



Field Walkover Guide

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**Plus: FIELD MANAGEMENT
DECISION TREES**

A practical on-farm conservation tool

Field Walkover Guide

A practical on-farm conservation tool



As a farmer, you make daily decisions based on visual assessments. Most planting, pest control, and harvest decisions for your farm are based on how something in your field looks. Why should conservation practices be any different? You can and should be the one to conduct a visual assessment of the conservation practices on your property.

Ultimately, it's your responsibility to ensure that your farming system does not contribute to excessive erosion and soil loss, and you should be making the decisions about installation and maintenance of conservation practices. Over the past several decades, the landscape of conservation assistance and planning has gone through a series of changes. Conservation professionals have fewer hours than ever before for visiting farms and walking fields as part of the conservation planning process.

There has also been a shift toward computer-based tools to generate conservation plans. The information in these new plans is very helpful in assessing erosion risk potential of crop rotations, tillage systems, and vulnerabilities based on soil type or slope. However, a visual assessment is still best for checking the current condition of conservation practices or troubleshooting an active erosion problem.

In 2010, UW Discovery Farms[®] Program, part of UW–Madison Extension, established two watershed projects, which included monitoring, to work toward a better understanding of the water quality impacts of different farming systems. For 10 years, the program had been working with farmers to understand the timing of runoff and nutrient loss in Wisconsin (see *Timing Lessons Learned* on page 3).

In addition to monitoring, a total of 60 farmers received walkovers on 15,000 acres. Walkovers are a visual assessment of erosion and erosion potential – similar to the conservation planning practice of walking fields traditionally used by conservation planning staff – and are a complement to modern erosion risk modeling. Information gathered during the walkovers was used to identify field-specific areas of concern. During a follow-up farm visit, areas of needed improvement were identified and prioritized, and farmers were offered simple solutions for improving problem areas.

TIMING LESSONS LEARNED:

OVER 40% OF ANNUAL RUNOFF OCCURS IN APRIL, MAY, AND JUNE

OVER 80% OF SOIL LOSS OCCURS IN APRIL, MAY, AND JUNE



MANAGEMENT LESSONS LEARNED:

SOIL TYPE AND SOIL MOISTURE LARGELY DETERMINE RUNOFF

NO-TILL AND REDUCED TILL SYSTEMS ALL BUT ELIMINATE SOIL LOSS

NO-TILL SYSTEMS REQUIRE CAREFUL MONITORING OF DISSOLVED PHOSPHORUS

Four main areas of concern were identified during the walkovers:

concentrated flow areas, waterway outlets, chronic or widespread in-field erosion, and eroded streambanks (see visual examples below).

Observations from walkovers confirmed that most areas of the farms were very well managed and required no changes, but identified that relatively small areas were often responsible for the largest portion of soil losses.



Concentrated flow area.



Waterway outlet.



Widespread in-field erosion.



Streambank erosion.



Example of mapped walkover observations.

On-farm walkovers help target management practices

At Discovery Farms, we have worked shoulder-to-shoulder with farmers on water quality and conservation issues for nearly 15 years. During that time, we have often heard interest in simple recommendations that are easy to understand and implement. When we began work on the watershed projects, we needed to find a way to target areas and management practices that had a high potential for impacting erosion or water quality. Field management models helped us understand the risks associated with nutrient application rates and timing, but the models didn't help us assess whether conservation practices, like waterways, were in place and working. That is when we turned back to the experiences of our farmer partners.

Several farmers mentioned conservation plans that utilized a "stoplight method." Red areas were places to be cautious of or improve, yellow areas needed extra attention but weren't as severe, and green areas were "business as usual" or areas not requiring extra attention or improvement. With this method in mind, we determined we would be most efficient out in the fields, observing and evaluating current practices, and utilizing the stoplight method to prioritize trouble spots.

Discovery Farms staff conducted walkovers with simple tools; an aerial map, a permanent marker, and an eye for signs of erosion. After a day walking the field, hand-drawn maps and scribbled notes were transferred to a computer program, which rendered a digital map and a summary evaluation of the surveyed land. These then formed the basis for talks about erosion, conservation, and water quality with all of the farmers in the area. While new observations are valuable, we also want to stress the importance of documenting and validating existing measures that have been successful in controlling erosion and keeping soil where it is most productive – in the field.

Over the course of two years, thousands of acres have been evaluated, and over 40 conservation practices have been implemented, with even more planned.

Walkovers have four main goals:

1 Identify the source

Visually assess the areas affected by surface water runoff and whether current management is in place to mitigate the risk of soil loss. This assessment becomes a snapshot in time that evaluates the interaction between landscape, farm practices, and surface runoff.

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Soil loss = source + transport

2 Layer-on transport knowledge

This is where visual assessment meets on-farm monitoring results. The most vulnerable time of year for soil loss is April through June. What do critical sites look like during that time? Are they protected? You can best understand risk potential for soil loss by pairing what is known about transport timing and conditions with a visual assessment.

3 Set priorities to change areas that are erosion-prone

Don't get overwhelmed. Prioritize the areas you assess. What can be done immediately and what do you need to plan to do in the future? Your list of priorities may be less comprehensive than the conservation planning process, and that's okay. Look at your walkover results not as a replacement, but as a complement to your existing farm conservation plan. There are limitations to a visual assessment, but the benefit is its simplicity; it offers an opportunity to establish feasible and productive next steps.

4 Enlist some help if you aren't sure where to start

Walkovers conducted by Discovery Farms encouraged open discussion about the areas of concern on a farm. If you are not sure about what to do with a given area, reach out to a conservation specialist or fellow farmer who may have dealt with something similar. This is your chance to enter the conservation conversation with knowledge about what your specific needs are.

For soil to erode, there must be runoff to transport soil and a spot that is vulnerable to erosion

Areas that are steep, have little soil cover, or some level of soil disturbance can be prone to erosion. Soil transport is minimized by protecting these areas with appropriate conservation practices. There are two types of protection practices: those which keep movement of soil within a field to a minimum (upland practices), and those that address movement off the field (treatment practices). These two types of practices should be layered together within fields and across landscapes to effectively limit soil loss.

Only a small amount of annual precipitation actually runs off fields, and most of this soil transport and erosion occurs in April, May, and June. On monitored fields, up to half of all annual surface water runoff and almost all soil loss occurred during these months. Runoff dislodges soil from vulnerable areas and carries it off the landscape. So, the question is, do the areas on your farm that are vulnerable to soil erosion have enough protection from April to June? Minimizing soil loss means working with factors that are within your control and adapting to factors outside your control. You can't change the weather, but you can control your tillage and use of conservation practices.



Spring runoff event when soils are vulnerable to erosion.

“Do the areas on your farm that are vulnerable to soil erosion have enough protection from April to June?”

Identify areas vulnerable to erosion and use results to set priorities

According to UW Discovery Farms Program data, when paired with conservation practices, using reduced tillage can nearly eliminate soil loss. During walkovers, staff saw firsthand the continued need for landscape-appropriate tillage and well-managed grassed waterways on landscapes across Wisconsin. Too much disturbance, a lack of upland practices, and inadequate waterways or other treatment practices were the most commonly identified issues during walkovers, regardless of soil types, landscapes, and systems.

When you are out doing field work in the spring, check for visible signs of erosion in and around your fields and waterways. Most often, the solutions to the issues identified in walkovers don't have to be complex. There is value in getting

back to the basics by limiting disturbance, increasing cover, and installing waterways.

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Landscape-appropriate tillage = no signs of chronic or widespread erosion

Consider prioritizing potentially erosive areas into three main categories: 1) areas where active management is functioning well and erosion is minimal, 2) areas requiring updates and improvements within the next few years, and 3) areas that need improvements immediately because water quality impacts are likely and erosion is substantial.

Examples of walkover categories by area

	CONCENTRATED FLOW AREA	IN FIELD	FIELD EDGE
No signs of erosion	There is an established grassed area where water flows.	Visible surface residue. No scattered channels.	Outlet is stable. No visible open cuts.
Moderate signs of erosion (make updates soon)	There is an established grassed area but water is not flowing within it.	Scattered channels across the field are visible but do not impact field work.	Outlet is moderately stable. Erosion is creeping into field.
Substantial signs of erosion (make updates right away)	There is no established grassed area. Clear damage to the field evident by equipment's inability to cross these areas.	Large areas of channels or deep channels are present and impede field work.	Very unstable outlet. Edges are actively eroding into cropland, impacting field work.

With each identified problem there are many solutions, including options that fit within the context of your current system. The most important thing is to make sure you don't get tunnel vision. For example, choosing to do no-till doesn't mean you can forget other conservation practices.

Conversely, some tillage may be appropriate, but you must keep an eye on residue and other soil protection measures. Use the two decision trees on pages 7-8 as a guide to help you walk through your own assessment.

Examples of landscape-appropriate tillage



High-residue soybeans after corn.



No-till corn planted on contour.



Minimum-till on erodible landscape.

If you see signs of erosion throughout your field, tillage is too intense

Without canopy cover or plant material on the soil surface, there is very little protection from rain, and erosion will likely follow. Even on slopes that are not highly erodible, Discovery Farms staff observed some sheet and rill erosion, suggesting

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HOW MANY POUNDS IS IT?
If you can visually see an erosion problem, soil loss is likely already more than the limits identified in traditional conservation plans. If you see something, it's time to do something.

that tillage was too intense on those fields or not enough residue was left after harvest. Over time, if your tillage is too intense, you are likely to experience a decrease in yield, a decrease in moisture holding capacity, and a different color of soil on hillsides. Look for places that show signs of erosion year after year. There are also several signs to suggest erosion is actively occurring: a soil surface that looks smooth and sealed, numerous small channels in the field, crops that are

washed out or buried, and corn stalks collecting in or around the field. If you witness any of these signs during your walk-over, it is time to reconsider your current system.

If you see signs of erosion throughout your field, look for ways to maintain more cover during April, May, and June, the most vulnerable months of the year. Discovery Farms staff frequently observed soil protection benefits and less erosion in fields that had less disturbance and more surface cover.

There are several ways to increase surface residue and reduce soil disturbance:

- 1 Plant a cover crop after corn silage, especially on your steepest fields.
- 2 Consider where no-till may fit into your crop rotation.
- 3 Limit the number of tillage passes before planting.
- 4 Equip your planter with aggressive trash movers for seedbed preparation to deal with high amounts of residue without another tillage pass.
- 5 Investigate tillage implements that chop up residue, but do not disturb soil.

Examples of signs of erosion



Sheet erosion accumulating at bottom of field.



Sheet erosion during growing season exposes roots and rocks.



Concentrated rill erosion after soybeans.

Decision Tree 1

CONCENTRATED FLOW AREA ASSESSMENT



START

Does water come together/concentrate and exit the field?

NO

Refer to Decision Tree 2

YES

Is there grass in the channel?

NO

Install a grassed waterway

Consider whether it can be done with your own equipment, or whether you need engineering assistance.

YES

Is the grass at least 20-30' wide along the length water flows to the exit?

NO

Shape and widen

It is likely that your waterway is undersized from years of nearby tillage or herbicide applications. An undersized waterway causes water to flow outside the grassed area, resulting in erosion. Work with a contractor or use your own equipment to widen the waterway again. The minimum grassed width is 30 feet (10 feet in the middle and 10 feet on each side).

YES

Is there an erosion channel within or alongside the grassed area?

YES

Reshape and reseed

It is likely there is excess soil within or alongside the waterway. This requires reshaping of the channel and reseeding the waterway area. When waterways don't have the proper depth, they don't function well.

NO

Is where water exits the field grassed with no visible signs of erosion?

NO

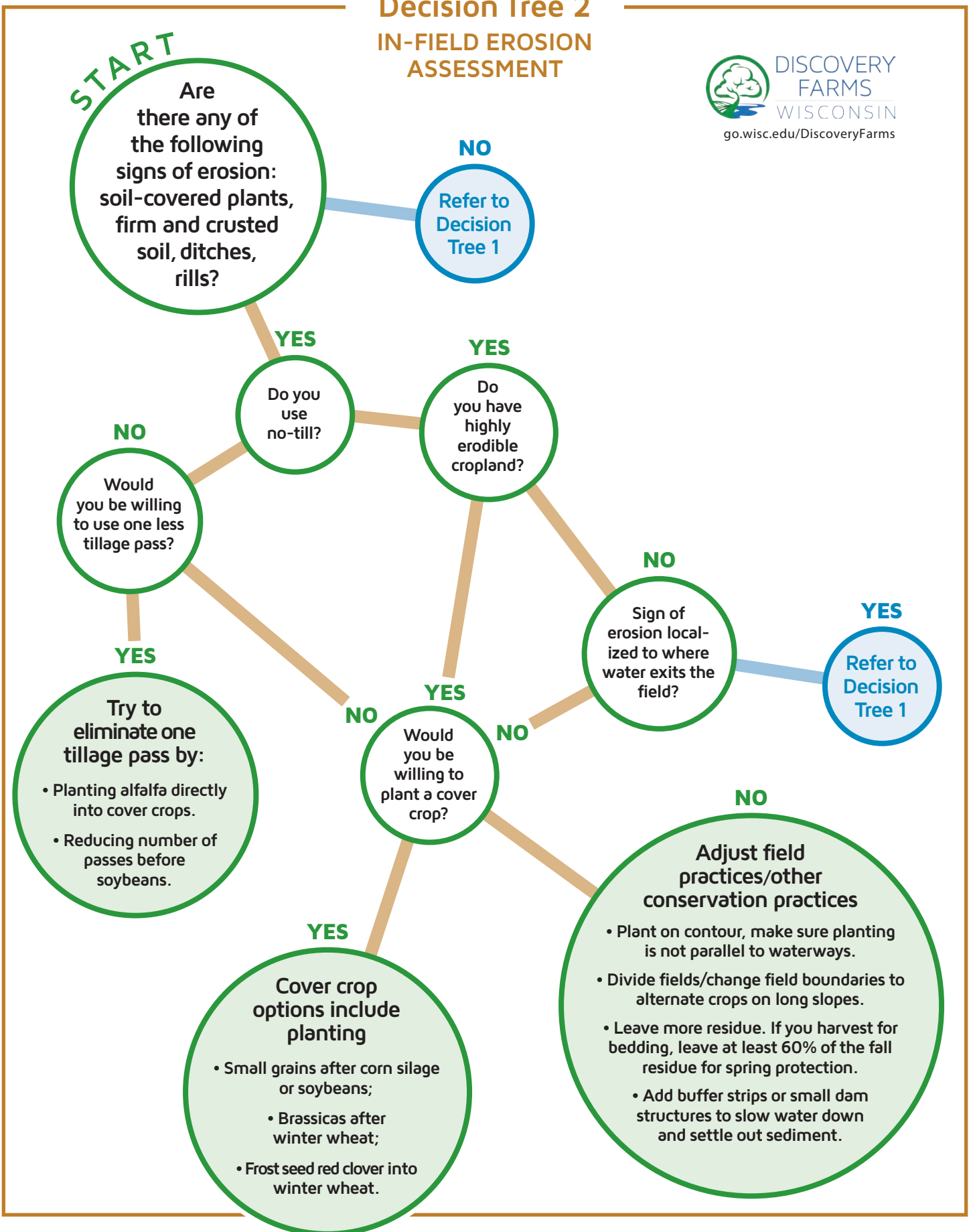
Fix outlet

The outlet of your waterway needs repair. If left untreated, erosion in this area can eat into the field. Consider consulting a contractor or conservation specialist to help. Fixing waterway outlets can be a complicated process.

YES

Waterway is in place and functions properly. Recheck annually.

Decision Tree 2 IN-FIELD EROSION ASSESSMENT





Erosion showing need for a waterway.



Grassed waterway that has mounded in the middle and needs reshaping.

If erosion is concentrated in one area, a waterway may be your best bet

No matter the farming system, some amount of rain or snowmelt water will run off the field, and it is usually in the spring. It is important to identify where water flows through and away from fields. Is there a specific part of your field that you have to avoid altogether or slow down equipment when crossing? If so, it may be a concentrated flow area. These areas could use a grassed waterway to provide an exit for water that will not leave signs of erosion behind.

- **If you already have waterways in place** but still see signs of erosion within or outside the waterway, your waterway is no longer functioning properly. On many walkovers, waterways existed, but weren't functioning well.
- **Waterways must have adequate width and depth** to handle the amount of water draining off the land. Tillage and herbicide operations can reduce the size of waterways over time. If you notice your waterways getting smaller, it is likely the result of an intrusion from these operations.
- **Soil accumulation causes waterways to mound** in the middle. Soil can accumulate in waterways from soil in runoff or from tillage equipment that passes

over the waterway. If you notice mounding, it is time to reshape your waterway to help water flow correctly through the waterway. Reshaping, reseeding, and maintaining waterways as a runoff route prevents unnecessary soil loss.

- **The layout of the field** is another important consideration for proper waterway function. If rows are planted parallel to the waterway, erosion alongside the waterway is likely. Rows should meet the waterway on the contour if at all possible.
- **When reshaping a waterway**, keep in mind that you want to easily drive through it. The best method is to keep the base wide enough so that the sides do not become steep and difficult to traverse.
- **Properly maintained waterways provide a route** for excess water to leave the field, but what happens at the end of the waterway? It is common to see soil build up, causing problems at waterway outlets. Keep waterway outlets functioning by reshaping outlet width and depth as needed so water can safely exit the field.



Newly reshaped waterway.



Waterway in good working condition.



Grade stabilization structure at transition to wooded ravine.

Consider that not only agricultural fields are susceptible to erosion

The line where cropland and non-cropland meet is the last line of defense to protect against soil loss. These areas can contribute to soil loss, and may be in need of repair and management (a point that became clear during Discovery Farms walkovers). Areas commonly in need of a closer look are located where cropland meets boundaries like property lines or wooded ravines, or where waterways transition between landowners or land uses.



Elevation difference at property line.

During walkovers, significant differences in elevation between property lines were observed. Sometimes the drop was three or more feet from one side of the fence line to the other. Where water flow paths intersect property lines, neighbors have to work together to create a stable “in between” area as an outlet for water to leave one property, and an inlet for that water to move efficiently across the next. Such projects often require some degree of earth work and coordination between landowners.

In hill-and-valley landscapes, water can either enter or exit cropland from woodlands and wooded ravines. Fast-moving water can create gully heads and begin to erode fields. Areas that transition to or from wooded ravines are often in need of large, well-defined waterways, and even grade stabilization structures to slow water and capture soil.

Evaluation of soil loss and soil loss potential must be conducted for all land, not just cropland. Often mitigating an erosion problem in an uncropped area, like a streambank, is more complicated than controlling erosion within a field. Land conservation departments or other local organizations can be helpful in creating a plan for improving streambank areas.

Onward in conservation

Walkovers have helped farmers plan and prioritize repairs, and utilize land management changes to minimize soil loss from their property. The process of implementing a visual observation was successful because many identified areas have been improved, discussions about erosion and water quality occurred that might not have otherwise, and other programs have adopted a similar approach.

Since receiving the information from their walkovers, over a third of farmers have made changes suggested by the process. Some examples of changes include waterway renovation, improving feeding areas, incorporating cover crops into rotation, and reducing the number of tillage passes. Farmers prioritized which areas to address, and decided on their own whether or not to seek additional funding to offset the cost of the improvement. Some farmers did seek additional funding, while others covered the cost of improvements on their own.

One program in Minnesota and another in Wisconsin have both taken a similar approach to evaluation of land management. The Minnesota Department of Agriculture, in its Root River Field to Stream Partnership project, is using a combination of monitoring, walkovers, and one-on-one work with farmers to address water quality concerns in South-eastern Minnesota. Similarly, Yahara Pride Farms, near Madison, Wisconsin, is a group of farmers committed to minimizing agriculture's impact on water quality. They have each evaluated thousands of acres and found similar areas needing attention.

The walkover effort has identified an implementation gap between soil and water conservation practices and chronic erosive areas. On one hand, it is easy to see where and how fixes can be made, but the process can often feel complicated and overly time consuming. There are situations where a detailed engineering plan is necessary, yet, there are many situations where simpler, non-engineered practices will do the job. As farmers, it is critical to be in charge of conservation on your farm, and with a few resources, it is easy to accomplish your own evaluation.

“There are situations where a detailed engineering plan is necessary, yet, there are many situations where simpler, non-engineered practices will do the job.”



Erosion damage to a waterway caused by a June storm.



Damaged waterway from above, after reshaping and reseeding.

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For over 25 years, UW Discovery Farms has worked with Wisconsin farmers to identify the water quality impacts of different farming systems around the state. The program, which is part of UW–Madison Extension, is under the direction of a farmer-led steering committee and takes a real-world approach to finding the most economical solutions to agriculture’s environmental challenges. If you are interested in learning more about UW Discovery Farms, visit go.wisc.edu/DiscoveryFarms.

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