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Summer 1999

Death from a Distance

Mississippi nutrients are everybody's prob-

by Brett Larson

I live on the Rum River, a tributary of the Mississippi River. In its upper reaches, the Rum flows clear and pure through forests, wetlands and hay fields with few homes, farms or towns along the way. As it gets closer to Milaca, the town nearest my home, things begin to change.

If you canoe the river, you begin to see corn stalks crowding the river bank. You round a bend and see a herd of Holsteins drinking from the river. In the fall, fields cleared of their beans and corn are plowed under, leaving the topsoil vulnerable to erosion by wind and water. More and more homes with green lawns spring up along the riverbank before the Rum empties into the Mississippi in Anoka.

Now take that small story about one small river and tell it a thousand times about a thousand small rivers. Each tributary carries clear water from lakes, springs and wetlands. Bit by bit, once-clear tributary streams are infiltrated with sediments and chemicals. That water, those sediments and those chemicals flow into the Mississippi and its major tributaries, the Minnesota, the Missouri and the Ohio, eventually reaching the Gulf of Mexico.

Death by River

In 1972, over a thousand river miles downstream, beyond the outlet of the Mississippi, a fisherman named Donald Lirette trawled the coastal waters in his shrimp boat. The descendant of Spaniards

and Nova Scotia Cajuns, Lirette fished for shrimp the way his forefathers had, but what he saw was not the gulf coast his forefathers had seen.

Instead, he noticed a problem. "I always wondered why in some areas I caught fish in the wintertime, but I'd go back in the summertime, and everything was dead," said Lirette. "The water looked dingy and rotten. We'd run test trawls in the hot spots, but after a few years, we realized some areas didn't produce shrimp in the summer." The hermit crab shells were empty. The few fish they caught looked sick. Vast stretches of the coast yielded no fish at all.

One year, Lirette saw people wading on the beaches of Grand Isle scooping up shrimp in nets — shrimp that should have been far out at sea. "In all



When excess nutrients run into the Mississippi River and its tributaries, it affects water quality from here to the Gulf.

my years of fishing," Lirette said, "I'd never seen anything like it." Shrimp, which spend most of their lives in shallow estuaries after drifting in on the "Lenten winds," normally migrate back out to sea to spawn. Instead, a wall seemed to be holding them

Meanwhile, scientists were starting to notice the same thing: a huge "dead zone" that moved back and forth, in and out along the gulf coast, varying in size but steadily increasing over the years. Since the 1980s, fishers have found it harder and harder to catch shrimp. By 1998, the number of commercial shrimpers in Louisiana had dropped from a high of 32,000 to

Continued on page 4.





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MISSION:

Friends of the Mississippi River (FMR) advocates a new vision for the Mississippi, especially the river and its watershed in thea Twin Cities metropolitan area. Through active leadership and education, FMR seeks to preserve and restore the river's fish and wildlife. its vital floodplains and scenic bluffs, its natural and cultural treasures, its beauty and its romance. We envision a river on which small boats are safe and welcome, to which we have clear and easy access and in which we can safely swim and fish. We envision a river that is cleaner, healthier, more alive and more inviting, a river no one can ignore or take for granted.

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Whitney Clark, Executive Director

gone. But is it really?

s you approach the bridge at sixty-five miles per hour you catch a glimpse of a sign out of the corner of your eye. It reads:
"Mississippi River." If traffic isn't too snarled, you might even sneak a peek at the river itself, big and broad, an oasis of sun-dappled tranquility amidst the hurly-burly of the urban landscape.
In a moment it is passed. The defining natural feature of the mid-continent recedes in your rearview mirror and is

Scientists remind us that a river is part of a larger hydrologic unit called a watershed or basin and in North America, the Mississippi River basin is the mother of all watersheds — the third largest watershed on the planet.

The Mississippi River is more than its main stem, a column of water, a channel. It is a living, breathing system of breathtaking complexity. It is a dendritic web of interconnected tributary streams and rivers, high bluffs and deep ravines, backwater lakes, bottomland forests and wetlands.

The more we understand about the ecology of rivers, the more one fact stands out: The health of a river is directly related to the land uses within its watershed. Within the Mississippi's watershed, human changes to the landscape have had a profound impact on the river — adversely affecting water quality, biodiversity, and the ability of the river to perform environmental functions such as flood water storage. In this way, the river, which sits at the bottom of the watershed, is the bellwether for the environmental health of the region.

Though degraded by development, rivers such as the Mississippi and its tributaries in the Twin Cities area offer an exciting opportunity. As linear natural features, rivers and creeks provide us with a footprint for a restored green infrastructure — an interconnected network of parks, trails and natural areas.

By protecting the land along our rivers and streams and maintaining those riparian lands in a natural state, we provide a buffer between the water and adjacent development. These "shoreland buffers" serve the critical function of filtering runoff pollution from agricultural land, city streets and suburban lawns.

In this issue of the newsletter we explore the role of nutrient pollution to the Mississippi River and the Gulf of Mexico. As readers will see, often global problems have local solutions. Here in Minnesota where the river gets its start (and alot of its pollution) we must do a better job of stewarding our precious water resources.

Friends of the Mississippi River is taking a multi-layered approach to this issue. Whether working one-on-one with riverfront landowners, promoting shoreland protection at the State Legislature or teaching kids that their neighborhood is part of the Mississippi River too, we're building a watershed movement. Thanks for your interest and support and remember: Think Globally — Act Watershed!

New Outreach Staff, New Outreach Programs

To protect nature you need people. It's an ethic FMR's new Outreach Director Irene Jones understands well.

"Human development has been the cause of many of the river's problems, but it is people working together for the Mississippi that is going to ensure its long term protection and improvement," she says.

Jones joined FMR's staff this summer to help the organization build on local citizens' connection to our river — to engage them in fun events, educational programs and river protection activities that "plug them in" to the life of the Mississippi River.

As Public Outreach Director, Jones is overseeing FMR's largest-ever storm drain stenciling project and Mississippi River Canoe Adventure. She'll also be helping to launch several new initiatives including a "Points of Interest Guide" to the Twin Cities stretch of the Mississippi River.

The guide will include maps, paddling suggestions and detailed information about sites of particular ecological, social and historical value on the river in the Twin Cities.

Other new outreach projects are in the planning stages. For example, FMR is considering expanding the scope of its spring bird hikes and arranging new tours of interesting or unique places along the river. A computer kiosk covering FMR's river protection initiatives is also being discussed. This project would build on

There is a huge demand for opportunities that help people explore and protect the river.

the Mississippi National River and Recreation Area (MNRRA) network of interactive computer terminals located at interpretive sites along the river in the Twin Cities.

"There is a huge demand for opportunities that help people explore and protect the river," says FMR Board member John Anfinson. "Now we have the staff to really expand our work in this area."

Jones bring extensive training and experience to FMR. For the past 11



FMR Outreach Director Irene Jones

years she has worked at the Frost Valley YMCA Environmental Education Center in the Catskill Mountains of New York State. She has built Elderhostel programs, taught classes, worked with educators, and overseen all communications operations at the center.

"Getting people enthused about the natural world, and providing the tools needed to protect the environment is what I love to do," she says.

A native of the Twin Cities, Jones grew up near Minnehaha Creek and lived on both the East and West Banks of the Mississippi while working toward her B.S. in Biology at the University of Minnesota.

For information on FMR's expanding outreach work, feel free to give Jones a call at FMR's office.

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It's a great time to become a Friend of the Mississippi River

Join us — or continue our friendship — as we expand our efforts to protect the mighty Mississippi! All contributions to FMR are <u>tax deductible</u>. Please make checks payable to Friends of the Mississippi River and send them, along with this form, to 46 E. Fourth St., Suite 606, St. Paul, MN 55101 • 651/222-2193.

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*If you join at a level of \$40 or more, we will send you the beautiful, full-color FMR poster, "Native Fish of the Upper Mississippi River - A Diversity of Species" or a set of ten notecards featuring the photographs of Henry Bosse. These items are also for sale individually. Contact FMR for more information.

Of Gorges and Ruins

by James H. Johnson

Think of ruins and you conjure visions of abandoned cities. But I think there are other kinds of ruins, too; ruins of once-pristine, natural places which have not fared well in the Industrial Age. I thought of this recently while hiking in the Mississippi River Gorge, which stretches downstream from St. Anthony Falls to the confluence of the Mississippi and Minnesota Rivers.

Seen from the Lake Street or Ford Avenue bridges, the gorge is a lovely tree-lined strip of water flowing between hundred-foot bluffs.

Seen from the Lake Street or Ford Avenue bridges, the gorge is a lovely tree-lined strip of water flowing between hundred-foot bluffs. Here and there outcrops of limestone jut forward, the rock faces smoothed white by hikers. But in the gorge itself, down in the cottonwoods, ash, maples, and burr oaks, the atmosphere changes. Graffiti covers rock faces, storm-felled trees block footpaths, sewer odors swirl out of manhole covers, and cigarette butts and snack wrappers cover too much ground.

It wasn't the case one hundred and eighty years ago. When Maj. Stephen H. Long took a skiff voyage to the Falls of St. Anthony in 1820, he noted:

"The [gorge] ... needed no embellishments to render it romantic in the highest degree. The banks on both sides of the river are about one hundred feet high, decorated with trees and shrubbery of various kinds. The post hickory, walnut, linden, star tree, white birch, and the American box; also various evergreens, such as the pine, cedar, juniper, etc., added their embellishments



to the scene. Amongst the shrubbery were the prickly ash, plum, and cherry tree, the gooseberry, the black and red raspberry, the chokeberry, grapevine, etc. There were also various kinds of herbage and flowers, among which were the wild parsley, rue, spikenard, etc., red and white roses, morning glory, and various other handsome flowers. A few yards below us a beautiful cascade of fine spring water, pouring down from a projecting precipice about one hundred feet high."

The gorge slopes are not the only changes along this section of river. The water, too, is not what it was. Long noted:

"The [Mississippi River water] is entirely colorless and free from everything that would render it impure, either to sight or taste. It has a greenish appearance... but when taken into a vessel is perfectly clear."

I think of these descriptions often when I wander down there and have to climb over crumbling storm sewer outfalls and cracked retaining walls. I think of it when I stumble down the eroded, rooty trails, and when I step over cans and bottles scattered around fire pits.

A natural tendency might be to cloak myself in a thick blanket of denial and ignore the ruination of this place and focus on the good (and there's lots of that). But the concept of ruination, it seems, fits this place and makes me appreciate it more because

of my sense of what was. The result is a sense of loss, mystery, and wonder; the same thing I felt at Mesa Verde or Tikal.

So several times a week I hike through the ruins of a once-great natural community. I imagine that I am surrounded by "... plum, and cherry tree(s), the gooseberry, the black and red raspberry, the chokeberry, grapevine." On a slope covered with buckthorn I see "... wild parsley, rue, spikenard, ... red and white roses, morning glory, and various other handsome flowers." And I also sense something I've never felt in an archeological zone: hope for the future.

Recently state and federal agencies have provided funds to bring back the prairie and remove invasive plants. The neighborhood residents, in turn, provide time and effort needed to implement some of these changes. We pick up litter and attack buckthorn. We close renegade trails and monitor the health of the few remaining prairie patches, and we constantly renew our commitment to a narrow strip of land that provides a window to the past and an opportunity to reclaim part of our shared natural wealth.

James H. Johnson is a writer who lives about a block from the gorge in Minneapolis' Longfellow neighborhood. He is active in neighborhood efforts to restore the area.

Protecting More of Our Riverfront

FMR's Conservation Program Expands Staff, Scope

FMR's Conservation Program is a multifaceted effort to protect and improve a green corridor along the Mississippi River between Inver Grove Heights and Ravenna Township near Hastings. This area, in fast-growing Dakota County, includes some of the Twin Cities' highest-quality habitat, wetlands, forests and marshes.

Conservation Director Tom Lewanski is working with landowners along the Mississippi River in the program focus area. He is helping them evaluate the health of their properties and define how they can improve the land's ecological functioning. Interested landowners are joining FMR's heritage registry and taking voluntary actions to add to their land's value as habitat and improve water quality — from planting new trees and removing invasive exotic species to instituting controlled burns and other management activities.

Big Rivers Partnership

Restoring and improving riverfront property can be a costly endeavor, requiring detailed expertise. For this reason, FMR works to leverage new funding and technical assistance to help landowners make improvements. One recent method of providing these resources stems from FMR's involve-

ment in the Big Rivers Partnership. A collaboration of several non-profits and local governments, this partnership was funded in 1999 through the Legislative Commission on Minnesota Resources (LCMR). The project will provide cost share dollars for private and public landowners who want to restore the ecological health of their riverfront property.

"This is a tremendous boost to the river," says FMR Executive Director Whitney Clark. "Most landowners want to be stewards of their land but can't afford to do it all themselves."

Planning for Growth in Dakota County

In addition to work with landowners, FMR's conservation program includes education, outreach and planning work with Dakota County citizens and government officials. The County is projected to receive 100,000 new residents over the next twenty years. FMR is helping the county identify priorities for land protection and improvement before it is too late.

This aspect of FMR's program also received new LCMR support through a county-led initiative to protect farmland and natural areas from the effects of urbanization. The project will take a grassroots approach — holding public meetings throughout the county this

fall to determine residents' priorities.

"We're working to help people envision how they want their community to look in the future — which landscapes they want most to protect," says Lewanski. "Then we'll begin to take the appropriate steps to make that vision happen."

New Focus on the Vermillion River

A final area of conservation program activity is the expansion of the program's scope to include shoreland work along the Vermillion River — a key tributary where agriculture and suburban development are causing pollution and loss of habitat.

This spring FMR hired ripar-

ian ecologist Shandor Szalay to carry out a parcelby-parcel assessment of land along the Vermillion near the Mississippi River. Szalay has an M.S. in



Riparian Ecologist Shandor Szalay

Water Resources Science and extensive experience in aquatic ecology with an emphasis on restoration. (See page 5 of the cover story for more information on the Vermillion River project and assessment.)



Volunteers of all ages promote river stewardship through FMR's storm drain stenciling project.

Making the Mississippi - Storm Drain Connection

The message is appearing on storm drains around the Twin Cities: "Please! Don't Pollute! Drains to River." It's a reminder that anything we dump into storm drains ends up in the Mississippi River. Marking drains and distributing educational materials on river pollution is also an excellent way to involve people in river protection activities.

By the end of the summer over 3,000 drains will be marked, including all the storm drains at the State Fair grounds. But what is most exciting about the program, according to Watershed Organizer Brooke Crowe, is the more than 1,200 volunteers involved in the effort.

"It's really exciting to see our volunteers — particularly the young people we work with — learn from the stenciling experience," she said.

Families and groups can get involved during our one-day stenciling event, "Watershed 100," on Saturday, August 21. For information on how to get involved, call Brooke at the FMR office.

Cover Story

What is the Dead Zone?

The "dead zone" is a shifting area of low oxygen in the Gulf of Mexico — a section of the ocean where the ecosystem is so badly damaged that no fish, shrimp or other life forms can live there. Scientists have determined that the dead zone— which can range from 800 to 18,000 square kilometers — is caused by nutrient-rich water flowing into the gulf from the Mississippi River. Those nutrients, mainly nitrogen and phosphorus, act as aquatic fertilizers, resulting in "blooms" of plankton, primarily algae or "phytoplankton," in the water. As those plankton die, they sink to the bottom and are decomposed by bacteria. The process of decomposition depletes the oxygen dissolved in the water, a condition called hypoxia. Because dissolved oxygen is necessary for life, the areas of depletion cannot support life. Hence, the "dead zone."

Where Do Nutrients Come From?

Fertilizers and decaying organic matter dumped into the river — or more often, washed in during a storm or flood — are the key sources of nutrients. While industries and sewage treatment plants contribute to the problem, the U.S. Geological Survey estimates that 90 percent of the nitrogen delivered to the Gulf by the Mississippi originates from "non-point" sources, primarily agricultural runoff and atmospheric deposition. Over 70 percent of those nutrients come from the northern reaches of the river and its tributaries, the area including and above the confluence with the Ohio.

Death from a Distance Continued from Page 1

barely 8,000.

Dr. Nancy Rabelais was one of the scientists who began monitoring the dead zone in the mid-eighties. Using the measurements of others, Rabelais and her team were able to make estimates about the trend dating back to the early 1970s.

Core samples taken from the ocean floor give scientists a glimpse even further into the past. Rabelais said, "By looking at the remains of plankton, we can tell that the problem has been worsening since the turn of the century, especially since the 1950s."

The change, said Rabelais, is closely related to the amount of nutrients flowing into the gulf from the Mississippi.

A Problem "Up North" Too

As Louise Hotka of the Minnesota Pollution Control Agency points out, you don't have to go to the gulf to see the effects of nutrients. Fish kills due to depletion of oxygen have occurred as close to home as Lake Pepin and the Minnesota River, especially during times of low water, when the river slows down and algae blooms occur.

The Minnesota River, in fact, is one of the "hot spots" of nutrient loading in the upper Mississippi basin. A

look at nitrogen and phosphorus concentrations in the Mississippi above and below the Minnesota clearly shows the impact the smaller river has on the overall quality of the Mississippi.

The Minnesota River's concentration near its mouth is a whopping 5.48 mg/l, compared to 1.40 mg/l for the Mississippi near Fridley. The Minnesota's concentrations are further put in perspective by

comparing them to those of the St. Croix, a slightly larger river that flows primarily through forests rather than farmland. The St. Croix's nitrogen concentration at the mouth is 1.11 mg/l.

National Level Solutions

One of the most significant approaches to the dead zone problem is coming from — of all places — Washington. But it took some prodding for the federal government to take the initiative to address the problems of nutrient loading.

In 1995, the Earth Justice Defense Fund filed a petition under the Clean Water Act to force the EPA to act on the hypoxia problem. The EPA formed an inter-agency task force which, among other activities, recently completed a scientific assessment which will result in the most extensive studies to date of causes, effects and solutions to nutrient problems.

Because early data seem to show that agricultural fertilizers are the main culprit, preliminary studies of solutions have focused on possible changes in fertilizer use. One study looked at reducing nitrogen use by 60 percent and found that the economic consequences for agriculture would be drastic. Smaller reductions, however, seem to show some promise. In fact, some of the reductions could



Poorly mangaged livestock and other farming practices are a key source of nutrient loading. Farmers are now working with government and others to find "win-win" solutions to the problem of excess nutrients in the Mississippi River.

MN DN

be brought about simply by more efficient methods of applying the chemicals.

Another area being looked at is wetland restoration. Wetlands act as sinks for nutrients that would otherwise wash into waterways. Plants in wetlands and vegetated buffer strips filter nutrients. The task force has determined that a combination of wetland restoration and reduced fertilizer use might be beneficial and feasible.

FMR Takes Local Action

According to FMR's Executive Director Whitney Clark, the dead zone and hypoxia problems between the Twin Cities and the Gulf are linked to patterns of development that have widespread effects on the river.

"We've changed the landscape so dramatically over the last hundred years," says Clark. "Development, farming and our other activities on the land have had an enormous impact on nutrients in the water as well as habitat and other water quality issues."

FMR's approach to preventing excess nutrients in the river is taking place in several forums. In the southern stretch of the metro area, where FMR's conservation program is focused, efforts revolve around work with owners of the lands along the Mississippi and the Vermillion River, the largest tributary in the area.

The Vermillion meets the Mississippi in a pristine area called the Vermillion River Bottoms. It is one of the few large natural areas remaining along the Mississippi, but it is a site where excess nutrients threaten the ecosystem.

"Looking at the health of the Mississippi means looking at the health of its tributaries and the land around them," says FMR's conservation program director Tom Lewanski. "We chose to work on the Vermillion because there is so much land in agricultural use along this tributary and so much good that can come from working with landowners to stop this pollution."

This spring FMR hired a riparian

ecologist, Shandor Szalay, to conduct an assessment of the land along the Vermillion River near the Mississippi River. Using a Global Positioning System, he is doing a parcel-by-parcel analysis of riverfront land. At each site he is examining the vegetation along the river, noting where

crops are planted right up to the floodplain, and where livestock are grazing near — or even trampling through — the river.

FMR is using the results of this assessment to work one-on-one with landowners, providing information on how they can take action to make sure they are not contributing to nutrient loading and other water pollution problems. FMR also offers technical assistance—and some matching funds—to landowners who wish to plant new vegetation along the river or take other on-the-ground steps to better steward their section of the river. (For more information on FMR's conservation program, see page 3.)

Nutrients in Your Back Yard

While the dead zone is clearly linked to agricultural runoff, there are many other sources of excess nutrients along the river. Some of those sources are caused directly by us: the people who live and work in the Mississippi River watershed.

"Pet wastes left on the boulevard, fertilizers on lawns, and leaves swept into the street all wash into the storm drain system when it rains," says Clark. "As they decompose they also take oxygen out of the waters of the Mississippi River."

FMR has worked for several years to help people make the connection



Nutrients from farms along the Vermillion River threaten water quality in the spectacular Vermillion River Bottoms, and may contribute to the dead zone and other problems downstream.

between what happens on their lawn and sidewalk and the health of the Mississippi River through its storm drain stenciling project. This educational, volunteer-driven effort includes marking local storm drains with the message: "Please! Don't Pollute! Drains to River."

According to stenciling project coordinator Brooke Crowe, it's a message that needs to be heard. "Many people still don't realize that when something goes down the storm drain, it goes directly to the Mississippi," she says.

People may also do not realize that animal by-products, grass clippings and other seemingly safe substances can wreak havoc on our river ecosystem.

"Compared to toxic pollution, nutrient loading may seem complex and somehow less critical," says Clark. "But from a river ecology standpoint, the dead zone — and its effects on our economy and environment — make it clear that excess nutrients are an enormous problem."

Brett Larson is a writer living in Milaca, Minnesota.

Ron Nargang Joins FMR Board of Directors

FMR is pleased to welcome former Minnesota Department of Natural Resources (DNR) Deputy Commissioner Ron Nargang to our Board of Directors. Nargang brings extensive knowledge of Minnesota conservation and resource management issues — as well as in-depth legislative knowledge — to the organization.

Nargang traces his connection to the Mississippi River back to when he was a teenager roaming the channels and backwaters of the Mississippi, hunting and fishing along the Iowa-Wisconsin border. Professionally, he has been involved in Mississippi River issues for more than 15 years. In addition to DNR-related river work, Nargang has been a key player in various river decision-making bodies. He was appointed by Secretary of the Interior Bruce Babbitt to chair the Mississippi National River and Recreation Area (MNRRA) Commission which developed the initial plan for the 72-mile stretch of the Mississippi River in the Twin Cities. More recently, he was the governor's representative to the Upper Mississippi River Basin Association Board. In his current position as the Nature Conservancy's Assistant State Director for Conservation, Nargang supervises the organizations programs in the areas of land acquisition, land management, government relations, and science.

Nargang joined FMR's board because of his "deep affection for the Mississippi as a river and as a resource." He is currently serving on FMR's Conservation and Legislative committees. We look forward to putting his expertise to work!

Volunteers Needed

There are many volunteer opportunities at FMR. Photographers and writers are needed, as well as people who can provide graphic design and marketing assistance. Donated services are tax deductible. For more information, call Gabe at 651/222-2193.

FMR in the News

On June 22, FMR's Conservation Program was the subject of a KSTP-TV "Focus 5" report. The report includes footage of natural areas FMR is working to protect, including the Vermillion River Bottoms. Call Gabe at 651/222-2193 to borrow a copy of the report.

A Passport to Summer Fun

The Official Mighty Mississippi Passport is a map and companion to a summertime of fun, prizes and discovery along the Mississippi River. The passport booklet lists activities along the river, including FMR events, and suggestions for self-directed hikes and visits to historic sites. By completing six passport activities you can get an "Official Mightly Mississippi Steward" certificate and enter a drawing to win a prize. To receive a passport booklet or for more information, call: 612/379-3858.

Thank You FMR Donors

The following foundations, corporations and agencies have awarded funds to FMR thus far in 1999:

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