In common trust...: report on gains and goals for Wisconsin's natural resources. Special report, [Vol. 12, No. 1] [January/February 1988]

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IN COMMON TRUST

. . .report on gains and goals for Wisconsin's natural resources

Carolyn Rumery
Environmental Specialist
—Madison

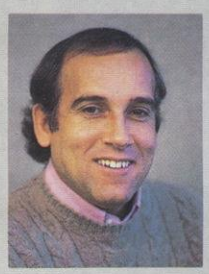
"I'M PROUD THAT. . .

over 200 volunteers are now collecting water quality data on lakes all over the state. The Self-Help Lake Monitoring Program has proven to be an excellent way of building cooperative relations between the DNR and the general public."

Laurie Osterndorf
State Naturalist
—Madison

"I'M PROUD THAT. . .

nearly 70,000 youngsters and their parents have had fun learning together over the past three years in the Junior Ranger/Wisconsin Explorer program. This privately funded program is offered at 45 state parks, forests and recreation areas."



Del Maag
Water Supply Unit Supervisor, Southern District
—Fitchburg

"I'M PROUD THAT. . .

the department and the general public finally realize the importance of groundwater and pure drinking water to our state and that I and numerous other DNR staffers are working hard to protect that resource and protect the public health when the water does become contaminated."

An accounting for our "stockholders"

Taking stock of good people

My friend has a sweatshirt with one of those catchy messages that mean more to people than they will ever admit. The message, next to a Garfield-like character is: "Cats are people, too."

The message of our report is similar: "DNR employees are people, too." We are your relatives, your neighbors, your friends. We work hard and at your side, for our schools, communities and state. Like you, we aspire for ourselves and dream for our children.

Perhaps more than most, however, we often look beyond our children. Because taking care of Wisconsin's natural resources for our children and their children is what working for the Department of Natural Resources is all about. So in sharing this accounting with you, our "stockholders," we are also reporting to generations unborn.

Just as you — as voters, taxpayers and outdoor users — evaluate our performance today, our children's children will judge all of us by the environment we hand down to them. As Worldwatch Director Lester Brown said, "the earth is not inherited from our fathers, but borrowed from our children."

That special motivation, and how we as DNR people respond to it, is what this publication is all about. It's something that a more bureaucratic report could not communicate well. Those drier ledgers report through numbers, charts, graphs and stuffy language. This one reports through people — people who count.

Our accomplishments and our record are due to a great team of employees. This team — time and time again — has helped put Wisconsin at the top of the list as a place where natural resources are taken seriously and serious professionals take care of the natural resources. We are successful, and we are proud.

C.D. "Buzz" Besadny
Secretary
Department of Natural Resources

Our successes, however, are yours too because natural resources management is a responsibility we all share. You help by speaking out on behalf of conservation. You help by agreeing that a sound economy is built on a clean environment. You help by supporting the fees and taxes needed to practice scientific management. And you help by contributing thousands of hours as conservation volunteers and active advisors.

So, neighbor, here's to us! We can be proud of Wisconsin and its Department of Natural Resources because we all made it happen. Let's savor it for just a moment. Then, let's get back to work. It's worth it.

I'M PROUD THAT . . .

We knew we could never capture the enthusiasm of all DNR employees in a few stories. We gave everyone who works here the opportunity to reflect on the small triumphs that keep staff enthused about natural resources work. Several hundred people responded. We only have room to share 30 or so responses with our readers. It's a thumbnail sketch of people who share your commitment to Wisconsin's resources.

All original watercolor illustrations by Paul Lackner.

Special help in producing "In common trust" was provided by Diane Brinson, Bob Queen, Jean Meyer, Ron Semmann, Jim Bishop, Don Bragg, Dave Crehore, Dave Weitz and Jeff Smoller.

Editorial assistance from Richard Mulhern and Kendra Nelson.

FRONT COVER: K.T. Gould, program specialist at DNR's MacKenzie Environmental Education Center, measures the circumference of the biggest limber pine in Wisconsin. The tree is native to western North America and this specimen is a champion tree in Wisconsin.

Wisconsin's forests provide multiple benefits for wildlife, watershed management, wood products and scenic beauty. In cooperation with conservation groups, the forest products industry, the Department of Public Instruction and others, the Department of Natural Resources is promoting forestry education through Project Learning Tree. For more information contact Project Learning Tree Wisconsin, DNR, Box 7921, Madison, WI 53707. Photo by Robert Wallen

George Osipoff
Area Wastewater Engineer
—Fitchburg

"I'M PROUD THAT. . .

the West Side Sanitary District, Beloit, at long last will be getting much needed public sewer service due to the efforts of the HELPS citizens group; Milton Donald, Legal Services; and Robert Weber, Southern District Wastewater Supervisor, of DNR."

Milton L. Donald
Attorney
—Madison

"I'M PROUD THAT. . .

I have risen to the challenge of assisting the DNR in protecting the waters of the state. It is a difficult task which is often charged with strong emotions, financial obstacles and political pressures. Our decisions must be sound and reasonable and we must be clear and persuasive in explaining them."

Thomas I. Meier
Project Manager
—Wisconsin Rapids

"I'M PROUD THAT. . .

Mead Wildlife Area is treated as a neighbor by adjacent landowners. Working together and understanding each other is our number one objective!"

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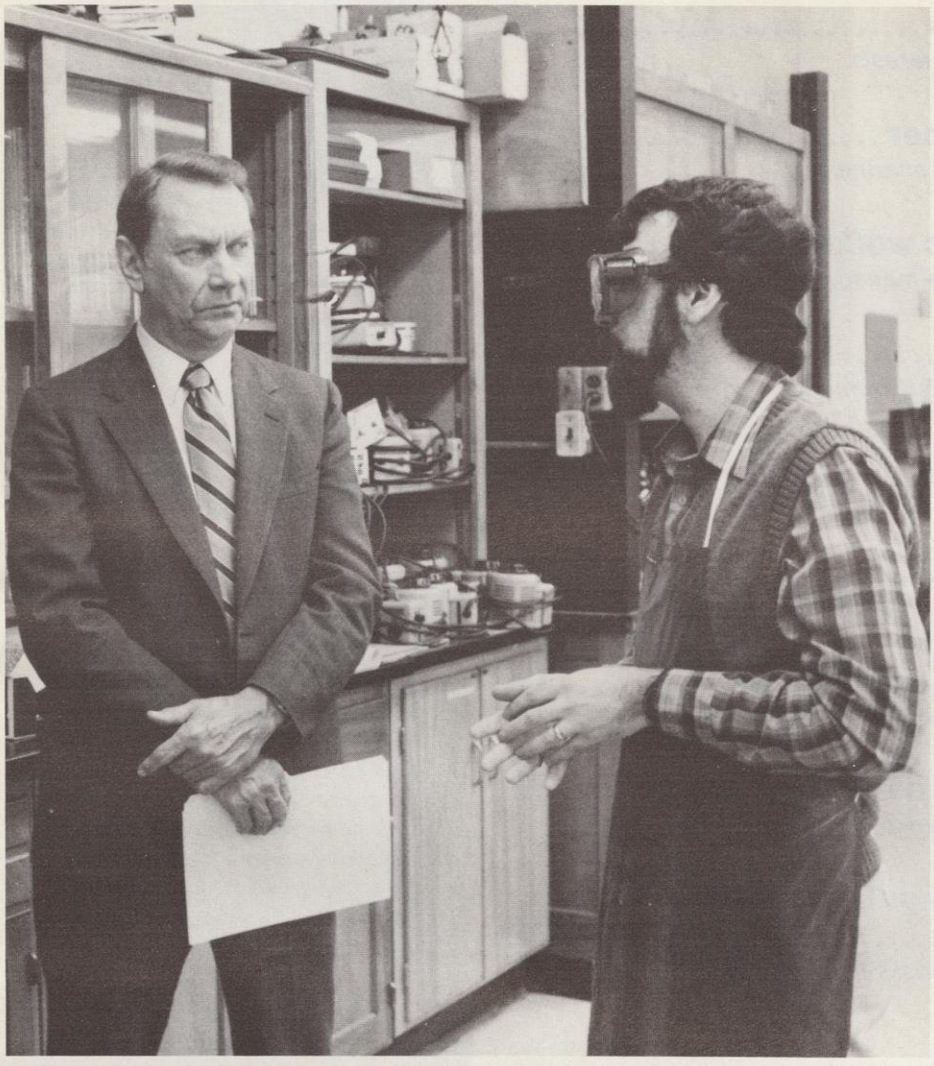
Training employees for excellence

Jeff Smoller



Ever wonder what you'll be doing 10 years from now? What will be required of you to survive in a changed world?

That's the question the Department of Natural Resources is asking as it plans for the next century. It's a question whose answer lies in organizational change and a change in what's important for the DNR employee of the future.

Today, DNR employees rate tops in their chosen professions and trades. The department enjoys an excellent reputation among natural resources professionals worldwide.

But being at the top in 1988 doesn't mean you'll be there in the year 2000. So Secretary Buzz Besadny and his staff developed a vision for the agency and its employees to meet the next century's needs.

The agency then set about recruiting employees to implement that vision. In the future, the Department of Natural Resources will continue to need skilled specialists. But technical skills will not be enough.

Future employees, Besadny said in the agency's internal newsletter, must be "creative and comfortable taking the initiative." They must "serve the people of the state, treating them as we would wish to be treated."

Many of these attributes exist in today's employees. But "in the long term, we need the understanding and support of high schools and colleges, where young people first become interested in natural resources matters. We need to tell educators what we are looking for and the kinds of individuals we will hire."

And that's what the department did.

In a letter to 300 educators whose graduates apply for work with the department, Besadny outlined his vision of the kinds of employees and employee skills the agency will require "to maintain our position as one of the nation's leading natural resources agencies."

"The DNR's new operating philosophy recognizes the importance of sharing

(above) DNR Secretary Carroll "Buzz" Besadny visited Alverno College in Milwaukee to share ideas about training tomorrow's resource professionals.
Photo courtesy of Alverno College

(below) As technology improves, environmental investigators must hone communication skills to interpret scientific results for a nontechnical world.
Photo courtesy of Alverno College

responsibility and authority with others to accomplish our goals," he wrote. "It stresses problem prevention, interdisciplinary cooperation and communication with others in and outside the agency."

Future employees will have to fit into that philosophy, Besadny continued, warning that graduates in the various technical specialties "will value the views of average citizens as well as individuals in other professions. Moreover, we will search for staff who can understand and weigh the social implications of their recommendations and decisions."

How well educational institutions respond, Besadny suggested, will "affect the employability of your students and graduates."

The letter drew praise and some concrete action.

From Southern Illinois University-Carbondale: "I'm truly delighted to see one in your position establish such (hiring criteria) and I hope that others will follow your leadership in this matter."

From a Tennessee Valley Authority official: "Your words on basic skills DNR job candidates need were on target and apply universally to both private and public sector employees."

From the University of Wisconsin-Milwaukee: "It will be interesting to see how effectively one can design exams that mirror the need that you have expressed so well."

From the University of Alaska-Fairbanks: "You are right on target. Your choice for DNR is to move toward the 'breadth' side. You have chosen to look for certain basic characteristics such as a liking and respect for people, an ability in team play, a sense of larger wholes... and an orientation toward service."

Some educators proudly said they already required communications and interdisciplinary education.

Not everyone was impressed, however. A UW-Madison professor said students and professors have no time for learning communications skills, and broad thinking wasted valuable time that could be better spent on technical training.

There was some follow-up action. Some of the encouraging responses in part due to the letter included:

- Alverno College, Milwaukee, rated one of the nation's best small colleges, shared with DNR its inspiring educational and managerial philosophies. The college now provides DNR interns.
- The UW-Stevens Point established a dialogue on ways courses can be changed and faculty kept current on practical problems facing DNR.
- The UW-Madison College of Engineering and DNR produced a videotape on the value of communications skills for practicing engineers, and a new program that encourages students to acquire a technical communications training to complement their science and analytical skills.
- Northland College, Ashland, created a committee to enhance the liberal arts program's contribution to environmental studies.

Also, DNR officials in Minnesota, Michigan and Wisconsin are talking about exercising even stronger influence over the education of natural resources professionals in Besadny's new direction.

Natural resource professionals must meld technical know-how with commitment and skills to communicate important issues.

In Wisconsin there was editorial support:

From *The Milwaukee Journal:* "It remains to be seen how well various schools will respond to Besadny's call for graduates with a broader perspective. But his effort is welcome nonetheless."

From the *Milwaukee Sentinel:* "Besadny figures he has a better chance to get the right people if the talent pool is prepared. What he is saying is that you're going to have to be more than a tree hugger... to work at the DNR in the next century."

Although organizational change is slow, there is a sense that something is happening at DNR. As the *Wisconsin State Journal* stated in a story headlined "Besadny guides DNR with new philosophy":

"At the heart of the (DNR's) new philosophy is an unusual and humble premise — that the agency isn't perfect and the job of protecting Wisconsin's environment is too big for the agency to accomplish by itself. Now when was the last time you heard a state official admit something like that?"

Jeff Smoller directs the Bureau of Information and Education. He also chairs the DNR's Trends Analysis Group.

Kenneth Sloan
Area Forestry Supervisor, Woodruff Area
—Woodruff

"I'M PROUD THAT...

volunteer fire service and the entire DNR worked together to meet the challenge on May 6, 1986, when 64 forest fires started throughout the Woodruff area (Vilas, Oneida and Forest counties) in one eight-hour period. It was an outstanding example of service to people and their resource!"

Jim Buchholz
Park Superintendent
—Sheboygan

"I'M PROUD THAT...

the Kohler-Andrae State Park nature center is supported and often staffed by local citizens who volunteer their time and talents for the benefit of other park visitors. The park has no permanent or seasonal naturalist. A limited term employee naturalist is hired for about three months. The volunteers keep the center open in spring and fall as well as help the naturalist all summer long. Without this help the facility would be closed."

Ron Eckstein
Assistant Area Wildlife Manager
—Rhinelander

"I'M PROUD THAT...

we've established a breeding population of pine martens on the Nicolet National Forest. The return of a native species to Wisconsin's northwoods has been a very satisfying experience."

Clean air is good business

Jeanne Sollen

Pragmatic. . . sensitive. . . helpful. . . available. . . responsive. . . decisive. . . technically competent. . . fair. . . understanding.

Complimentary terms used to describe, of all persons, a DNR regulator.

Moreover, the accolades were offered by leaders of industries that the Department of Natural Resources regulates.

Some of these industrial leaders have known Wolf Klassen, Southeast District DNR air program supervisor, for more than a decade and worked with him through a succession of air emission crunches. Others, like Grover Foote, president of Sunrise Packaging, Incorporated, met Klassen less than three years ago.

Foote and three other investors bought the packaging firm in 1981 and subsequently found that Sunrise was not meeting VOC (volatile organic compound) emission limits. Solvents emitted from inks and plastic packaging printed at Sunrise produced excessive amounts of these air pollutants.

Reducing the amount of VOC in the manufacturing process has been a laborious and exasperating experience for Foote, but his contacts with Klassen were one of the pluses of the situation.

"He's given us a lot of good guidance," said Foote. "I've learned a great deal from him and DNR people about meeting regulations while further expanding (our business) and still staying in southeastern Wisconsin."

Help for public utilities

Frank Boucher, who directs the environmental department of Wisconsin Electric Power Company (WEPCO), has worked with perhaps 50 environmental regulators through the years. He considers Klassen one of the best of them.

"Over the years, the DNR has been like a constant companion of our operations," he declares wryly. "After all, regular visits from a regulator are a mixed blessing."

He and Klassen have respect for each other's views.

When state approval was needed to apply a chemical to coal piles to suppress fugitive dust, Klassen promptly attended to the matter and rendered a verbal judgment, avoiding what could have been "a very tortuous" paperwork process.

In another case, when the company had to conduct test burns on low sulfur coal to estimate the costs of meeting Wisconsin's acid rain controls, Klassen worked closely with WEPCO to conduct the tests quickly. That's important because power companies must anticipate long-term needs when contracting with coal companies to supply fuel. Trying different kinds of coal and coal blends is expensive. Klassen accommodated the company by "understanding our need, making himself available, taking the time, and giving us a decision about the test burn," Boucher said.

"While that might sound less than fantastic," he added, "not every administrator is willing to take that time, show that understanding, be available or 'stand up and be counted' by delivering a prompt decision."

"It's so easy sometimes to do nothing," he noted. "Doing nothing is a decision — a passive decision, but a decision."

Working with private companies

Unlike a public utility, a manufacturer has a rapidly changing, worldwide market. A manufacturer who faces competition from eight countries with weak environmental laws is especially interested in minimizing the environmental protection costs that get tacked on to U.S. products, according to Carl A. Weigell, president of Motor Castings Company.

"In the United States, enforcement is different from state to state. We're very conscious of that, and we regard Wolf as a person who is an environmentalist's environmentalist. He never lets anyone in industry forget that his first job is to protect the environment, but he's a person who can put himself in the position of the people he's dealing with.

"He's worked in industry. He understands industry, understands the many forces that we face every day. Because of that, he's a very effective communicator."

"An effective regulator will not use an approach that antagonizes the client he's working with. He really has to be a teacher, a helpmate and, in some cases, explain why it's simply good business to cooperate with the agency to maintain high environmental standards."

Part of Klassen's success as a regulator is "he is a good listener," Weigell said, ". . . very direct and very firm; stays on track and keeps us on track; keeps on looking at the goal and how to get there."

Dr. Kim E. Anderson, corporate director for safety, health and the environment for the A.O. Smith Corporation, used to be a regulator himself. He worked for the Oklahoma Health Department when it had environmental responsibilities, and he also served with the Occupational Safety and Health Administration. In those early years of environmental consciousness, however, both regulators and regulated were still doing a lot of groping, he said.

"The program has evolved now so that people like Wolf get around and have a better grasp of what industries are doing. That is a benefit DNR can provide."

Anderson and others say that DNR's knowledge of industrial solutions to pollution problems has proven very valuable. Anderson said he has received phone calls from industrial contacts asking to be filled in on information that came originally from the department. Klassen says it's only natural that environmental regulators know which pollution control devices are more effective and relatively economical. Although some regulators feel they should not be expected to recommend solutions to industry's pollution problems, Klassen himself sees this as one of his strengths.

"They (industries) should consider us a resource (for answers) rather than a regulator — so long as we will not sacrifice the integrity of environmental programs in the process," he says.

"We know the rules better than they do; that's especially true for the smaller companies," Klassen added. "We can be a source and a channel for information. We often deal with two or three companies doing the same thing. We can help firms share information."

A.O. Smith, which has recently wrestled with a VOC emissions problem, got considerable help from Klassen and his staff, Anderson said.

"The DNR helped by letting us know we were using some exempt coatings," he said. These coatings are exempt from environmental laws because they don't contain VOC chemicals that contribute to ozone pollution.

"Basically it's been a pleasant experi-

ence working with Wolf," said Anderson. The words best expressing the contact, he said, are "reasonable" and "rewarding."

Michael McCauley coordinates the environmental law practice of Quarles and Brady law firm. He likes the topical mix of science, technology, law and human health. The firm handles environmental cases for 50 to 100 companies; six attorneys working in the field deal with a mix of clients.

"I appreciate the position that people in the regulatory agencies are in," said McCauley. "They are subject to pressures from a variety of different groups — industry, environmental and citizen groups, the public in general, EPA, the legislature, the governor's office. Sometimes conflicting demands are placed on agencies.

"A good regulator can successfully balance those conflicting interests. I think Wolf does extremely well in that role. In cases I've been involved in, he has exhibited a genuine interest in the companies I represent, a sensitivity for their concerns, while at the same time being resolute in upholding the law. He stands out in suggesting flexible and innovative approaches. In a number of cases, some of the suggestions he has made have lead to resolution of a problem situation.

"Frequently it's the (DNR) staff that know the regulations the best, know how compliance can be achieved by adopting an innovative approach. They have knowledge of what other companies have done in similar situations and sometimes these methods can be applied."

The human aspects of the enforcement process are as important as the strictly legal aspects, McCauley suggested.

"In a tough situation, it's always nice to have someone who can maintain a good disposition, a sense of humor and keep things in perspective. Wolf is knowledgeable about the Clean Air Act, and he knows what's going on. He's been able to help in other areas, other facets of the regulatory business or even in knowing what other industries are doing. It's air quality he's most interested in, but he

Wolf Klassen

Milwaukee industrialists place high stock in this evenhanded environmentalist.

he's respected for that knowledge because he's been helpful."

Jordan Harwood directed environmental services for the management association, MRA, before joining a private law firm. Unlike some of Klassen's longtime contacts, Harwood has known the air program supervisor for only five years but already appreciates him as a source of information on a variety of subjects.

"I can talk to him, ask questions and get answers. If he doesn't know the answer, he'll get the answer. It's his vast knowledge of being in the regulatory end; also gets into reforestation and fisheries; he can talk about what's happening in Germany in air pollution."

One quality he especially appreciates, said Harwood, is that Klassen's responses remain the same no matter what group he is addressing.

"Some of the (regulators) say certain things if talking to industry, and they'll shade the answer differently if talking to environmentalists to appease that group. I've found that Wolf doesn't do that."

Jim Williams, vice president of environmental affairs for Grede Foundries, Incorporated, has known and worked with Wolf Klassen for about a decade.

"One of the things that helped Wolf is that he had some private sector experience," Williams commented. "He understands the problems of the private sector, and that leads him to come up with more pragmatic solutions.

"I think Wolf has an agenda, things he wants to get done, and when he deals with people, he deals with them firmly and fairly. . . I think a regulator has got to have some reasonableness about his approach and some reasonable standards to work with. . . Some regulators get too impractical. Then, they lose the respect of the people they're dealing with."

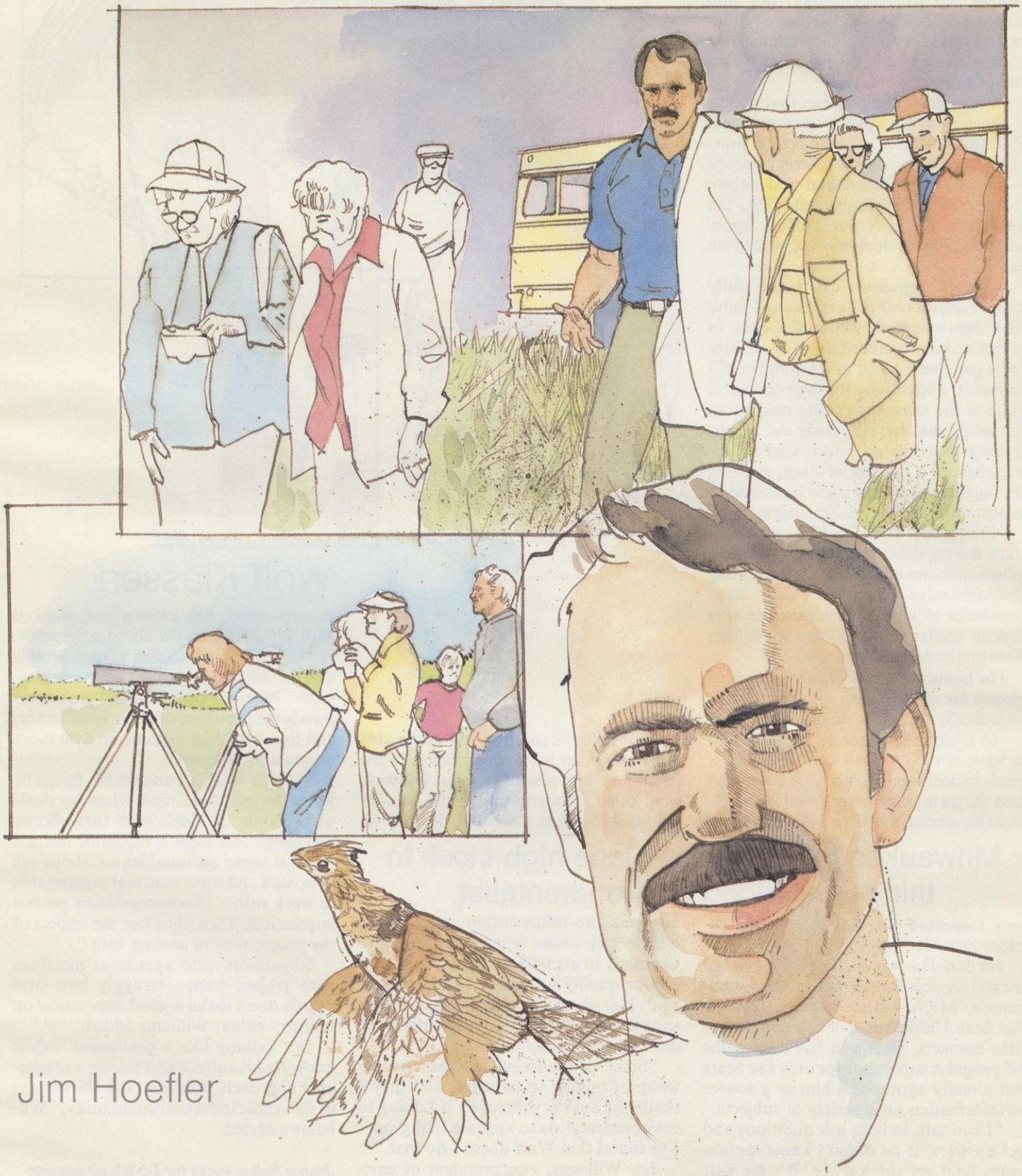
Regulators who appear at meetings with ripped pants, straggly hair and beards don't make a good impression on industry either, Williams added.

In "looking like a gentleman" while knowing his subject and taking a reasonable approach, Klassen "has the respect of the whole industrial community," Williams asserted.

Jeanne Sollen works for DNR's air management program in Milwaukee.

Joint ventures and partnerships

Jim Bishop



Jim Hoefler

When people talk, Jim Hoefler listens, says Henry Kartarik, White Bear Lake, MN.

And according to Bob O'Hara of Minneapolis, when Hoefler talks, people listen.

Hoefler is a wildlife interpretive naturalist at Crex Meadows Natural Area near Grantsburg, WI. The Friends of Crex is a volunteer organization aiming to enhance public appreciation and support for the area's wildlife management program. O'Hara chairs the group; Kartarik is a member. They say visitors who discover Crex find it is one of Wisconsin's best kept secrets.

Crex's 30,000 acres host a wide variety of wildlife inhabiting a mixture of brush prairie, wetland and forest. Eagles, deer, sharp-tailed grouse, prairie chickens, sandhill cranes and other wildlife species abound on the property. Through deliberate management, DNR staff and volunteers are concentrating on replanting native prairie plants.

With Hoefler's assistance, the Friends of Crex are out to make more people aware of the area's diverse biological environment. "It is important that we open this area up to the public and make them more knowledgeable about the wildlife and plant species we have here," Kartarik says.

praising the organization. "They have really done a lot of good work."

Admiration and respect are a two-way street.

O'Hara says Hoefler is easy to work with, very flexible, knowledgeable about wildlife and generous about sharing his professional attitude.

"I've been through Crex on Saturday and found him giving tours," O'Hara said. "I've joined the tours because I find him interesting to listen to."

Kartarik, a visitor to the area since 1952 and a member of the Friends Board, said he has known and appreciated the naturalist since 1980, when Hoefler first came to Crex.

"He listens well to everybody and takes in all opinions," Kartarik said. Such things are important, he said, when a person like Hoefler has to help answer concerns on subjects like prescribed burning or high water levels, which are often controversial.

One major joint venture Friends and Hoefler are working toward is to build a new interpretive center. According to O'Hara, the building would include office space, a research center, wildlife display area and a small auditorium for lectures. The group goal is to raise $100,000 while the state raises the rest of the needed funds.

A special place and concerned people brought Jim Hoefler and the Friends of Crex Meadows together.

Hoefler began the interpretive program in 1980 to meet an increasing demand for wildlife information about Crex Meadows and the adjoining Fish Lake Wildlife Area. Today, more than 100,000 visitors use the area each year.

From the start, state funding has not kept up with demand for printed information, equipment and research. The Friends of Crex are helping to alleviate such shortfalls.

The Friends were organized in 1985. The 300-member group has produced a number of pamphlets, purchased a telescope, staffed the visitors' center on weekends, updated bird and plant lists, assisted with legbanding work and provided new photos and slides for the visitors' center. Club members also assist with the annual open house held each October, which has been attracting about 700 persons annually.

Cooperation between Hoefler and the Friends group has built a successful program. "Without them, the interpretive program would be limited," Hoefler said,

Friends contracted with artist Louis Raymor to paint a rendition of a sharp-tailed grouse for Crex. Profits from print sales will go to the building fund.

Hoefler is also excited about the prospect of a new center. "We are a little cramped for space here, all of our slide programs have been given in a small cafeteria building," he said. The new center would help provide space for the five teacher workshops we hold on the grounds each year, and numerous talks given to school groups. Hoefler said he gives 80 to 90 tours per year in addition to slide programs.

Until the new center is built, the Friends of Crex and Hoefler will continue to provide information to visitors on foot, in buses, in the cafeteria and on the roadsides. Some new, visible signs of this department/volunteer partnership greet visitors — two 4-by-8 foot signs, courtesy of Jim Hoefler and the Friends of Crex.

Jim Bishop is a DNR Public Information Officer stationed in Spooner.

Jim March
Assistant District Director, Resource Management
—Fitchburg

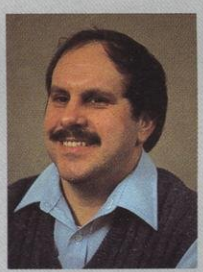
"I'M PROUD THAT. . .

we are working actively with private landowners to improve land and water management and stewardship and to promote outdoor recreation. This is one of the most productive steps we've taken in my 20-plus year career as a biologist and natural resources administrator."

Dolly Zosel
Project WILD Specialist
—Fitchburg

"I'M PROUD THAT. . .

the Project WILD program has trained over 6,000 Wisconsin educators in the past three years to help Wisconsin's youth learn about our wildlife resources and take responsible action in caring for our environment."



Dale Patterson
Water Resources Modeling Unit Supervisor
—Madison

"I'M PROUD THAT. . .

I've helped protect the major rivers of Wisconsin by using computer models to design discharge limits that will keep the rivers fishable and swimmable for everyone's use."

Looking forward, working together

Cindy Swanberg

A frontline forecast for wildlife management in Wisconsin.

Cindy Swanberg

A wildlife manager is not often asked to take the time to think about the future of the wildlife management program for the entire state of Wisconsin.

My days are usually filled with people asking questions, complaining, needing supervision; animals demanding care; memos needing responses; marshes needing restoration. There never seems to be time to consider the "big picture," the long-range view. And yet, maybe everything I and other wildlife personnel do is about the big picture. After all, why else restore a marsh, put up bluebird boxes, spend hours with a college student or plant a prairie?

I often feel overwhelmed by the magnitude of the responsibility I have been given for wildlife management in this small portion of the state. I feel it's a responsibility many more people should share so they will know the excitement, frustration and ultimate rewards of helping protect some small natural remnants for the future.

I have no special insight into the future nor any special gift for meeting its demands. To be successful in wildlife management takes some measure of dedication, perseverance, flexibility, creativity, professionalism, a love of people and a sense of humor. These are traits that have helped get me through seven years of college, years of temporary employment and five years with the Department of Natural Resources in a field still seen as unusual for women. These are traits also shared by most of my co-workers; traits that help us survive frustrating days of trying to protect wildlife resources in the face of more people, more problems and less money.

The wildlife manager of the future will need even more. The job has changed as society and resources have changed. There is no longer a traditional role for wildlife management to fill. Our staff in Madison tells us that the next 10 years will require "holistic thinking" and an "ecosystem approach." I, for one, hope I can be the type of ecologist for whom this approach to wildlife management calls.

The wildlife manager of tomorrow is, for the most part, already working on the front lines. The "hands-on" projects of the future are being formed right now in about 153 minds [153 employees manage Wisconsin's wildlife resources]. Overall direction will be coming from a new strategic plan being prepared by the Bureau of Wildlife Management. It is a thought-

provoking look at the next 10 years. It stresses creative and flexible ways of meeting challenges and renewed commitments to wildlife habitat, as well as a new dedication to education, workers, professionalism and people. For me, it seems like this future starts each morning.

One of the most challenging aspects of the plan is a mandate to share responsibility with others: the public, other agencies and our co-workers. Many wildlife managers have already been doing it for years out of necessity. There has never been enough time to do it all alone.

In my area, sportsmen and women raise pheasants, licensed rehabilitators take care of injured wildlife, teachers teach wildlife ecology in the classroom, groups of sportsmen and women raise money for special fish and wildlife projects, volunteers survey sandhill cranes, a group of citizens in New Richmond sets out to eradicate purple loosestrife in their community, and one individual even mows a parking lot for us. As I sit here, I can think of almost a hundred ways I could share responsibility and get others involved. If all wildlife people did the same, that would be 15,300 ideas!

One of the yet to be implemented ideas suggested by our Madison staff is an "adopt-a-wildlife-area" program. In my area, the 46 separate blocks of land I manage never get all the attention they deserve from the two of us who work here. I would prefer that each of them was spoiled like a grandchild, watched over and doted upon. It would be nice to know that someone knew, and cared, where all the birds nested.

People also get involved through private organizations like Ducks Unlimited and the Ruffed Grouse Society where money and personal dedication have had big payoffs for resources. Statewide county alliances of sporting organizations channel money, energy and ideas into the wildlife program. These groups and others have already done great things for wildlife in Wisconsin and promise to do more in the future. I intend to work with them as a consultant and encourage their efforts whenever I can. And I must not forget the 12 Boy Scouts who are ready to do a project of my choosing. Everybody counts. I just wish I had another day a week to direct all this energy.

Education goes hand in hand with sharing responsibility. By learning about wildlife, others naturally assume a stake in its care. There are so many children out there to teach. I feel lucky to have the help of public school teachers and the new Project WILD curriculum. We give talks ourselves and participate in conservation and career days, but I bet we reach fewer than a thousand kids a year.

I particularly try to work with girls and their parents because, as a woman, I feel a personal obligation to demonstrate that there are no restrictions, even in nontraditional fields, to what a person can do.

To reach a wider audience; we go to fairs; we try to make slide shows and displays; but mostly we talk a lot to sports clubs, civic groups and individuals. In our office, we decided among ourselves to take turns writing newspaper columns; a small effort, but a start. In the future, I want to develop new ways of teaching and want to reach groups of people I seldom encounter, such as women, retired people, conservationists and suburban landowners. The young have no monopoly on learning.

There is one more way to share responsibility, and that is within government: with our co-workers and other agencies. Sometimes, it is as easy as a discussion over coffee and other times involves difficult compromises and tough decisions.

I am lucky to be involved in a model for interdisciplinary study called "Duck and Pheasant Management in the Prairie Pothole Region." The bureaus of Research, Wildlife Management and Fish Management; the U.S. Fish and Wildlife Service; the University of Wisconsin and many volunteers are involved. Incorporating many viewpoints sometimes makes decisionmaking difficult, but the result always seems more professional and ecological. It is exciting to think about similar projects with other agencies and bureaus where we each work with a specific role that is strengthened by the shared responsibility for the final product and, ultimately, the resource.

It is so easy to get disheartened by threats facing the future for wildlife — and for all life for that matter. It is amazing to realize that even in the muddle we, as a society, have made of our natural resources, there are many people out there who care a great deal. Some of them work for the Department of Natural Resources, and some do not. They all share a common concern for the health of living natural systems. Some watch birds, some hunt and some just read books. Some have time, some have money and some have ideas. I try to think about all that enthusiasm every time I feel like the job is too big to do alone, and though it sounds corny, it really does give me hope.

Cindy Swanberg oversees several wildlife properties as DNR's wildlife manager in Baldwin.

Dee Ferver
Program Assistant
—Madison

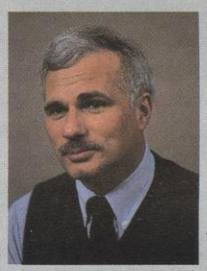
"I'M PROUD THAT. . .

I've been a member of a DNR committee to commemorate Aldo Leopold's 100th birthday anniversary. I believe our efforts will have a lasting positive effect on our environment by promoting discussion of Leopold's philosophy."

Vic Pappas
Water Management Specialist
—Milwaukee

"I'M PROUD THAT. . .

public awareness and attitudes about protecting wetland resources are beginning to change in southeastern Wisconsin. Wetlands are no longer considered wastelands, thanks in part to implementing zoning regulations in our cities, villages and counties."



Lee Kernen
Chief, Fisheries Management Section
—Madison

"I'M PROUD THAT. . .

I get to work with five of the best fishery biologists in the nation in my Fisheries Management Section. If Wisconsin fishing can be improved, we've got the professional talent to tell us how to get on with it."

Linking those who make "public works" work

Jim Bishop

"Two prisoners gazed from the prison bars, one saw sand; the other stars" (old proverb)

Kathy Bartilson

Building professional pride for vital, but unglamorous jobs takes a special kind of enthusiasm.

People generally grimace when the topic of sludge management comes up. Utilizing or disposing of this human by-product has been typically left to the back lots of local and state governments.

Hired hands with dirty tank trucks removed the substance from wastewater treatment plants and septic systems. The material was then disposed of in drying fields or special landfills.

One department employee, Kathy Bartilson in northwestern Wisconsin, however, sees sludge as "recycling at its best." According to Bartilson, her job is a combination of agricultural practices, mathematics, physics, chemistry and microbiology, which aims to produce a usable liquid compost. When applied sparingly and incorporated into fields, sludge can be a valuable soil conditioner and fertilizer.

Her professional pride has been a catalyst in organizing the sludge management industry in the 12-county Northwest District. With her assistance, the first district liquid waste hauler's group was organized. While only two years old, the group has started to communicate and work well together, even though, according to Bartilson, members remain individually competitive.

Members of the group highly praise Bartilson's work. Diane Bowen and her husband John own Lake Area Sanitation of Rice Lake. She said, "We can work with Kathy on any of our problems. We have an excellent relationship (with her), and she has always gotten back to us."

"She's been real helpful, definitely put DNR in a good light," said Bill Gramms of Gramm's Septic Service, Wentworth.

Coping with change

Impending changes in state environmental rules can be a nightmare for government and industry officials. According to Northwest District Wastewater Supervisor Bob Gothblad, Bartilson took a different approach in getting involvement from waste haulers on NR 113, the new septage code.

"First, she explained why the new code was needed," Gothblad said. "Then, she held workshops for the haulers on how to make an effective appearance at a public hearing to discuss their concerns." Bartilson triggered haulers' imaginations and self-esteem. When it came time for haulers to provide their views, they felt comfortable within the political system.

"The long process can be intimidating," Gothblad said. He added that the district haulers provided more effective testimony than came from any other part of the state. Plus, their advice was grassroots and practical.

Diane Bowen said that revisions made NR 113 "more satisfactory than the original proposal. All the pumpers were given the opportunity to comment on the code changes. We all thoroughly understood the laws and the reasons behind them."

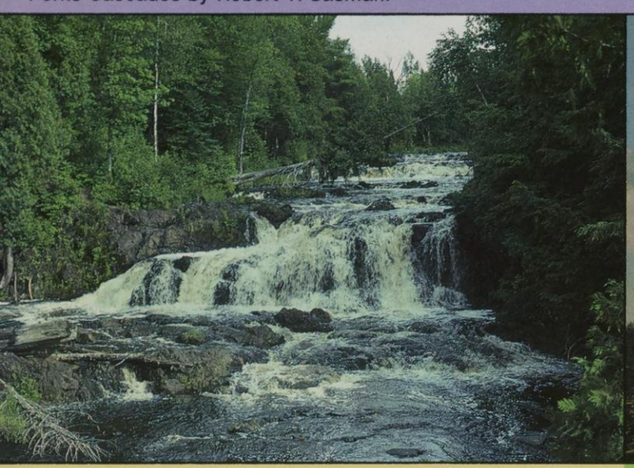
Communication among waste haulers and wastewater treatment plant operators is vital. Bartilson started a newsletter called *Northwest Ripplings* in June 1981 to inform professional sludge managers about government and professional topics. All the DNR district wastewater staff, along with the treatment plant operators and waste haulers, now write articles for the publication. Currently, 225 copies are sent out quarterly. And industry officials enjoy it.

"She once wrote a poem on sludge spreading," said Wally Thoms, Rice Lake's superintendent of water supply and wastewater. "She named all DNR district staff and provided stories about operators. It was great," he said.

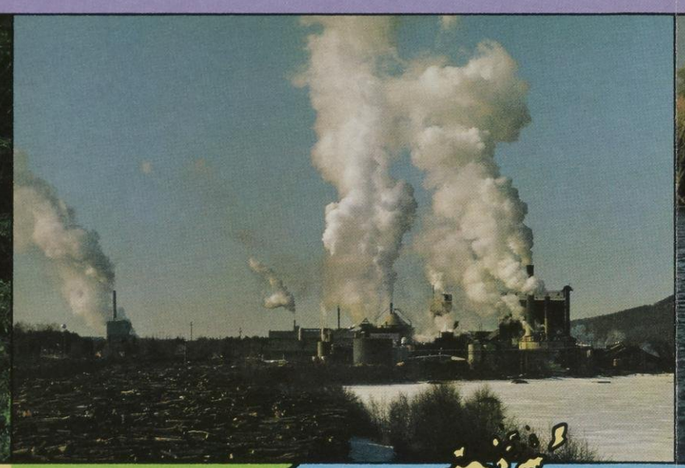
Jim Bishop is DNR's Public Information Officer in Spooner.

NATURAL RESOURCES
Wisconsin's heritage and future

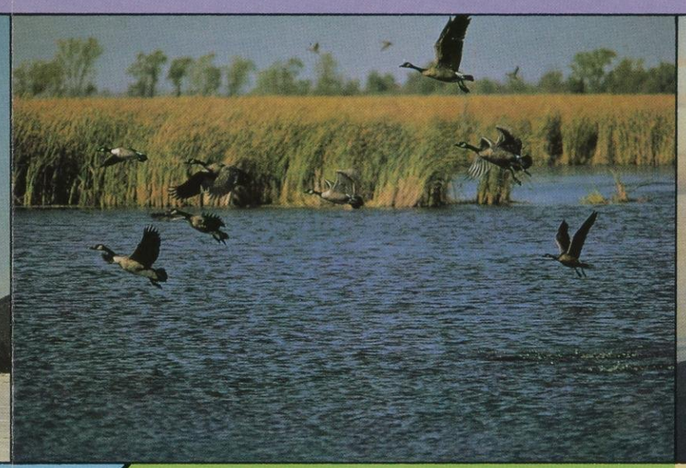
Waterfalls occur along geologic fault lines where streams fall steeply over hard rock ledges that resist erosion. Wisconsin has 45 major waterfalls. The most spectacular can be seen along the south shore of Lake Superior and in Florence and Marinette counties. Our largest waterfall is Big Manitou Falls which drops 165 feet on the Black River in Douglas County. Photo of Tyler Forks Cascades by Robert T. Sasman.



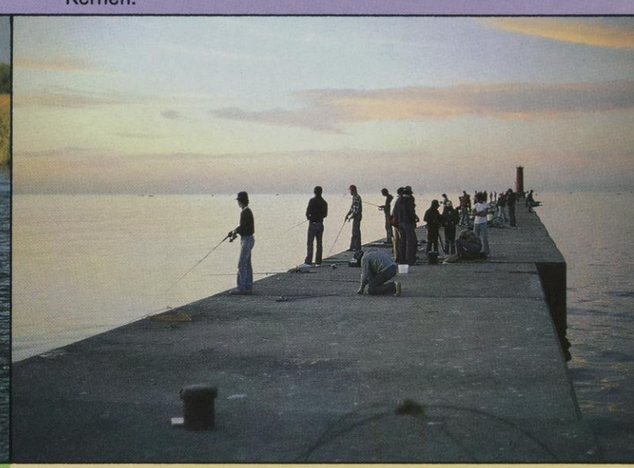
Industries and waterways link our past to our future. Wisconsin businesses that continue to thrive by the riverside include pulp and paper making, hydroelectric power, brewing and tourism. University of Wisconsin-Madison photograph.



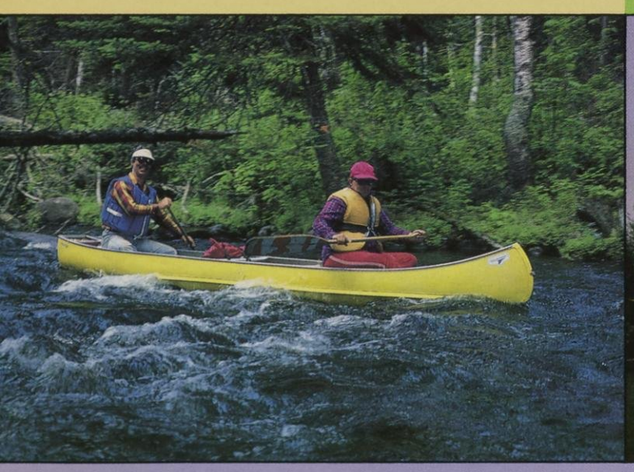
Wetlands provide food and shelter for wildlife. Wetlands retain flood waters during storm. Wetlands filter sediments and impurities from water. We also grow marsh hay, wild rice and cranberries in wetlands. Preserving Wisconsin's remaining 2.5 million acres of wetlands is important. Photo by Mark Wallner.



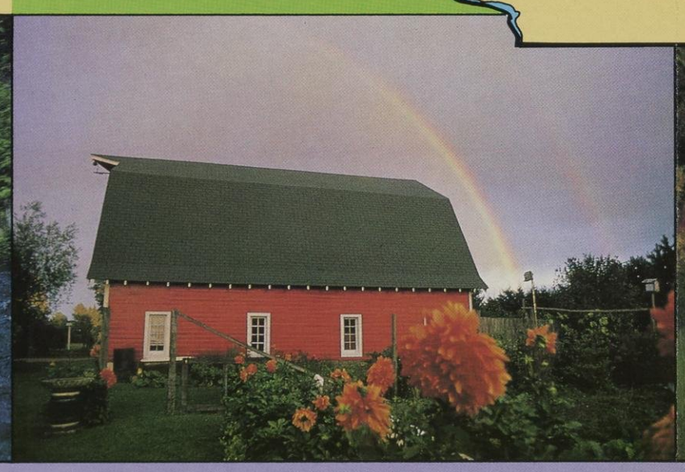
Fishing, both for fun and profit are important to Wisconsin. Two million sports anglers catch 66 million fish each year. Commercial fishers on the Great Lakes net an annual fish catch worth $4 million. DNR staff at 48 stations throughout Wisconsin improve fish habitat, raise fish, help maintain water quality and encourage people to catch on to Wisconsin fishing. Photo by Lee Kernen.



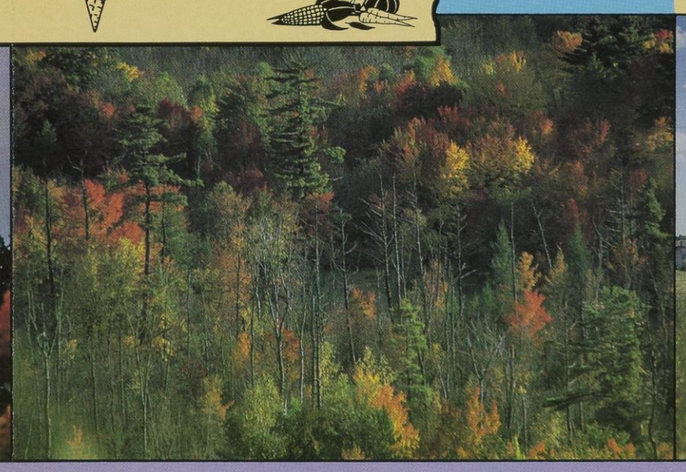
- Public Forest Lands
- Dairy Farming
- Shipping
- Cranberries
- Sport and Commercial Fishing
- Ginseng
- Potatoes
- Pulp and Paper
- Mint
- Brewing
- Cherries
- Vegetables
- Maple Sugar



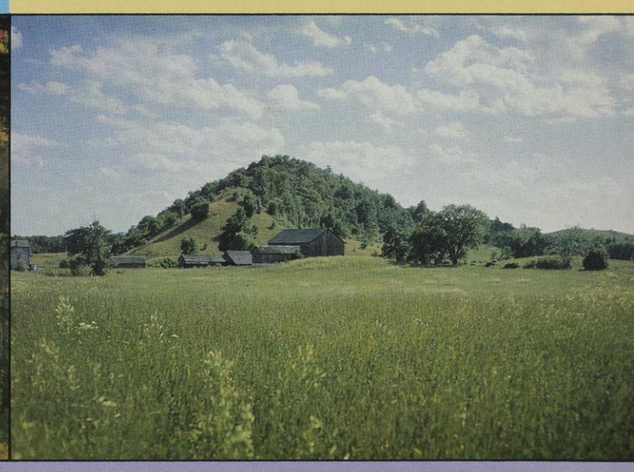
Canoeing has been a popular way to explore Wisconsin since Indians, trappers and french missionaries first traveled and settled this land. The names of our major water trails — Flambeau, Brule, Chippewa, Manitowish, Peshtigo and Namekogen — still evoke memories of their bark canoes, blue woodsmoke, dark rocks, white, foamy waters and green pines. Explore our waterways on almost 50 river trails and 15,000 lakes. Photo by Don Blegen.



Agriculture is still a mainstay of Wisconsin's economy; raising crops preserving woodlots, streams and providing homes for domestic animals and wildlife. Our 82,000 farms produce 17% of the nation's milk, 1.2 million barrels of cranberries, 3.4 million pounds of tart cherries, 5.6 million pounds of apples and 6 million pounds of strawberries. For those who like a little tang in their life, Wisconsin raises 9,800 acres of mint, 1,200 acres of onions, 700 acres of horseradish and one billion pounds of ginsing. Wisconsin could well be known as the nation's greengrocer raising 40% of the U.S. snapbean crop, 27% of the nation's peas, and 2.4 billion pounds of potatoes. We produce 450 million pounds of sausages annually as well as veal calves, hogs, beef, sheep, chickens and more than 28% of the nation's mink! Photo by Arvid A. Widvey.



Forests are a vital part of our present and past history. Almost 15 million acres (about 44%) of Wisconsin is covered with green forestlands used for paper, timber, furniture, Christmas trees and forest crops like nuts, maple sugar and shiitake mushrooms. We work hard to help landowners manage the 70% of Wisconsin forestlands which are privately owned. Photo by G. Johnson.



Glaciation sculpted Wisconsin's landscape thousands of years ago. Mountains of ice and meltwater flattened, gouged and reformed the earth during freeze and thaw cycles. Retreating glaciers left flat expanses of outwash plains, sand and gravel ridges (called eskers), conical mounded hills (called kames) rounded depressions that became kettle lakes and debris along the icy glacial edges called moraines. Kame photo courtesy of Wisconsin Division of Tourism.

Wisconsin Department of Natural Resources
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Visit us for fun-packed learning!

Southern District

MacKenzie Environmental Center
Rt. 2, Box 825
Poynette 53955 (608) 635-4498

State Parks

Aztalan
2405 Door Creek Rd.
Stoughton 53589 (608) 873-9695

Blue Mound
Box 98
Blue Mounds 53517 (608) 437-5711

Devil's Lake
55975 Park Rd.
Baraboo 53913 (608) 356-8301

First Capitol-Belmont Mound
Rt. 2
Blanchardville 53516 (608) 523-4427

Governor Dodge
Rt. 1, Box 42
Dodgeville 53533 (608) 935-2315

Governor Nelson
5140 Cty. Hwy. M
Waunakee 53597 (608) 873-9695

Lake Kegonsa
2405 Door Creek Rd.
Stoughton 53589 (608) 873-9695

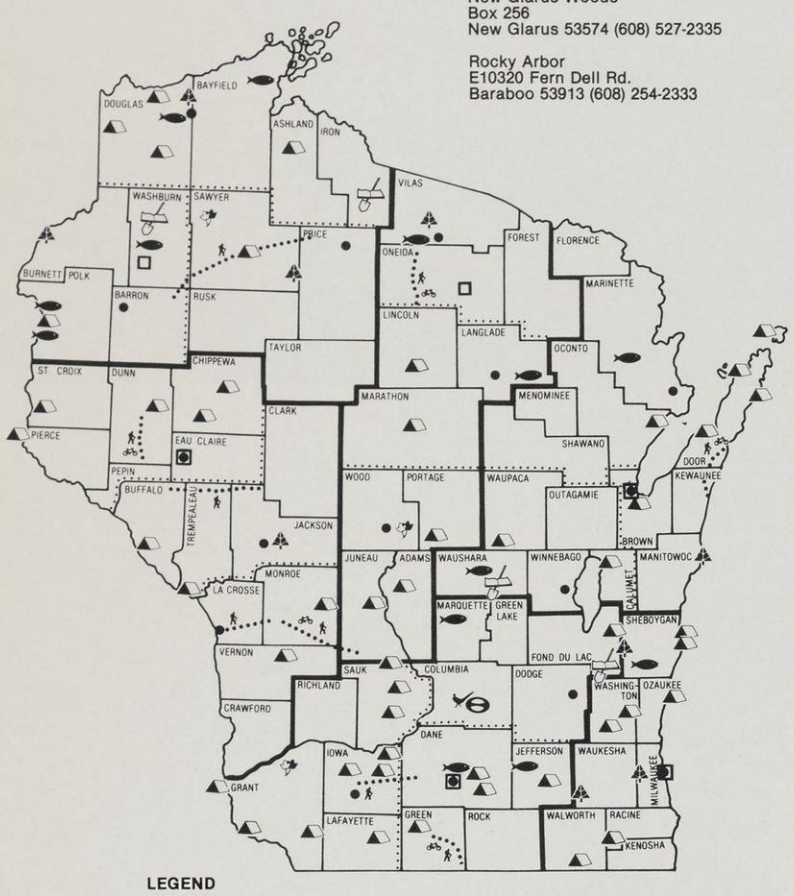
Mirror Lake
E 10320 Fern Dell Road
Baraboo 53913 (608) 254-2333

Natural Bridge
55975 Park Rd.
Baraboo 53913 (608) 356-8301

Nelson Dewey
Cassville 53806 (608) 725-5374

New Glarus Woods
Box 256
New Glarus 53574 (608) 527-2335

Rocky Arbor
E10320 Fern Dell Rd.
Baraboo 53913 (608) 254-2333



LEGEND

- DISTRICT BOUNDARIES
- AREA BOUNDARIES
- DISTRICT OFFICES
- AREA OFFICES
- STATE PARKS, RECREATION AREAS
- STATE FORESTS
- STATE FISH HATCHERIES
- STATE NURSERIES
- STATE TRAILS
- YOUTH CONSERVATION CAMPS
- POYNETTE GAME FARM
- MACKENZIE CENTER

- A park visitor's guide is available from DNR offices and parks.
- The DNR Bureau of Wildlife Management in Madison can supply a public hunting grounds map.

Tower Hill
Rt. 3
Spring Green 53588 (608) 588-2116

Wyalusing
13342 Co. Hwy. C
Bagley 53801 (608) 996-2261

Yellowstone
Rt. 2
Blanchardville 53516 (608) 523-4427

Recreation Areas

Browntown-Cadiz Springs
N3150 Hwy. 81, Box 256
Monroe 53566 (608) 966-3777

State Trails

Military Ridge Trail
Rt. 1
Dodgeville 53533 (608) 935-2315

Pecatonica Trail
Park Street
Belmont 53510 (608) 762-5878

Sugar River Trail
Box 805
New Glarus 53574 (608) 527-2334

Glacial Drumlin Trail
2405 Door Creek Rd.
Stoughton 53589 (608) 873-9695

State Nurseries

Wilson
5350 Hwy 133E
Boscobel 53805 (608) 375-4123

State Fish Hatcheries

Nevin Fish Hatchery
3911 Fish Hatchery Rd.
Fitchburg 53711 (608) 275-3246

Westfield Fish Hatchery
W. Park St., Box 44
Westfield 53964 (608) 296-2343

Lake Mills Fish Hatchery
302 S. Main St.
Lake Mills 53551 (414) 648-8012

West Central District

State Parks

Brunet Island
Rt. 2, Box 158
Cornell 54732 (715) 239-6888

Interstate
Box 703
St. Croix Falls 54023 (715) 483-3747

Kinnickinnic
Rt. 3, Box 262
River Falls 54022 (715) 425-1129

Lake Wissota
Rt. 8, Box 360
Chippewa Falls 54729 (715) 382-4574

Merrick
Rt. 1, Box 182
Fountain City 54629 (608) 687-4936

Mill Bluff
Hwy 33 E
Ontario 54651 (608) 427-6692

Perrot
Rt. 1, Box 407
Trempealeau 54661 (608) 534-6409

Wildcat Mountain
Hwy 33E
Ontario 54651 (608) 337-4775

Willow River
Rt. 2, Co. Hwy. A
Hudson 54016 (715) 386-5931

Recreation Area

Hoffman Hills
Rt. 6, Brickyard Rd., Box 1
Menomonie 54751 (715) 232-1242

State Forest

Black River
Rt. 4, Box 18
Black River Falls 54615 (715) 284-1426

State Trail

Buffalo River Trail
Rt. 1, Box 407
Trempealeau 54661 (608) 534-6409

Elroy-Sparta Trail
Hwy 33E
Ontario 54651 (608) 337-4775

La Crosse River Trail
Hwy 33E
Ontario 54651 (608) 337-4775

Red Cedar Trail
Rt. 6, Brickyard Rd., Box 1
Menomonie 54751 (715) 232-1242

North Central District

State Parks

Buckhorn
Rt. 2, Box 725
Necedah 54646 (608) 565-2789

Council Grounds
1110 E. 10th St.
Merrill 54452 (715) 536-4502

Rib Mountain
5301 Rib Mt. Dr.
Wausau 54401 (715) 359-4522

Roche a Cri
Hwy. 13, Box 100
Friendship 53934 (608) 339-3385

State Forest

Northern Highland-American Legion
Co. Hwy. J, Box 440
Woodruff 54568 (715) 356-5211

State Trail

Bearskin Trail
Co. Hwy. J, Box 440
Woodruff 54568 (715) 356-5211

State Nursery

Griffith
711 Nepco Lake Rd.
Wisconsin Rapids 54494 (715) 424-3700

State Fish Hatcheries

Lakewood Rearing Station
14865 Hatchery Lane
Lakewood 54138 (715) 276-6066

Langlade Rearing Station
White Lake 54491 (715) 882-8757

Thunder River Rearing Station
Rt. 2
Crivitz 54114 (715) 757-3541

Woodruff Fish Hatchery
Co. Hwy J, Box 440
Woodruff 54568 (715) 356-5211

Southeast District

State Parks

Big Foot Beach
Rt. 3, Box 12
Lake Geneva 53147 (414) 248-2528

Harrington Beach
Rt. 1, Box 75A, Cty. Hwy. D
Belgium 53004 (414) 285-3015

Kohler-Andrae
Rt. 3, Old Park Rd.
Sheboygan 53081 (414) 452-3457

Lizard Mound
Rt. 2, 3340 Kettle Moraine
Hartford 53027 (414) 644-5248

Old Wade House
Box 34
Greenbush 53026 (414) 526-3271

Pike Lake
Rt. 2, 3340 Kettle Moraine
Hartford 53027 (414) 644-5248

Recreation Areas

Richard Bong
2613 Burlington Rd.
Kansasville 53139 (414) 878-4416

State Forests

Havenwoods
6141 N. Hopkins St.
Milwaukee 53212 (414) 527-0232

Kettle Moraine-NU
Box 410 Cty. Hwy. G
Campbellsport 53010 (414) 626-2116

Kettle Moraine-SU
S 91W39091, Hwy 59
Eagle 53119 (414) 594-2135

State Fish Hatcheries

Kettle Moraine Springs Fish Hatchery
Rt. 1
Adell 53001 (414) 528-8825

Lake Michigan District

State Parks

Copper Culture
Industrial Parkway, Box 16
Marinette 54143 (715) 732-0101

Hartman Creek
N2480 Hartman Creek Rd.
Waupaca 54981 (715) 258-2372

Heritage Hill
2640 S. Webster
Green Bay 54301 (414) 497-4368

High Cliff
N7475 High Cliff Rd.
Menasha 54952 (414) 989-1106

Newport
Rt. 1, 475 S. Newport Lane
Ellison Bay 54210 (414) 854-2500

Peninsula
Box 218
Fish Creek 54212 (414) 868-3258

Potowatomi
3740 Park Dr.
Sturgeon Bay 54235 (414) 743-5123

Rock Island
Washington Island 54246 (414) 847-2235

Whitefish Dunes
Rt. 3
Sturgeon Bay 54235 (414) 823-2400

State Forest

Point Beach
9400 Cty. Hwy. O
Two Rivers 54241 (414) 794-7480

State Trail

Ahnapee Trail
3740 Park Dr.
Sturgeon Bay 54235 (414) 743-5123

State Fish Hatcheries

Wild Rose Fish Hatchery
Rt. 1, Hwy. 22N
Wild Rose 54984 (414) 622-3527

Northwest District

State Parks

Amnicon Falls
Box 435
Superior 54880 (715) 399-8073

Big Bay
Box 545
Washburn 54891 (715) 373-2015

Copper Falls
Box 438
Mellen 54546 (715) 274-5123

Lucius Woods
Solon Springs 54873 (715) 378-4528

Ojibwa
Box 187
Winter 54896 (715) 266-3511

Pattison
Rt. 2, Box 435, Hwy. 355
Superior 54880 (715) 399-8073

State Forests

Brule River
Box 125, Hwy 2
Brule 54820 (715) 372-4866

Flambeau River
HCR Box 51
Winter 54896 (715) 332-5271

Governor Knowles
Box 367, Hwy. 70
Grantsburg 54840 (715) 463-2898

State Trails

Tuscobia Trail
Box 187
Winter 54896 (715) 266-3511

State Nurseries

Hayward
Rt. 8, Box 8213 Nursery Rd.
Hayward 54843 (715) 634-2717

State Fish Hatcheries

Brule River Rearing Station
Box 310, Hwy. 2
Brule 54820 (715) 372-4820

Bayfield Fish Hatchery
Box 589, 141 S. 3Rd
Bayfield 54814 (715) 779-5430

Osceola Fish Hatchery
Rt. 3
Osceola 54020 (715) 294-2525

Spooner Fish Hatchery
Box 309, Hwy 70
Spooner 54801 (715) 635-4147

St. Croix Falls Fish Hatchery
Box 397, River St.
St. Croix Falls 54024 (715) 483-3535

Here are some things Wisconsinites can brag about:

Since 1961, governors and legislators of both parties have supported acquiring and developing state outdoor recreation areas through Outdoor Recreation Action Plan programs. ORAP and other programs provided funds to buy or lease about 3% of Wisconsin's land for outdoor recreation.

◆

Wisconsin sells more nonresident fishing licenses than any other state.

◆

An innovative, nationally-acclaimed system of allocating pollution permits on the Fox River allows industrial growth while cleaning up the river. In 1973, industries and communities discharged more than 218,000 pounds of biochemical oxygen demand (BOD) daily. After water quality standards were implemented, by 1981 these point source dischargers had brought their average daily load of BOD down to less than 40,000 pounds — a 210% improvement.

◆

Wisconsin forests help support more than 1,600 forest product industries employing over 325,000 people.

◆

Pollution cleanup and fish stocking have transformed Lake Michigan into a productive trout and salmon fishery with an estimated value of $1.8 million annually.

Wisconsin is internationally recognized as a leader in both quality and quantity of research on fish, wildlife and water resources leading to many innovative management programs.

◆

Wisconsin led the nation in banning the pesticide DDT in 1967. As a result, eagles, osprey and other affected species are making a comeback.

◆

More deer are harvested in Wisconsin each year than any other state except Texas and Pennsylvania.

◆

Hybrid muskies reared by the state have been stocked in southern Wisconsin lakes, expanding the range for the trophy fish.

◆

Ninety percent of the state's 570 municipal wastewater treatment plants met the July 1983 deadline of the federal Clean Water Act for "fishable and swimmable" water quality.

◆

As a result of the hard work of many, Wisconsin was subsequently cited as a national leader in water cleanup. Ninety-eight percent of our streams and 95% of our lakes were found to have high water quality; surpassing the national average of 84%.

Thanks in large part to hundreds of individuals, groups, schools and businesses who have "adopted" eagle nests, the American bald eagle has successfully expanded its nesting territories in Wisconsin. We're second only to Florida in eagle production. The bird will be removed from the endangered species list if the population can be stabilized.

Worth talking about

Wisconsin citizens can be justifiably proud of the state's natural resource accomplishments. Some are the direct result of state programs, but none could have been accomplished without cooperation from conservationists, public officials, businesses, volunteers, farmers, hunters, educators, anglers, students, laborers and many others.

Wisconsin has 120,224 acres of state parks, recreation areas and forests. Wisconsin is also a national leader with 420 miles of state biking and hiking trails. Often along abandoned railroad beds, these trails have added to the revenue of local businesses serving trail users.

◆

Wisconsin has been a national leader in recognizing the value of wetlands for clean water, fish and wildlife habitat, and to reduce flooding. All wetlands over five acres have been mapped. Each county and 450 communities will use these maps to implement state-mandated wetlands protection zoning.

Wisconsin has recognized that its solid waste challenges are critical. DNR inventoried dump sites are found: 191 with potential environmental hazards, 30 sites that warrant further investigation, 30 requiring state cleanup funds, and 44 sites in need of federal Superfund aid. Environmental hazards at an additional 708 dumps are unknown.

◆

Wisconsin was the first in the nation to implement standards for water wells to protect drinking water quality.

◆

Wisconsin was ranked by the Fund for Renewable Energy and the Environment as the best state for combined performance in reducing air pollution, managing solid and hazardous wastes, conserving soil, recycling, encouraging renewable energy and promoting resource conservation.

◆

Wisconsin was one of the first states to pass legislation to control acid rain and protect our lakes, streams and forests. This landmark law limits the amount of sulfur dioxide that can be emitted into the atmosphere by utilities and industries.

◆

The Wisconsin Legislature has enacted a program that will allow expanding or new businesses in Southeast Wisconsin to apply for a "credit" that will allow them to emit volatile organic compounds and still stay within federal pollution limits. VOCs are the main cause of ozone.

Wisconsin's natural resource treasures

Wisconsin has 13,580 miles of streams.

Wisconsin has 2,444 trout streams totaling 9,560 miles.

Wisconsin has 860 miles of Great Lakes shoreline.

Wisconsin has about 15,000 lakes larger than 50 acres.

Wisconsin has 14.8 million acres of commercial forests and woodlands.

Wisconsin has about 55 native species of trees.

Wisconsin has 174 native fish species.

Wisconsin's native species include 78 mammals, 380 birds, 38 reptiles, 20 amphibians and 50 mollusks.

Wisconsin has six distinct natural divisions based on major soils, vegetation, and glacial and bedrock geologic features. The six divisions are: Lake Superior Boreal, Northern Highlands, Lake Michigan Lowland, Southeastern Moraines, Central Sands Transition and Western Driftless Upland.

Wisconsin has 2.5 million acres of wetlands.

Wisconsin is home to more than 500 nongame species and 100 endangered and threatened plant and animal species.

Wisconsin has 6 million acres open to public hunting.

Wisconsin's highest point is Timm's Hill in Price County, elevation 1,952 feet.

Wisconsin has the world's largest chain of lakes — 28 — in Eagle River.

Wisconsin has 18 million acres of farmland.

Wisconsin has 300 billion tons of 500 different soil types.

Wisconsin has an estimated two million-billion gallons of groundwater and residents use about 600 million gallons daily in their homes, businesses, industries and farms.

Shelter from a storm

Dave Weitz

Dave Vetrano

A better idea safeguards lunker trout in western Wisconsin's fast-moving streams.

The clear streams flowing down steep coulee hills are among the best trout waters in the state.

Dave Vetrano is working in Wisconsin's Coulee country to make Wisconsin trout streams even better places. And he's saving money while he's at it.

Vetrano is a fisheries technician at DNR's La Crosse Area Office. His work to improve Western Wisconsin trout streams recently took a new twist. Vetrano and his crew built some special, new devices designed to produce the big ones, the lunker trout that anglers are looking for in Coulee streams. Vetrano's innovation is working so well that his professional peers voted his efforts Project of the Year for 1986.

First, some background. Fish managers are pros at trout home improvement. By placing log structures in streams and covering them with riprap (rock and rubble), soil and vegetation, managers can augment natural shelter for trout. This improves naturally productive streams.

For more than 25 years, fish crews have used a time-tested tool throughout Wisconsin: single wing, water deflectors made of logs, wire and rock. The structures deflect water currents, provide overhead cover for trout and create an area with slower current — a loafing area for lunkers and a place where food settles.

But the coulee streams pose special problems. During heavy rains or swift spring snowmelt, flooding and heavy siltation can destroy the work of fish crews and damage trout habitat.

Coulee floods rushing from steep ridges destroyed deflectors fastened to rocky streambanks with wire and poles. Silt sometimes covered the deflectors. Logs above water began to rot as Coulee stream levels shifted.

In 1978, the shortcomings of the structures were dramatized. A 100-year flood hit the Coulee country, destroying 355 wing deflectors in five area streams. Another 303 deflectors were damaged. It took $290,000 in federal disaster and trout stamp funds to repair the damage.

Enter Vetrano, who faced an immense problem. Putting the same structures back meant a similar flood would repeat the damage. So with his crew, Vetrano sought a better way.

He decided to build the structures on land. Then, he installed them in the stream using construction materials — reinforcing rod to anchor the oak plank and building techniques that blocked the devices against the streambed.

Vetrano and his crew called the new devices "lunkers" because they believed the solid structures would provide sturdy, long-lasting homes that would give trout plenty of time to grow big and sassy.

He says two experienced people can assemble and nail one of the units in 11 minutes. A four-person crew can install three to five structures on an outside stream bend in about two hours. So, they're less expensive than traditional models to install.

Vetrano estimates the new methods cost about half as much to build as the older ones. That means trout stamp funds stretch further and more fish management work gets done for fewer dollars.

Spring Coulee Creek in Vernon County received the first prototype prefabricated structures. In 1984, a 500-year flash flood occurred. The stream, which normally flows at 2,900 gallons per minute, reached about 5.4 million gallons per minute.

The devices withstood the deluge. Apart from a few rocks that had rolled away and some topsoil that eroded, the lunkers units were untouched.

A great project for volunteers

"Given the ease with which the new structures can be built and installed, private conservation groups, rod and gun clubs, and similar organizations can start habitat improvement projects on their own," Vetrano says. "Volunteer time and materials that may be donated by these groups will decrease the unit costs."

During the last two years, the 24-Valley Trout Club has installed 33 of the new structures on 24-Valley Creek in Vernon County. The structures were prefabricated by club members and a contractor was hired to install the "lunkers," landscape and seed the stream banks. The cost for each unit including landscaping and seeding was $209.

Vetrano won't take credit for the system himself. "I came up with the initial idea and some modifications," Vetrano says. "But my crew made it work." The crew members were Tip Bagstad, Jeff Kastenschmidt, Todd Mathison, Heidi Langrehr, Larry Brinkman and Tammy McGuire.

The word about lunkers is spreading. Minnesota and Illinois may soon be using the units for improving streams. Vetrano said the Soil Conservation Service may also incorporate lunkers into guidelines, as an alternative erosion control when riprapping.

David Weitz is DNR's public information officer in Eau Claire.

Nurturing nature in the city

Bonnie Gruber

Al Stenstrup

When Al Stenstrup became superintendent of Havenwoods Forest Preserve in 1981, the area was "not exactly pristine," he says.

The 240 acres included abandoned Nike missile silos, a former landfill, the foundations of an old farm and the Milwaukee County House of Corrections, acres of asphalt paving, septic tanks, and parts of countless stolen bicycles and other vehicles.

With the help of many volunteers, Havenwoods has become an island of nature within the city. There are deer, foxes, opossums and a raccoon that looks at nearly every school group that comes by. Birdsongs almost drown out traffic noise.

Stenstrup shows a group of visitors an aerial photo of the City of Milwaukee, which surrounds Havenwoods. "This is our resource," he says.

More than eight acres of asphalt have been removed. In the course of removing 1,300 gallons of a petroleum product and an asbestos-lined steam tunnel from the property, Stenstrup matched up experience in toxic waste disposal and air management with his environmental education experience.

Stenstrup came to Havenwoods from Oconto, where he taught eighth-grade science for eight years, because he wanted to work for the department and work full-time in environmental education. He holds a master's degree in environmental education from Northern Illinois University.

The Havenwoods Environmental Awareness Center, a modern passive solar building, opened in September, 1986. It has displays and free booklets about such things as other state forests and parks, national forests, fishing and barn owls. There are rooms for classes and meetings and a library.

When DNR took over the property in 1979, only three percent of it was wooded, and most of the trees were box elders. The Friends of Havenwoods, 4-H clubs, boy and girl scouts, and others helped plant six acres of one-to-two-inch diameter trees of about 18 varieties, plus 30,000 seedlings.

An arboretum is being established in memory of Dr. Martin Luther King Jr., and various local organizations take part in annual Dr. Martin Luther King Jr. tree planting day.

"Al's openness to the use of volunteers and encouraging public involvement has led to shared husbandry on the property," says Ed Trecker, parks supervisor for the DNR Southeast District.

"This guy is fabulous," said Gordy Ziglinski of the North Milwaukee Lions Club, which has committed $10,000 and volunteer labor for a children's discovery area playground at Havenwoods. Ziglinski described Stenstrup as very outgoing, open-minded and knowledgeable, "and he gets along with kids, too."

A landscape company donated plants for an area where city residents can see locally available trees and shrubs that will attract birds to their yards. Volunteers have collected and planted prairie seeds.

Stenstrup is "always hustling, coming up with new ways to stretch dollars," according to Ken Ottman, supervisor of the City of Milwaukee Forestry Division, which donated wood chips for surfacing Havenwoods' trails.

Stenstrup has also enlisted volunteers for Havenwoods' educational programs, drawing on contacts with DNR's Bureau of Information and Education, the Wisconsin Department of Public Instruction, and five colleges and universities in Milwaukee. Four interns from local universities tested out their skills and got experience with children at Havenwoods this

summer.

In 1986, nine teen-aged minority interns spent four weeks working and learning at Havenwoods and one week at UW-Stevens Point. At least six of them planned to return for another year of the program.

Havenwoods is, equally, a meeting center to teach teachers. Some 1,500 teachers participated in programs at Havenwoods in eight months of 1986, and 20 workshops were held in January through May of 1987. For example, the "Urban Environmental Issues" workshop explored air pollution, landfill operation, water supply and treatment, and nonpoint pollution. Activities helped teachers discover new methods and new nearby places to help them teach environmentalism in a city setting.

Organizations such as the Sierra Club, the Milwaukee County Zoo and the Smithsonian Institution have sponsored workshops with Havenwoods.

Stenstrup serves on technical advisory committees of Milwaukee's Madison (environmental) and Vincent (natural resources) specialty high schools. He helps develop their curricula, acts as a liaison with DNR, talks to classes, leads field trips and advises teachers. "It's helped me a lot in developing contacts with the Milwaukee schools," he says.

Stenstrup also has served as a resource person for the 8.3-acre outdoor wilderness area adjacent to Daniel Webster Middle School, up Lincoln Creek from Havenwoods. "We really appreciate him," said Gil Gjere, the school's learning coordinator. "He's so knowledgeable and gives freely of his time."

Stenstrup chaired the Wisconsin Association for Environmental Education in 1985 and has led sessions at state and regional teacher conferences. Under his leadership, Havenwoods received environmental education awards from the Milwaukee County Conservation Alliance and the Wisconsin Arborists Association, and the Gold Leaf Award of the International Society of Arboriculture this year.

For the last five years, Stenstrup has also been the DNR liaison with the Olympic Ice Rink Operating Corporation.

The Havenwoods property doesn't have game fish in its three-acre pond and creek, but that didn't stop Stenstrup. He worked with Milwaukee County Parks and the DNR Bureau of Fish Management on an urban fishing program. Al developed the curriculum that fishing club members used to teach more than 1,000 children on a drizzly April Saturday. A rod and reel manufacturer helped underwrite the program and loaned equipment.

Mike Ross, coordinator for the program this year, said Stenstrup's work made it much more enjoyable for the volunteers than it had been the year before. "He's not afraid to get involved," Ross said, noting that the presence of Stenstrup and other DNR staff at the fishing clinics helped to give children a positive image of the department.

Havenwoods has no campgrounds, but Stenstrup works with the Urban Family Camping Association in teaching Milwaukee residents camping skills, coordinating trips and helping people to reserve campsites.

In a sense, the former missile launch site now is a site for launching city dwellers toward greater interest in nature and the outdoors.

Stenstrup's interest in marketing the state parks and forests shows both in his chairmanship of the state parks Public Information Committee and the way he reaches out to neighbors of Havenwoods.

Working with UW-Extension, Havenwoods set aside 20 garden plots for residents of the nearby Berryland housing project. There is now a waiting list for plots, and Havenwoods' 70-seat auditorium was nearly filled for the sessions on how to plant and care for the gardens.

At Havenwoods, naturalists created an emerald isle, thanks largely to volunteers.

Stenstrup and his staff have visited 15 senior centers to encourage members to come to Havenwoods. In June through September, eight programs have been planned with older adults' interests and energy levels in mind. Subjects include urban wildlife, state parks, insects, wild edibles, wild flowers and natural dyes.

The number of visitors to Havenwoods has grown by 10 to 25 percent a year, to 32,000 in 1986.

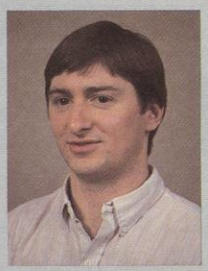
Stenstrup enjoys his work because "the job still changes day to day." An example, he says, is cooperative promotional efforts by the state parks and private businesses — something that would not have been done a few years ago.

Bonnie Gruber writes and edits publications for DNR's Bureau of Parks and Recreation in Madison.

John V. Semo
Park Superintendent
—Superior

"I'M PROUD THAT. . .

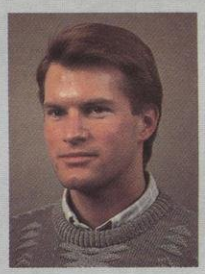
backpack camping facilities and 4.5 miles of new hiking trail have been added at Pattison State Park with no expenditure of state tax money due to the combined efforts of Boy Scout volunteers, Youth Conservation Corps and Wisconsin Conservation Corps enrollees and park staff."



Brian Galley
Environmental Engineer,
Bureau of Air Management
—Madison

"I'M PROUD THAT. . .

I work in an organization where I am surrounded by so many top quality environmental professionals, and that I live in a state whose citizens appreciate the value of natural resources."



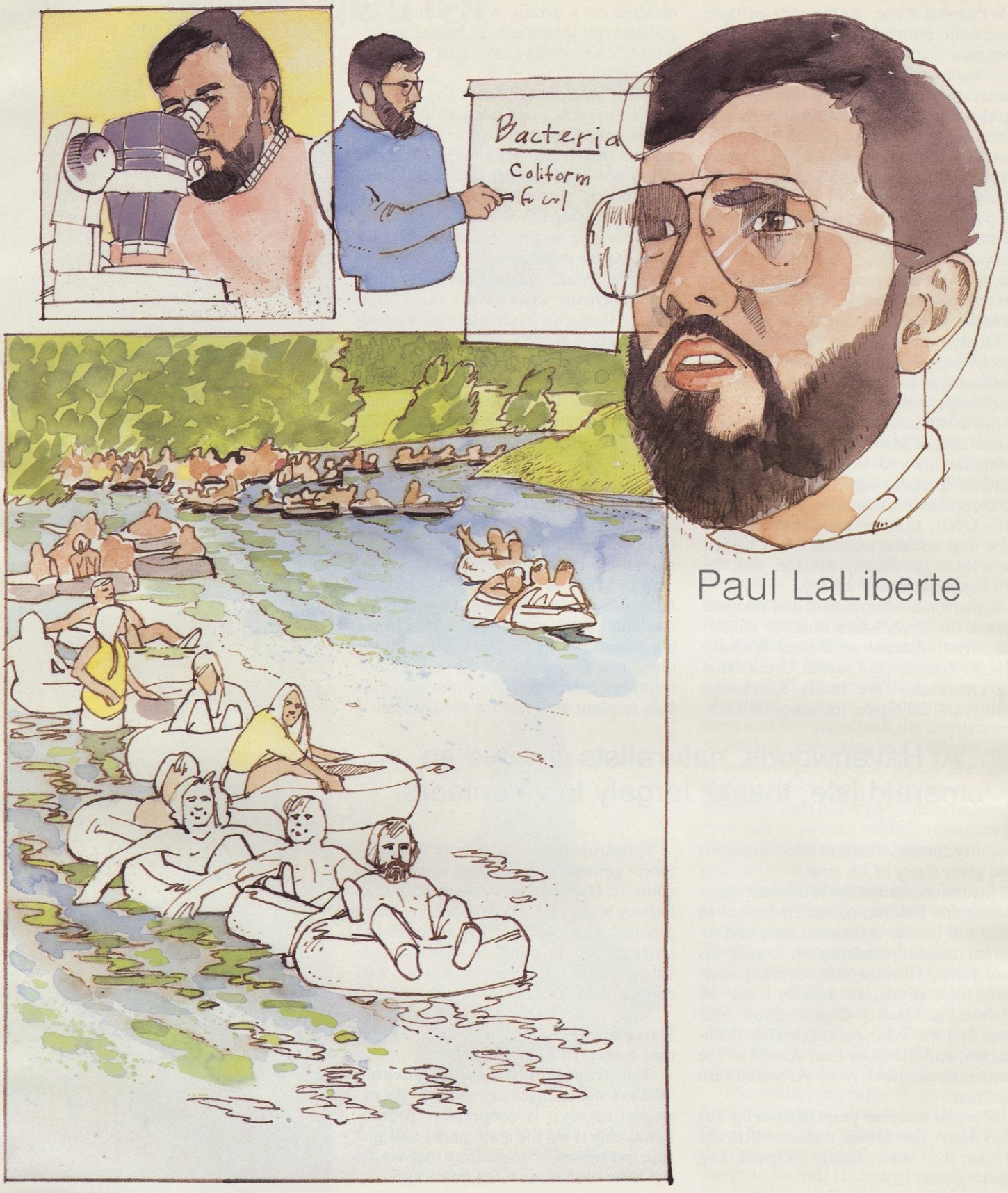
Bill Sturtevant
Assistant State Dam Safety Engineer
—Madison

"I'M PROUD THAT. . .

we've proven that our dam safety program is more than just inspections, reports and permits — through newsletters, seminars and personal contact we're providing a service. For the first time, dam owners are contacting us when they think they have a problem."

Keeping float trips fun

Dave Weitz



Paul LaLiberte

In 1984, controversy over "tubing" — taking a float trip on an inner tube — on the Apple River at Somerset spilled into Department of Natural Resources territory. The Somerset Chamber of Commerce estimates that nearly 30,000 people float the river during a good weekend. Residents in the area complained that the river's water quality was being degraded by tubers relieving themselves in the stream.

The residents complained of ammonia, urine and feces in the water and they expressed fears for the water's safety. The complaints had erupted during a public hearing about an upstream dam. Those testifying alleged that tubers were making the water unsafe, and that cans and garbage littered the river.

A preliminary study of coliform counts and ammonia concentrations in the river was conducted during the summer of 1984. That study found that ammonia levels were no different in river segments used by tubers than upstream. It also revealed bacterial counts on the river are occasionally high.

Paul LaLiberte, DNR water quality scientist from Eau Claire, got the job of checking on stream pollution. He and Keith Krenz, a sanitarian for the Department of Health and Social Services, asked local residents to meet in December 1985 at the Somerset Town Hall.

LaLiberte outlined the study and its results, and Krenz discussed the health implications. Krenz said there was reason to show concern, but a health advisory wouldn't be issued on the river.

Meanwhile, Dave Weitz, information officer for the DNR's West Central District, circulated cards asking people to write down their questions. Weitz also asked people who might want to serve on a volunteer group to list their names on a roster.

There was agreement that more studies would be necessary.

LaLiberte turned to the local residents for help. "We will design the testing, the computer work, the evaluation and the technical report, but we need help with the sampling," he said.

Local residents helped plan the study. LaLiberte later met with local officials, members of a tubers association and residents. "Because of the complex nature of this study, we suggested a joint study between local persons and tubers."

The tubers association, formed of businesses renting tubes and organizing float trips, offered to hire an independent consulting firm to do sampling. That made the work possible.

A lab located 30 minutes from Somerset in Minneapolis/St. Paul could quickly analyze river samples technicians collected during rainfalls, an essential part of the study.

The study analyzed fecal coliform sampling to pinpoint whether pollutants were coming from human or animal sources.

"Rather than just conduct some traditional monitoring for fecal coliform, we used some more recently developed techniques to monitor bacterial quality," LaLiberte said. Tests for *Enterococcus*, *Escherichia coli*, and fecal *Streptococcus* were geared to help evaluate sources of pollution.

After the plan was formulated, it was reviewed and approved by the Department of Health and Social Services.

The cooperative effort worked.

Throughout the summer of 1985, sampling proceeded. LaLiberte analyzed the findings, and in April 1986 his report was ready.

Shore dwellers, businesses and the DNR pooled energies to ensure a safe ride for Apple River tubers.

"During conditions under which most of the tubing occurs, the river is not polluted," he said. "The concentrations (of bacteria) we monitored were typical of a Wisconsin river, and Wisconsin rivers are pretty good as a whole."

LaLiberte listed five major results from the testing program:

1) The bacteria water quality of the Apple River is similar to an average Wisconsin river.

2) Under conditions when tubing normally occurs (when it isn't raining) the bacterial water quality is at acceptable health guidelines.

3) As in most Wisconsin Rivers, bacteria counts do go up during rainstorms.

4) Tubing activity raises bacteria counts slightly but does not result in significant added risk to swimmers.

5) The bacteria found in the river were most likely of animal origin.

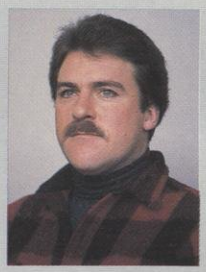
In the overview, the testing program was a success, because the people of Somerset helped the Department of Natural Resources stretch dollars and staff time by providing some help.

Dave Weitz is DNR's public information officer based in Eau Claire.

Lawrence M. Kriese
District Warden
Lake Michigan District
—Green Bay

"I'M PROUD THAT. . .

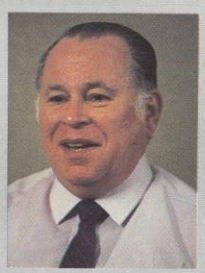
Wisconsin conservation wardens continue to enjoy the support and cooperation of our state's citizens. Our job is made easier and more rewarding knowing there are so many people willing to become actively involved in working with us to protect Wisconsin's natural resources. Thanks!"



Bill Ishmael
Wildlife Manager
—Hartford

"I'M PROUD THAT. . .

DNR resource managers have worked to establish productive, working relationships with private organizations and clubs towards the joint effort of improving Wisconsin wildlife and fish habitats."



Julian Chazin
Chief
Air Monitoring Section
—Madison

"I'M PROUD THAT. . .

the U.S. Environmental Protection Agency has said that Wisconsin has one of the finest air monitoring programs in the nation; a tribute to the excellent staff who do the work. Our air monitoring network has provided the data demonstrating that DNR has been successful in cleaning up Wisconsin's air over the past 10 to 15 years."

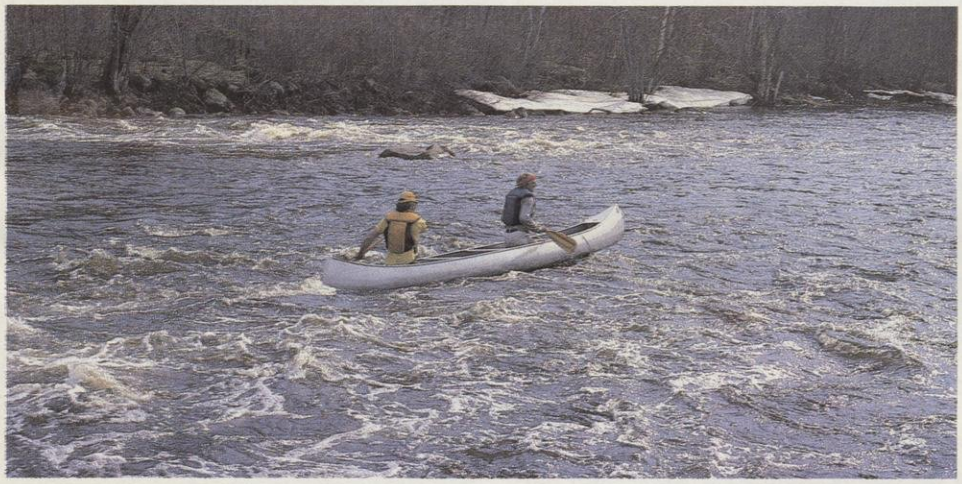
Protecting and balancing future rights to water

David J. Daniels

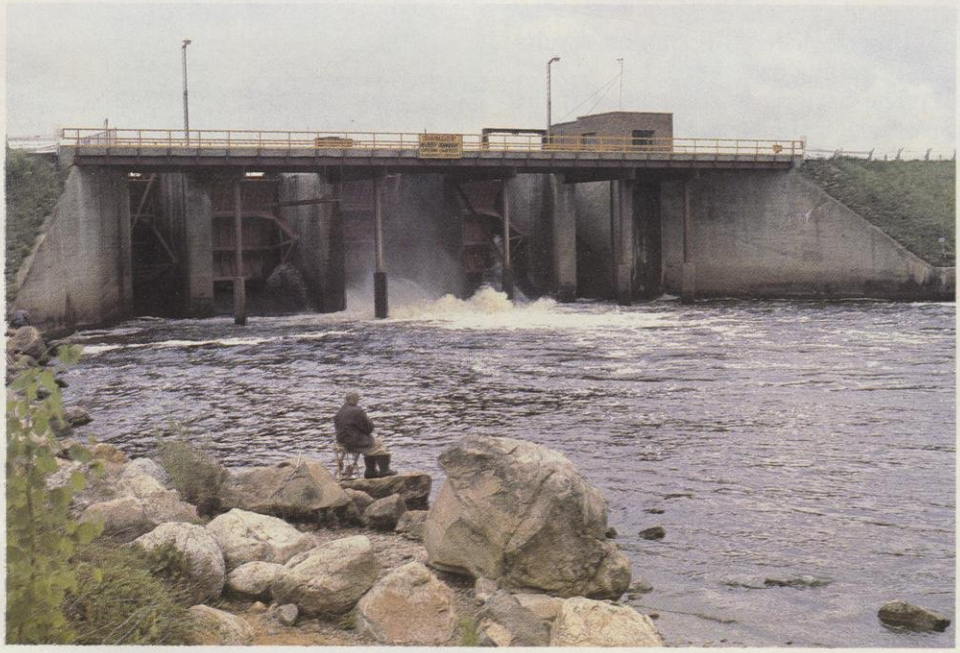
The river rises as does the sun, up from the lake, up from the marshes . . . flowing light and flowing water between the cattails and towering pines.

The river is just a hint of what it will become further downstream. It quietly meanders from one oxbow to another in the mist of another morning. Width and depth have little meaning at this point — the barrier of water barely ripples, easily crossed by a deer and her fawn in the half-light of dawn.

The river courses tentatively, as it always has morning after morning, season after season, longer than history has been recorded. Here, in far northern woods at a place called Lac Vieux Desert, the headwaters of the river, source of our state's name, begin a 430-mile downstream odyssey.



A river that produces power and pleasure. Two canoeists enjoy fast water below the Hat Rapids dam on the Wisconsin River about six miles south of Rhinelander. Photo by Robert Martini



Aesthetics and energy — an angler wets a line on the Wisconsin River's Rainbow flowage, a couple miles northeast of Lake Tomahawk. Photo by Dale Lang.

The Wisconsin River cuts its banks past forests, cities and farmlands from the Wisconsin/Michigan border to the Mississippi River at Prairie du Chien. The river is, in a real sense, an economic and recreational artery that pumps vitality into the heart of the state. Cities, farms and industry depend on steady river currents to turn the turbines that light neighborhoods and barns and power the wheels of paper and pulp mills. Anglers are rediscovering the river's increasingly cleansed larder.

Much about the mighty Wisconsin is about to become more sharply defined as a major DNR study of river operations and management takes shape.

Since late summer 1986, a team representing three DNR districts, the department's central office in Madison and the U.S. Fish and Wildlife Service has come together to learn as much as possible about the river's operation.

The group meets with the Federal Energy Regulatory Commission (FERC), which governs many of the power dams and reservoirs on the river. Federal licenses for dams and hydropower are set to expire in the early 1990s.

The Wisconsin may be the nation's hardest working river — 21 storage reservoirs supply the water needs of 26 power dams, numerous pulp and paper mills, and cities. Today, only the last 92.3 of the river's 430 miles can be considered free flowing.

Given its importance as a power source, it is curious that so little attention had been paid to the river and its resources in recent years. But, as one observer pointed out during a public meeting, "there was little need to pay attention to a river few beyond industry cared about."

That has all changed now, largely because of a changing environmental ethic in Wisconsin and the millions of dollars spent since the 1970s on pollution abatement controls by industry and cities.

There has been a revival of the Wisconsin River. Where once long stretches of water struggled to support rough fish, today game fish like walleye and musky abound. On portions of the river about which former Gov. Anthony Earl once said, "you wouldn't go on a dare," boaters and swimmers can be found on just about any hot summer day relishing the cool water.

As part of the relicensing process, the

department must review proposals for continued power generation and forward its comments to FERC.

During January and February 1987, members of the review team hit the road on a seven-city, river-length tour to gather comments at public meetings. At all stops along the river, public concern ranged from maintaining hard won water quality standards, to wondering how water levels and flow affect shorelands, to increasing recreational facilities and opportunities.

The public, in many cases, is turning to the Department of Natural Resources for answers to long held concerns about river operations. But Robert Sonntag, a DNR environmental engineer working on the project, readily admits "We don't have all of the answers." Thus, public and department concerns are being raised in the relicensing review.

"No review of this scale has ever been attempted before in Wisconsin," says Bob Martini, Wisconsin River System Review project manager in Rhinelander. "Many of these operating licenses are granted for a very long term: some as much as 30 to 50 years. The decisions we will be making will affect a whole future generation of Wisconsin River users."

The river's hydroelectric dams and reservoirs are managed by the Wisconsin Valley Improvement Company (WVIC) of Wausau. WVIC and its member power utilities operate under a state charter dating back to the turn of the century. The goal, as expressed by WVIC president Bob Gall, is to "provide the length of the river for member companies to use and to provide flood control."

There's no denying that WVIC does its job in meeting those goals very well — the river is managed for industry and municipalities very efficiently.

However, successful environmental cleanup of the Wisconsin River has brought with it unexpected conflicts. Fishable and swimmable waters of the Wisconsin are attracting outdoor activities and tourists in renewed numbers. People who wouldn't consider living near the river a decade ago are rediscovering it.

Bernie Ksionek of Nekoosa says improved water quality means more fishing pressure on the river.

"Ten years ago, nobody fished it," he says. "Even three or four years ago, you could catch and release 100 fish in an afternoon. Now, you really have to work."

In short, water levels on an old industrial river may still be controlled by business, but now others are laying claim to using it.

The DNR's river review team will need to walk a fine line when assessing river resources, recreation potential, power capacity, water quality concerns and the affects of controlling river flow.

At stake in all of this is the economic vitality of a large portion of the state that depends on the river. Consider the importance of the river to the vitality of the ninth-largest industry in the state — Consolidated Papers of Wisconsin Rapids. As Daniel Meyer, director of public affairs for Consolidated, puts it, "Ours is one of many companies that benefits from harnessing the river, and we need to appreciate the economic resource. The operation of the river has brought economic benefits to the people — 4,300 of whom work for Consolidated."

Also at stake are the hopes of people who value 430 miles of river as a unique natural resource. Delores Olsen, executive vice president of the Merrill Area Chamber of Commerce, sums it up best: "We place high aesthetic value on the river, and considerable value on the quality of river management. The river is used for many purposes, including fishing, boating and swimming. It attracts visitors to the area."

These deliberations take on added importance because recreational plans for the entire 92.3-mile stretch of the Lower Wisconsin River are also being debated now.

It's difficult to grasp that such complicated issues could arise from such uncomplicated beginnings as the quiet, misty marshlands of northern Wisconsin. But that is part of the mystery of the Wisconsin River.

David J. Daniels is a DNR Public Information Officer stationed in Rhinelander.

Wisconsin River dams that provide power and vitality are only relicensed every 20 to 50 years. Today's plans will influence industry and recreation for decades on the state's hardest working river.

William S. Meier
Wildlife Manager
—Merrill

"I'M PROUD THAT. . .

during the past four years, wildlife management, Merrill and the Wisconsin Public Service Corp. have, at the Lake Alexander project, initiated an innovative co-management program for industrial forest lands that in the future will benefit all of Wisconsin's citizens and natural resources."

Kenneth E. Wojahn
Nursery
Superintendent-
Coordinator
—Wisconsin
Rapids

"I'M PROUD THAT. . .

in a short three-week period, the very efficient staff at the Griffith Nursery successfully processed and entered into the computer over 2,500 tree applications for a total amount of 15 million trees and shrubs. This very keen interest in tree planting by the citizens of the state demonstrates to me a positive effort to enhance our environment, not only for themselves, but also for thousands of others and for future generations."

Tim Babros
Assistant Area
Fish Manager
—Whitehall

"I'M PROUD THAT. . .

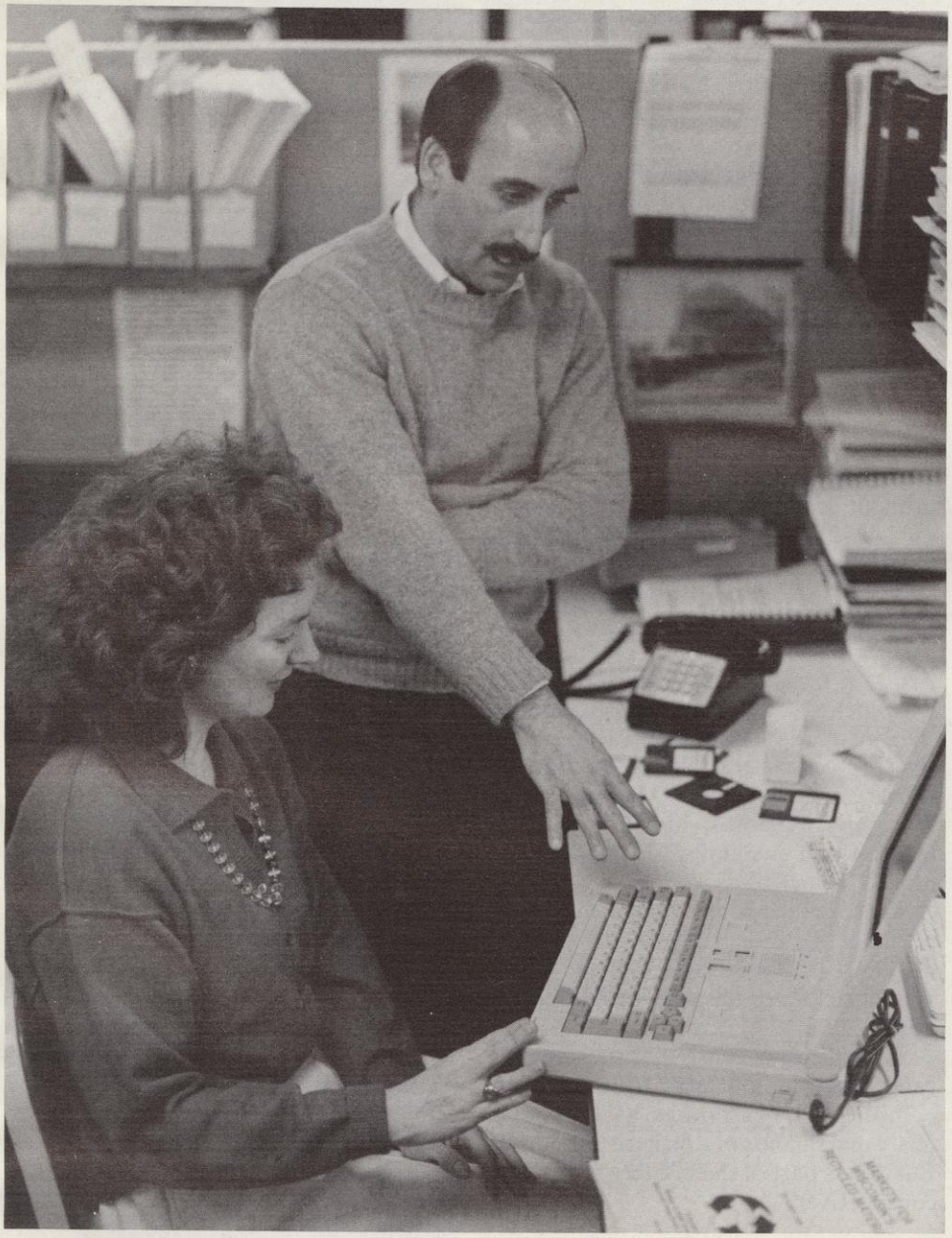
handicapped fishing access, boat access and parking facilities have been improved on the Trempealeau Lakes Fishery Property, Trempealeau, Wis. The $66,000 project was completed using money from the sale of fishing equipment and outboard motor fuels."

New markets and new ideas for natural resources

David L. Sperling

Like a seasoned stockbroker, John Reindl keeps a close eye on the marketplace, and he sees opportunities. He charts the ebbs and flows of worldwide demand for goods and commodities. But Reindl isn't tracking gold or silver, bonds or pork bellies; he's tracking trash.

Reindl and Kate Cooper run DNR's recycling program. These days, their eyes sparkle as they enthusiastically relay high prices being paid for scrap aluminum, paper, glass and cardboard.



John Reindl and Kate Cooper, DNR recycling coordinators, carefully track the ebb and flow of dynamic markets for recyclable resources. Photo by Bob Queen

"Recycling is a quiet business, but it's a huge business," Reindl explained. "We bury about 6 1/2-million tons of waste in Wisconsin annually, but we recycle more than 20-million tons of materials."

It's a business of national and international significance. In his response to President Reagan's State of the Union address last year, House Speaker Jim Wright lamented that the biggest exports from the port of New York are not American made goods but American scrap metal and scrap paper.

"Another fascinating feature about the trash business is it changes rapidly. It's very important for us to stay in close contact with a variety of people," Reindl added. "That's why Kate and I spend so much time keeping close contacts with a wide variety of entrepreneurs, private recyclers, municipal officials, waste management professionals, environmental engineers, university professors, civic groups and environmentalists.

"We really have to cover the waterfront. Solid waste management affects everyone from big business to young children. We need to show each person the importance of individual commitment to recycling: why *I* have to change *my* habits, bundle up *my* newspaper, recycle aluminum cans and consider the societal costs of the packaging *I* buy."

The loss of natural resources is a painful tally. In Wisconsin, the wastes buried in landfills each year have an energy value equivalent to 250-million gallons of gasoline. Twenty million trees provided the paper we waste. We annually toss 1 1/2-billion metal cans, a billion glass bottles, 400-million plastic containers, four-million tires and half a million tons of food and yard waste.

The message to convince people to be less wasteful and more resourceful can take many forms. The recycling program produces written materials — an annual directory of more than 600 markets for Wisconsin; fact sheets on technical aspects of waste management; "how to" recycling guidelines; a new newsletter where state recyclers can share information, word games, models and craft projects for children; a special *Wisconsin Natural Resources* issue on recycling and a teacher's guide.

Reindl and Cooper also recommend

recycling incentives in proposed state legislation, and they have spoken to: municipal officials weighing waste management options, Wisconsin Counties Solid Waste Management Association meetings, regional planning commissions, Badger Boys State, the Science World in Clam Lake and other regional conferences. They participate in the DNR exhibit at the Wisconsin State Fair. Last year, they developed a high tech computer program, which showed visitors which recyclers serviced their communities.

They are also branching out into audiovisual presentations. Cooper is putting the finishing touches on a recycling slide show, and she is producing a videotape this year, which includes a segment with Jefferson County officials who are in the early stages of planning a community recycling program. The recycling program also produced a catalog of current educational films and slide shows on recycling and resource recovery.

Last year, the recycling program hired Wendy McCown for a limited time to produce informational materials and programs which encourage waste composting at home and on communitywide bases. Her series of articles, "The Green Machine," was distributed to newspapers from May through October to provide step by step instructions for composting yard and garden wastes. McCown also displayed composting exhibits at conferences and regional fairs throughout the gardening season and will sponsor several workshops on community composting for municipal officials.

The recycling program gets lots of requests for information on recycling ordinances, publicity ideas and waste exchanges, but there are daily surprises.

"The best part of the job has got to be the unusual phone calls," Reindl grinned, "you never know what to expect on the other end of the line." Recent callers included:

- a former Wisconsin mayor who's interested in recycling nylon from hosiery and carpeting scraps;
- a recycler who purchased thousands of defective plastic fishing reels and wants ideas for removing the metal plating before the reels can be recycled;
- a homeowner who wants to recycle two jars of mercury found on a basement shelf;
- a meat packing firm looking to sell or recycle packaging glue it no longer uses;
- a businessman who wanted to know if sand used to sandblast stainless steel could be used at a golf course in sand traps;
- a firm making vodka from cheese whey;
- a manufacturer who's developing a process for forming sheet rock from glue and ground up trash;
- someone who wants to recycle six barrels of old antifreeze;
- a man who wants advice on starting a pallet recycling business; and
- an auto body shop that wants to recycle old fiberglass car bodies.

Reindl says he gets a slew of questions about other DNR programs, too. "When you're out there, you are the Department of Natural Resources and people think you know the answer to everything the agency does." Like every DNR employee who visits a community, Reindl and Cooper act as a referral service to help people find the appropriate DNR staffer to answer questions.

It takes keen interest and business savvy to plot new opportunities for recyclers.

As DNR continues to work with legislators to develop recycling incentives, Reindl is encouraged that recycling remains a wide open field for new businesses, new attitudes and new opportunities.

It's a lot like the old story about the two shoe salesmen who are sent to a remote jungle village. The first salesman cabled the home office: We're finished. No markets. The natives don't wear shoes. The second salesman cabled the next day: Send more sales help. This is the greatest unexplored territory I've ever seen.

"The entrepreneur who can develop clean, economical methods of recycling materials will find a vast supply of raw materials that can be the basis of a profitable business," Reindl said. "I see a tremendous business frontier to explore new ideas and new products while solving a pressing environmental problem. Even given the tremendously creative proposals I hear about every day, I don't think we've even scratched the surface. The opportunities are really exciting, and a viable, good idea could be staring us in the face waiting for the right person to make it work."

David L. Sperling edits Wisconsin Natural Resources magazine.

Pat Launder
Program Assistant
—Madison

"I'M PROUD THAT. . .

I was given the opportunity to serve as a volunteer on Sturgeon Watch in April. In fact, I have been at Fish Camp three years in a row. I met and chatted with local townspeople as they stopped to observe the fish. I hope I have the opportunity to go next April."

Dale P. Morey
Boating Law Administrator
—Madison

"I'M PROUD THAT. . .

the Wisconsin DNR has a group of dedicated employees titled District Law Enforcement Safety Specialist who have provided 15 years of continued services. Their efforts save lives and encourage enjoyable use of our resources."

Michael R. Willman
Park Superintendent
—Merrill

"I'M PROUD THAT. . .

I work in a community where both the department and the citizens have an impact upon each other. Council Grounds beckons valuable tourist dollars. The community recognizes this and actively participates in the promotion and future planning of the park."

Sound advice — the link between public health and public trust

Jeff Welsch

Walleyes, raccoons and eagles don't appear to have much in common, but they share some important traits. They all call Wisconsin home. They all thrive among some of the state's best waters, forests and air. And all are exposed to some of the worst by-products society produces.

Identifying the toxicants these populations are exposed to is no small task. It requires the expertise of professionals in fish and wildlife management, analytical chemistry, water and air quality, toxicology, research, animal health, solid waste and wastewater management to determine which animals to test, where to concentrate the search for contaminants and which toxicants should be analyzed in each species.

Testing fish and animals consumed by people provides practical advice about our food supply, but there are other compelling reasons to continue the search. Today, tracking pollution buildup in animals often provides researchers with first warnings that environmental toxicants are accumulating in the environment. The tests also provide practical clues to start the search for pollution sources.

The Department of Natural Resources has looked at many of Wisconsin's creatures, including more than 20 species of fish, crayfish, snapping turtles, ducks, eagles, mink, bobcats, deer and ruffed grouse. Fish monitoring has proven to be an especially effective tool in monitoring pollution's effects.

Using animals to alert us to dangerous chemicals in the environment is not new, but we've progressed a long way from the days when coal miners kept a close watch on their canaries, which collapsed when air was getting unsafe to breathe.

According to Lee Liebenstein, DNR toxic substances specialist, fish are the best tool for identifying compounds that, because of laboratory analytical limitations, can't be detected in wastewater effluent.

"For instance, you can't just take a jar of water and test it for polychlorinated biphenyls (PCBs)," said Liebenstein. "However, as fish ingest the chemical, they accumulate it over time. Fish flesh concentrates PCBs by thousands or tens of thousands of the amount found in wastewater. Then, we can detect it."

Early fish monitoring in the mid-1970s took a "shotgun approach" to detecting environmental toxicants, according to Bruce Stewart, DNR fish health specialist. The department developed a monitoring schedule with the U.S. Environmental Protection Agency to determine the extent of toxicant pollution as part of a nationwide study. This surveillance monitoring first tested waters near obvious "hot spots" — just downstream from wastewater dischargers near industrialized areas, and municipal harbors.

Surveillance, or trends monitoring led to the discovery of PCBs in the Sheboygan River in April 1978. Subsequent trends monitoring led to discovery of mercury, PCBs, dioxin and pesticides in rivers and lakes at selected locations around the state. Fish samples are also analyzed for signs of chlordane, DDT, dieldrin, toxaphene, other chlorinated compounds and heavy metals such as arsenic, chromium and lead.

Interpreting the risks from fish and game contaminants takes teamwork and timing.

The trends monitoring program continues to play an important role in identifying potential toxicant problem areas, in advising anglers which fish to eat and in estimating long-term trends in environmental quality. Year after year, same-sized species of fish are taken from the same location at the same time of year and analyzed using the same procedure.

When a toxicant is detected, that area gets targeted for intensive follow-up monitoring. The bulk of information used to develop fish advisories comes from intensive monitoring.

Recently, popular fishing lakes have been more intensely monitored for signs of mercury, according to Stewart. He relies largely on the advice of fish managers in the field, who know the lakes better than anyone, to determine where and when fish should be collected.

Similarly, Liebenstein consults with environmental specialists before he recommends a schedule for collecting fish.

"I ask experts in solid waste management if fish monitoring could help them determine if suspect landfills are leaking," said Liebenstein. "I talk to people in air management to find out where incinerators handling toxicants are located (some toxicants are deposited through the atmosphere), and I talk to wildlife biologists to find out what types of fish are found near eagle, cormorant and loon nests."

The Department of Natural Resources has analyzed more than 6,000 fish samples since monitoring began in 1976. The Bureau of Fish Management uses the data to develop part of its management strategy.

For example, Stewart notes that salmon are no longer stocked in the Sheboygan River due to PCB problems. And in Lake Michigan, coho and steelhead salmon are stocked instead of Chinook. Monitoring data has shown that Chinook salmon tend to have higher levels of PCBs because they live longer, get fatter and have more time to build up toxicants in their tissues.

Fish monitoring has made a significant splash through issuing fish consumption health advisories.

The fish advisory uses U.S. Food and Drug Administration and Wisconsin Division of Health guidelines to advise people what fish they shouldn't eat. Advisories are updated every six months and include the most recent fish monitoring data. Without fail, fish advisories stir controversy.

Proponents applaud the combined efforts of the Department of Natural Resources and the state Division of Health to warn people of the possible dangers in eating some fish. Opponents question the methods used to determine what level of contamination is safe to eat and how the announcements affect tourism.

The advisories use science to make educated estimates of health effects. There's limited available information on human health effects of consuming fish containing PCBs. Liebenstein agrees that, in some ways, issuing health advisories is as much an art as a science.

"We don't have a 'smoking gun,'" said Liebenstein, "that shows a direct

link between low-level toxicant consumption and increased incidence of cancer. Toxicant research is conducted on rats and other test animals. There are some problems in transferring white rat studies to humans. However, there's other evidence that can't be ignored."

Some of the evidence comes from studies done in Green Bay. Forster's tern eggs from Green Bay were analyzed and found to contain PCBs and dioxin; eggs from Lake Poygan, a good distance upstream, showed no signs of either chemical. The fledgling rate for terns (the number of hatched young that survive) was several times lower for the Green Bay Forster's terns than for those on Lake Poygan.

Other biologists studying Green Bay found birds with birth defects they attributed to toxicants in the bay and in sediments. Investigators found double-crested cormorant nestlings with crossed bills and herring gulls with enlarged thyroids. Both species feed on Green Bay fish, which contain toxicants in varying amounts.

Dr. John Olson, a state Division of Health toxicologist, assists the DNR in developing fish advisories.

"Our risk assessment of mercury's effects on people, which are well documented and understood, includes a 10-fold safety factor," Olson said. "That safety factor is where the 'art' enters the process."

While toxicologists have a firm grasp of how mercury affects humans, the effects of PCBs are not as well understood.

"The toxicity end points (concentrations where health effects are first noticeable) of mercury and PCBs vary," notes Olson. "Excessive mercury intake causes neurological disorders and birth defects, but (poses) no cancer risk. The PCBs, on the other hand, present a cancer risk at low doses."

Epidemiologists are filling in some of the unanswered questions about PCBs' effects on people. Studies in Sheboygan and neighboring Michigan found PCBs in blood, fat tissues and mother's milk. Babies of mothers who consumed PCBs in their diets had lower birth weights and reduced head size compared with average figures for newborns.

Interpreting epidemiological and fish monitoring data is no easy task. But relating complex risk assessments to people in a form they can understand presents an even greater challenge.

"You can swamp them with information," added Olson.

Wendy Weisensel, a DNR public information officer, plays a major role in determining how the message is delivered in fish advisories. Having assisted with advisories for several years, she's pleased with the teamwork in the process, but she knows definitive information about toxicants is difficult to interpret.

"The process is by no means perfect," Weisensel says. "We use our best professional judgments, erring on the side of caution."

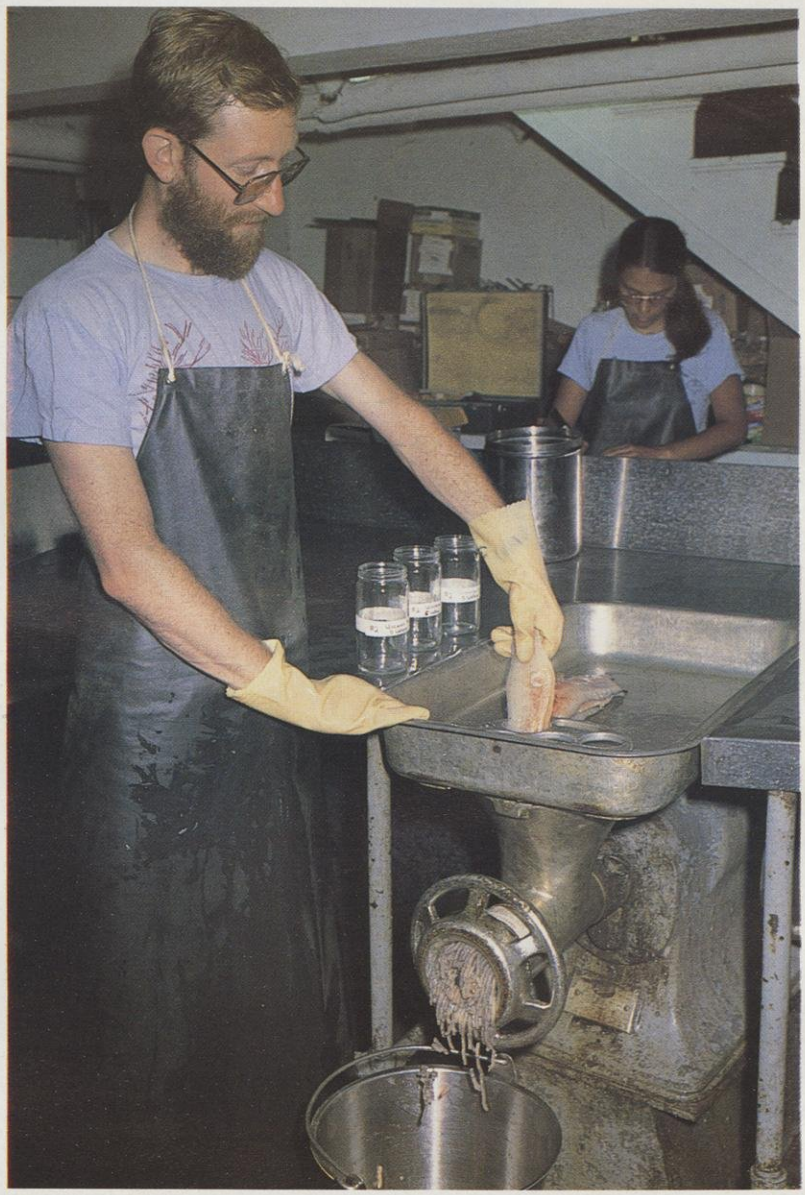
Wisconsin is one of the nation's leaders in issuing fish advisories, according to Weisensel, and advice from concerned residents has helped the state achieve that status.

"This year, we will be sampling black crappies on Tainter Lake in Dunn County because a high school teacher told us a lot of those were being caught," Weisensel said. "The teacher notified the Department of Natural Resources after reading that another species in Tainter Lake was listed on the fish advisory. An area fish manager confirmed the observation, and the lake was placed on the collection schedule."

"The main point to note," continues Weisensel, "is that our fish advisory is just that — an advisory. We give people the best information available, and let them make the decision whether they want to keep the fish they catch."

People are being affected by toxicants. Fortunately we haven't found that anyone has died from exposure to toxicants in fish or wildlife, adds Olson. "If we're doing our job, you won't find one."

Jeff Welsch works on DNR's public information staff in Madison.

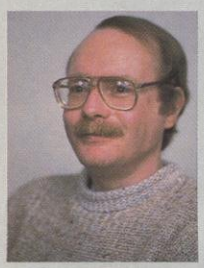


Fish that will be tested for trace toxicants are filleted, ground up and analyzed. Only edible portions of fish are tested. Photo by Lee Liebenstein.

Scott Fischer
Assistant Area Forester
—Manitowoc

"I'M PROUD THAT. . .

I have been able to help many woodland owners manage their forest resource for multiple benefits: wildlife habitat, timber production, aesthetics and recreation."



Tom Blotz
District Community Services Specialist
—Milwaukee

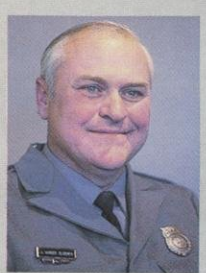
"I'M PROUD THAT. . .

the department has assisted local governments in purchasing and developing public outdoor recreation facilities."

Julia Riley
Community Services Specialist
—Madison

"I'M PROUD THAT. . .

I've had the opportunity to work with so many competent members of the public who are seeking solutions to their wastewater pollution problems."



A.L. VanderBloemen
Conservation Warden
—Hartford

"I'M PROUD THAT. . .

as a state conservation warden for over 25 years, my profession afforded me a chance to meet thousands of fine outdoor users, citizens and sportsmen from all walks of life."