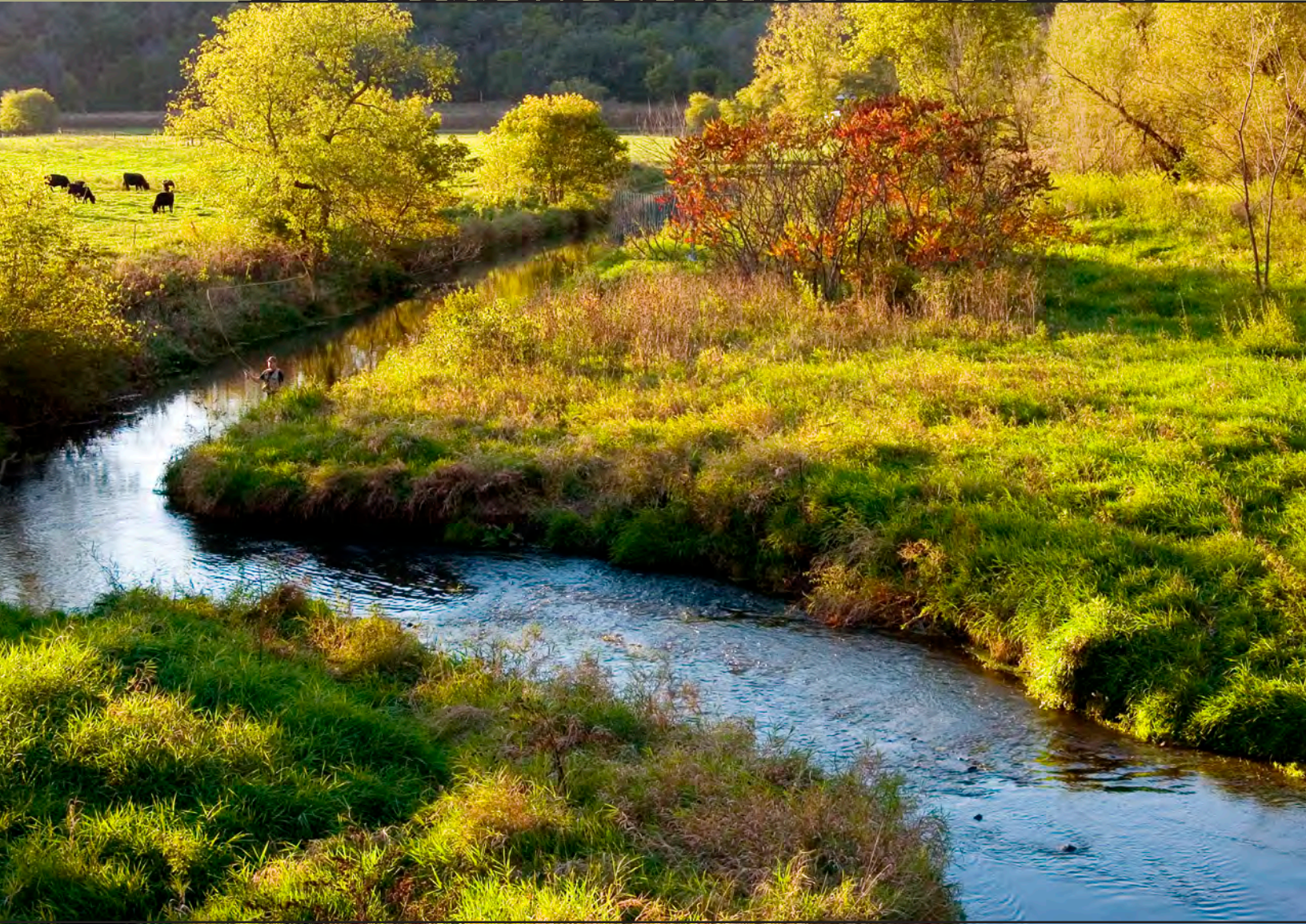




BLUE RIVER PASTURE, HIGHLAND, WISCONSIN | Photo by Brent Nicastro Photography

*The Midwest's Driftless Area is a national treasure.
Its distinctive topography, caves & springs, and hundreds
of coldwater streams make the region unique.
So, too, are the restoration challenges it presents.*

Driftless Area Restoration Effort



BIG GREEN RIVER, FENNIMORE, WISCONSIN | Photo by Brent Nicastro Photography

Building a Fish Habitat Partnership





"DRIFTLESS DAWN" | Painting by Bob White

[Acknowledgments]

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Thanks to all DARE's partners—volunteers, agencies, nonprofits and businesses—for their support of both our regional program and local projects.

To the hundreds of volunteers from Trout Unlimited chapters and other groups who have led and worked on projects on the Driftless Area streams.

To the communities, both rural and in-town, who have joined us, sweated on projects, and celebrated the accomplishments that enrich their home waters.

To the many welcoming landowners who allow and encourage anglers to enjoy the incredible water resources of the Driftless Area.

For further information contact DARE Project Manager Jeff Hastings (jhastings@tu.org) or Outreach Coordinator Duke Welter (dwelter@tu.org).

For project questions, contact Stream Restoration Specialist Paul Krahn (pkrahn@tu.org).

[Driftless Area Restoration Effort: *Looking Forward*]

Every successful project faces hurdles large and small. Once a hurdle is overcome and success follows, new hurdles emerge. The Driftless Area Restoration Effort (DARE) has followed this path, and emerging and unforeseen hurdles face it in the years ahead. As we look forward, we see major hurdles in the form of changing climatic conditions in the region as well as limited resources to develop new and needed initiatives.

CLIMATE CHANGE is confronting Driftless watersheds in the form of high-intensity, short-duration rain events that have occurred almost every year since 2007. Often, too, they have occurred soon after another similar event, causing more damage and runoff from already saturated soils. Nine inches in six hours slammed into northern Buffalo County, Wisconsin in 2016, followed by six inches in the same period two weeks later. Later the same summer, the Virgoqua area received three major events in a six-week period, the last a nine-inch, six-hour storm. In August 2018, Black Earth and its namesake creek suffered a state record 15-inch rainfall in 24 hours. And soon after, two successive rain events hit the Ontario-Elroy area with 23 inches in a week. All these events battered riverside communities and damaged rural infrastructure and older restoration work.

Over a two-year period ending in February 2019, Trout Unlimited invited a group of Driftless scientists and river restoration leaders to assess the problem of flooding across the Driftless Area, and to suggest ways to address it. They issued their report as a special publication of the Driftless Symposium in February 2019, a notable addition to the scientific body of knowledge of the region. The white paper is titled, "A Look Back at Driftless Area Science to Plan for Resiliency in an Uncertain Future" and can be found at www.tu.org/driftless-science-review.

Not only did these flooded streams devastate riverside communities and local infrastructure, but they also tested both restored and unrestored waters. The distinctions were evident: the banks of unrestored waters with a corridor of box elders were torn out and the corridors filled with massive tree jams. Older restoration work from the 1970s and 80s was badly damaged. But more recent work, done with intent to buffer streams against heavy storms, held up in excellent fashion. New restoration techniques have emphasized re-connecting streams with their flood plains, removing shallow-rooted trees and planting streamside buffers to absorb flood power and filter excess nutrients being washed toward streams.



PINE CREEK PROJECT, RUSHFORD, MINNESOTA | Photo by Habitat Solutions, LLC

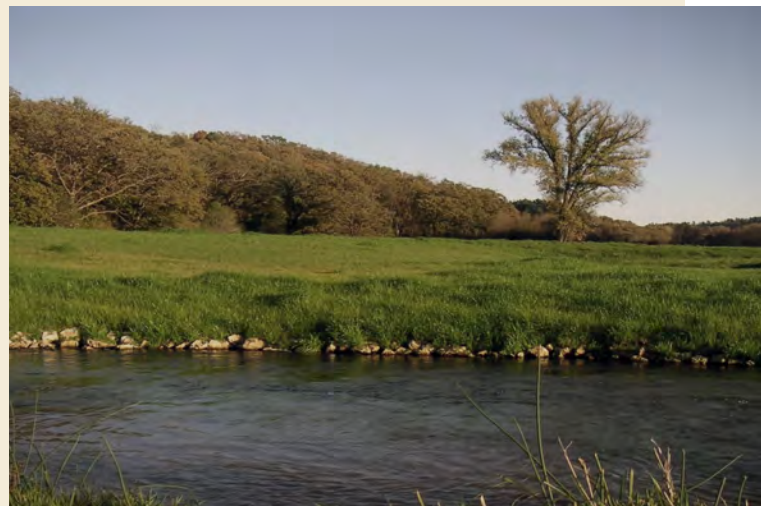
[*Looking Forward :: continued*]

Buffalo County farmer Gerald Boberg had been a bit reluctant to having a restoration project like his neighbors. He finally agreed to a project after watching intense rains beat up his pasture and croplands along Swinns Valley Creek but left his upstream neighbors' restored water undamaged. Just after the first half of his project was completed, a storm dropped nearly five inches of rain in a few hours. The restored area fared well, but the high water flooded his cornfield and eroded banks into the cropland. "I was a little reluctant before," he said, "but now I can't wait for them to come in and finish the rest of the project through my pasture."

Solid funding relationships have been built with several governmental units, and they may be models for other growth in Driftless restoration. In Minnesota, the Clean Water Land and Legacy Amendment has funded Minnesota Trout Unlimited (MNTU) and its chapters with up to

\$2 million annually for stream restoration. That entails strong planning, competitive bidding, diligent execution and annual audits to account for every penny. Now in its 10th year, the program will continue for another 15 years. MNTU is poised to keep doing extremely well-recognized, innovative and durable projects for that period. DARE plans to fund additional positions to help build project capacity in Minnesota.

Across the region, DARE has been strongly supported by the USDA's Natural Resources Conservation Service (NRCS), which has contributed almost \$22 million in several large restoration awards. "This has been a tremendous partnership," said Angela Biggs, Wisconsin State Conservationist for NRCS. Landowners and project teams then apply for stream-specific grants from those larger pools. In 2019 alone, over \$3 million was applied for by local landowners working with DARE in Iowa and Wisconsin.



Banks of Blue River, Highland, Wisconsin, before and after restoration.

Photos by Don Pluemer; Nohr TU

On the Blue River: Fitting it all Together



BLUE RIVER AUTUMN | Photo by Brent Nicastro Photography

Of all the projects done in the past 16 years across the Driftless Area, none has had more impact on a watershed than the Blue River Project carried out by the Harry & Laura Nohr Trout Unlimited (TU) chapter and its partners. The watershed lies between Highland and Boscobel in Iowa and Grant counties, flowing into the lower Wisconsin River at Blue River.

The Nohr chapter began working here in 2004. Now, habitat projects have been completed on Big Spring, a major tributary, and have continued on the Blue and its tributaries, Six Mile, Bronson, and Big Rock Creeks.

What has been notable about the project? First, the robust partnerships built by the chapter. They sought funding from the USDA's Natural Resources Conservation Service (NRCS), U.S. Fish & Wildlife Service (FWS), TU chapters from Chicago and other areas, and grants from foundations and businesses like Patagonia. Enough money was raised—over \$1.6 million so far--that landowners who provided public fishing easements had to pay nothing from their pockets for the projects.

Second, their patience. Landowners had to decide at their own pace that they wanted a project to be done. Some, experienced ecologists, jumped at the chance. Others, farmers who wanted to be sure their lands would benefit, took a “wait-and-see” attitude. It took a few floods for some of them to realize restoration would buffer their lands from future flooding. More and more, says Nohr TU Project Manager Don Pluemer, landowners express their appreciation and tell their neighbors about the benefits they've experienced.

The cumulative impacts to the watershed, and downstream, are notable as well. Soil erosion from streambanks has been significantly reduced. The projects have saved over 5,500 tons of soil each year from being washed downstream, according to Joe Schmelz, the NRCS Grant County District Conservationist. One project alone, on grazing lands owned by Chuck Zwolanec, annually saves 170 tons of soil erosion and keeps over 120 pounds of phosphorus in place rather than being washed away. Projects planned over the next few years will restore nearly two more miles of stream, and will prevent over 1,700 tons per year of soil loss, Schmelz estimates. In record-setting rains in 2018, the project held up without damage, says Nohr TU President Tim Fraley.

Why is phosphorus loss important? It's a key ingredient in algae growth from Wisconsin to the Gulf of Mexico, where it contributes to the size of the hypoxic (“Dead”) zone where fish and other creatures have no oxygen and can't survive. It costs downstream communities more to filter out from their drinking water supplies. And it degrades water quality in these streams.

“Improved water quality, healthy pasture lands, a great fishery and angler access: The Blue River Project brings it all together.”

~Tim Fraley, Nohr TU President

On top of all those positive impacts, adult trout numbers are up over 53 percent in 14 years of monitoring, according to UW-Platteville Prof. Kris Wright.

Schmelz sums up, saying, “The Blue River watershed should serve as a notable example of the cumulative impact that can be obtained from TU chapters targeting an area and opportunistically completing small projects. The farm bill dollars brought in through TU DARE efforts along with local chapter fund raising and outreach efforts are the fuel that drives the progress. Through 15 plus years of work the main branch of the Blue River and its primary tributaries have had over 20 projects completed, benefiting the cold water resource and creating a desirable tourist destination for anglers and outdoor enthusiasts.”

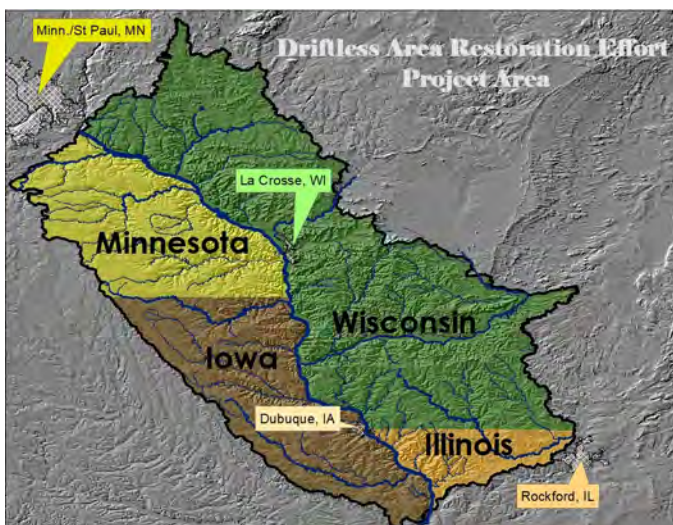
[*Looking Forward :: continued*]

Although many field offices have the experience and capacity to do projects, there are still some offices that lack the capacity to do stream restoration projects. To help out, DARE Stream Restoration Specialist Paul Krahn can work with local field offices to develop projects and help them build their capacity to do projects on their own. If we had three more of Paul to offer these services across the region, they would all keep busy! When a landowner provides public fishing access, TU chapters utilize a wide range of funding sources to fund the entire project. (All projects to which TU chapters or councils contribute are required to have legal, permanent public fishing access.) With those solid funding relationships, annual funding for Driftless restoration from all sources has risen from about \$1 million in 2004 to over \$6 million today.

The NRCS funding comes from the federal Farm Bill's conservation titles, and TU's national and regional legislative efforts have been buoyed by the success of restoration funded in

the Driftless Area. The historic Coon Creek Watershed in Wisconsin was the NRCS' first large-scale watershed project in the nation, aided by Aldo Leopold and others. Every chief of the NRCS has visited the area, as have other upper-level NRCS leaders and state conservation chiefs. We'll work to continue to build on this notable conservation history.

Could funding be expanded for more projects? Opportunities are out there, but they will take time and people to develop. For instance, many of our waters are impaired by pollution or sediment. It's possible other federal agencies such as the Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (COE) could become regular partners. And with the numerous flood-related challenges, we believe the Federal Emergency Management Agency (FEMA) and other agencies could collaborate and pool their resources on stream restoration and other conservation practices that would serve multiple functions.



THE DRIFTLESS AREA | Map by Tim Meyer

What is the Driftless Area?

This 24,000 square mile area was missed by the glaciers that ground down much of the landscape of the Upper Mississippi River Basin. The boulders and rubble left behind by glaciers are known as “glacial drift.” Early geologists noticed its absence and called it the “driftless area.” We are grateful, for what remains are the limestone and sandstone bluffs and hundreds of cold, clear spring-fed creeks.



IN THE NET: WILD BROOK TROUT | Photo by Mike Dvorak

[*Looking Forward :: continued*]

Local municipalities also face Clean Water Act requirements that require them to meet new, stricter phosphorous rules. Upgrades to treatment plants are expensive, but a more cost-effective way of reducing phosphorous releases going downstream can be water quality trading. At least three villages and cities have instead devoted funding to upstream bank stabilization and restoration, which tie up sediment and the phosphorus which attaches to the soil. Water quality trading can be more cost-effective than plant upgrades. In Sparta, Wisconsin, the city used phosphorus trading credits to fund restoration along Beaver Creek, through and above the city. "This restoration project is one of our city's proudest achievements," says former Mayor Ron Button, "We have created a wonderful asset that will benefit our citizens and visitors well into the future... Plus, we've developed a great trout fishery right here." More widespread use of phosphorus credits could be an effective way to expand restoration.

A model long used by another conservation organization, Pheasants Forever (PF), utilizes "Farm Bill Biologists" to work to contact landowners help them through the maze of paper work to access Farm Bill conservation dollars for projects on their lands. The positions are jointly supported by the USDA, state DNR and PF. Could a similar approach be developed for Driftless Stream Restoration projects?

PROJECT PLANNING has been and remains a major emphasis for DARE projects. Working with numerous partners with sometimes congruent, sometimes divergent goals, or with varying planning cycles of their own, creates challenges that take creativity and good intentions to overcome. We've had significant success in areas where all interested groups and agencies can meet and discuss a project horizon 1-5 years ahead. Those meetings can involve one to six counties. But when all parties meet regularly, they can identify and agree on target watersheds, develop solid partnerships and funding, and carry out longer projects (sometimes five or more years) than could be developed on a year-to-year planning cycle. Wisconsin DNR is hiring several Trout Habitat Project Coordinators to develop those projects, and we intend to be a strong working partner with them across the Driftless Area. DARE Outreach Coordinator Duke Welter will be working with DNR fisheries staff on longer-range planning.

Moving ahead, DARE has a goal of strengthening partnerships with watershed organizations and local schools and universities. Across the region,



WILD DRIFTLESS BROOKIE | Photo by Duke Welter

A Home-Grown Restoration Program: Buffalo County, Wisconsin

Photo by Duke Welter



Stream day crowd watches DNR crew sampling trout.

Buffalo County lies along the Mississippi River in west central Wisconsin, a rural county about equidistant from the larger cities of La Crosse and Eau Claire. It presents the crookedest roads, steepest bluffs, and most hard-used streams in the Driftless Area. The land is almost completely privately-owned, used by farmers and deer and turkey hunters.

Over past decades, little conservation attention had been paid to its beat-up trout streams. But the county's local rod and gun clubs thought it was a good idea. They reached out to Trout Unlimited's WI Clear Waters chapter and to DARE for help.

DARE helped train volunteers, plan projects, found money from NRCS and transmission line mitigation, helped the clubs and county develop an easement program, and helped organize several stream days that have now become regular attractions in the county. The TU chapter brought volunteers and seed money to the mix.

Todd Mau, retired NRCS District Conservationist and a leader in the effort, now a board member of WI CW TU, says "TUDARE has been critical to this effort. They helped us with the easement part. They showed us how to organize these projects. And they've found the big parts

for funding these projects, and that makes it easy to come up with the small parts. Clubs, TU, NRCS grants, electrical transmission line mitigation dollars, the DNR—they're all part of our picture."

"DARE helped us get these stream days going, too, when we were kind of unsure if they would be popular. But they have been. And this year I'm looking forward to taking my grandkids to the stream day so they can fish."

Now Buffalo County's home waters project is busy. Almost 9 miles of stream have been restored into productive trout streams, each with a public fishing easement.

County leaders are taking notice, too. County Board member Nettie Rosenow, whose family farms along Waumandee Creek, supports both the conservation goals of these projects and the potential they have to bring economic benefits to the area. "I'm very proud of the people in Buffalo County who have made it their mission to

"We wanted this project and fishing easement to leave this stream in better condition, and to make sure our grandchildren and their kids would always be able to fish there"

~John & Mary Stettler, Eagle Valley Creek landowners

improve the trout streams here. The Trout Days each summer highlight the efforts of the Waumandee Rod & Gun Club, Trout Unlimited, Wisconsin DNR, NRCS and the county conservation department. Kids and adults are amazed at the progress we are making, and the size of the trout!"

And there's a buzz too: more landowners want to have projects done than there are dollars to do them.

[*Looking Forward :: continued*]

existing educational alliances have been very productive and provide excellent models for future organizing. Many rural students reached by those efforts are likely to be the ones who take over their families' farms and become the next generation of stewards. Watershed groups can also help out with long-term monitoring of stream conditions and maintenance of project sites.

DARE is one of two key supporting organizations assisting a larger subregional organization in Northeast Iowa. Iowa's Coldwater Conservancy (ICC) formed in 2017 and began raising funds and awareness about public access and the value of stream projects in that 17-county area. Made up of Iowa's Trout Unlimited chapters and Hawkeye Fly Fishers Association local clubs, ICC has been strongly supported by DARE and the Iowa DNR in their efforts. Since access to streams in Iowa is legally limited, purchasing land or access rights from private landowners

has been a long-time roadblock to restoration projects in that state. ICC, with help from DARE, is making strides to overcome that hurdle.

Farmer-led watershed councils being formed across the region are leading discussions about soil conservation and clean water as well as upland erosion control and soil health. DARE believes these groups are making a difference in their watersheds and we continue to support them with technical assistance and collaborative outreach events with our partners.

"DARE's lessons have been instrumental in helping us move forward in Iowa. Critically, we've learned how important it is to build trust with landowners and conservation partners."

~Tom Murray, ICC President



ROBUST BROWN TROUT | Photo by Mike Dvorak



AUTUMN ANGLER, BLUE RIVER | Photo by Paul Smith



[*Looking Forward :: continued*]

Several Native American tribes live in the region, with significantly more familiarity with the streams than many conservation groups or any agencies. Tribes dedicate funding for stream restoration, and we should be discussing ways to develop mutually beneficial partnerships.

Throughout the course of DARE’s work, we have emphasized monitoring projects and assessing their impact. Citizen scientists can help provide data to help us better understand our streams and watersheds. Through the work of Kent Johnson, a career water monitoring specialist, a region-wide monitoring protocol has been developed and distributed to our chapters to use. His latest development, working with TU’s National staff scientist Dr. Dan Dauwalter and Psiflow Technology, Inc., is a smartphone app being piloted in 2019. It allows the user to run test strips on stream water to test various indices and transmit the data via smart phones to a lab for analysis.

Driftless Restoration has been built on the support of partners, communities and dedicated volunteers over the past 15 years. Its success has brought new challenges and new opportunities. If the past is prologue, the stage of the future is set for more restoration impact in coming years.

“For 15 years, DARE has emphasized using good science to underpin good restoration projects. It’s been a leader across the nation of encouraging and exchanging research on riparian restoration.”

~Dr. Dan Dauwalter, Ph.D. TU National Science Team



RIFFLE AROUND THE CORNER | Photo by Duke Welter



CROUCHING ANGLER, HIDDEN TROUT | Photo by Duke Welter

[Driftless Restoration: *Looking Back, Moving Forward*]

In June of 2004, a handful of about 40 conservationists, most of them volunteers from various chapters of Trout Unlimited from the upper Midwest, gathered in Galena, Illinois. Their goal: to find ways to expand watershed restoration across the unglaciated, or “Driftless” area of the Upper Mississippi River Basin. Its 600 watersheds suffered from the effects of over a century of hard use. Upland erosion had been largely stemmed with conservation practices since the 1930s, but a thick blanket of deposited sediment choked streams and wasted soil. Some experts thought trout streams were things of the past in the Driftless Area.

Southeast Minnesota and northeast Iowa streams faced the same problems as those in western and southwestern Wisconsin. Across the region, most lands are privately owned, and farming is the predominant land use. To be successful, projects would need the support of farmers and recreationist owners.

Some bright spots of restoration gave hope to the Galena participants. Since the 1970s, fisheries teams and Trout Unlimited volunteers had done some ground-breaking restoration in a few parts of the region. However, the scale of that stream work was limited to a few miles and a few projects each season, and mostly focused on the area from bank to bank of each stream.

More was needed: More funding, more agencies working together, more volunteers trained to organize and carry out projects. More landowners and communities on board. A wider perspective about watersheds and broader emphasis on habitat for many species, not just fish.

What followed was, in the opinion of many observers, remarkable. Volunteers fleshed out a program,

convinced TU’s National headquarters to get behind it and hired an experienced conservationist, Jeff Hastings, as its project manager in 2006. The governors of the four states of the Driftless Area (Wisconsin, Minnesota, Iowa and Illinois) and the U.S. Department of Agriculture all endorsed the program and pledged to work with it. The National Fish Habitat Initiative named it as the first National Fish Habitat Partnership in the nation, and it has been a model for several dozen more. Since 2004, nearly \$70 million has been raised for Driftless watershed restoration by state, federal and county governments, foundations, businesses, individuals and private conservation groups. Over 200 miles of stream restoration has taken place. More than 500

“The only progress that counts is that on the actual landscape of the back forty...”

~Aldo Leopold

“The Ecological Conscience”

miles of public access have been added, bringing the total to nearly 1,300 miles across the region. Two thousand stream miles have been reclassified as trout water, bringing the total to over 6,000 miles. Over 500 volunteers have been trained at workshops. Each year around 200 people get together for the Driftless Symposium in La Crosse, Wisconsin to listen to reports on scientific research and restoration topics. Two studies have been done by economists on the economic impact of recreational anglers coming into the region, with similar estimates of annual impact exceeding \$1 billion. Each year, it seems, more people find out about the area’s diverse recreational and aesthetic attractions as they come to visit. Public awareness of this unique region grows each year.



“DARE is an American Success Story.”

~Chris Wood, TU President and CEO

Photo by Mike Dvorak

Significant support has come from Trout Unlimited chapters situated outside the Driftless Area, from Chicago, Milwaukee, Des Moines and Minneapolis/St. Paul. Their members build stiles, clear trees for projects in all kinds of weather, maintain established projects and consistently provide needed funding.

A notable addition to restoration programs has been a strong emphasis on including, wherever possible, habitat for nongame wildlife species such as amphibians, snakes, birds as well as native plant species. Project Manager Jeff Hastings developed a handbook of NRCS-approved habitat features, now being used on projects across the country.

DARE has been recognized nationally for its accomplishments. In 2017 it was inducted into the Fresh Water Fishing Hall of Fame. And in 2014, DARE and Project Manager Jeff Hastings received the National Wild Trout Stewardship Award from the Wild Trout Symposium. The Stewardship Award honors “an outstanding fishery program that makes a strong contribution to the conservation or restoration of a coldwater fishery.” DARE was described as “one of the finest landscape-scale restoration programs in the nation.”

DARE’s regional collaborative approach has been a model for programs in northeast and central Wisconsin, where multiple TU chapters work with WI DNR and the U.S. Forest Service and other partners to make major progress on stream habitat each season. Retired WI DNR Fisheries Biologist Dave Vetrano, who pioneered many of today’s restoration techniques, observed, “Whenever you take an uncharted path you can never be sure where it will lead. It is clear now that TUDARE lit a roadway for others who might embark on a similar journey.”

TU’s President and CEO, Chris Wood, supported a Driftless Area restoration initiative when it was first proposed, and likes its effects: “Thanks to the work of the Driftless Area Restoration Effort, no one ever again should refer to this part of the world as ‘fly-over country’. With over 750 miles of restored creeks in the area that can yield a tenfold increase in wild trout populations, and having added nearly 500 miles of new public access for fishing, the Driftless Area is an American success story. It’s a place where state and federal agencies, non-profits such as TU, and local communities have worked together to recover their lands and waters, and by so doing to revitalize rural economies, improve drinking water, and build community.”