

Protecting, restoring and enhancing the metro Mississippi together since 1993

# Volunteers monitor small insects to gain big insights into water quality

FMR's Stream Health Evaluation Program has delivered vital scientific data for nearly two decades — and a new FMR volunteer monitoring program just launched on land.

**By Christine Schuster**

Katherine Majkrzak can trace her fascination with the natural world back to her childhood in northwestern Minnesota's Red River Valley, where she'd collect water from the ditch near her home and gaze at the bugs swimming inside the jar. Although she'd go on to study music composition, she never lost her curiosity about life beneath the water's surface.

Today, both Katherine and her husband, Darrell Majkrzak, are experts in macroinvertebrate anatomy. They own their own microscope, can spot if an antenna has two segments or three, and can distinguish a damselfly from a truefly or a crustacean from a snail.

They've developed their expertise over nearly two decades as volunteers with Friends of the Mississippi River's Stream Health Evaluation Program. SHEP, as it's often referred to, is an award-winning and nationally recognized volunteer monitoring effort that collects scientifically valid macroinvertebrate data in the Rice Creek Watershed District just north of the Twin Cities.

FMR contributes to other ecological research and monitoring efforts, such as annual breeding bird surveys at restoration sites, but SHEP, which will mark its 20th

anniversary this year, is FMR's longest-running scientific data collection project.

Katherine and Darrell, who now co-lead a team of volunteers, discovered SHEP in the program's early days.

"Before I joined the program, I only noticed the things on top of the water," Darrell continued. "Now with SHEP, I realize there's a whole ecosystem under there that's crucial to everything else. I had absolutely no idea that existed."

## Lasting relationships and impact

Katherine and Darrell said they've built lasting friendships through SHEP with fellow volunteers in their community — something Darrell said brings him back to the program year after year.

In fact, many of SHEP's 30 volunteers have participated in the program for over a decade — no small thing considering volunteers each serve about 30 hours per year.

While SHEP volunteers lean on each other, they can also depend on the expertise of Katie Farber, the program's contracted partner and field biologist. In addition to leading training and assisting in the lab, Katie, a water resources scientist and education specialist at Bolton &

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Friends of the Mississippi River engages people to protect, restore and enhance the Mississippi River and its watershed in the Twin Cities region.

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## FROM THE DIRECTOR

# Connecting with the river and each other keeps us moving forward

By Whitney Clark, Executive Director

At our annual Earth Day river cleanup in Minneapolis, I got to talk with many FMR volunteers, advocates and members. Person after person told me how grateful they are for the river and for the opportunity to spend a sunny spring morning on its banks, working with their families and neighbors to keep it healthy and clean.

I always find it heartening to reconnect outdoors with people that have common values, especially after a long Minnesota winter. But this Earth Day, it felt even more significant.

While FMR has not been greatly affected by Trump administration grant cancellations, we've watched with deep dismay as the administration has slashed environmental and science agencies' budgets, and fired many employees. This administration has paused or revoked grants funding critical environmental research and other conservation projects, and weakened or erased key environmental rules. We've seen terms such as "sustainability", "climate," and "environmental justice" scrubbed from federal websites and program language. Unbelievably, even "clean water" (per a leaked USDA memo) has been excised from use in certain federal agricultural research work.

These withering attacks on federal agencies and protections that the river and our environment depend on are one of the main reasons that American Rivers, one of our partner organizations, named the Mississippi America's Most Endangered River this year.

The great river's watershed



encompasses all or part of 31 states. America's River requires America's federal government to set standards, fund programs, conduct research and ensure its health and the health of the communities that rely on it for clean water and all the other blessings it bestows.

Voters didn't call for the dismantling of environmental protection. Polls continue to demonstrate strong, bipartisan support for protecting water quality and wildlife.

In the absence of federal leadership, FMR's work becomes even more critical. We're collaborating with partners at the state and federal levels to defeat attempts to weaken environmental protections and defend nonprofit organizations from attacks. And, importantly, we're staying focused on the long-term work we know we must do for the benefit of the river: restoring quality habitat along our river bluffs and banks, advancing clean-water crops and inspiring the next generation of environmental leaders.

Thirty-two years ago, Friends of the Mississippi River was founded to be a voice for the metro river and to advocate for actions and policies to protect and restore it.

On Earth Day, cleaning up the river banks with neighbors and friends, I was once again reminded of how important this mission remains.



## Bumble bee habitat: What we've learned from monitoring (so far)

How can we make the best possible habitat for bumble bees? That's the gist of the question FMR Pollinator Biologist Dr. Julia Leone and our Land Conservation team are trying to answer. The team recorded more than 800 bumble bees at FMR sites during last year's survey season, and they found these bees foraging on 40 different native plant species. They're gearing up for another field season now, but we shared some preliminary findings, including the most bee-loved flowers and Julia's account of finding the rusty-patched bumble bee pictured here.

[Learn more at fmr.org/bee-study-2024](https://fmr.org/bee-study-2024)

### PROGRAM SNAPSHOTS

#### Top stories from [fmr.org](https://fmr.org)

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#### Sustainable Aviation Fuel taking off

We're celebrating a Strib piece on clean-water crop fuel and a push for 1 million acres of winter camelina.

[Check out our updates at fmr.org/SAF](https://fmr.org/SAF)



#### FMR to co-host a river-inspired juried art exhibition in December

We invite artists whose work relates to the river to submit by June 1.

[Submit at fmr.org/art-2025](https://fmr.org/art-2025)



#### Meet Logan Olson, FMR's new Restoration Project Manager

Logan brings great experience in restoration ecology and passion for habitat and building community.

[Learn more at fmr.org/LOlson](https://fmr.org/LOlson)



#### How aquatic critters can help indicate stream health

Learn what macroinvertebrates SHEP found in 2024 and what their presence means for water quality.

[Learn more at fmr.org/SHEP-2024](https://fmr.org/SHEP-2024)



#### Speak up for strong riverfront rules in St. Paul

St. Paul's updated river rules draft removes bird-safe buildings and other vital riverfront protections.

[Sign the petition at fmr.org/MRCCA-STP](https://fmr.org/MRCCA-STP)

### State grants help local businesses speed clean-water crops to market

By Peter LaFontaine, Agricultural Policy Manager

FMR has a long history of advocating for clean-water crop research and development, most notably through our partnership with the Forever Green Initiative. But scientific research and development on its own isn't enough. Nascent industries in Minnesota are growing around Kernza, regenerative poultry systems, camelina, hazelnuts, elderberry and more. But the markets for these products also need to grow — in some cases, need to be created — as does the critical infrastructure to support them. To reduce the pollution that runs off farm fields and into the river, FMR is driving public investment in clean-water crop value chains — the network of people and businesses who grow, process and sell. FMR was instrumental in creating a state-funded program that provides grants so those businesses can scale up operations. So far we have secured over \$1 million dollars for these crucial investments, with more on the way. Check out three examples of those funds at work in Minnesota:



DODD DEMAS



#### Purchasing a winter camelina seed-cleaning machine on wheels — Chatfield, MN farmer Paul Novotny (\$50,000)

Winter camelina's tiny seeds need to be cleaned before processing for oil or aviation fuel. Farmer Paul Novotny worked with a manufacturer to retrofit a hemp cleaning machine. Funding for the cleaner won't just benefit Novotny. This giant machine is mobile and rentable, so more farmers will be able to plant the newly developed crop knowing they won't have to worry about this crucial step.



#### Designing and prototyping an elderberry de-stemmer — Midwest Elderberry Cooperative (\$48,800)

American elderberries are delicious and nutritious. But right now, workers have to de-stem these small fruits by hand — an intensive step and a significant barrier for growers. To scale up production, Midwest Elderberry Cooperative is designing and testing a continuous-flow de-stemmer that would reduce labor by two-thirds.



#### Operationalizing a new Kernza processing facility in Northfield — Perennial Pantry (\$50,000)

You might have snacked on Perennial Pantry's award-winning Kernza crackers or baked bread made with its flour. This growing company opened a new processing plant in Northfield in 2023, but to get it up and running, they needed to retrofit equipment and improve inventory systems. Now they're producing more foods made with Kernza perennial grain, a clean-water crop that reduces water pollution.

# Pollinator habitat now in bloom beneath a major metro solar installation

By Laura Domyancich-Lee, Senior Ecologist



*We chose shorter prairie wildflowers that pollinators love — like black-eyed Susan, butterfly milkweed and wild columbine — to seed among the solar panels.*

Beneath rows and rows of solar panels in Rosemount, FMR is creating 360 acres of pollinator-supporting plantings.

We've worked on habitat improvement at the Flint Hills Resources Pine Bend Refinery for many years, including parts of Pine Bend Bluff Natural Area. Flint Hills Resources' solar installation, turned on in 2023, is a carbon-free energy source that supplies up to one-third of the refinery's electricity needs. And the open ground beneath the panels offered a major opportunity to build new habitat.

## Hundreds of acres of new habitat

Since 22% of North American pollinators are in decline due to habitat loss and fragmentation, when there's a chance to create new or enhanced plantings, we take it.

"FMR has been an important partner in this project, making sure that habitat benefits are emphasized in line with the energy generation benefits this project provides," Flint Hills Resources' Mike Westereng said.

To make quality habitat a part of this unique project, we've been restoring the site since 2023 with a specially designed seed mix of native, short-statured, pollinator-focused species that will provide blooms throughout the growing season. The scale of this continuous planting is massive. In addition to the solar field, we're also working on over 100 acres of woodland restoration right around the solar site, making nearly 500 acres of contiguous habitat — one of our largest projects yet.

We just finished seeding the last phase of the solar installation planting in April, and woodland restoration will continue over the next few years.

## Solar panels, flowers and ... sheep

This is FMR's first foray into habitat creation under and around solar panels, and it's not been without challenges. Construction delays, Minnesota weather and the site's technical design required us to be flexible and adapt. Typically we help new seedlings get a foothold by mowing weedy plants that compete for light and water. But we can't easily mow a site filled with sensitive equipment like solar panels and wiring. Our workaround? Sheep! This spring, we'll bring in solar grazers to eat up the weeds so they don't shade the panels. Grazing will also allow smaller seedlings to reach the sun. A more cost-effective way to reduce weeds on a project like this, solar grazing also improves soil's water infiltration and nutrient density.

We're excited to see how the site changes over the next few years. Once plants are established, we'll conduct pollinator surveys to see which critters have found their way to the new blooms. We look forward to sharing our findings to support more projects that combine renewables with habitat creation.

**Plant your own pollinator habitat:**  
[fmr.org/plant-habitat](https://fmr.org/plant-habitat)



*Holcim's existing mine is outlined in yellow — as seen from Pine Bend Bluffs SNA. The expansion would be in nearby backwater.*

## Why the proposed riverbed mine is a bad idea

By Colleen O'Connor Toberman, Land Use & Planning Program Director

A proposed mine in — yes, in — the Mississippi River backwaters near Grey Cloud Island in Cottage Grove could face quite a few hurdles.

Holcim Industries has proposed to dig a 200-foot-deep mine pit in the riverbed to extract sand and gravel. Holcim's existing operation, including a large inland mine pit, covers most of Lower Grey Cloud Island. The proposed expansion site, in shallow backwaters next to the island, is about 260 acres in size. Mining a river bottom is rare; there may not be any other such project in Minnesota.

FMR, other advocates, and state and federal agencies agree: This proposal has serious legal shortcomings and could be environmentally damaging.

### Habitat loss and recreational impacts

The proposed mine would destroy hundreds of acres of backwater wetlands that provide habitat for several threatened and endangered species.

By state and federal law, such destruction should be avoided. If unavoidable, Holcim would need to mitigate by investing in wetland habitat improvements elsewhere. But agencies have questioned whether there is any mitigation option that could fully compensate for the level of habitat damage this mine would cause.

The proposed mine would also have recreational and scenic impacts. Huge berms and mining equipment, noise and the closure of the back channel would all affect boaters and visitors to Spring Lake Regional Park for 20+ years.

### State rules say no new mining

Another legal question is whether mining is allowed in this location at all. The Grey Cloud Island area is part of the Mississippi River Corridor Critical Area, a state-designated area with special protections, including an explicit ban on new mining in shoreline areas. Expansions and relocations are not exempt from this ban.

### Many checks ahead

Cottage Grove is currently reviewing comments on the draft Environmental Impact Statement (EIS) and will eventually vote on whether it meets the state's required level of thoroughness and accuracy.

However, even if the city approves the EIS, Holcim would need other agencies to approve permits — which could be challenging due to the mine's severe environmental impacts. And because Grey Cloud Island is important to Dakota people, we would also expect thorough consultation with tribal nations before permitting. The city and Holcim have done little in this regard to date.

But if, despite all this, the project moves forward, we'll let our River Guardians know when to speak up.

**Sign up as a River Guardian  
to advocate for the river at [fmr.org/RG](https://fmr.org/RG)**

### How 15 years of work on riverfront rules helps halt projects like this

This proposed mine spotlights the importance of FMR's work to secure Mississippi River Corridor Critical Area (MRCCA) rules. FMR led state advocacy efforts to reform MRCCA with stronger, more consistent protections for 72 miles of Mississippi riverfront. That work has culminated in local ordinances all along the metro river that guide riverfront development and provide checks against environmentally damaging projects.

These new laws are working, and not just in Cottage Grove. In Minneapolis, a judge recently ruled that a house could not be built right on the edge of a bluff, because of the city's MRCCA ordinance protections.



(continued from front page)

Menk, conducts independent cross-checking to ensure the integrity of SHEP's macroinvertebrate data. On average, she said, SHEP volunteers score around 98-99% accuracy.

"If you talk to any of those volunteers, they know what happened five years ago, 10 years ago, last year and how it looks different this year," Katie said. "I can see all that on paper. But they just go to a site and they're able to assess it visually and perceive things automatically because they're so familiar."

### Data to support restoration

Alexandra Jabbarpour, who leads SHEP as a program associate with FMR, said long-term monitoring data is a rarity, but the research outcomes of SHEP and similar programs are vital to help inform natural resource management policy at the watershed level.

The presence of certain macroinvertebrates, which have different reactions to pollution, provides insight into a stream's health.

"Over time, we get different snapshots of what these streams look like," Alexandra explained.

As runoff and stormwater pollution threaten Twin Cities waterways, SHEP's long-range dataset can help illuminate how urban development, agricultural practices and other decisions on land impact water quality.

"SHEP has been a valuable asset for directing and evaluating stream restoration projects," shared Matt Kocian, lake and stream manager for the Rice Creek Watershed District, which has completed several large projects over the last 15 years.

"These data were used to assess pre-project conditions, providing justification for restoration efforts," Matt explained, noting SHEP's data are also used to assess changes afterward.

SHEP samples macroinvertebrates in nine different streams each year. Katie calculates a health score based on those findings. The most recent SHEP report shows those scores are stable or improving in all but one of the streams. That's good news for the Mississippi River, since Rice Creek is an important tributary, and water quality successes in the watershed eventually flow downstream.

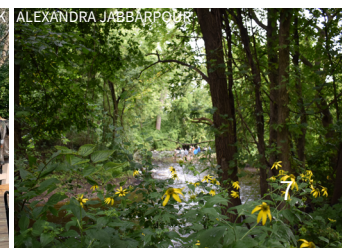
### From streams to fields

This spring, FMR launched another volunteer monitoring effort, the Pollinator Evaluation Program (PEP), which will contribute to Monarch Joint Venture's Integrated Monarch Monitoring Program.

"It's a great, established program that we can plug into and know that we're contributing to a database that's being actively used by scientists, conservation organizations and government to help improve conservation and restoration for monarchs," said Dr. Julia Leone, FMR's pollinator biologist.

PEP volunteers will collect data on monarch butterflies at three FMR restoration sites in Elk River, Inver Grove Heights and Hastings. One of those sites is the William H. Houlton Conservation Area, where FMR's natural resources management plan has guided an ongoing transformation from farm fields to prairie habitat. FMR's surveys there will also deliver insight into how pollinators are responding to seeding methods, native plant species and other management practices. Because of volunteer dedication and research, PEP, like SHEP, will help inform restoration efforts for wildlife and water quality well into the future.

**Want to volunteer? PEP is full, and SHEP is nearly full this year, but we share openings and more in our enews: [fmr.org/sign-up](https://fmr.org/sign-up).**





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## ART FOR THE RIVER

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