

Final Report

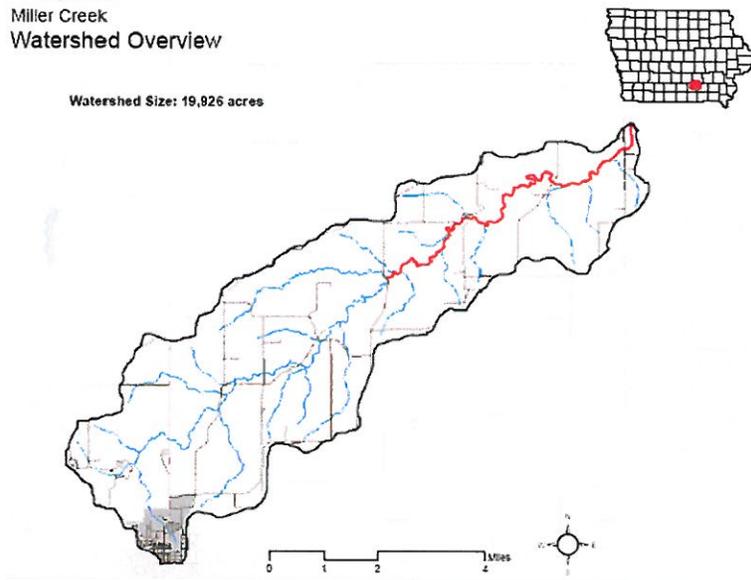
9032-017

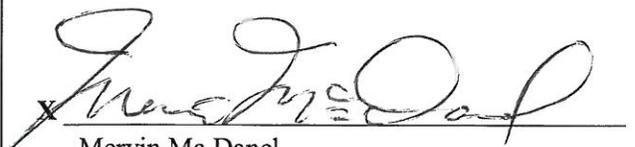
Miller Creek Phase I Water Quality Improvement Project

Watershed Improvement Review Board

Figure 1
Miller Creek
Watershed Overview

Watershed Size: 19,926 acres





Mervin Mc Danel
Monroe County SWCD Commissioner Chairman

Date 6-9-14

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9032-017 Miller Creek Watershed Phase I Final Report
Executive Summary

Project Title: **Miller Creek Watershed Project Phase I**

Grant Number: 9032-017

Project Start Date: April 8, 2010 Project Completion Date: June 30, 2014

Funding: **Total WIRB Budget** \$244,706.29

| | <u>Totals</u> | <u>% of Total</u> |
|---------------------------|----------------------|--------------------------|
| WIRB | \$235,536.25 | 34% |
| NRCS | \$9,870.00 | 1% |
| EQIP | \$71,431.76 | 10% |
| IFIP | \$76,851.71 | 11% |
| CRP | \$18,427.95 | 3% |
| IDALS-DSC | \$16,325.00 | 2% |
| Recipient | \$261,142.69 | 38% |
| Total Expenditures | \$689,585.36 | 100% |

Summary of Goals and Accomplishments

Objective:

The goal of this project was to reduce sediment delivery by 70% on 60% or 3,837 acres on priority lands improving water quality in Miller Creek that has been caused by sedimentation (turbidity) and associated nutrients contaminating the creek. The plan of action was to target areas with soil loss of 5 tons per acre or more or a sediment delivery rate of .5 tons per acre or greater. This will be accomplished through installation of strategically placed structural practices, rotational grazing systems and buffer strips.

Goals of Project:

1. Install 13 Grade Stabilization Structures
2. Install 14,690 feet of Terraces
3. Install 57 Water and Sediment Control Basins
4. Install 220 Acres of new seeding
5. Develop and install managed grazing systems
6. Written and verbal communications to educate the public on water quality

Introduction

Miller Creek is a warm-water stream located in the northeastern part of Monroe County in Southern Iowa. The Watershed consists of approximately 19,926 acres of land that starts at the northeastern corner of Albia and stretches to the town of Eddyville where it outlets into the Des Moines River. This area is located in the Iowa and Missouri Heavy-Till Plain, which is best described as steep rolling hills interspersed with areas of uniformly level upland divides and level, alluvial lowlands. The majority of land use is cropland, with the principal crops for the area being corn and beans. Hay and feed grains are also produced on a smaller scale.

Monroe County's Soil & Water District Commissioners (SWCD) & Natural Resource Conservation Service (NRCS) became concerned when Miller Creek had been listed on our State's 303d Impaired Waters list. The list represents lakes and streams failing to fully support our state's water quality standards. With this resource concern in mind, the following report describes the first phase of the assessment and work plan for the Miller Creek Project and its findings. Phase I of the Miller Creek Assessment revealed that excessive sediment and nutrient delivery into the stream from upland runoff could possibly be causing the impairment. It is believed that elevated water temperatures caused an increase in algae growth creating low dissolved oxygen levels. This motivated the Monroe County SWCD Commissioners to apply for a grant of \$255,300 which was awarded from the Iowa Watershed Improvement Review Board (WIRB) in 2010. Grant funds were partnered and matched by recipients over a three year period to support water quality projects addressing issues of soil erosion and pollutants entering Miller Creek.

As part of the Phase I assessment, a comprehensive Watershed Management Plan was developed with the main focus of reducing sediment delivery by 70% on 60% or 3,837 of these priority acres. The strategy of implementing Best Management Practices (BMP's) would help address gully and upland sheet and rill erosion reducing sediment downstream.



Financial Accountability

Of the \$244,706.29 grant, a total of \$235,536.25 has been spent during a three year period implementing practices in the watershed. The agreement with WIRB and the SWCD established three BMP's representing the goals for the county; see **Table 1**. WIRB divided the funding among Grade Stabilization Structures, Water & Sediment Control Basins and Terraces. Of the three BMP'S a total of \$136,501.96 has been spent achieving the agreement goals. During the third year, several factors, including the increased support for cropland improvement, lead the District to amend the original agreement. The decision was based upon continuing requests for cropland protection in the upland areas. There were limited funds in the original agreement for basins and more designated for grade stabilizations and terraces. The District felt by moving funds into basins from the other two practice line items would accommodate more landowners. The request of \$1,613 from Terraces and \$3,165 from Grade Stabilizations moved into basins allowed an additional \$4,778.00 to be used.

In April of 2013, after meeting project goals, the District asked the WIRB board to allow moving remaining money from terraces and unobligated money from grade stabilization structures into salary a total of \$13,000.00. This ensured the District could employ a project coordinator to fulfill the administrative duties and complete the final reports required in the grant agreement. In October 2013, the unpredicted shutdown of the Federal Government delayed the remaining grade stabilization project. Then, with time constraints related to obtaining an easement and the shutdown, the ability to complete the remaining practice by December jeopardized the whole Miller Creek Phase I project deadline. As the deadline and winter weather neared, the District decided to request an extension allowing the landowner to complete the project the spring of 2014 approved in October. Then in mid-April of 2014, Jerry Neppel suggested it would be advantageous for the District to transfer the remaining grade stabilization to I-Jobs funding 1233-015 to complete the 9032-017 final report sooner.

While funding was designed to be used in high priority areas; some landowners still needed help with erosion on their land but were not able to benefit from WIRB dollars due to the fact their site location was above an existing structure. Landowners were given the opportunity to use state and federal funds in those cases but many chose to forfeit due to the County's first-come, first-serve sign-up and their position on that list. Landowners able to install practices utilized partner funds along with WIRB funding which helped the District to stretch the dollars among more people. A few landowners chose to pay to install practices themselves or fund it through the states low or no interest loan program. **Table 2**

| <i>Table 1 Grant Agreement</i> Budget Line Item | Total Funds Approved Grant | Amendment | Total Funds Expended | Total Spent % |
|--|-------------------------------|--------------|-------------------------|------------------|
| Salary/Benefits | \$90,000.00 | \$103,000.00 | \$99,034.29 | 100%+ |
| Grade Stabilization Structures | \$112,500.00 | \$91,401.29 | \$85,919.96 | 99% |
| Water/Sediment Control Basins | \$28,800.00 | \$33,578.00 | \$32,242.40 | 96% |
| Terraces | \$24,000.00 | \$16,727.00 | \$18,339.60 | 84% |
| Total | \$255,300.00 | \$244,706.29 | \$235,536.25 | 100%+ |

| <i>Table 2 Partner Funding Totals</i> Funding Source | Approved Application Budget (\$) 255,300.00 | Total Spent from Budget(\$) | % of Total Spent on Projects |
|---|---|--------------------------------|---------------------------------|
| WIRB | Amended Budget \$244,706.29 | \$235,536.25 | 34% |
| NRCS Technical Support | \$9,900.00 | \$9,870.00 | 1% |
| EQIP | \$38,421.00 | \$71,431.76 | 10% |
| IFIP | \$87,900.00 | \$76,851.71 | 11% |
| CRP | \$37,278.00 | \$18,427.95 | 3.0% |
| IDALS-DSC | \$10,500.00 | \$16,325.00 | 2.0% |
| Recipient | \$121,761.00 | \$261,142.69 | 38% |
| Total | \$550,466.29 | \$689,585.36 | 100% |

Watershed Improvement fund Contributions:

Approved application budget 46%

Actual 34%

Environmental Accountability

The assessment was completed in 2008 which revealed environmental concerns such as stream bank erosion causing unnecessary sediment and other nutrients such as phosphorous from upland erosion to enter the main stream affecting water quality. Assessment findings determined that ephemeral gully erosion was estimated to be around 3,635 tons/year and the sediment delivery from upland sheet and rill erosion carried in runoff was approximately 9,588 tons/year. By installing 14 grade stabilization structures, 63 water & sediment control basins and 14,770 feet of terraces we have surpassed many of our project goals. Using the Sediment Delivery Calculator as a tool; a cumulative estimate loading reductions of 5,267.5 tons of sediment and 6,850.6 pounds of phosphorus per year was reduced from entering the creek.



The main challenge of the project was finding sites that have suitable conditions for Grade Stabilization Structures. Several landowners were interested in Grade Stabilization Structures but many had to forgo because of poor rocky conditions at the proposed site. This area consists of soils developed in loess consisting of gently sloping soils, convex ridge tops and upper side slopes and glacial till on strong to steep sided slopes. Areas of the watershed that are gently sloping support native grasses are mainly composed of Grundy, Haig and Arispe soils. Remaining areas are composed of glacial till soils that are steeper hillsides consisting of Gara, Pershing and Gosport soils. With such diversity in the lay of the land it made locating potential construction sites challenging.



Some landowners decided to take their land out of production and enroll it into the CRP program which impacted over 257 acres. Landowners also conserved soil loss by installing terraces and basins for erosion control on gradual sloping hills. Unfortunately, since this region of Monroe County is mostly crop ground, the project fell short of its initial goal of implementing 300 acres in grazing systems. There was only one applicant that enrolled over 110 acres into the grazing system which included the installation of two structures and 79 acres of new seeding; reducing 458 tons of sediment and 595 lbs. of phosphorus from entering Miller.

In the 1980's Cargill purchased land in the North east corner of Monroe County to start an ethanol complex. Since then, the corn milling plant has evolved and now covers around 2,000 acres. The main facility sits along the north side east corner of where Miller Creek outlet into the Des Moines River at Eddyville. In 2010, the company underwent several conservation mitigation projects that were solely funded by Cargill. Conservation practices as such are referenced in the email from Don Stephenson in **Appendix A**.

An updated analysis of the watershed was completed in October of 2013 incorporating new and current data of newly installed BMPS that have been completed since the beginning of the project in 2010. Updated data was generated by a DNR GIS Analyst of the before and after information from which maps were created. Information and tools have since been updated since 2008 assessment so changes in the maps were inevitable. *See Appendix B & C*

Table 3 Practice Activities

| BMP Practice | Unit | Planned Agreement | Amendment | Installed | Percent Completed | Load Reductions | |
|------------------------------------|------|-------------------|-----------|-----------|-------------------|-----------------|--------------|
| | | | | | | Sediment | P (Lbs.) |
| Grade Sta. Structures | EA | 15 | 13 | 14 | 100% | 3423.8 | 4,451 |
| Water & Sediment Basins | EA | 24 | 57 | 63 | 100% + | 687 | 893 |
| Terraces | FT | 6,000 | 14,690 | 14,770 | 100% + | 235 | 306 |
| Grazing System | AC | 300 | ----- | 110 | 36% | 84 | 109 |
| Fence (Incl. Exclusion Grade Sta.) | Ft | 21,000 | ----- | 6,701 | 32% | 59 | 77 |
| Cool Seeding | AC | 210 | ----- | 184 | 87% | 273.5 | 356 |
| Native/Warm Season Seeding | AC | 10 | ----- | 152 | 100% + | 265.2 | 345 |
| Other (Cargill Projects) | | | | | | 240 | 312 |
| Total | | | | | | 5267.5 | 6,849 |

Program Accountability

With on-going public outreach, educational activities were key to the project’s success. To kick-off awareness for landowners a special meeting was held mid-July of 2010 to discuss available funding for the watershed. One-on-one landowner contacts along with Field Day tours provided public education on how proper conservation efforts can help land productivity while also helping the environmental impact of the creek. A photo journal was kept of individual sites throughout the life of the project helping to create informational material for the public. Quarterly newsletters and informative hand-outs also kept the public aware of Miller Creek’s progress. Upon completion of the project, the District placed 6 metal signs at site locations throughout the watershed for continuing



Signage installed in highly trafficked areas at practice locations



Jess Jackson, NRCS Grazing Specialist, presenting at a Field Day on a newly installed grazing practice

public awareness of the watershed and of water quality projects completed.

One significant challenge was the resignation of the original Watershed Coordinator the fall of 2012 project year. Although the project was without a Coordinator for only three months it had a big impact. Retraining a new coordinator takes time from the project because of the many hours of training before they are up to speed on the position of a Coordinator. Many projects are never fully completed due the fact employment funds are solely funded by the grant. In the future, finding a way to give coordinators an opportunity for permanent employment will secure project implementation while also preventing the district losing time and money for additional training for another coordinator.

Last October Iowa Secretary of Agriculture, Bill Northey made an impromptu visit to Monroe County to meet with staff and landowners who have implemented conservation practices this past year. Secretary Northey was able to view a Grade Stabilization Structure near Albia, Iowa. Secretary Northey met with landowners Ronald and Sharon Reed at their latest conservation improvement, a grade stabilization structure, in the Miller Creek Watershed. Partnering sponsors of the watershed project were also on hand to discuss the project details and answer any questions Secretary Northey had.

–Article by Stacy Wickman



Conclusion

In conclusion, the Miller Creek Watershed Project was successful in accomplishing its major goals as set forth in the signed agreement. Miller Creek’s Phase I project has increased the knowledge and interest of landowners and producers that good conservation ethics will help the over-all health and sustainable aesthetics of the watershed. While approaching the end of the three year project, many landowners expressed interest in wanting to still complete more conservation practices. In order for the Monroe SWCD to give everyone an opportunity that had signed up or finish planned practices, an additional management plan was developed as Phase II which will be completed by June 2014.

Appendix A Email from Don Stephenson on Cargill funded projects for the purpose of mitigation

From: Don Stephenson
To: Shumate, Linda - NRCS, Albia, IA
Subject: RE: Miller Creek Watershed Project
Date: Wednesday, April 03, 2013 8:22:32 AM

Thanks for your patience. Here is the info:

The following practices were installed in the Miller Creek watershed during 2010:

21.3 acres of emergent wetlands
5.6 acres of forested wetlands
1.3 acres of deep water within two ponds and 1.8 acres of fringe wetland around these two ponds.
9 rock riffles in Miller Creek
8.4 acres of buffer strip adjacent to Miller Creek
Planting of 11.9 acres of timber in the bottom land adjacent to Miller Creek.

These projects were completed with Cargill funds. The purpose of these projects was for mitigation.

From: Don Stephenson [mailto:Don_J_Stephenson@cargill.com]
Sent: Friday, March 15, 2013 9:41 AM
To: Shumate, Linda - NRCS, Albia, IA
Subject: RE: Miller Creek Watershed Project

From: Shumate, Linda - NRCS, Albia, IA [<mailto:Linda.Shumate@ia.nacdnet.net>]
Sent: Tuesday, March 12, 2013 2:25 PM
To: Don Stephenson
Subject: FW: Miller Creek Watershed Project

Good Afternoon,

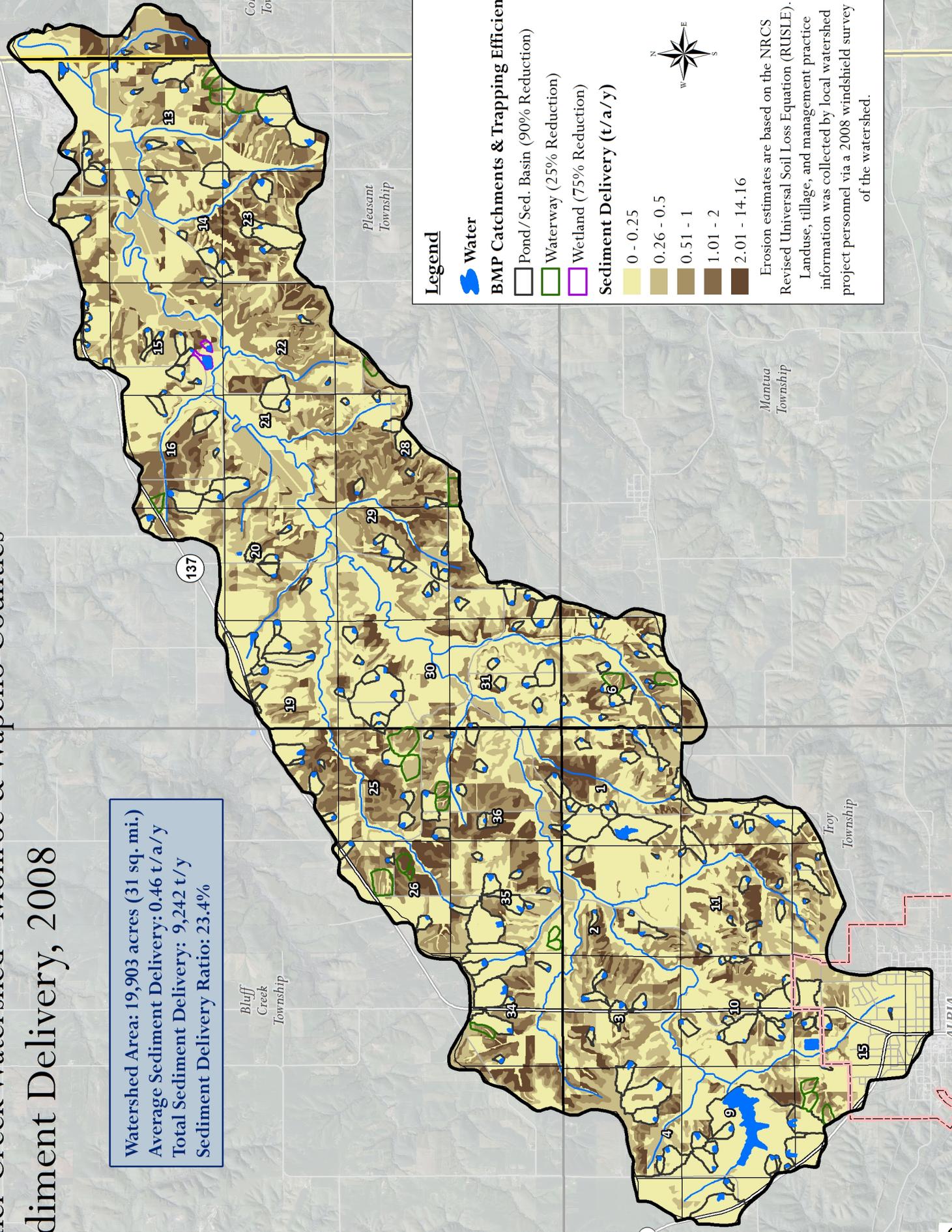
My name is Linda Shumate and I work for the Monroe County Soil & Water Conservation District. I received your contact information from Betty Voss, who said you would be the person I need to contact. I was hired last December to replace the previous Watershed Coordinator, Jo Runnells. I was updating our ledger and maps for the Miller Creek Watershed Project and was wondering if you could provide some information. As you may already be aware, we received grant money from the Watershed Improvement Review Board (WIRB) to help implement conservation practices with in the watershed. The WIRB Board requests we submit a ledger showing the progress that has been made and what type of funding sources were used. On the ledger it indicates as Grant funding or "Other", meaning landowners opted to implement conservation methods on their own. We are able to show the success of installed practices even if it was not funded by WIRB. If conservation practices were installed with "Other" than WIRB funding, we do not need to know actual dollar amounts spent, just practice types and acres. With this said, would you be able to provide any of this information? If so, all I would need is the type of conservation practices that were installed such as: new seeding, ponds, or wetlands, terraces, tree planting, riparian buffers etc., and the number of acres each practice covered. A general idea of where it was located in the watershed would also be helpful so I can create new maps showing before and after results for sediment loss into the creek. Mrs. Runnells possible spoke with someone a while back regarding this because she indicated on the ledger work had been completed and gave practices types and dollar amounts. Although she accounted for this on the ledger, there was no information who she spoke with, maps or anything to explain how this information was obtained, so I am not able to use this. Any information would be greatly appreciated. Thank you for your time.

Sincerely,

Linda Shumate, Monroe County Watershed Coordinator
641-932-2746 Ext. 112

Miller Creek Watershed - Monroe & Wapello Counties Sediment Delivery, 2008

Watershed Area: 19,903 acres (31 sq. mi.)
 Average Sediment Delivery: 0.46 t/a/y
 Total Sediment Delivery: 9,242 t/y
 Sediment Delivery Ratio: 23.4%



Legend

- Water
- Pond/Sed. Basin (90% Reduction)
- Waterway (25% Reduction)
- Wetland (75% Reduction)

Sediment Delivery (t/a/y)

- 0 - 0.25
- 0.26 - 0.5
- 0.51 - 1
- 1.01 - 2
- 2.01 - 14.16

BMP Catchments & Trapping Efficiencies

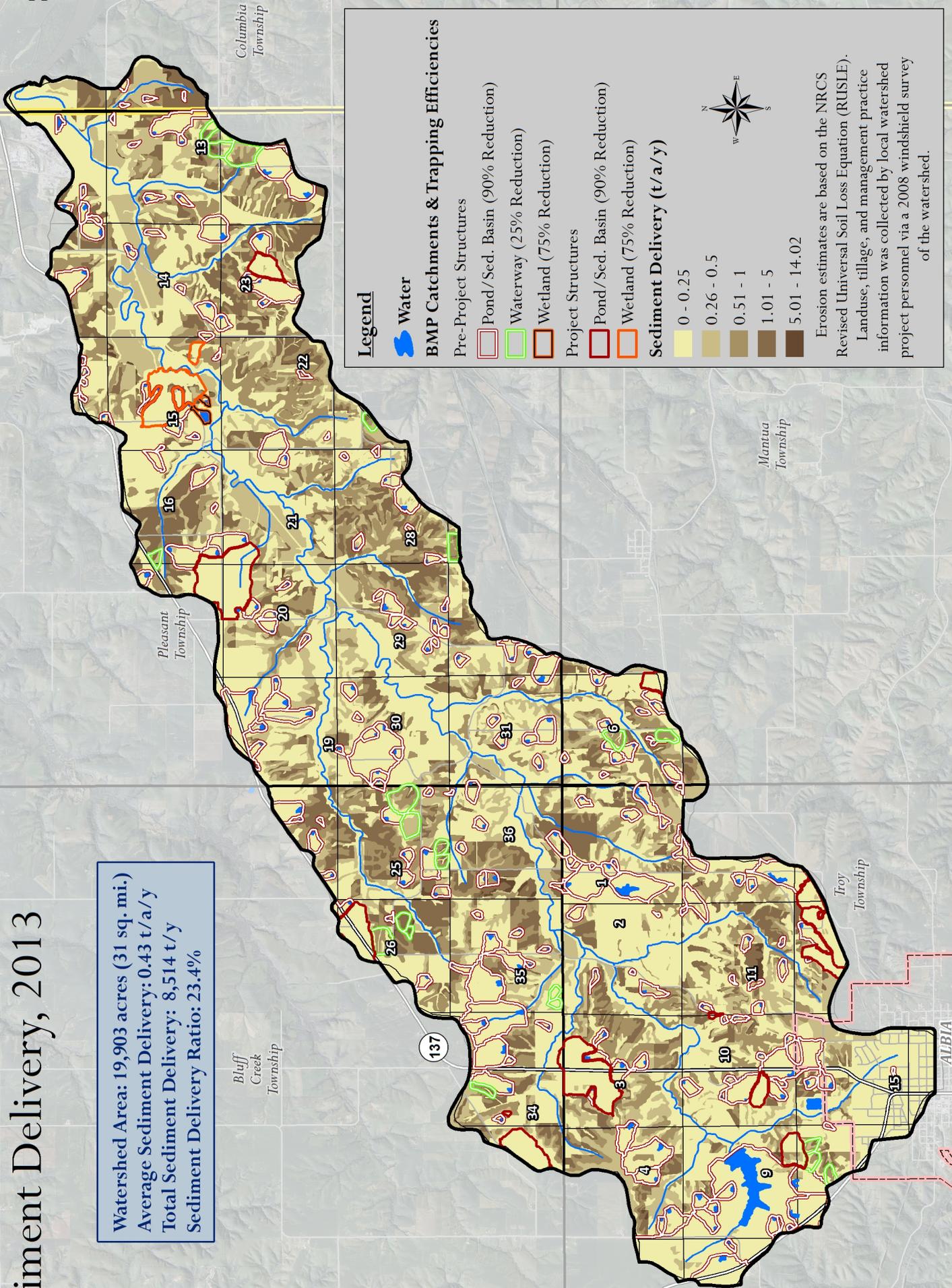
- Pond/Sed. Basin (90% Reduction)
- Waterway (25% Reduction)
- Wetland (75% Reduction)

Erosion estimates are based on the NRCS Revised Universal Soil Loss Equation (RUSLE). Landuse, tillage, and management practice information was collected by local watershed project personnel via a 2008 windshield survey of the watershed.



Miller Creek Watershed - Monroe & Wapello Counties Sediment Delivery, 2013

Watershed Area: 19,903 acres (31 sq. mi.)
 Average Sediment Delivery: 0.43 t/a/y
 Total Sediment Delivery: 8,514 t/y
 Sediment Delivery Ratio: 23.4%



Legend

- Water
- BMP Catchments & Trapping Efficiencies**
 - Pre-Project Structures
 - Pond/Sed. Basin (90% Reduction)
 - Waterway (25% Reduction)
 - Wetland (75% Reduction)
- Project Structures**
 - Pond/Sed. Basin (90% Reduction)
 - Wetland (75% Reduction)
- Sediment Delivery (t/a/y)**
 - 0 - 0.25
 - 0.26 - 0.5
 - 0.51 - 1
 - 1.01 - 5
 - 5.01 - 14.02

N, S, E, W

Erosion estimates are based on the NRCS Revised Universal Soil Loss Equation (RUSLE). Landuse, tillage, and management practice information was collected by local watershed project personnel via a 2008 windshield survey of the watershed.

