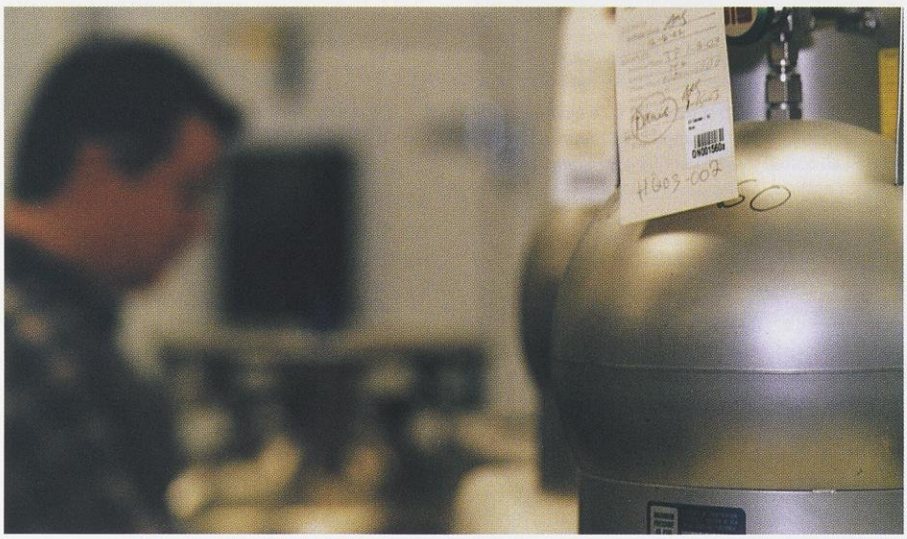

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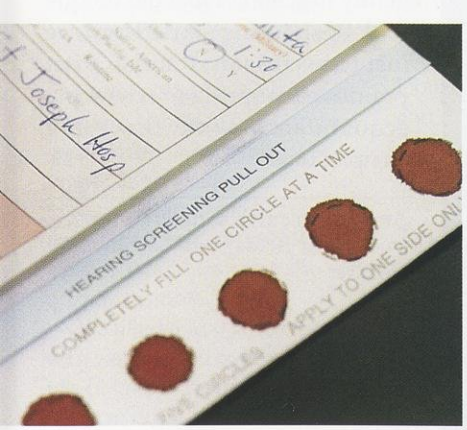
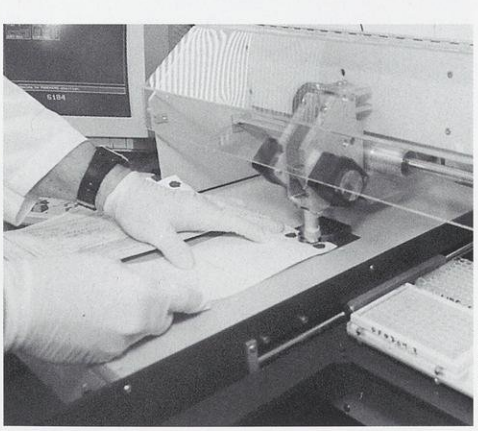
(top) Water fleas (daphnia), scuds, worms and minnows that can be raised in a lab are sensitive to certain water pollutants. The lab tests how well they survive and what contaminants they absorb when exposed to river water for a week. Here, daphnia are counted and placed in sampling cups.
(above) These domed samplers collect air samples for as short as minutes to as long as 24 hours. Gas chromatographs form a sort of chemical fingerprint of each compound collected in the sample and the relative concentrations of each.

"We've helped make similar improvements in other rivers and lakes throughout the state," Sonzogni added.

The events of September 11, 2001 — and the anthrax scare that followed shortly thereafter — brought another dimension to the work of the Wisconsin State Laboratory of Hygiene. In the last three months of 2001, the WSLH ana-





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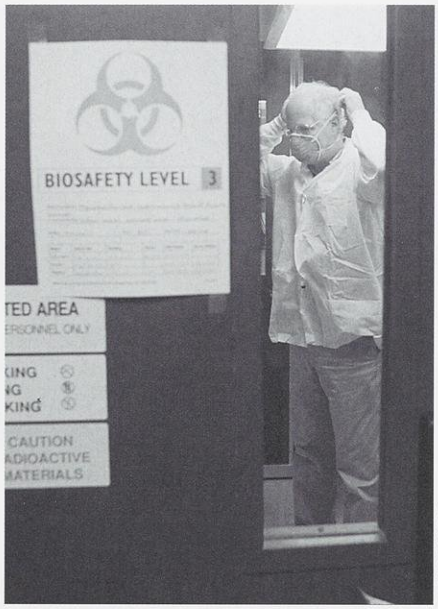
In addition to environmental analyses, the lab performs a wide spectrum of human disease tests. The Newborn Screening Lab analyzes blood samples from every child born in Wisconsin for early diagnosis and treatment of 26 congenital and metabolic disorders – health conditions that could be life threatening. The machine at the right takes tiny paper punches from the dried blood samples for each analysis. Results are phoned to hospitals and physicians when potential concerns are discovered.



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A biosafety level 3 lab provides a safe environment for conducting tests to respond to bioterrorism. The State Lab tested more than 650 specimens last year for anthrax. All were negative.

lyzed over 600 Wisconsin samples for anthrax — all turned up negative. In the summer of 2002, the WSLH, along with other public health laboratories across the nation, received federal funds from the Centers for Disease Control and Prevention to better prepare for public health emergencies. The WSLH recruited new staff to facilitate planning, develop protocols, expand analytical capabilities, train staff and coordinate activities with other emergency responders.

"The world recognizes, and the state of Wisconsin recognizes, that public health laboratories have a unique role to play in the big picture of creating a safe and healthful place to live for our citizens," Dr. Laessig said.

"We have been successful in transitioning the laboratory from 1903 to 2003, to keep up with the changing situation in which we find ourselves," Laessig observed. "The major job that I see in the director's office is figuring out how to manage change, because public health needs are not going to be the same a week from now, a year from now, or a decade from now. Public health problems are going to be new and different, and we have to figure out how to get from here to there, and hopefully do it in front of the curve."

One last look back

And what of George Bowman and his mysterious sample?

As it turns out, the sample had not been sabotaged, nor was it a prank. The well from which the sample had been drawn had been drilled into a filled-in bog, in violation of state law. The yellow color? Organic compounds, tannins including an extremely high concentration of iron caused by boring through several feet of muck. The putrid smell? Swamp water.

On the advice of the DNR, the well was abandoned. Another day, another improvement in the public health of Wisconsin. And so it goes for the Wisconsin State Laboratory of Hygiene, as it begins its next 100 years.

Jason Loughrin is a senior chemist at the Wisconsin Occupational Health Laboratory — a part of the EHD division of the WSLH. He is also a copy editor and reporter for the Wisconsin State Journal.

continued from page 2

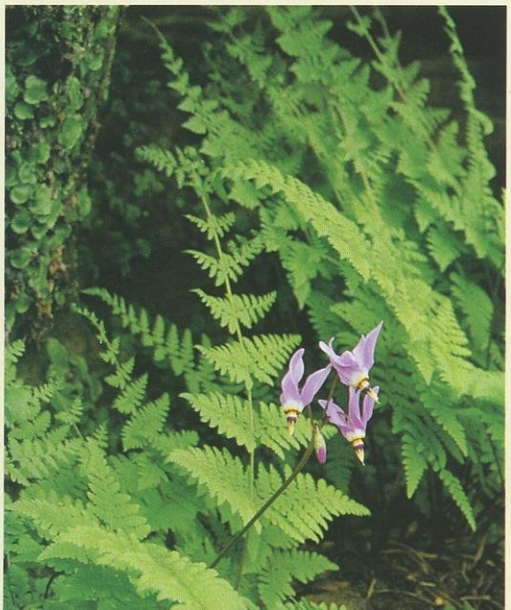
Unlike their celestial namesake, terrestrial shooting stars are not as fleeting. Pollinated flowers fade from white to shades of pink. A maturing reddish-brown capsule encloses the tiny seeds and straightens up so the barrel-shaped capsules are held upright like tiny candelabras. Seeds are released the following spring. If the seeds germinate and new plants survive, three to four years may elapse before the first flowers appear. In undisturbed prairies, these perennial shooting stars may live to be very old plants.

Shooting stars belong to the primrose family, Primulaceae. The plant we are most familiar with, *Dodecatheon meadia*, is just one of 13 shooting star species found in North America. Its genus name, *Dodecatheon*, is from the Greek word *dodeka* meaning twelve and *theos* meaning god. The ancient Roman scholar and naturalist, Pliny the Elder, named a similar spring primrose for the 12 principal gods and goddesses; the top-ranked Olympians of Greek mythology.

Seventeen hundred years passed. Discovery of New World flora and fauna was in full swing. From 1722–26 Mark Catesby, an English naturalist spent time in South Carolina and Georgia collecting plants and sending them back to England. One of these newly discovered plants was the shooting star. The Swede, Linneaus, credited some 250 years ago with originating the plant and animal classification system we use today, retained the genus name, *Dodecatheon*, and called the species *meadia*, to honor British physician and scientific patron Dr. Richard Mead.

As you stand in a Wisconsin prairie gazing upon the fragile-looking shooting stars, let your mind wander and wonder. Think of this simple flower, its relationship to ancient peoples and to the mythology we should have studied more diligently in school! I like the unique look of shooting stars. They are just one reason I must visit prairies each spring to renew my acquaintance with flowering companions.

Shooting stars growing amid a stand of ferns. The blossoms can range in color from white to rose and shades of lilac.



RJ & LINDA MILLER

Anita Carpenter wanders prairies, woods and fields from her home in Oshkosh.

NICE MICE

Thanks for the December story about deer mice ("The Midnight Marauder"). When I was a schoolboy of about 10 or 11 in 1930, my brother Art and I had the task of re-setting the caps on shocks of bundled grain in the fields.

The standing ripe grain had been cut and bound with sisal twine into bundles tied by "the knotter" — an invention of a Mazomanie farm boy for whom an historical marker was erected along Highway 14 just before the Highway K turnoff on the way to our farm. The grain binder (pulled by four horses) cut the stalks close to the ground, pushed them together in a bunch about a foot in diameter, tied them and tossed them. The hired man picked up the bundles and shocked them. Eight bundles were shocked up against each other and a ninth was spread over the top to shed rain off the grain until the threshing machine came. Windstorms often blew the caps off some of the shocks, and one hot August day, Art and I were sent out to repair the storm damage.

Toward the end of the afternoon, I came to a shock where a field mouse had made a nest. She stayed close to her babies, which were just beginning to get fur and could walk around slowly. We easily caught the ma mouse and I stuck her in my pocket. We scooped up the nest with all four or five babies and calculated that we had an excuse to quit work for the day.

At home we had a little cage made of fly-screen and one side had a swinging door. We put the nest and babies in one corner and released ma mouse, who immediately rushed over to the nest, piled in among her babies and started to nurse them. We were amazed how tame she had quickly become.

We filled a fruit jar cover with water and provided some bits of bread. Ma mouse soon came to drink and nibble. The next day we found some sunflower seed. To my amazed pleasure, ma mouse crept right up to my hand, grabbed the seed, shucked it and gobbled it up. She never showed any inclination to bite us.

Within a few days, the babies were running around the cage, falling in and out of the tiny water tank and lining up for lunch as ma mouse laid down on her side.

Her family endeared themselves to us — two usually bloodthirsty little boys — and we pondered their future. We decided we could not give them a secure or good life. About a week later we carried the cage back to the very same shock and restored them to liberty. The threshing machine was a couple of weeks away and we knew by that time the mice would all be grown up enough to run away.

When my wife, Martha, I and two-year-old son Eric lived in a cottage near Chippewa Falls, we would hear deer mice (the "city" cousins) rolling acorns and hazelnuts across the linoleum floor in our living room while we tried to sleep in the adjacent bedroom. I never held it against them.

I remain fond of both *Peromyscus* families to this day.

Robert G. Lewis
Washington, DC

CITY FORESTS

I was delighted to see the articles in "The forest where we live: a guide to caring for trees" in the October issue. As a tree farmer in northern Wisconsin and an advocate for urban trees, I found the articles well done and easy to understand. Forestry management is so important to a healthy Wisconsin and its citizens. I applaud you for providing this kind of information for readers and hope to see more forest management related issues in the future.

Michael Gehrke
Director, Wisconsin Woodland Owners Association, Inc.

LOTS OF CWD QUESTIONS

I've been an avid reader of the magazine for many years and have always found it helpful and filled with good solid information. However the August article "CWD update") left some thought-provoking questions in my mind and I hope in the minds of most Wisconsin deer hunters.

I am concerned with the statement made regarding the DNR's monitoring of the state deer herd since 1999 for Chronic Wasting Disease and the testing of 1,000 deer in 72 of the 130 deer management units, indicating that other than deer monitored in the Dane and Iowa county areas, no cases of CWD or tuberculosis have been detected.

It is my understanding that this year approximately 500 deer from each deer management unit will be tested for signs of CWD or TB. This brings up two questions:

1. Can we eat the animals and what are our chances of getting any kind of disease that affects them? The jury is still out on this, but some recent findings are alarming.
2. Inasmuch as there is no practical way of testing a hunter's animal other than divesting it of its head, one can only visualize the tremendous turmoil that will exist at the registration stations when a hunter is asked to give up a 10-point buck's head. The results of testing will not be known for weeks, maybe months. In many warmer years, venison cannot be kept unprocessed or hung while someone awaits results from a laboratory. You can certainly bet that no antlers will ever be returned to any hunter abandoning the head of his trophy....

Certainly we need to be told more, we need to be told often and we need to be told by area papers, magazines and TV. This (CWD) needs more understanding than you have been willing to put out and I am certain that it will mean the loss of revenue in the form of licenses not purchased.

Dr. Armin C. Block
Cameron

Dr. Block wrote us last August in the midst of the summer special shoots. Our agency practices remain to inform people as promptly as CWD test results are confirmed, to set up emergency response units at Dodgeville with accessible collection stations in the CWD Eradication Zone, to hold public meetings, to issue statements through newspapers and broadcast media, to seek help from landowners, to set up a system for issuing shooting permits, to set emergency practices for efficiently collecting deer samples and sharing results, to devise a way to preserve trophies, to encourage our ability to analyze deer for the presence of CWD in the state, and to explain as best we can the nature of the disease.

CWD testing started in 1999 when national trends showed CWD was moving eastward from Colorado and Wyoming where it has been endemic for decades. In 1999–2001, DNR's wildlife health team chose to sample deer at those registration stations where we believed CWD might first appear in Wisconsin — sites near large captive herds, sites in management units where we knew deer yarded, and sites in units where deer densities were higher. That testing was announced statewide each year, including in this magazine in October 2001.

The risk of a person contracting CWD or a prion-related disease from eating venison is very small given that: a.) To date, only 80 deer of more than 30,861 deer samples analyzed statewide have been found to carry CWD, b.) No researcher has documented prions in edible portions of deer, c.) No researcher has documented that CWD can be transmitted from

COMMENT ON A STORY?

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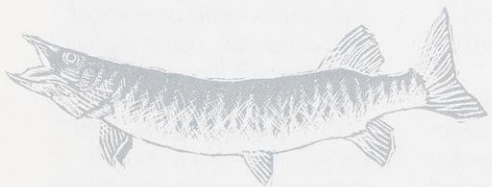
deer or elk to people. Nevertheless, given recent history in explaining the risks of mad cow disease and other bovine spongiform encephalopathies, the State of Wisconsin is trying to give people the best information we can so they can make their own decisions about consuming venison. Our sampling strategy is designed to help people gauge the risks of CWD exposure in the areas where they hunt. We surely share your resolve and concerns about how CWD may affect hunting in the near future.



ON MANAGING MUSKIES

I have a couple of comments about the December article on managing muskies. First, the article states that anglers are releasing 98 percent of the muskies they catch to grow bigger and fight another day. This may be true, but it insinuates anglers are "voluntarily" releasing 98 percent of the muskies. They are releasing them because some of the fish are not of legal length. I'd like to know the number of "legal" fish that are voluntarily released.

Second, the article states costs run to $70 per stocked fingerling that survives for 18 months in the wild. How much would it cost to raise fish to 18 months in the hatchery? I realize this would tie up hatchery ponds for two spawning seasons, but wouldn't this still be cheaper than $70 per fish?

Finally, you cite creel surveys as a measure of the harvest. I still have little faith in these surveys for providing accurate harvest projections and numbers.

Let me say that I feel musky fishing in Wisconsin has never been better in terms of the numbers of fish caught, but in measuring the numbers of larger fish, we're still working at it. Progress will be hard given the small size of most of our lakes and increased fishing pressure from more anglers who are both knowledgeable and better equipped to catch muskies.

John Aschenbrenner

Fisheries biologist Tim Simonson responds: *You are correct. The 98 percent release rate is for all fish, not just legal fish. We don't directly measure the release rate for legal fish because we don't ask anglers during creel surveys for the size of fish they released since we can't actually measure them. The creel surveys may or may not be "accurate" (meaning close to the true value for the harvest), but the surveys are "precise" (predictably repeatable from year to year), so we are comfortable using them to track trends. Harvests may well be higher than we estimate, but there is little doubt that the musky harvest has dropped considerably over the last 30 years. In relative terms, the actual harvest is 92 percent lower than it was in the late 1970s.*

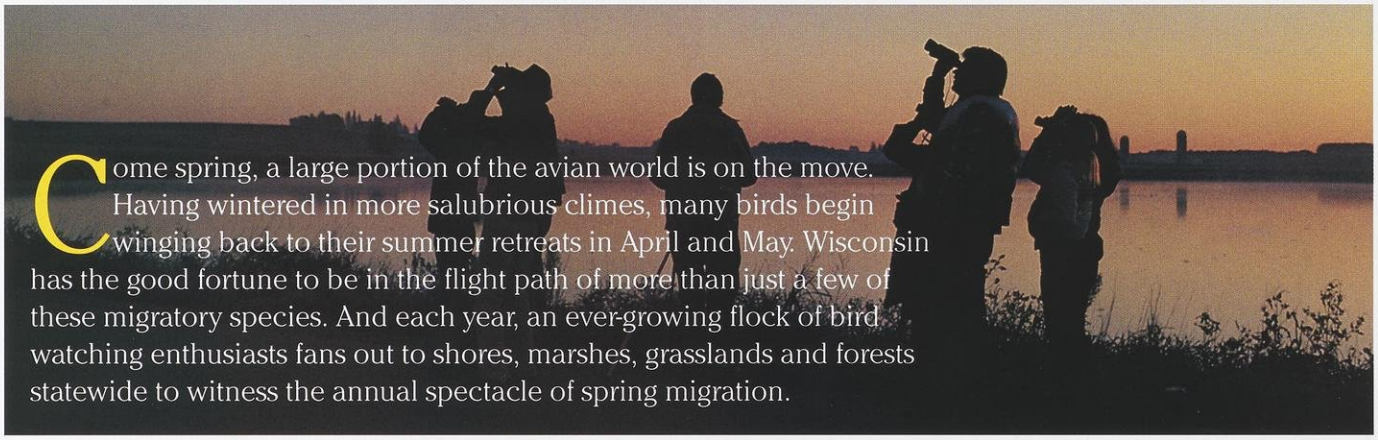
DNR fisheries researcher Terry Margenau conducted a mail survey of anglers that indicated 98 percent of the musky anglers and 90 percent of the general license holders "generally" release legal sized muskellunge. Clearly, the harvest numbers are reduced and catch-and-release fishing has been a major contributing factor. Further harvest reductions will result in population increases, but relatively smaller increases considering the size of our waters and the fishing pressure they receive. Higher size limits should also improve the size-structure on many of our musky waters.

To answer the hatchery question, the costs of raising fish increase exponentially as they get larger. They eat more and convert their food to muscle less efficiently. Hatchery Supervisor Al Kaas estimates it would cost $14 per fish to raise a musky to be a fall yearling not including the costs of tying up propagation ponds for two summers. At a survival rate of 20 percent, these muskies would still cost about $70 per survivor after one year at large. If survival were 40 percent, these muskies would only cost about $35 per survivor. However, we could only produce about 300 muskies per acre as opposed to the 8,000 fall fingerlings per acre that we now raise. Given space limitations, we would probably end up with about half as many survivors after considering mortality after stocking. The sheer numbers of fall fingerlings that we can produce, even given smaller survival rates end up contributing more adult fish to the population than we would get from raising a limited number of fall yearlings.

IN OUR JUNE ISSUE

- Wisconsin's spill prevention law
- Public health and public beaches
- What's happening with yellow perch?
- A snowy show in summer

In-flight entertainment



DENNIS YOCKERS

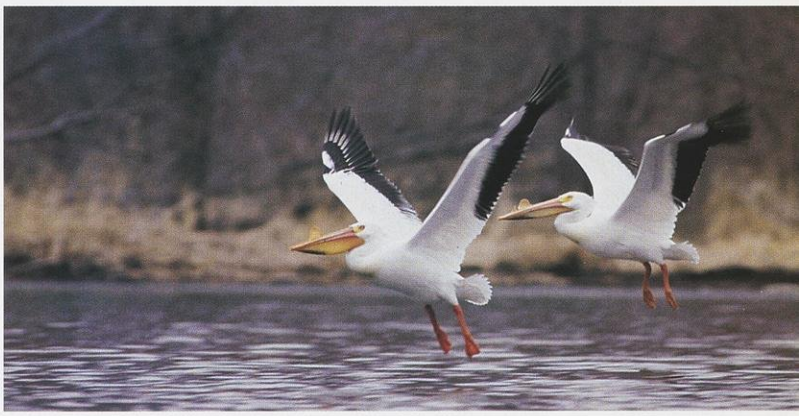
Come spring, a large portion of the avian world is on the move. Having wintered in more salubrious climes, many birds begin winging back to their summer retreats in April and May. Wisconsin has the good fortune to be in the flight path of more than just a few of these migratory species. And each year, an ever-growing flock of bird watching enthusiasts fans out to shores, marshes, grasslands and forests statewide to witness the annual spectacle of spring migration.

To view the birds en route, polish your binocular lenses, pack a sack lunch and visit the following locations:

Necedah National Wildlife Refuge — Located in Wood and Juneau counties in central Wisconsin, the Necedah National Wildlife Refuge was established in 1939 as a refuge and breeding ground for migratory birds and other wildlife. Known by early settlers as the Great Central Wisconsin Swamp, Necedah today consists of 43,656 acres of wetlands and open water areas; pine, oak and aspen forests; grasslands; and savannas. It also contains the state's largest wetland bog, measuring 7,800 acres. To help visitors get a good look at migrating waterfowl and songbirds, the refuge has designated six sites as viewing hotspots with blinds and observation platforms. Look for tundra swans, trumpeter swans, sandhill cranes, golden eagles and more than 20 types of ducks on the move. Red-headed woodpeckers take to the refuge's oak savannas in large numbers, and warbler aficionados may see blackburnian, blackpoll, black-throated green, black-throated blue and black-and-white representatives, to mention but a few. Be sure to watch for the return of the reintroduced whooping cranes. In 2001 several whoopers raised at Necedah were guided on their first migration to wintering grounds in Florida by an ultralight aircraft. Five returned to Necedah in April and May 2002; a second flock is expected to migrate back to Necedah this spring. (608) 565-2551.

Wisconsin Point — At the extreme west end of Lake Superior, this long sand spit protects the city of Superior's harbor. Situated at the happy intersection of marsh, lake and woodland, Wisconsin Point serves as a welcome rest stop for plenty of feathered travelers. Bald eagles and hawks soar above the chatter of great black-backed and glaucous gulls. Red-necked and pied-billed grebes pass through the point, along with just about every duck species known in North America. The point is one of the best locations in the state to observe rarities such as the parasitic jaeger and Cassin's kingbird. (715) 395-7270.

Upper Mississippi River National Wildlife Refuge — When someone yells "Duck!" you can bet they're calling from this 261-mile-long refuge along Wisconsin's western border. Sloughs, backwaters, forested bottomlands, marshes, sandbars and islands provide abundant waterfowl habitat. About one-third of the North American population of canvasback ducks — 75,000 to 100,000, give or take a quack — use Lake Onalaska, a backwater of the Mississippi north of La Crosse, as a springtime staging area. Other birds likely to make an appearance include white pelicans, turkey vultures, peregrine falcons and bald eagles.(608) 783-8403.

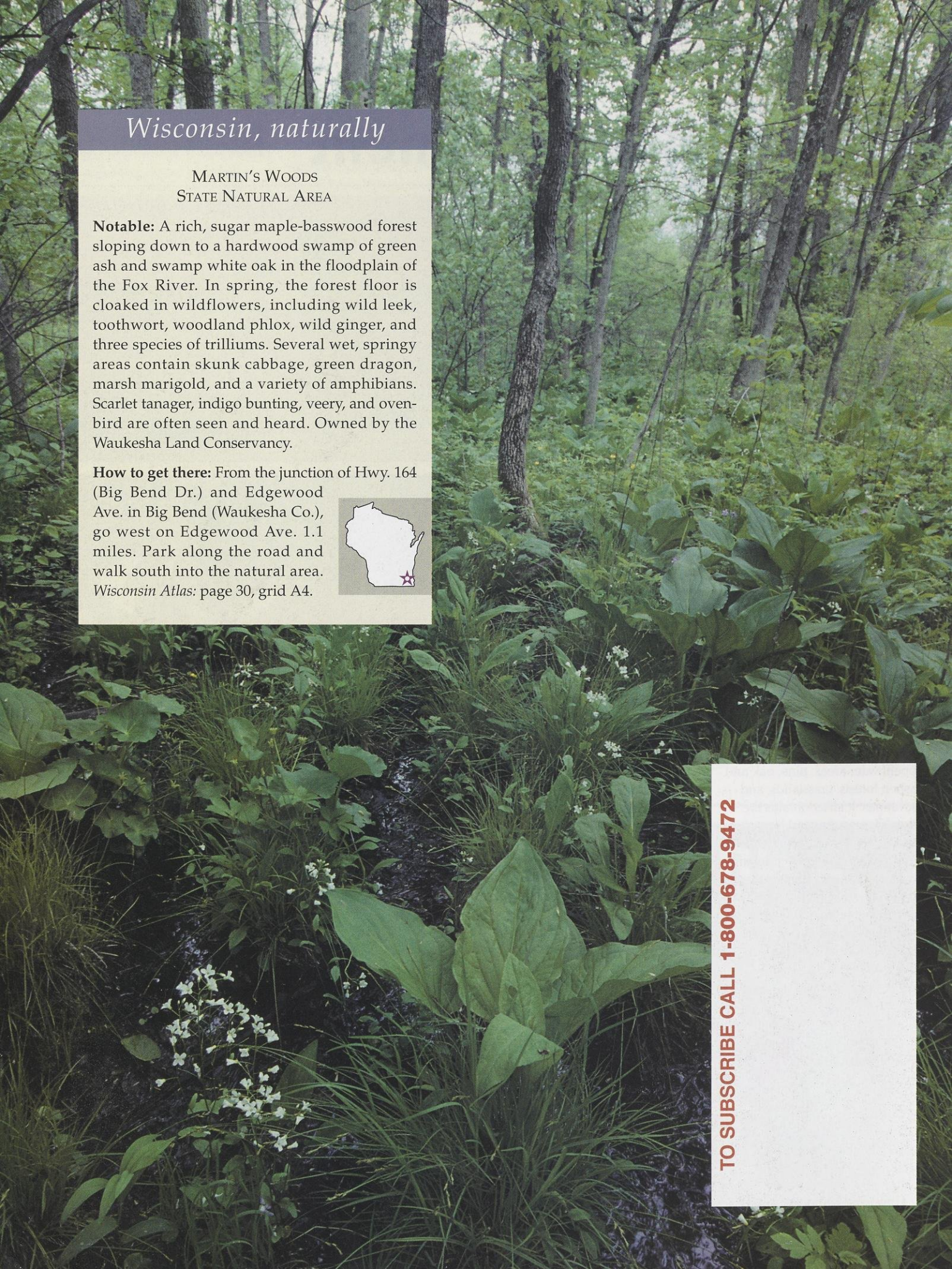


HERBERT LANGE

Birding can include pleasant surprises, like seeing pelicans along the Mississippi River.

The bluff-top trails of nearby **Wyalusing State Park**, at the confluence of the Wisconsin and Mississippi rivers, provide outstanding vistas of the river valley and give birders a bird's-eye perch: By looking down at the treetops, sharp-eyed visitors can see Kentucky and cerulean warblers, which migrate to nest at Wyalusing. These and other forest songbirds are easiest to spy in early spring, before the trees are in full leaf. (608) 996-2261.

Horicon Marsh — Only superlatives need apply here. The nation's largest cattail marsh, located in Dodge and Fond du Lac counties, is a seasonal staging area for the world's largest population of migrating Canada geese. The big honkers do leave a little bit of space for other species: Some 3,000 redhead ducks settle in every spring, in the largest redhead nesting area east of the Mississippi River. White pelicans, herons and egrets also nest at the marsh in Wisconsin's largest heron and egret rookery. Horicon Marsh National Wildlife Refuge, (920) 387-2658; Horicon Marsh State Wildlife Area, (920) 387-7860.



Wisconsin, naturally

Martin's Woods State Natural Area

Notable: A rich, sugar maple-basswood forest sloping down to a hardwood swamp of green ash and swamp white oak in the floodplain of the Fox River. In spring, the forest floor is cloaked in wildflowers, including wild leek, toothwort, woodland phlox, wild ginger, and three species of trilliums. Several wet, springy areas contain skunk cabbage, green dragon, marsh marigold, and a variety of amphibians. Scarlet tanager, indigo bunting, veery, and ovenbird are often seen and heard. Owned by the Waukesha Land Conservancy.

How to get there: From the junction of Hwy. 164 (Big Bend Dr.) and Edgewood Ave. in Big Bend (Waukesha Co.), go west on Edgewood Ave. 1.1 miles. Park along the road and walk south into the natural area. *Wisconsin Atlas:* page 30, grid A4.