



A tale of one city: a community searches for solutions to urban nonpoint pollution.

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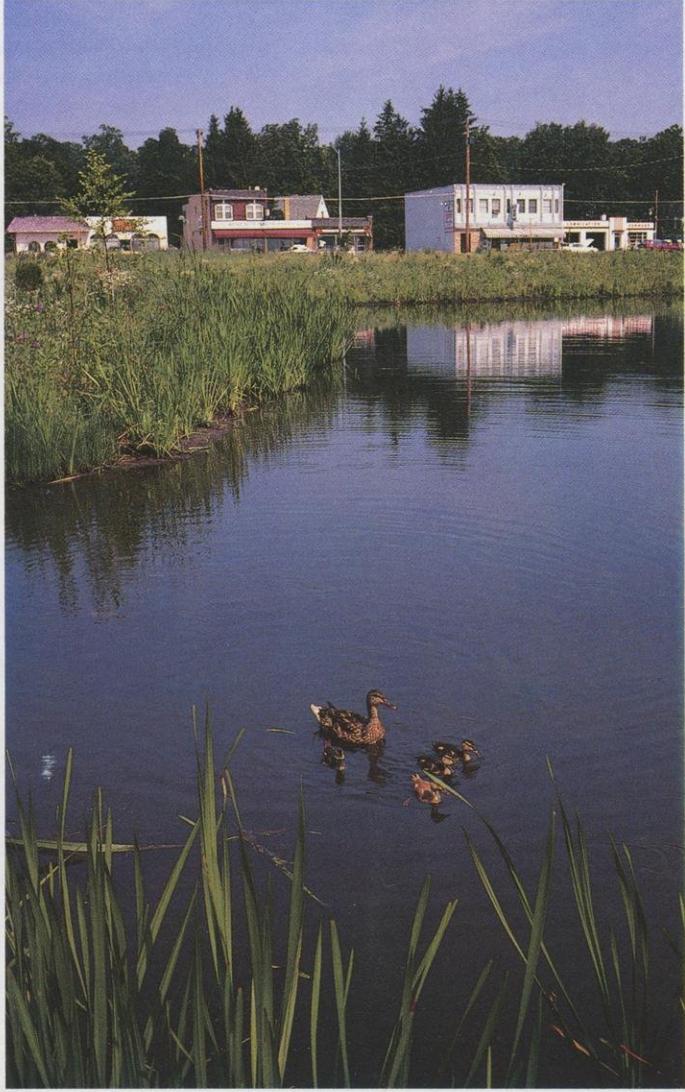
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A tale of one city

**A community searches for solutions
to urban nonpoint pollution**



PROLOGUE



A beautiful, valuable addition to a Madison neighborhood. This naturally landscaped stormwater detention pond protects area lakes and streams by slowing water flow and allowing sediments to settle.

Everyday life is a series of decisions, small and big. Should I sprinkle salt on my scrambled eggs, or pepper? Should I quit my job as a computer systems analyst and pursue a career in medicine, or should I just chuck it all and open a lemonade stand?

Each decision shapes your life. Although you may not realize it, most of the decisions you make also shape the environment.

Let's say you simply cannot live with those dandelions sprouting up all over the front yard. You decide a weed killer is the only answer. Unbeknownst to you, almost everybody else in your community has arrived at the same conclusion about *their* front yards. The weeds are obliterated. And quite unintentionally, so are many of the fish and aquatic plants in nearby lakes and streams.

You've just made an everyday contribution to nonpoint source pollution.

How? Rain washed some of that herbicide off the lawn into storm sewers, which discharged the water, untreated, into the lake. In addition to the herbicide, the cloudburst carried off oil from parking lots, gasoline from around station pumps, the soil from new home construction, pet droppings, leaves, old chewing gum on the sidewalk and a whole lot more you'd never, ever want in your water.

Nonpoint source pollution, so-called because it comes from a number of places and not just one specific smokestack or pipe, is the cumulative result of individual decisions. Come visit an imaginary Wisconsin town and see how those decisions can make a difference.

CHAPTER ONE INNOCENCE

Welcome to Lake Waunawinnowoc, population 15,000. Like many Wisconsin cities, Lake Waunawinnowoc is named for its most valuable asset — a body of water so clean and clear the bass use suntan lotion and alderman Felix "Gritz" Gritzmacher pilots a glass-bottomed boat.

Even though you've never heard of it, Lake Waunawinnowoc happens to be one popular spot. "People come for a visit and stay for a lifetime," Gritz likes to say. Ask him and he will point proudly to the four-lane highway, the new shopping mall and the condominium projects under construction on the east side of the lake — signs of solid economic growth. "Used to be a worthless marsh," says Gritz.

The lush lawns and two-car garages accompanying many of the homes in Lake Waunawinnowoc are further evidence of the town's prosperity. In the driveway of one of those homes, Felix Jr. ("Little Gritz") carefully washes his '64 Thunderbird, hosing the suds down the sidewalk and into the curb. "Don't forget to change the oil

in your dad's Buick," calls Sally Gritzmacher to her son. "And flush the radiator, too. And take Grrrritz for a walk, okay?"

Felix Jr. opens the back door and the terminally perky schnauzer makes a beeline for the nearest oak. The dog officially walked, Felix Jr. attends to his other chores. He collects the oil and antifreeze in a bucket and, uncertain about where to dump the liquids, decides the storm drains are a good place.

Out in her garden, Sally carefully prunes a Peace rose and to her dismay discovers aphids on the leaves. A spray of rose dust takes care of the problem. She digs 10-10-10 fertilizer into all her garden beds, adding a little extra for good measure.

Business is booming at The Gritz Mill, the resort owned by Felix and Sally. Located right on the lakeshore, the Mill is frequented by locals and vacationers who come for the Friday night fish fry and the Saturday afternoon horseshoe matches. Last weekend the Mill was so busy the septic system failed; Felix had to call in Schoof Plumbing for some emergency pipe-wrenching. After he saw the bill, Felix sighed. He had planned to use that money to pave the Mill's gravel parking lot.



SUSAN E. BERGQUIST

Dirt hosed down the curb will likely end up clouding a nearby stream. Better to sweep up soil and dig it into the garden or compost heap. Prevent construction site erosion with hay bales or other barriers.

CHAPTER TWO PREMONITION

As he restocked provisions in the Mill for the Big Bass Bonanza, the first fishing tournament of the season, Felix thought about the city council meeting he attended the night before. Predictions of a harsh winter led the Department of Public Works to purchase extra road salt and sand, stored in big piles outside at the city garage.

About half the salt and sand

was used; the remainder dwindled from exposure. "Waste of the citizen's money," muttered Felix. He also took the DPW director to task for shoddy leaf collection. Residents piled their leaves at the curb, but then the leaf vacuum broke and the spare part was three months coming from Japan.

The thought of rain made Felix glance outside the window. It was pouring, as it had been for two days, but Felix wasn't worried. The sun always shone on the Bonanza. Always.



E. JONES

Wetlands are natural water filters: Cattails, reeds and other wetland plants consume nitrogen and phosphorus from sediment-loaded stormwater. By preserving wetlands, urban areas may spend fewer tax dollars on nonpoint source pollution controls.

You'll wait a long time for a bite if you wet a line in a lake polluted by nonpoint sources. Overgrown lake weeds — the product of nutrient-loaded runoff — choke out aquatic plants valuable for fish habitat. Decomposing weeds use up large quantities of oxygen, leaving little for fish to breathe.



CHAPTER THREE DISASTER

The day of the tournament dawned bright. Felix and Felix Jr. polished the hull of the glass-bottomed boat ("so the bass get a good look at us," says Felix) and greeted the anglers and spectators arriving for the festivities. Registration complete, the anglers headed out on the water, led by the Gritz-machers.

Felix Jr. was the first to notice something wrong when they arrived at their favorite fishing spot. He always cast under the boat so he could watch those fightin' bass devour the lure. This time, he couldn't see anything: The brown, murky water concealed lure and line alike. To make matters worse, he snagged the lure on an unseen weed.

"What's up there, son?" asked Felix. "Gotta strike?"

"Hey, Dad ... this water's really ... well, you know ... gnarly!"

Felix didn't have to comprehend the latest in senior high slang to understand his boy. The glass-bottom hull slick with

algae gave explanation enough.

On other sections of the lake, disgruntled anglers hauled nothing but muddy, slimy weeds up from the once-clear depths. Not a bass was to be had.

"Gritz said there was good fishin' on Lake Waunawinnowoc," said one man. "I don't want to call the guy a liar, y'know, but"

Boat by boat, the anglers pulled up to the landing and left, angry and confused. Folks who came to the Mill's beach to swim didn't dare dive through the scum floating on the water. They went home, too.

By 2 p.m. on what normally would have been the busiest day of the year at The Gritz Mill, there wasn't a customer in sight.

CHAPTER FOUR DESPAIR

Felix and Sally sat at an empty table in their empty resort, wondering how their lovely lake had become so polluted. There were no major industries discharging wastewater into Lake Waunawinnowoc or leaky hazardous waste dumps on shore. "There's nothing we can point to, really," mused Sally. "But maybe that's it."

"Whatzit?" said Felix.

"That there's not any one source, but a whole lot of sources"

"Such as?"

"Well, what about those leaves that didn't get picked up last fall? I mean, where did they all go?"

"The melting snow and rain washed them into the storm sewers, which empty into the lake," said Felix.

"And the soap Felix Jr. uses to wash the cars?"

"Into the storm sewers . . . and into the lake."

"And the old oil and antifreeze?"

"Into the storm drains . . . and into the lake."

"And when our septic system failed last weekend?"

"And each time Grrrritz goes for a walk?"

They paused and looked at one another.

"There's an awful lot of crud trickling into Lake Waunawinnowoc, isn't there?" said Felix.

CHAPTER FIVE REVELATION

Felix and Sally decided to do a little research and, in the process, discovered a lot of interesting facts. They found that very few Wisconsin communities (Lake Waunawinnowoc included) treat stormwater; instead, it's channeled into sewers and left to run as is into local lakes and streams.

When it rained, or even when people watered the lawn or hosed down the sidewalks, all kinds of pollutants washed into the storm sewers: residue from asphalt shingles, oil and gas from parking lots and service stations, yard pesticides



and fertilizers, garbage, paint and soap. Rain released car exhaust particles from the surface of roads, just as melting ice and snow carried road salt and sand down the storm drains. Felix thought about those piles of extra road salt and sand at the city garage and cringed; left uncovered during rainstorms, the piles washed away into the lake.

Sally went door-to-door in the neighborhood to do an informal survey. Ninety-three percent of the neighbors said they, too, dumped oil and anti-freeze and turpentine and paint in the storm drains. ("I thought that's what they were for," said old Sven Olesson. "City amenities!")

Plumber Jack Schoof told Felix that decomposing leaves, pet wastes, fertilizers and effluent from failing septic systems flooded the lake with nitrogen and phosphorus. Algae and aquatic weeds thriving on the nutrients grew so thick they blocked sunlight from rooted aquatic plants valuable for fish habitat and waterfowl food. And, Jack said, when a lot of al-



ROBERT QUEEN

Sprinkle the lawn only during very dry periods. Overwatering weakens turf and leaches nutrients and herbicides into groundwater and surface waters.

gae and weeds die and decay, the decomposition process uses up oxygen and doesn't leave enough O₂ for the fish. "That's probably why there weren't any bass at your tournament," he said to Felix. "They couldn't breathe! And no wonder nobody wants to swim at your beach — they get swimmer's itch from the bacteria in the water."

Members of a nearby conservation club showed the Gritzmakers how land management plays an important role in lake management. When it rained, soil stripped of its grassy cover at the condominium construction site eroded into the lake, clouding the water and covering the gravel fish need for spawning with a layer of sediment. To make matters worse, the rain ran off the impervious concrete and asphalt surfaces of streets, parking lots,

sports courts and driveways all over town and gushed into the lake, causing the banks to erode.

"Turns out that 'worthless marsh' was really pretty valuable," Felix said to Sally. "Marshes and other wetlands are like filters, slowing down the water flow and giving the sediment a chance to settle out before it reaches the lake. Wetlands provide food and habitat for wildlife, too. I sure wish we hadn't paved that marsh!"



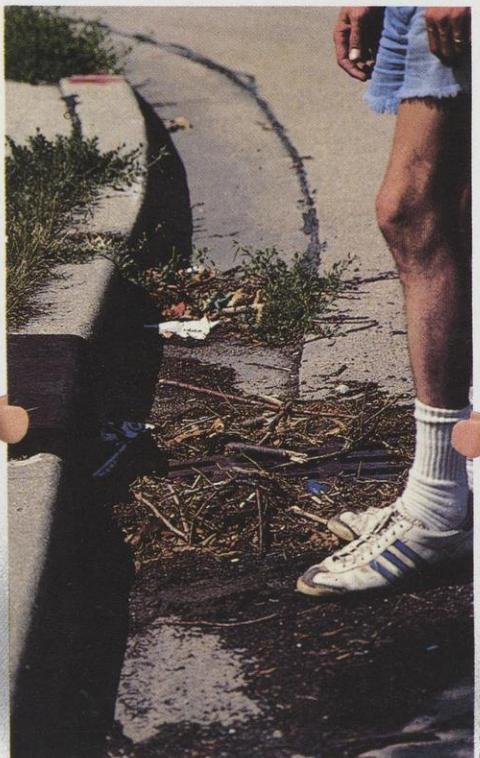
CHAPTER SIX

INSPIRATION

The Gritzmakers had done their homework. They knew Lake Waunawinnowoc was suffering from nonpoint source pollution. Now, they had to do something about it.

"We need everybody involved in this or it'll never work," Sally observed. "We can start right here in our neighborhood, by sharing what we know."

With the help of staff at the Department of Natural Resources and the UW-Extension, Sally prepared a how-to flyer and stuffed one in each mailbox:



DNR PHOTO



YOU:

The solution to nonpoint source pollution

Compost leaves
and grass clippings.



LAWNS:

A healthy lawn can help prevent erosion by acting as a filter for rainwater from roofs, downspouts and driveways. Apply fertilizers at the proper time of year and use no more than necessary — you can hurt your grass if you use too much! A soil test can show how much to apply; call your County Extension agent for assistance.

Leave grass clippings on the lawn. Clippings decompose rapidly and return nitrogen to the soil, cutting down on fertilizer costs.

Try composting leaves, weeds and grass clippings. You'll create a valuable soil amendment and keep organic matter from decomposing in our waterways. Write the Department of Natural Resources, Bureau of Solid Waste Management, Box 7921, Madison, WI 53707 for composting tips.

A square foot of soil may contain over 5,000 weed seeds, so even the best lawns are bound to have a few weeds. Mow or dig up weeds before they go to seed; use herbicides only when the lawn is in serious danger of being overtaken by weeds.

Overwatering your lawn wastes water, weakens the turf and causes nutrients and herbicides to leach out. Water early in the day only during very dry periods.

Make a regular practice of sweeping your sidewalks, driveway and gutters. Dispose of the dirt and debris in the trash.

LANDSCAPING:

Grade the ground on all sides of your house at a gentle slope of 1 percent. This gives rainwater a chance to soak slowly into the soil.

Put gravel or grass trenches along paved driveways and sidewalks to collect and absorb rainwater.

Install gravel, brick or wood patios and walkways, which allow water to seep into the soil.

Maintain the existing trees on your property and plant more wherever possible! Trees and shrubs minimize erosion by reducing runoff. Choose varieties that don't need lots of water.

Berms and swales — slight elevations and depressions in the land surface that provide channels along which water can flow slowly — can be sculpted on property with poor drainage. Terracing is the answer for steeply-sloped yards. A good landscaper can give you advice.

GARDENS:

Plant gardens on level, well-drained sites when possible. If you must garden on a slope, plant across, not up and down the hill, or use terraces and raised beds to prevent erosion.

Use mulch — compost, grass clippings, straw, leaves, sawdust or any other organic matter — around your flowers and vegetables. It adds nutrients, makes the soil easier to work, and improves the moisture-retaining capacity of the soil.

Cover bare soil with mulch, or plant a winter cover crop like rye grass and turn it under the following spring to prevent wind and water erosion.

Take a soil test before you add fertilizer. Don't overfertilize — it damages plant roots, and the excess will run off and cause water pollution.

Herbicides, insecticides, fungicides and rodenticides fall under the generic category of pesticides. Use a pesticide only as a final alternative — runoff carries these products into waterways, killing fish, aquatic plants and wildlife as well as tainting our water supply. Consider these techniques for controlling garden insects and diseases:

1. Plant disease-resistant flower and vegetable varieties.
2. Inspect plants and pick off pests or egg cases by hand. A spray of water will dislodge aphids, spider mites and mealybugs.
3. Rotate your crops.
4. Encourage birds, bats, ladybugs, praying mantises, lacewing larvae and other creatures that eat garden pests.
5. Time plantings to avoid the peak of insect infestations.

Mulch exposed soil in garden and flower beds.



SEPTIC SYSTEMS:

Septic systems can contaminate lakes, streams, groundwater and wells if they are not maintained. To keep your system working:

1. Don't use a garbage disposal. It adds unnecessary solids and grease to the septic system.
2. Don't pour grease or household chemicals down the toilet or drain.
3. Don't use toilets as trash cans. Put disposable diapers, paper towels, and sanitary napkins and tampons in the garbage; compost coffee grounds.
4. Direct downspouts away from the drainage field.
5. Conserve water whenever and wherever possible.
6. Have the scum and sludge in the tank pumped out every two



or three years. Don't rely on additives; they won't eliminate the need for pumping.

7. In areas with dense populations where many homes use septic systems, contamination of groundwater and surface water may result even when the systems are working properly. Sewers or holding tanks are the only answer.

IN THE HOME:

The ground, your household drains and storm drains are not the places to dump oven cleaners, floor wax, spot removers, furniture polish, paint, strippers, paint thinners, solvents and a host of household products containing lye, phenols, petroleum distillates and trichlorobenzene. Use up what you have or share the extra product with neighbors, then switch to a nontoxic alternative.

If you must dispose of household chemicals (including pesticides), bring them to a hazardous waste collection site or "Clean Sweep" day in your community. Call (608) 262-0142 for information.



Bring used oil to collection tanks for recycling.

CARS:

Use a gentle, biodegradable soap and elbow grease to wash your car — you don't need mountains of suds to do a good job! Hose the suds off onto the grass, not the driveway.

One quart of oil can contaminate up to two million gallons of drinking water, and the oil from one engine can produce an eight-acre oil slick. If you change your car's oil at home, collect it in a plastic milk jug or other container and take it to a municipal garage or oil recycling center. Some waste oil recycling centers also accept used brake and transmission fluid.

Antifreeze can be toxic in high concentrations, so never pour it into septic systems, storm drains or on the ground. Dilute used antifreeze by mixing one gallon of antifreeze with 15 to 20 gallons of water. The solution can then be flushed down the toilet if your home is connected to a municipal sewer and water treatment plant. If not, have your antifreeze changed at a service station.

Don't dispose of batteries in a landfill. Bring them to a recycling firm.

Use up degreasers, carburetor cleaners and other petroleum-based products. If you have any left over, don't pour it on the ground. Share with a neighbor or open the bottle or can and let the liquid evaporate in an open, well-ventilated area away from flames, children and pets. Wrap the dried residue in newspaper and put it in the garbage.



Pick up after your pet!

E. JONES



PETS:

To prevent animal feces from being carried by storm water into streams and lakes, use a "pooper scooper" when you walk your pet. Collect the waste and flush it down the toilet when you get home.

BOATS:

Use phosphate-free detergents when you wash your boat.

Never discharge raw sewage from your boat. Use pump-out facilities at marinas.

Don't throw trash overboard.

Don't let fuel overflow from your gas tank.

Be cautious when using boat cleansers, paint and antifouling compounds; some are very toxic to aquatic life.

WHO CAN HELP:

Chemical spills and related emergencies

— your local police or county emergency government
— Wisconsin Division of Emergency Government, (608) 266-3232

— Chemical Referral Center, 1-800-262-8200
— U.S. National Response Center, 1-800-424-8802
— Poison Control Center in your area

Lawns and gardens

— Cooperative Extension Service office (check the phone book under "County Government")

Pesticides

— National Pesticides Telecommunications Network, provides emergency and general information, 1-800-858-7378

Protecting lakes and streams

— Department of Natural Resources district water resources program (check the phone book under "State Government")
— Cooperative Extension Service office (check the phone book under "County Government")

Recycling or disposal of household chemicals

— Department of Natural Resources district solid waste management program (check the phone book under "State Government")

Septic systems

— county sanitarian
— local health department
— DNR district wastewater engineer



CHAPTER SEVEN

CHALLENGE

The neighbors really appreciated the advice in the flyer. It was posted on refrigerators all over town, and copies were shared with friends and relatives. But Felix, being an alderman, knew that stopping nonpoint source pollution in Lake Waunawinnowoc would take more than the good intentions and actions of individual citizens. People had to join together and make some important decisions about land use in the area.

The next city council meeting was packed. "I haven't seen this many people since the time we considered making Lake Waunawinnowoc a dry town!" the mayor whispered to Felix. Clearly, the populace was riled about something.

Sylvia Witloof — developer of the condominium and shopping mall complex — led the

charge. "We demand to know what's wrong with our lake!" she insisted. "It's dirty! It's scummy! It . . . smells bad! Who is responsible for this? We demand accountability!"

A roar came up from the audience. "Uh, thank-you for that comment, Ms. Witloof," said the mayor. With the easy grace of someone well-practiced in the art of deflection, the mayor turned to Felix, smiled, and said in a loud voice, "Perhaps Alder-



man Gritzmacher can shed a little light on the topic!"

Felix rose and approached the microphone. He looked out at his fellow Lake Waunawinnowocans.

"My fellow Lake Waunawinnowocans," he began, "our city and our lake are suffering from nonpoint source pollution . . . and we are the cause."

A hush came over the crowd as Felix detailed the everyday activities contributing to the degradation of the lake. If the council chambers had been a glass house, no one inside that night could have thrown any stones.

"But what we do at home is merely the beginning," Felix continued. "There are things we must do together to combat the problem.

"We need ordinances to guard against erosion at new construction sites," he said, looking right at Sylvia Witloof. "Haybales, sod and matting will control erosion, but only if we use them. We've got to get those ordinances on the books and enforce them!"

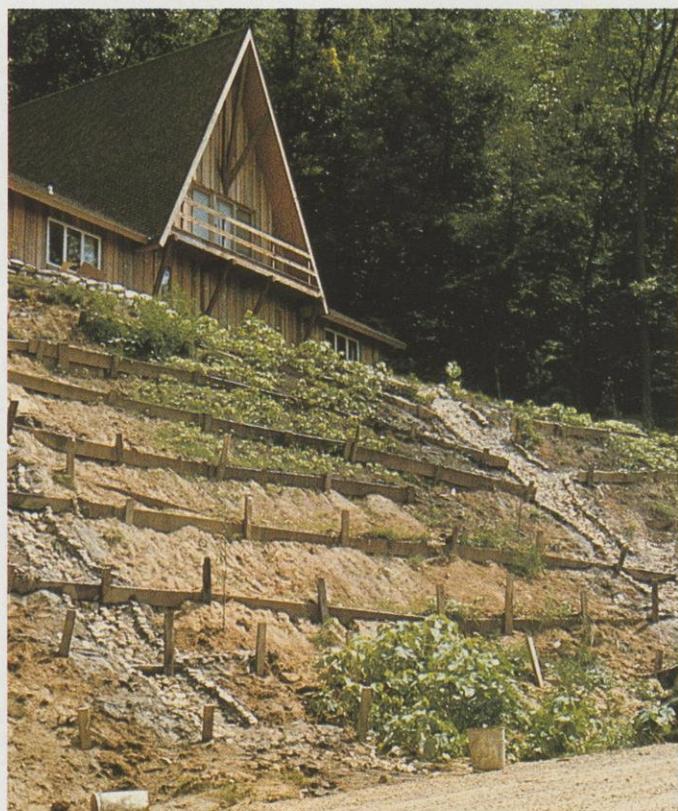
"We must insist that grassed waterways, porous pavements and detention ponds become a part of any new commercial or residential development in

town. It's the only way we can slow runoff. And since we've filled in so many of our wetlands, we'll probably need to make room in our existing neighborhoods for detention basins, which means that part of your property or my property might have to be used to stop nonpoint source pollution."

Sven Olesson let out an audible gasp.

"That's right, Sven. And there's more. We don't send stormwater through a treatment system," Felix said. "It goes right into the lake, full of sediment, oil and nutrients. Our wastewater plant wasn't designed to handle such a large volume of water. Building detention ponds to handle the flow will cost each one of us money. Are we willing to pay the price for a clean lake?"

"We need to improve city services," Felix noted, with a nod toward the mayor. "Leaves should be picked up promptly and composted. Streets ought to be cleaned regularly. The public works crews have got to get out and clean catchbasins and storm sewer pipes at least twice a year. Are we willing to pay higher taxes for better equipment and more staff to do this important work?"



A series of terraces will hold soil in place on this steep slope. Landscaping with gentle grades, berms and swales slows stormwater flow during heavy rains, preventing erosion. Trees and shrubs also help reduce runoff.

JIM BAUMANN

A murmur of assent rippled through the crowd.

Felix took a deep breath. "Just one more thing," he said. "This is a biggie. *We're not in this alone.* We're part of a watershed—basically, a whole region whose water eventually drains into the lake. So we can do lots of things to stop nonpoint source pollution here in Lake Waunawinnowoc, but our efforts won't amount to a hill of beans if we can't cooperate with our neighboring communities and get them to do the same!"

The mayor sighed. He saw his term pass before his eyes in a long string of public hearings, council debates and baked-chicken banquets. But Felix was right — tackling nonpoint source pollution would require cooperation between the state, counties, communities, neighborhoods and individual citizens. It would require leadership.

"Thank you for shedding light on this problem, Felix."

said the mayor. "I see that the council has some work to do regarding zoning codes and tax levies." He looked toward the audience and said, "Now, what will you do?"

Sally Gritzammer stepped forward with a proposal for a "greenbelt" around Lake Waunawinnowoc. A broad belt of forests and parks would help improve water quality in the lake, create a refuge for birds and wildlife, and prevent urban sprawl. Several people expressed an interest in joining Sally to make the greenbelt a reality; others agreed to distribute flyers and work with neighbors on nonpoint source pollution solutions. The Lake Waunawinnowoc Clean 'n' Green Club was born.

Never one to miss a chance for good publicity, Sylvia Witloof announced that the next Lake Waunawinnowoc Parade of Homes would feature landscaped detention basins and porous patios and sidewalks. "From now on, Witloof Devel-

opment will place a high priority on environmental quality," she stated with pride.

Other citizens left the hall grumbling. "Higher taxes — no way!" said one man. "We don't get what we pay for now! They can forget about my vote!"

Felix Gritzammer grimaced when he heard that comment. "Nobody said it was going to be easy," he muttered to himself. Tomorrow he would call Jack Schoof and see about having a holding tank installed to replace the failing septic system at the Mill. Felix knew hooking up to a sewer would be better, but pipe hadn't been laid out that far. Just one more thing to put on the agenda for the next council meeting.

And then he smiled. He wouldn't need to pave the gravel parking lot after all.

E P I L O G U E

So the citizens of Lake Waunawinnowoc, like so many people in cities and towns all across

Wisconsin, began to take the first steps leading to better water quality in their community. Although they're bound to hit detours and roadblocks along the way, you can bet they'll live happily ever after when the nonpoint source pollution problem is licked.

Especially Sven Olesson, who took a solemn oath in front of his fellow citizens and vowed never, ever to pour oil down the storm drain again.



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By stopping nonpoint source pollution problems now, the future will be bright for Wisconsin's lakes and streams. But there's work to be done before everyone walks off into the sunset. Legislation, zoning, cooperation between neighborhoods, cities and counties and a commitment from individual citizens to change habits will get us off on the right foot.