



Wallace Center
AT WINROCK INTERNATIONAL



Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

Table of Contents

Introduction.....	1
Background	1
About partners.....	1
Who this report is for	2
How to navigate this report	2
Ingredients for success	4
Adaptive management.....	4
Cultivating farmer leadership	4
Resources:	7
Outreach and education	7
Environmental & ecological monitoring.....	9
Resources	10
.....	11
Technical assistance framework and decision support	11
Resources	13
Financial resourcing.....	13
Pull strategies for adoption	15
Resources	17
Regional scaling	17
Results from Tainter Creek	19
In a nutshell	19
Background: Tainter Creek and the Kickapoo River	20
Project structure.....	22
Cost share program.....	24
Agricultural best management practice adoption	26
Modeled water quality improvements	27
Measured water quality comparisons	27
Regional framework and scaling	30
Lessons learned & What we would do differently	31

Introduction

BACKGROUND

Despite decades of efforts to improve water quality in the Gulf of Mexico, the hypoxic zone continues to threaten marine organisms and coastal communities. Agricultural production using high-disturbance tillage, inefficient fertilizer and manure application, and winter fallowing is a leading cause of the nutrient and sediment inputs driving hypoxia in the Gulf.

This report compiles lessons learned from a farmer-focused program designed to concentrate financial resources, technical assistance, water quality monitoring, and decision support tools in a specific watershed to improve water quality. This project, which supported farmers in Tainter Creek, Wisconsin from 2019-2023, was by many metrics a clear success: in just three years, farmers transitioned almost 1,000 highly sensitive acres to regenerative practices, in many cases converting highly erodible cropland to perennial pasture. The project far exceeded its goals to reduce phosphorus loss and erosion in the watershed by 5% from baseline. This report compiles the implementing partners' recommendations on how similar watershed-scale programs might be structured.

ABOUT PARTNERS

This report was created by the [Pasture Project](#) at the Wallace Center. The Pasture Project led this project after almost a decade of previous partnership with grazing partners in southwest Wisconsin. The Pasture Project works to advance regenerative grazing and grass-fed value-added food chains in the Upper Midwest as a scalable, market-driven solution for building healthy soil, viable farms, and resilient communities. This includes working with farmers, land managers, public agencies, and farm member-based organizations to build resources, provide technical assistance, and remove barriers for expanding use of regenerative practices, grass-fed/finished value-added food chains and end markets that yield win-win outcomes for farmers, communities, and the environment. The Pasture Project is part of the Wallace Center at Winrock International.

In Tainter Creek, [Valley Stewardship Network](#) worked with the [Tainter Creek Farmer-Led Watershed Council](#) to offer technical assistance, financial assistance, and water quality monitoring. Valley Stewardship Network's (VSN's) mission is to protect our land and waters through research, education, and supporting community empowerment. VSN is a resource for our communities by facilitating collaboration between and supporting stakeholders in our regional watersheds, including landowners, farmers, townspeople, businesses, conservation organizations, municipalities, and our partners. VSN promotes conservation by educating community members to evaluate ecological conditions and encourages voluntary adoption of best-management practices. VSN maintains a diplomatic, cooperative approach focused on positive, solution-oriented activities.

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

The Tainter Creek Farmer-Led Watershed Council currently consists of approximately 30 members in the HUC-12 watershed of Tainter Creek. Current Tainter Creek Farmer-Led Watershed Council members represent over 4,000 acres (or 12.5%) of land in the Tainter Creek watershed. Individual landowners own anywhere from 40-1,000 acres. The typical landowner is a second or third generation farmer who is part of the group because they are interested in the health, welfare, and future of the watershed and the people and wildlife that live within it. They are interested in adopting changes in their farming practices that will lead to improvements in water and land quality.

This program was funded by a Farmer to Farmer Cooperative Agreement from the US Environmental Protection Agency Gulf of Mexico Division. The Farmer to Farmer program aims to improve water quality, habitat, and resilience and environmental education through the demonstration of innovative practices on working lands.

WHO THIS REPORT IS FOR

This report is written for those implementing or advocating for place-based agricultural conservation. Agricultural conservation or regenerative agriculture program managers, water quality managers, resource conservationists, soil and water district staff, or farmer groups or watershed councils might all find relevant information about how to design and implement programs for water quality improvement or other resource concerns.

HOW TO NAVIGATE THIS REPORT

This report is structured in two parts: the following section covers **Ingredients for Success** that project partners in Tainter Creek found to be facilitative. This section includes a compilation of best practices, concrete examples from Tainter Creek, and in some sections, key resources that partners generated or found to be helpful.

The final section covers **Results from Tainter Creek**. This section dives into transparent detail about the project's successes, failures, and structures. It is designed to be a deeper dive into what might be possible for a given grant size in a given geography.

Part I: Ingredients for Success



Flyfishing in Tainter Creek.
Credit: Valley Stewardship
Network

Ingredients for success

This section compiles best practices that program implementers found helpful in the Tainter Creek project and in other place-based projects focused on addressing a resource concern through agriculture. The intent is not to say that all ingredients are required for a given context, or that this is an exhaustive list of project components that might help your project be a success, but rather to present a list of concepts for program implementers to consider. Additionally, in the Tainter Creek example, not all ingredients were initially in place or funded directly by EPA—some components were learned and adopted midway by trial and error. This leads to the first ingredient:

ADAPTIVE MANAGEMENT

- **Stay firm on end goal, flex on intermediate goals.** Define your ultimate goal or outcome for your work early. As your project progresses, you may learn that your plan for getting there needs to change. Do not be afraid to change your project outputs in service of meeting your project outcomes.
 - **Tainter Creek example:** This project closely coincided with the coronavirus pandemic. As such, the project pivoted towards fewer events, differently structured events, and deeper relationship development and technical assistance with fewer farmers than originally planned. The result was more transformative changes for the fewer number of farms engaged. Ultimately, the project exceeded its water quality goals despite not reaching intermediate goals for farmer engagement.
- **Include regular pause, reflect, and pivot points.** Build in regular chances for your team to reflect on what is working well and what is not.
 - **Tainter Creek example:** Project meetings focused in part on troubleshooting bottlenecks and challenges. The project team met annually for a reflect and pivot conversation focused on how to change the workplan for the following year based on project metrics and lessons learned.

CULTIVATING FARMER LEADERSHIP

- **Cultivate trusted relationships and collaborative program development.** Farmers and allied organizations should, wherever possible, build projects together on a foundation of trust and transparency. Bring farmer leaders into your project development process from the beginning and invite their leadership to inform how the budget is created.
- **Cultivate a community of farmer leaders.** Are farmers in your geography working together, sharing their lessons learned, and supporting each other to be leaders? In the authors' experiences, this is a key ingredient for effective place-based agriculture projects. If it is not already present, strongly consider focusing resources in developing community and farmer

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

leadership among farmers in your area. When this ingredient is in place, a core group of farmers is likely to become your project's strongest advocates, spokespeople, and sounding boards.

- **Resource farmer leadership.** Ideally, the community of farmers above is resourced to work together. Several states have begun funding watershed councils or farmer networks—if your state has this, this is an excellent resource to support the farmers you serve. Additionally, many farmer networks express that it can be extraordinarily helpful to have backbone support for a network. Farmers are busy people. Meeting scheduling, promotion, and facilitation support from a person based in a paid role in a partner organization can propel farmer networks to their full potential.
 - **Tainter Creek example:** The Tainter Creek Farmer-Led Watershed Council formed in 2016 with about 5 founding members. It receives funding annually from the Wisconsin Department of Agriculture, Trade and Consumer Protection (most recently \$22,500 for 2024). It receives facilitation, promotion, fiscal management, and other backbone support from Valley Stewardship Network, Vernon County Land and Water Conservation Department, and Hill Country Watershed Alliance.



A Tainter Creek field day. Credit:
Valley Stewardship Network

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

- **Identify a focal resource concern(s).** A clear group focus on one or more resource concerns can help farmers in your watershed stay focused and create compelling arguments for more funding. This can also help farmers and the organizations who support them determine what data or information farmers need to address their identified resource concerns.
 - **Tainter Creek example:** The Tainter Creek Farmer-Led Watershed Council drafted the following goals together: “To gain a better understanding of the baseline surface and subsurface water quality in the Tainter Creek watershed and find ways to actively improve it; to get a better understanding of the public perception of farmers, and to find ways to actively improve those perceptions through outreach and education; and to find ways to reduce the effects of floods.”
- **Use peer-to-peer learning.** When communities of farmer leaders work together in a given geography, their influence accelerates. Just as peer pressure is often cited as a barrier for farmers adopting new conservation practices, peer pressure can also be a force for positive change. Support and encourage the farmer leaders in your program to consider ways they can signal and promote the conservation work they implement to the broader farming community.
 - **Tainter Creek example:** The Tainter Creek Farmer-Led Watershed Council designed signs given to their members who use certain practices. The signs are now a bit of a status



Tainter Creek
Farmer-Led
Watershed
Council signage.
Credit: Valley
Stewardship
Network

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

symbol among farmers in the area—more than one producer has asked what they need to do to get one for their own farm!

Resources:

[Farmer Network Design Manual: A Guide for Practitioners, Advisors and Research Partners](#)

[Wisconsin Department of Agriculture, Trade and Consumer Protection Watershed Council Grant Program](#)

[Producer-Led Group Roadmap: Finding Success in Farmer-Led Watershed Organizations](#)

OUTREACH AND EDUCATION

- **Create events driven by farmer needs.** It may be obvious, but outreach and education must be responsive to the needs of farmers in your geography. If possible, directly survey your farmers about what topics they need assistance with. One way to do this is to include a question about future events on an exit survey for events you host.
- **Create events driven by program goals.** In addition to farmer needs, events should be designed to help your program goals. Focus on events that address your resource concern (e.g. water quality) and help each speaker draw connections back to your project. Use events as a recruitment tactic.
- **Use a variety of event types.** Different farmers will be at different stages of learning on any given practice. Are you meeting a diversity of needs with your events and programming? Additionally, you may need to consider whether the technical assistance providers in your area need further training or events. Finally, adapt how you think about events as the project continues and the context around you changes.
 - **Tainter Creek example:** Project events intentionally tried to capture skeptical audiences with certain events and advanced practitioners with other events. Events ranged from short evening pasture walks to longer workshops to multi-part events designed to pair one-on-one technical assistance with group training. Previous to this project, the Pasture Project has offered technical service provider trainings in the area to build the base of trusted grazing expertise. Due to the pandemic, events needed to change significantly! Some events were pivoted to deeper technical service visits with 3-5 farmers on day one, followed by a report-back to a broader audience on day two focused on common themes from the previous day.
- **Bring in a mix of local and “celebrity” expertise.** Different technical assistance providers meet different needs. Often, a well-known speaker from outside your region can draw in large



A field day with Dr. Allen Williams
Credit: Wallace Center

crowds and build excitement. Trusted, locally-experienced technical assistance providers are also necessary—they often know the local context to provide more specific recommendations.

- **Leverage local press coverage.** Consider if there are ways to deepen relationships with your local print and radio outlets. Recurring features can raise awareness and plant seeds for audiences you aren't reaching with your direct outreach.
 - **Tainter Creek example:** A local reporter is deeply invested in agricultural conservation in Tainter Creek. Tainter Creek Farmer-Led Watershed Council invites her to all events, and in turn, she reports on successes, project progress, and upcoming events almost monthly.
- **Raise profile of farmer leaders.** Consider if case studies would be valuable to farmers, and what information they need from those case studies. When receiving requests for interviews or information about the project, support a farmer to be a spokesperson whenever possible. Providing them with talking points can help make sure the coverage includes the information your project is trying to communicate.
- **Respect farmer leaders' time.** Be mindful of the volunteer time many farmer leaders spend off the farm at events, in interviews and for farmer-to-farmer mentoring. Find ways to help compensate farmers for that leadership time with honoraria, grant funds for their on-farm demonstration, etc.



ENVIRONMENTAL & ECOLOGICAL MONITORING

- **Lean on baseline historical data (or create it now).** Many direct monitoring projects need to consider baselines before trying to collect data about how your project is influencing a resource concern. If your project’s resource concern is water quality, work to gather information about baseline water quality conditions in your geography. If you do not have this data, confirm no one else has collected it prior, e.g. through EPA’s Water Quality Portal or a state database like Wisconsin’s Surface Water Integrated Monitoring System (SWIMS) Database. If baseline data is still needed, it can be a good use of funds to collect baseline information now. Often, environmental monitoring projects take years to see results.
- **Leverage existing monitoring programs.** Does your state have a volunteer water quality monitoring program? Many states in the Midwest have resources or programming around environmental monitoring. These resources can save you valuable time determining the appropriate supplies and methods that work in your geography.
 - **Tainter Creek example:** Valley Stewardship Network participates in Wisconsin’s Water Action Volunteer (WAV) program, which provides some supplies, training, and protocols for volunteer water quality monitors. Valley Stewardship Network staff and WAV volunteers collect water quality data directed by the goals of the Tainter Creek Farmer-Led Watershed Council.

A biologist demonstrates trout monitoring in Tainter Creek at a Stream Day event. Credit: Wallace Center

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

- **Encourage farmer leadership and participation in monitoring.** To the extent possible, invite farmers into the monitoring process and place resources where they want more information. Maintain transparency around monitoring and privacy. For example, for surface water quality monitoring, it can be helpful to monitor stream sites where several upstream farmers are implementing conservation activities, but if monitoring sites are downstream of only a couple of farmers, those farmers should be supported to understand monitoring activities and consent to how the information is shared.
 - **Tainter Creek example:** The Tainter Creek Farmer-Led Watershed Council has several members who volunteer to collect water quality information. Water quality information is regularly shared back at Council meetings. Farmers drive where further monitoring resources go; due to concerns from the Council about groundwater contamination, the Council pursued funding for well sampling and analysis, and samples were analyzed as an anonymous group.
- **Combine modeling with monitoring.** Because monitoring can often take many years to show results, consider evaluating program impact with modeling. Many models now exist to help evaluate agricultural programs on many aspects: erosion, nutrient losses, carbon emissions, and more.
 - **Tainter Creek example:** This project worked to co-develop a model, GrazeScape, based on SnapPlus, which is Wisconsin's state phosphorus loss model. Partners worked with University of Wisconsin scientists to develop grazing and cropping scenarios relevant to Tainter Creek producers and develop an easy-to-use interface that allowed project staff to use GrazeScape for both project technical assistance and evaluation of final practice adoption.
- **Lean on academic or agency advisory support.** Consider partnering with an academic institution, government agency, or other entity to help you navigate historical databases, analytical methodologies, modeling options, and interpretation of results. These partners can both take pressure off of program staff to become experts and lend credibility to results.

Resources

[EPA Water Quality Portal](#)

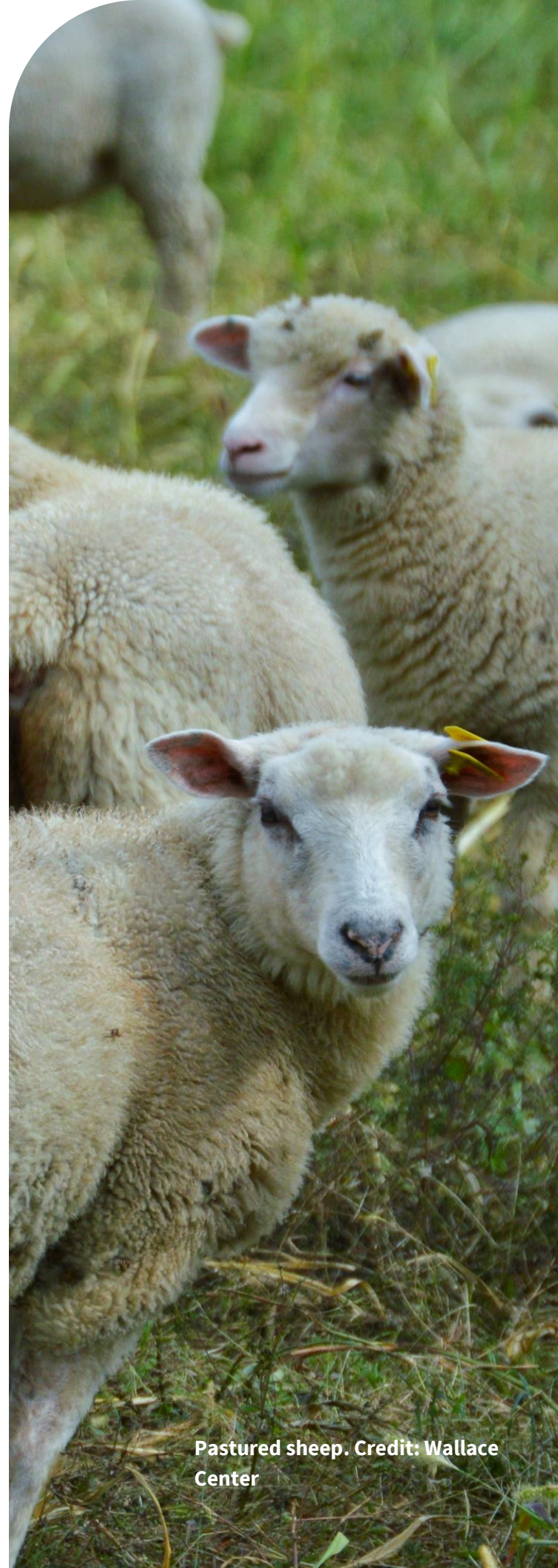
[American Farmland Trust Outcomes Estimation Tools Guide](#)

[Wisconsin Water Action Volunteers](#)

[Illinois RiverWatch](#)

TECHNICAL ASSISTANCE FRAMEWORK AND DECISION SUPPORT

- **Have a framework for technical assistance.** Technical assistance for different cropping systems and practices needs to look different and bring different resources to bear. Prior to starting your project, spend time reflecting on what technical assistance approaches have worked and what approaches have not for the practices and farmer audiences you are supporting. It can be helpful to consider what touchpoints each farmer will have with your program. Consider having multiple points of entry to your program, and know that not all farmers who access your program will adopt practices. Consider how many people you need to reach to ultimately influence adoption among a smaller subset. Then, adapt as needed as you figure out what works well.
 - **Tainter Creek example:** Project partners worked together to develop a technical assistance approach prior to rolling out information about project recruitment. In Tainter Creek, the technical assistance framework included a variety of events designed for recruitment and ongoing learning, an initial whole farm assessment visit, mapping support to map out current practices and potential fields with new practices, a grazing planning visit to discuss specific changes in management to specific fields, and development of a grazing plan (with several iterations typically needed to revise maps, confirm final plans, and meet farmer needs).



Pastured sheep. Credit: Wallace Center

- **Map the technical assistance and cost share ecosystem and direct traffic.** In all likelihood, your project will not be the only technical assistance or funding available in a given geography. In our experience, taking time to understand other available resources and equipping technical assistance providers to help farmers navigate the various resources is critical. This can reduce farmer confusion and ideally help farmers access complementary resources to what you are offering.
- **Hire trusted technical assistance providers with different skillsets/approaches.** In the authors' experience, one technical service provider cannot effectively work with every type of producer in a given watershed or geography. Different styles or perspectives between farmers and technical service providers can result in conflicts or farmers exiting the process. Some amount of farmer attrition is always to be expected, but ideally, multiple technical service providers are available through your project. If one technical service provider is having trouble reaching a given farmer, another can be brought in to try a different approach.
 - **Tainter Creek example:** Two primary technical assistance providers served Tainter Creek farmers on grazing. One person was more transformational in his approach and often brought together systems concepts like farm viability and ecological function together in a way that inspired farmers. Another technical assistance provider was deeply rooted in practicality and finding the next best step for that producer. Sometimes, certain farmers did not respond well to one of those approaches, and the two technical service providers had close communication to trade out when necessary.
- **Incorporate field or sub-field level context on key resource concerns.** A gold standard in projects focused on agricultural practice adoption is having site-specific data and decision support. Ideally, if it is available, using information about specific fields, and even parts of fields, can focus project resources where they are most needed and help farmers draw connections between their resource concern and specific areas on their farm.
 - **Tainter Creek example:** In this project, the GrazeScape interface was developed to estimate nutrient and erosion implications of cropping and grazing management decisions. GrazeScape allows users (in this project, primarily a technical service provider working with a farmer) to draw fields, develop scenarios for those fields, and model yield, nutrient loss, erosion, and infiltration results from those scenarios. GrazeScape simplifies inputs so that the process of entering fields and scenarios can take only a few minutes, and results are available for any given field at a 9x9 meter resolution. This allows farmers to consider changing practices or converting only parts of fields.
- **Use iterative planning and follow-through.** The above real-time decision support enables iteration and ability to explore options informed by customized information. This can be very helpful for helping farmers see many options and feel empowered to choose the best ones for



Grazing cattle in Tainter Creek watershed. Credit: Valley Stewardship Network

their farm. Often, several touchpoints might be needed at this point to finalize plans for adoption or transition. We also found that continued follow up, even after the farmer made choices, was critical to the changes actually being sustained—farmers ran into new questions once they began new practices for the first time. Finally, lean on the community of farmer leaders you have cultivated to provide peer support to each other—research indicates that this is a key determinant in the longevity of new practices.

Resources

[Whole Farm Assessment template](#)

FINANCIAL RESOURCING

- **Determine need.** If you are able to offer financial resources for new practice adoption, you are likely addressing a major need for farmers in your geography. But it can be helpful to dig into the details about how different funding sources are serving farms in your area. Which USDA programs are farmers taking advantage of, and which programs or practices have backlogs? Where do current funding opportunities fall short of meeting farmers where they want to make changes?
 - **Tainter Creek example:** As part of the early phase of the project, partners met with USDA Natural Resources Conservation Service (NRCS) staff to map their funding across the Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), and other resources. NRCS staff quickly identified areas where they had significant backlog (upwards of two years) in approvals for certain grazing infrastructure. They also

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

identified places where NRCS standards were frustrating to farmers on the cutting edge of regenerative, rotational grazing (like grazing infrastructure and seed mixes that works for grazing cover crops). The project was able to build a cost share program that filled these gaps.

- **Tie financial resources to resource concerns.** Focus your available resources on your ultimate desired impact. If that is water quality, is there a way to tie financial resources to nutrient loss reduction? Consider pay-for-performance models of financial assistance.
 - **Tainter Creek example:** This project used a hybrid cost share program that paid the cost of practice adoption up to a maximum amount based on water quality benefit. For example, the project set a goal of reducing phosphorus loss by 1,700 pounds. We had a total cost share pool of \$200,000. Thus, farmers could be paid up to \$118 per pound of phosphorus reduced through our cost share program (\$200,000 divided by 1,700 pounds), but the final payment was based on their expenses.
- **Tie technical assistance to cost share.** For quality and longevity of practices, it can be helpful to require a certain amount of technical assistance in order to access project funds, especially for complicated projects like converting from a cropping system to a grazing system.
 - **Tainter Creek example:** In order to be eligible for cost share, farmers had to receive a whole farm assessment, work with Valley Stewardship Network to fine tune custom maps of their farms with their input, and work with a technical service provider to finalize plans via a grazing plan. This requirement also ensured that farmers who were a better fit for other funding could receive technical assistance and support getting connected with other resources.
- **Work with renters and resource-limited farmers.** A common gap of USDA financial assistance programs is inaccessibility for renters and for those who cannot afford to front expenses in reimbursement-based programs. Consider how your project's financial resources can be structured to support these audiences. Ask why farmers are not able to access USDA programs.
 - **Tainter Creek example:** This project's cost share approach had a pathway for renters to access funding by working with their landlord to add express permission of new practices in their lease. The cost share program allowed Valley Stewardship Network to buy materials or pay vendors directly with project funds if participants were unable to float costs until reimbursement.
- **Develop clear program materials, deadlines, and verification processes.** Clear rules and guidance are a necessity in cost share programs to avoid misunderstandings and stay accountable to project goals. However, it is also helpful to have the flexibility to stay adaptable based on how your program is working. This tension between clear rules and

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

adaptiveness can be tricky to navigate, but building in opportunities to change aspects of your program annually or so can be the best of both worlds. Additionally, consider having regular deadlines of some sort; rolling application acceptance meets more people where they are, but deadlines can both encourage more attention to your program and make program planning and adaptation much easier.

- **Tainter Creek example:** The cost share program had a rolling application period. We adapted the eligible materials and practices annually. We also added a “small grants” pathway in the second year to support farms with projects <\$1,000 with streamlined requirements. By the third year of the program, it became clear that a lack of annual deadlines had created a large group of farmers lingering in the middle of the process and in danger of missing out on funding. We set several interim deadlines to help farmers partway through the technical assistance process to plan ahead.

PULL STRATEGIES FOR ADOPTION

- **Develop markets.** Regardless of cropping or grazing system, farmers need to sell their products. Many agencies and organizations primarily focus on practice adoption without providing farmers support with marketing and selling their products. In order to scale conservation practices, the resulting products need to have profitable markets. If you don't have this expertise in-house, consider partnering with others who can help ensure that farmers in your programs have solid markets.
- **Tainter Creek example:** Valley Stewardship Network coordinates the Bird Friendly Farming program, which develops protocols for farming that protects grassland birds. They are working towards marketing that helps farmers receive price premiums for protecting bird habitat.

Grasshopper sparrow in a pasture. Credit: Wallace Center



- **Lean into value chain coordination.**

Sometimes, even if demand exists for an agricultural product, there are still barriers for accessing markets. In meat, for example, cow-calf producers with cattle genetics that perform well on grass may have trouble finding finishers who want to finish those animals on grass. Grass finishers may have trouble scheduling processing dates or finding right-sized distributors that will work with the quantities of meat they are able to produce. Value chain coordination is the process of working to link parts of a food value chain more effectively together, like helping match calf producers with finishers in another county, or helping farmers aggregate enough product to be attractive to a larger outlet.

- **Tainter Creek example:** Wisconsin Grass-Fed Beef Cooperative is a longstanding group of livestock graziers who work together to sell their products and attract more resources to solving meat supply chain issues in Southwest Wisconsin (including Tainter Creek). The Cooperative has attracted investment to build new processing facilities and aggregates enough volume from beef producers across the state to be able to sell to larger outlets like regional grocery stores. Though not officially funded through the Tainter Creek project, we benefitted tremendously from their work.

- **Consider payments for ecosystem services.**

As carbon markets and incentives expand and water quality incentives are possible in more states, consider how your project helps farmers navigate these resources and how they may accelerate your program. These programs are often too numerous and confusing for all but the most resourced farmers to take advantage of fully.

Resources

[Bird Friendly Farming, a Valley Stewardship Network program](#)

[American Farmland Trust Agriculture Carbon Markets Guidebook](#)

REGIONAL SCALING

- **Center regional context while maximizing lessons learned from other geographies.** Projects focused at a smaller geographic scale often know best how to engage the audiences in their geography. At the same time, numerous similar projects with potentially relevant learnings are being implemented all over the country. Invest in your teams' thought leadership and participation in working groups, communities of practice, and conferences so that they may both learn from peers and disseminate what worked in your project.
- **Facilitate academic, federal, and local relationships and goals.** Navigating constraints and perspectives between academic perspectives, local USDA offices, farmers, and other stakeholders can be challenging, but when these relationships work towards the same goal, projects can have outsized impact. Is your organization able to be a translator between these audiences? Are there central goals that can be agreed upon across all relevant stakeholders in your geography?
- **Design for replication.** Capture the “how” alongside the “what” so that your approach can be replicated, improved, and – ideally – scaled.

Part II: Results from Tainter Creek



Ironweed and a sulphur
butterfly in a pasture. Credit:
Wallace Center

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

Results from Tainter Creek

IN A NUTSHELL

Project Goal: This project worked with farmers managing land in Tainter Creek watershed to directly reduce nutrients and sediment through expanded adoption of regenerative grazing practices such as grazing cover crops, improving existing grazing practices from continuous to adaptive grazing, and converting cropland to pasture between early 2020 and early 2023.

Project Support: Valley Stewardship Network, Tainter Creek Farmer-Led Watershed Council, Pasture Project, and other partners provided education and training on regenerative grazing practices, free farm-level assessment/planning for regenerative grazing systems, cost-share support for target implementation, and on-going technical assistance.

Assessing Our Impacts: As part of this project, Pasture Project worked with scientists at the University of Wisconsin to develop GrazeScape, a web-based decision support tool that can estimate phosphorus (P) loss and soil erosion from a variety of grazing and cropping systems scenarios. This SnapPlus-based tool was used to estimate water quality outcomes from this project. In addition, Valley Stewardship Network measured water quality in Tainter Creek and nearby watersheds to understand water quality trends.

BY THE NUMBERS



14 grazing plans

\$173,000 in cost share



1,640 acres in grazing plans

986 acres with new practices

BY THE NUMBERS (continued)



2,445 lbs estimated
P loss reduction

(144% of project goal)



1,684 tons estimated
erosion reduction

(179% of project goal)

Phosphorus measurements taken during this project indicate that water quality may be improving in Tainter Creek compared to neighboring Halls Branch and Knapp Creek-West Fork watersheds.



BACKGROUND: TAITER CREEK AND THE KICKAPOO RIVER

The Kickapoo River watershed of southwest Wisconsin is a mix of pastures (38%), row crops (12%), and extensive forests (47%), all spotted with its iconic dairies and other diversified farms. Like many areas, the region is experiencing a significant loss of livestock farms. From 1997-2012, the counties covered by the Kickapoo River watershed lost around 18% of their pastureland. During the same period, the same counties went from 2,006 to 1,124 dairy farms and 3,642 to 1,637 beef farms ([USDA NASS](#)). Many of those producers have since become corn and soybean farmers, only a generation separated from having livestock on their farms. Losing these investments is a burden on the economic vibrancy of this community and threatens to permanently lose the technical knowledge of small-scale dairy and beef production. In these counties, farm operators make up around a tenth of the workforce ([USDA NASS, WI Department of Workforce Development](#)) but just over 50% of operators reported a net loss in the 2012 Census of Agriculture.

Scaling Up Farmer-Driven Water Quality
A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

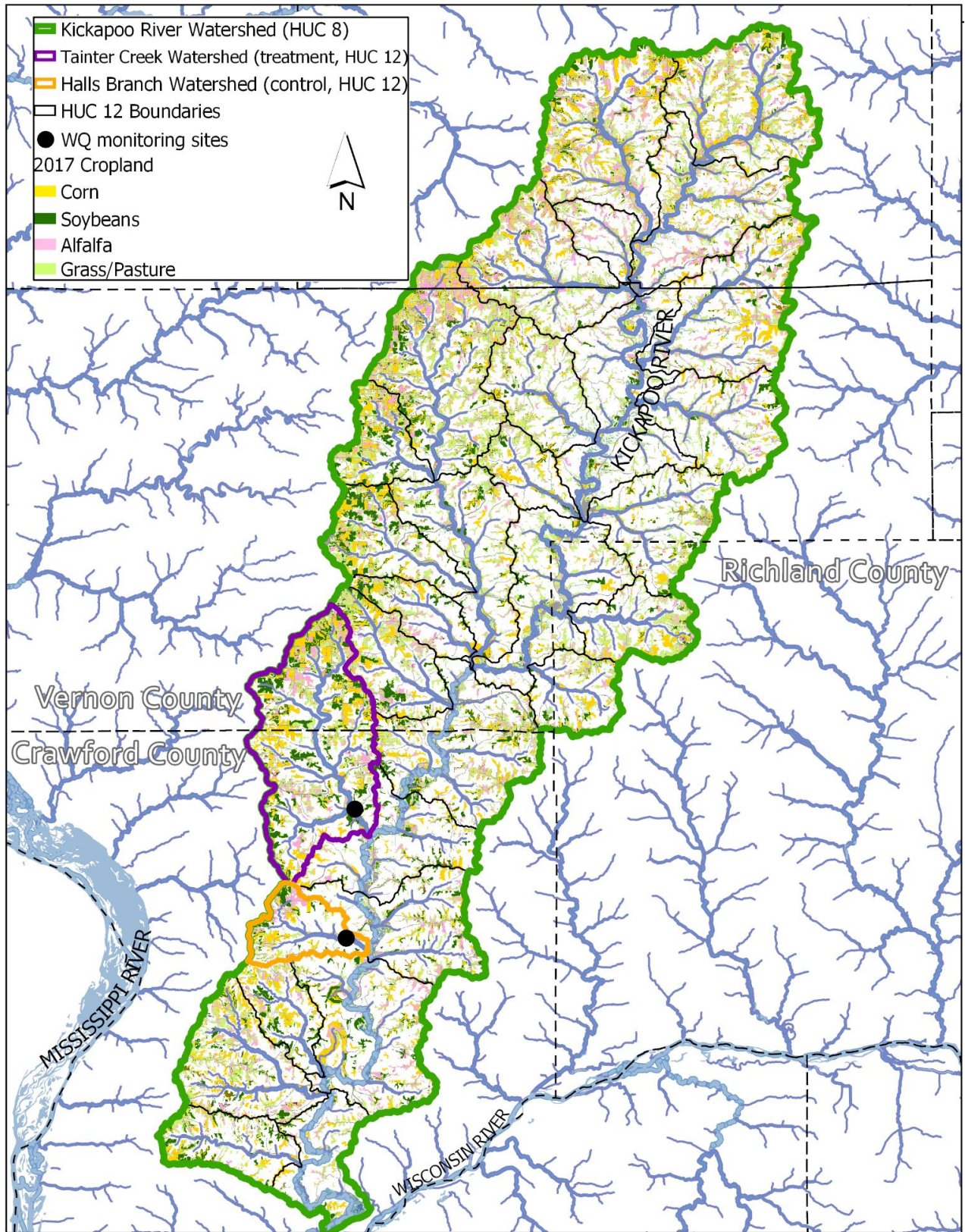


Figure 1. Map of the Kickapoo River and its subwatersheds

The loss of pastures in the Kickapoo River Watershed has increased the environmental vulnerability of an already vulnerable region. Due to its rolling hills, almost 45% of the watershed's 30 subwatersheds are in the top 20th percentile of all HUC12 watersheds in Wisconsin for water quality sensitivity to agricultural best management practices (WBI, 2005). One of these is Tainter Creek watershed, a 33,600-acre basin with significant farmer interest in conservation grazing BMPs. After years of collaboration between Wallace Center's Pasture Project and farmers and organizations in the Kickapoo, Wallace Center, Valley Stewardship Network, and Tainter Creek Farmer-Led Watershed Council designed a new program to focus significant resources in a single watershed, Tainter Creek. This program's goal was to move the needle on water quality via regenerative or conservation grazing practices.

PROJECT STRUCTURE

The project designed a multi-step technical assistance process based off of Pasture Project's research into supporting farmer behavior change. GrazeScape, a decision support tool, was designed in partnership with University of Wisconsin to support each step of the technical assistance and cost share framework, which begins after a farm expresses interest in adopting or improving managed grazing. Through this project, the Tainter Creek Farmer-Led Watershed Council and Valley Stewardship Network were able to pilot test and guide development of GrazeScape so that this tool is maximally helpful to technical assistance providers and farmers. The steps below outline the process used in this project, with call-outs to how GrazeScape can support/improve this process.

- **Overarching events, workshops, and webinars calendar:** This project funded dozens of events designed to support recruitment and better understanding of regenerative/conservation grazing. These events were driven by the Tainter Creek Farmer-Led Watershed Council and included a variety of topics, formats, and speakers.
- **Step 1 - Initial Map Suite Creation:** VSN makes a suite of map layers for each farm showing slope, soil types, hydrology, and forage suitability classifications.
 - GrazeScape was developed during this project, so was not available for all farmers at this stage, but GrazeScape incorporates these layers for easily creating and saving a map, without the need for desktop GIS software. The map suite assists technical service providers when they conduct a preliminary whole farm assessment with the interested farm.
- **Step 2 - Whole Farm Assessment:** The technical service provider visits the farmer and works through a whole farm assessment template (developed by the project) about current cropping and livestock systems and resource concerns/constraints. Then, the technical service provider often begins exploring scenarios with the producer (sometimes across multiple visits), such as potential impacts to the operation if certain fields are cover cropped and grazed, or converted into permanent pasture.
 - GrazeScape is designed to make it quick and easy to draw field boundaries and tag field characteristics of the current/baseline scenario. GrazeScape also allows the technical service provider to explore scenarios of new practices, including impacts on

Scaling Up Farmer-Driven Water Quality

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yield, erosion, nutrient loss, pollinators, and rain runoff/infiltration. Crucially, erosion and nutrient loss outputs are visualized at a sub-field scale, allowing users to see where perennial cover might provide the largest impact.

- **Step 3 – Grazing Planning:** Once the producer has decided on implementing grazing practices in certain fields, the grazing planner helps confirm stocking rates, forage suitability classes, and fencing and water infrastructure design.
 - GrazeScope provides context layers like soil characteristics and allows the farmer and technical service provider to map infrastructure into a specific grazing plan which can help with efforts to secure financing and implement practices.
- **Step 4 – Funding and Quantifying Impacts of Implementation:** Finally, as part of this project, producers have the option to complete a cost share application to receive implementation funding for approved practices.
 - GrazeScope makes it easy to share maps of the grazing planner-approved design and lengths/locations of each fence, water line, and trough that will help farmers get the necessary quotes for their cost share applications. GrazeScope even estimates the costs of the infrastructure system based on USDA estimates of per unit (foot, gallon, or acre) material and installation pricing to help farmers know if they are getting a reasonable deal. GrazeScope also estimates environmental impact of the planned project, making it easy to understand the return on investment, as well as aggregate project results to share with funders and community members in relation to measured water quality data.

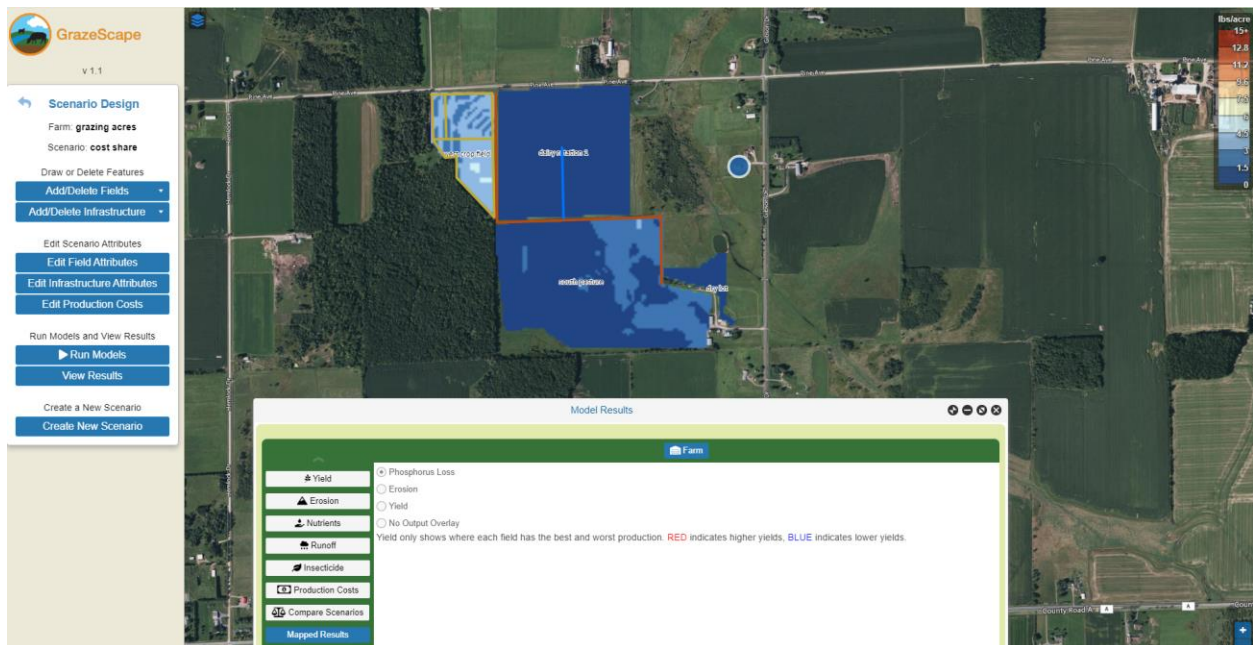


Figure 2. GrazeScope interface showing estimated phosphorus loss for a set of fields

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COST SHARE PROGRAM

From the beginning, this project set out to try to fill existing gaps in available funding to farmers for grazing practices. During the proposal process and early stage of the project, partners met with USDA NRCS county offices, Crawford and Vernon County governments, and other organizations supporting regenerative or conservation grazing in the same geography. We focused those conversations on what those partners believed they were supporting well with resources and cost share programs, and what they wished they were better able to support. Several key takeaways emerged from this exercise which ultimately were channeled into a cost share program.

- NRCS had an approximately 2 year backlog for practices requiring certain approvals. This was especially true for perimeter fencing and livestock watering systems.
- NRCS requirements for fencing were considered by many leading graziers to be “overbuilt” (i.e. too many posts and wires, and thus more expensive than necessary) for their context. There was an opportunity to better support producers with fencing that met the legal fencing requirements in Wisconsin but not the NRCS requirement.
- There were many opportunities for cost sharing the cost of cover crops, but NRCS had challenges funding infrastructure for grazing on crop fields (e.g. grazing cover crops). Grazing cover crops can be an important way to incentivize more cover crop adoption because it can save livestock farmers money on winter feed costs.

Ultimately, the Valley Stewardship Network and Pasture Project teams worked to design a program that met several of these needs while helping farmers navigate into NRCS programs if their projects were a better fit for that funding source.



Tainter Creek farm field.
Credit: Valley Stewardship
Network

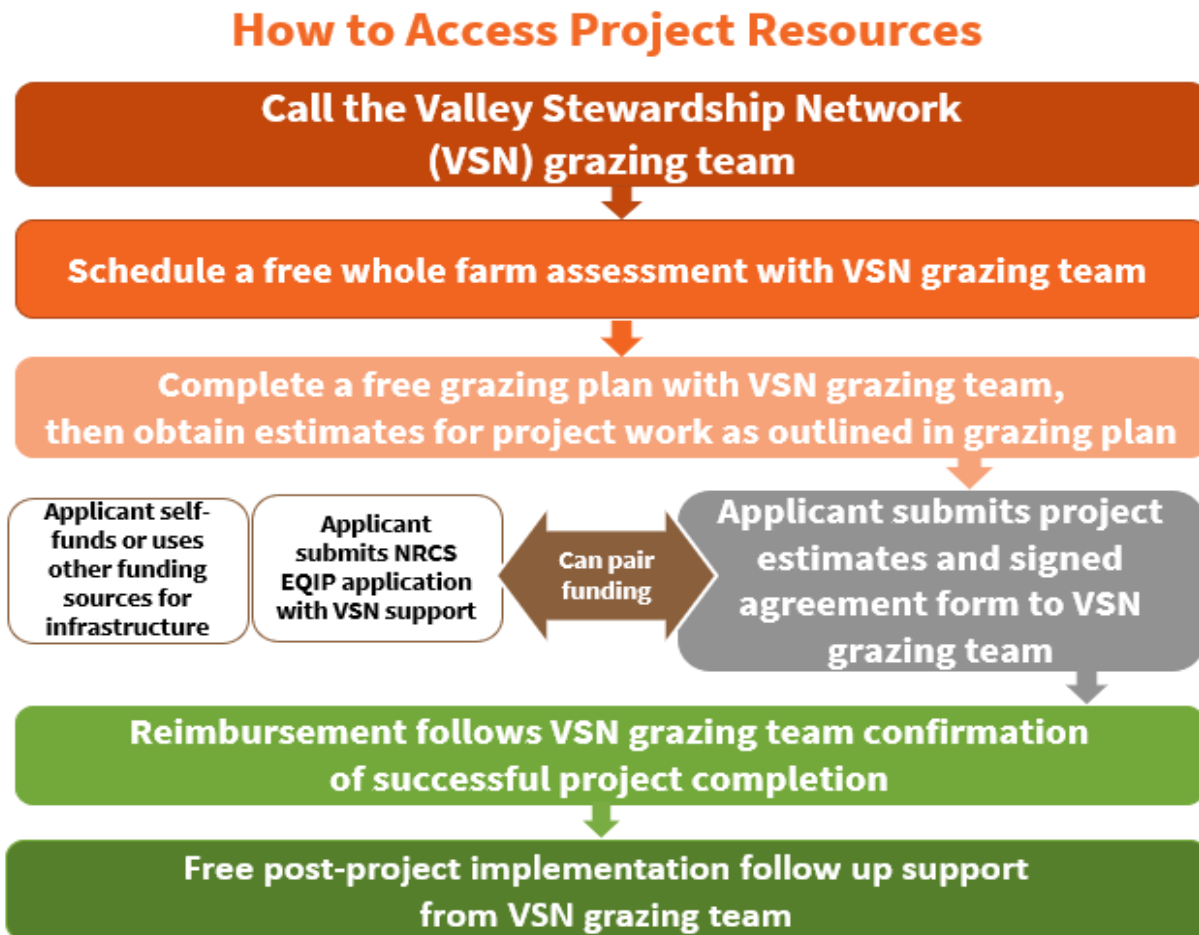


Figure 3. Flow chart of accessing project resources (technical assistance and cost share).

Eligibility requirements for the cost share program included:

- Land is located in the Tainter Creek Watershed
- A Whole Farm Assessment, Grazing Plan, and Map Suite have been finalized and the Grazing Plan and Map Suite shows the practice/installation plan
- The farmer is not receiving or applying for any federal assistance for the same practice on the same acres
- If renting, the producer needs a lease acknowledging the practices with at least 3 years remaining in the lease
- Quotes for materials or labor (2 or 3 quotes depending on total project cost)
- The project cost share needed cost-effectiveness of \$118/pound of phosphorus reduced, or better, based on GrazeScape modeling. If the project had worse cost-effectiveness, the project would pay only up to \$118/pound and the farmer could take on the remaining portion.
- The project cost needed to be comparable to USDA NRCS Environmental Quality Incentives Program for the same practice

Scaling Up Farmer-Driven Water Quality

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Eligible practices are shown in the table below. In order to encourage producer “skin in the game”, the project team decided to fund either materials or labor for most practices.

Table 1. Eligible practices for cost share

	Conversion of Cropland to Pasture	Grazing Cover Crops	Improvement of Existing Grazing Practices
New permanent/perimeter fencing	Up to 100% of materials (barbed wire ineligible) OR labor		
Replacing old perimeter fencing			
Temporary fencing			
Water systems and pads			
Grazable seed	Up to 100%		
Regrading/excavation	Up to 100% of materials (fill) and labor		
Agronomy Equipment Rental and Services (e.g. no-till drill, post hole auger)	Up to 100% as add on to above practices		
Livestock Equipment Rental (e.g. trailer/corral kit rental)			

AGRICULTURAL BEST MANAGEMENT PRACTICE ADOPTION

The above approaches and structures were well-used by farmers in Tainter Creek. The project reached hundreds of farmers with outreach and education. In addition:

- 26 farmers received support with implementing new grazing best management practices (BMPs)
- 14 grazing plans were drafted, including plans for new BMPs in each
- 10 cost share applications were funded for a total of \$173,000
- 1,640 acres had plans for improved practices via grazing plans
- 986 acres had verified new practices funded by this program. Funded practices include:
 - Grazing cover crops
 - Conversion of row crops to perennial pasture
 - Repairing flood-damaged fencing
 - Planting and grazing prairie habitat
 - Repairing heavy use areas
 - Adding water tanks and electrified fencing to enable better grazing management

MODELED WATER QUALITY IMPROVEMENTS



“Advice I’d give to other farmers: Go into a project like this with an open mind. Accept advice; people see things differently because of their experiences. Go with the flow, don’t get stuck on the small details. Give yourself extra time to complete the process.”

-Participating farmer

GrazeScape was designed to model baseline (current) production scenarios and future scenarios, and to estimate the differences in nutrient and sediment loss between them. For the environmental modules of nutrient and soil loss, GrazeScape was built on widely-used models. For phosphorus, GrazeScape uses a metamodel of the Wisconsin P Index. For sediment, GrazeScape uses metamodel of RUSLE2. The Wisconsin P Index has been calibrated and validated in Wisconsin farm fields and RUSLE2 was validated with more than 10,000 plot years from natural plots and 2,000 plot years of rainfall simulated plots nationwide. The metamodel approach increases computational efficiency without sacrificing accuracy.

Using GrazeScape, the project estimated the difference between nutrient and soil loss at the start of the project and at the end of the project for

each participating farm. **In total, project-supported activities reduced phosphorus loss from fields by an estimated 2,445 pounds per year and soil loss by an estimated 1,684 tons per year.** This is 144% of the original project goal for phosphorus and 179% of the original project goal for sediment.

MEASURED WATER QUALITY COMPARISONS

The Wallace Center used a paired watershed study with three Kickapoo Watershed HUC12 watersheds—Tainter Creek and Halls Branch and Knapp Creek/West Fork—to demonstrate the impacts of the project’s activities on water quality. Tainter Creek was project’s treatment watershed and Halls Branch and Knapp Creek/West Fork served as the control watersheds. The three watersheds have similar histories, land cover, and agricultural profiles, making them appropriate for comparison.

BMP adoption activities aimed to achieve a 5% reduction in phosphorus or sediment loading at the pour point of the Tainter Creek sub-watershed. The project attempted to



“Water quality has a positive impact on quality of life and tourism, and a magnifying effect on the trout fishing and low-impact recreationalists. In turn, this is a huge effect on our local economy.”

-Participating farmer

Scaling Up Farmer-Driven Water Quality

A FRAMEWORK FROM TAINTER CREEK, WISCONSIN

document this reduction through the water quality monitoring program of Valley Stewardship Network (VSN), a project partner. VSN supervises volunteers to gather water quality measurements using the Wisconsin DNR Status and Trends protocol. The Wallace Center used VSN's baseline water quality measurements to create the baseline regression for P concentration, as in Clausen & Spooner, 1993. VSN had 4 years of water quality data for the pour point of Tainter Creek, 4 years of data for the pour point of Halls Branch, and 3 years of data for the pour point of Knapp Creek/West Fork. VSN monitored P and turbidity during the project using consistent protocol to the baseline period measurements. The project conducted a new regression of treatment-period data each project year and compared it to the baseline regression. In 2022, we requested to add "rain chasing" sampling events to our monitoring protocol, because several project years had been droughty and did not capture any high flow events.

Note that if water quality were improving in Tainter Creek relative to control watersheds, the implementation period trendline for phosphorus concentration should shift downwards. The graphs below show this shift after the final year of water quality monitoring, which indicates that phosphorus concentration in Tainter Creek improved during the "implementation" period of this project relative to the control watersheds. Future years of data will be critical to seeing if this trend holds in higher flow periods.

Discussion of water quality and trout habitat at Tainter Creek Stream Day. Credit: Wallace Center



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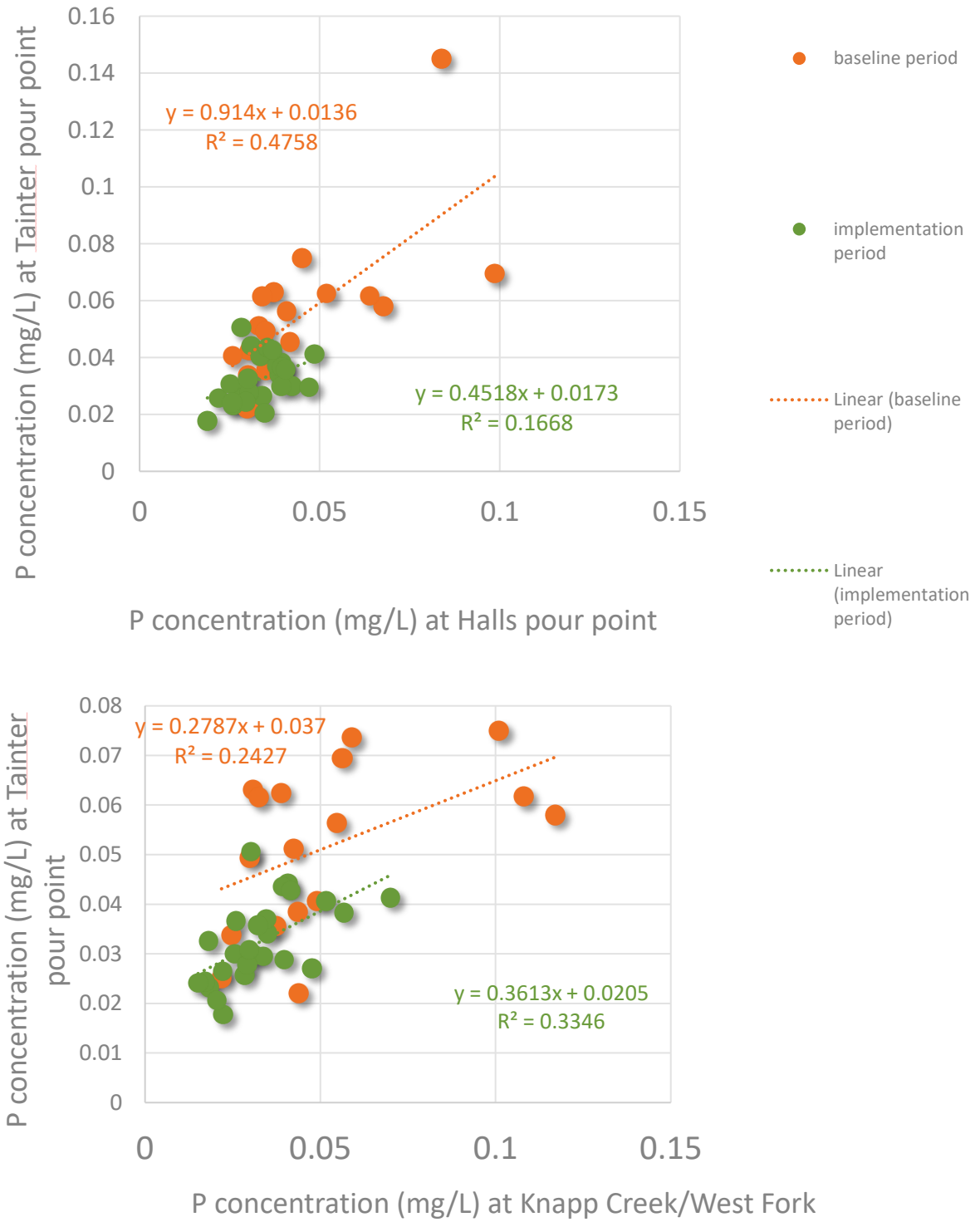


Figure 4. Measured water quality data in Tainter Creek vs. control watersheds

REGIONAL FRAMEWORK AND SCALING

The combination of a technical assistance framework paired with real-time, place-based decision support and water quality evaluation proved to be an impactful model for watershed-level change. From the project team's perspective, broader regional or national efforts certainly have large impacts. But sustainable change is powered by local knowledge and will. This project focused on resourcing that local knowledge and will in a given geography and can serve as a model for how to resource other agricultural geographies with knowledge and will to improve any resource concern.

Critically, the Tainter Creek Farmer-Led Watershed Council was critical in growing surrounding watershed councils including the West Fork Neighbors Watershed Council. They also have increased connectivity and partnership with other large programs, like Grassland 2.0 led by University of Wisconsin, where they continue to inform statewide programming about how to expand conservation grazing practices across the state of Wisconsin.

This framework proved successful enough to move into other funding sources beyond EPA funding. A USDA Regional Conservation Partnership Program, designed to cost share conservation practices, is using a similar technical assistance framework and was informed by this project. This project covers multiple counties in the Driftless region, which includes the Kickapoo River Watershed. Several farmers who participated in initial technical assistance in the Tainter Creek project were able to be referred to the Driftless Regional Conservation Partnership Program.

In addition, the Wallace Center is working with partners in Southern Indiana to expand this framework in 2024 and beyond. This work will need to adapt to that geography's context, but is expected to include the same basic components: technical assistance including outreach and education events designed to meet people at multiple levels of adoption, a cost share program, decision support, and evaluation. It may also include a heavier emphasis on market pull for the products produced from grazing.



"I'm proud of what the Tainter Creek Watershed Council has been able to accomplish since we first came together in 2017. We've come a long way since that first meeting. And we couldn't have done it without all the support from Vernon County, VSN and the Wallace Center Pasture Project."

- Tainter Creek Farmer-Led Watershed Council founding member

LESSONS LEARNED & WHAT WE WOULD DO DIFFERENTLY

- **Get comfortable with building program components while implementing the program.** A three-year project timeline often necessitates simultaneous design and implementation. This program learned by doing, including having a pilot cost share application prior to the full approach being determined. This adaptive approach helped be responsive to watershed needs, but it also created confusion at times, so consider what you need to lock in from the start, and communicate with farmers where you might adjust your approach year to year.
- **Build a program rather than a project.** Grant timelines are often three to five years, but this restricts the ability to plan, implement, and fully evaluate a program. Given that grant timelines are unlikely to change, we would focus on funding a similar program from multiple sources (e.g. funding it as a “program” rather than a “project”).
- **Depth of engagement can be more effective than breadth.** This may not be true in every geography, but in this project, we met our goals by going deeper with farmers who wanted to make more transformative changes (e.g. converting cropland to perennial pasture) rather than trying to reach large acreage with more moderate changes (e.g. cover cropping).
- **Streamline administrative requirements.** The administrative burden of this program was at times heavy both on staff and on farmers applying. In the future, some of the eligibility criteria or application requirements could potentially be streamlined. For example, instead of requiring receipts for reimbursement, a program could more directly use USDA payment rates (though this would require comparable practices and payment rates that accurately reflect the cost of goods; both of which were a challenge in this project).
- **Don’t ignore pandemic and supply chain constraints.** If your program relies on vendors, you should pay attention to supply chain constraints in that industry and understand your vendors’ needs. This project coincided with the pandemic, and like many sectors, agricultural suppliers of fencing and other materials felt a pinch. We learned to keep these vendors in the loop about our project so that they could plan ahead for stocking items we needed.
- **Serve those with financial constraints.** Not everyone can do cost share. We built a pathway for those who could not do a reimbursement-based program—for those participants, VSN bought materials directly. However, this program was still prohibitively expensive for some producers who could not cover the share of expenses not covered by the program. In the future, the team would love to find ways to meet more people where they are.



“This project was a great way to impact local farmers and the surrounding communities. With help from Valley Stewardship Network and the Wallace Center, we were able to complete a lot of our initial goals for our farm. Without their help, this process could have taken several years, or may have never been completed properly.”

-Participating farmer

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- **Have a place for producers left behind.** If your program has a fixed timeline, consider how to feed participants in your program into other funding and technical assistance streams after your program is complete. Not everyone will complete your program in a fixed timeline, so create a plan for what happens after your program ends.

**For more
information, visit:**

<https://valleystewardshipnetwork.org/>

<https://wallacecenter.org/>

<https://pastureproject.org/>

