

**Little Clear Lake Watershed**  
**Final Project Report**

Project 7017-006 Little Clear  
Lake Watershed Project  
Term of WIRB grant  
1-1-2008 to 12-31-2010

**Table 1**

<b>Summary: Watershed Improvement Funds</b>				
<b>Grant Agreement Budget Line Item</b>	<b>Initial Funds Approved (\$)</b>	<b>Amended Funds Approved (\$)</b>	<b>Total Funds Expended (\$)</b>	<b>Available Funds (\$)</b>
<b>Supplies</b>	\$500	\$500	\$178.84	\$321.16
<b>Information &amp; Education</b>	\$1500	\$1500	\$678.87	\$821.13
<b>Legal Easement Survey</b>	\$0	\$1250	\$1250	0
<b>Perpetual Easement Payment</b>	\$0	\$5000	\$5024	\$(24)
<b>Wetlands Development or Restoration</b>	\$40,000	\$33,750	\$12,244.82	\$21,505.18
<b>TOTAL</b>	<b>\$42,000</b>	<b>\$42,000</b>	<b>\$19,376.53</b>	<b>\$22,623.47</b>

The financial accountability table above points out that \$19,376.53 of the original allocation of \$42, 000 was used in various ways for the Little Clear Lake WIRB Watershed project to enhance water quality and educate the public about water quality issues.

The budget that was submitted with the original grant application was followed as a guide for the bidding processes of the implemented practices. In reality the Pocahontas SWCD used the WIRB funds for the installation of a critical wetland practice within the Little Clear Lake Watershed to filter and treat approximately 90 acres of tile drained agricultural land. This practice totaled \$18,518.82. The wetland installed is an innovative practice used to treat tile flow to reduce nitrates and some phosphorous to the lake. In recent Iowa State University studies practices similar to this have proven that these wetlands can be credited to a 50% - 90% reduction in nitrates from tile water. This practice is treating approximately 26% of the watershed.

With regards to the unspent WIRB balance the project was assisted with Conservation Reserve Program Wetlands practices in the watershed. The two CRP projects will total \$10,574.70. The only actual changes that were made is that funds were used to complete a land survey while purchasing a perpetual easement for the wetland from Mike Nedved dba Nedved Farms.

**Table 2**

<b>Funding Source</b>	<b>Approved Application Budget (\$)</b>	<b>Total Actual (\$)</b>
WIRB	42,000	19,376.53
CRP	8,100	10,574.70
IFIP	8,750	0
Pocahontas County Foundation	0	1739.63
Pocahontas County Conservation Board	1,500	470
Landowners	9,650	
<b>Totals</b>	<b>70,000</b>	<b>32,160.86</b>

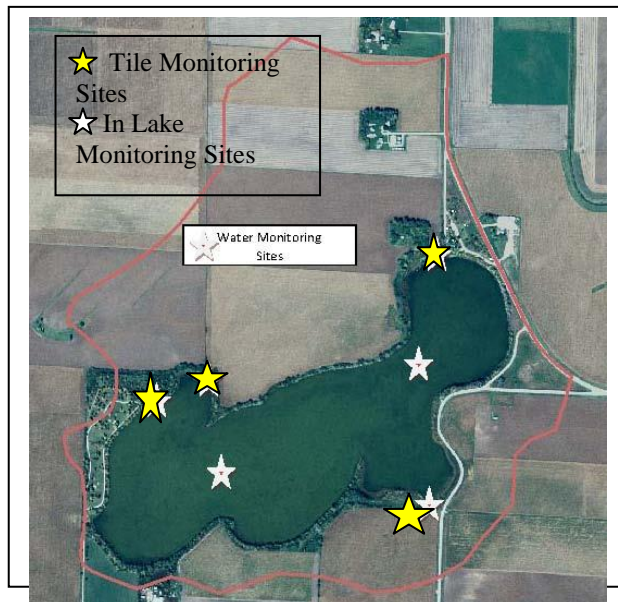
Watershed Improvement Fund contribution: Approved application budget: 60%  
Actual: 60%

Table 2 shows how we used other funding sources in addition to those planned to exceed our overall budget estimate. The largest increase came from CRP. The CRP continues to be one of the most widely used conservation program in Pocahontas County.

Environmental Accountability

The data below shows that there is a lot of variability in the tile water samples according to times of year and weather patterns. Nitrate values range from a low of 0.15 ml to 21 ml. The high levels are generally due to rain events in the spring and leaching through drainage tile. P levels run from .02 ppm to 0.21 ppm and again this is a reflection of time of year and storm events. There is sediment movement through the tiles and it is evident that it coincides with P levels. The highest levels occurred in the spring of the year during storm events.

**Water Testing Sites In-Lake and Tile Outlets**



Little Clear Lake In Lake Samples	Total Kjeldahl Nitrogen (ppm)	Secchi Disk (ppm)	Total Suspended Solids (ppm)	Nitrite Nitrogen as N (ppm)	Total Phosphate as P
10 year Iowa Average	1.2 ppm	.8m	11.2mg/L	1.6 mg/L	.07mg/L
Date					
7/19/2006	5.8 ppm	.2m	56	<0.05	0.34
9/26/2006	5.4 ppm	.1m	74	<0.05	0.25
6/5/2006	3.8 ppm	.3m	34	<0.05	0.18
5/10/2007	3.1 ppm	.6m	10	1.1	0.13
6/12/2007	3.1 ppm	.7m	11	<0.05	0.1
6/13/2007	3.3 ppm	.8m	11	<.05	.02

Little Clear Tile Samples	E coli Colonies/ 100 ml	Nitrate + Nitrite Nitrogen as N (ppm)	Total Phosphate as P (ppm)
10 year Iowa Average	126/100m L	10 ppm	.07 ppm
Site/Date			
3/22/2007	n/a	11	0.14
Clear East 4/26/07	120 / 100ml	21	0.21
Clear West 4/26/07	54 / 100ml	20	0.17
4/29/2008 New Tile	<10	0.15	0.1
4/29/2008 Tile 2W	<10	15	0.02
4/29/08 Nedved Tile	<10	17	0.06

In the above tables are some of the monitoring results that we obtained from in-lake sampling and tile outlet sampling. The in lake samples surpassed Iowa's 10 year average in 4 of the 5 categories 90% of the time. This is an indication that this lake is in a eutrophic or highly eutrophic state or is organically enriched which explains the algal blooms in the spring, summer, and fall. The tile samples indicate the same scenario. In these instances this is how the nutrients are transported to lakes. Out of six sampling times the level of nitrates and phosphate exceeded the 10 year Iowa average 5 times for nitrates and 4 times for phosphates

As with most tile drained systems nutrients are a major concern where tiles outlet. The watershed is 350 acres outlet to Little Clear Lake. 85% of this is tile drainage while there is also overland flow into the lake from adjacent ag lands. Typically most of the phosphorous loaded to the lake is from surface flow and sedimentation to the lake. While an effort was made to buffer the perimeter of the lake the success rate was low. Land owners felt that they were not contributing sediment to the lake. As is seen above the P loading is not overly extreme but is still present and also accelerates algal blooms within the lake.

Computer modeling used to estimate sheet and rill erosion shows that the average was 1.74 tons/acre/year with some acres being as high as 5 to 8 tons/acre/year. The average sediment delivery for the watershed was estimated at 0.12 tons/acre/year with total sediment delivery at 44 tons/year.

Our practices have treated approximately 165 acres of cropland within the watershed. According to computer modeling done that should reduce sediment delivery to Little Clear Lake by 19.2 acres per year if you take the average soil loss of .12 tons/acre/year into consideration. Our original application goal was 26.5 tons/year reduction. The project achieved 74% of the original goal. To take it a step further the nutrient reduction can be calculated at 25 lbs/P per year that will not reach Little Clear Lake.

## Program Accountability

### Summary: Practices and Activities

Practice or Activity	Unit	Approved Application Goal	Accomplishments	Percent Completion
Created Wetland/Tile Water Infiltration	No.	1	1	100%
Wetland Restoration	Ac	3	2	67%
CRP Buffers	Ac	15 ac	7.4	49.3%
Advisory Council Meetings	No.	8	6	75%
BMP Field Days/Public Field Days	No.	3	3	100%
News Releases	No.	8	5	63%
Project Newsletter	No.	16	8	50%
Grassed Waterways	Ft	1000	0	0%
Grade Stabilizations	No.	3	0	0%

The goals for the application of program goals was of general success even though there was only work done with basically 2-3 landowners. The impact that these landowners had on this watershed will only help the biology of the lake which will help with water quality. With three practices installed at targeted locations we will be reducing nitrate input into the lake by outletting tile into 3 wetlands. These impoundments will be treating approximately 165 acres, 47% of the watershed, of tile drained landscape before entering Little Clear Lake. This will also eliminate some P loading by holding water in the upland or adjacent to the lake. While these practices are exemplary for nutrient reduction there was also 222.4 acres or 64% of the watersheds conservation plans redone within the watershed documenting nutrient management, residue management, crop rotation, and conservation cover which will all reduce sediment and nutrient delivery to Little Clear Lake.

The Little Clear Lake advisory committee was intent upon educating citizens in the county about Little Clear Lake. The Committee consists of 6 individuals that met diligently for once a month for eight months during the project and the results speak for themselves.

Below are bulleted activities that took place during the two year period:

- **2 Shallow Lake Management Meetings**
  - Wisconsin DNR
  - Iowa DNR
  - Combined 158 participants
  - General public and agency personnel
- **5 Newspaper articles/news releases**
  - Shallow water management
  - Conservation Programs-BMPs
- **8 Project Newsletters**
  - 58 person mailing list
  - General water quality topics
  - General innovative drainage and farming practices
  - Conservation Reserve Program

- **3 Field Days/Clean Up Days**
  - 1 Strip Nutrient Strip Trial w/ ISA
  - 2 Lake area Cleanup days

The Pocahontas SWCD also applied for a county foundation grant to upgrade the Little Clear Lake roadside park. The overall plan was to establish an ecosystem education area that includes a warm season tall grass prairie, a restored savannah, and a managed woodlot with native hardwoods. There will be separate informational stations located on a trail throughout the area along with an informational kiosk for visitors. The grant award was \$3000 towards the materials for the kiosk and informational centers. The roadside park was cleared spring 2010 and is being managed for the re-emergence of warm season grasses present on site while the informational kiosks with signs were installed to educate the public about the diversity of the area.

In an effort to control sediment and nutrient loading the Little Clear Lake Watershed Protection Plan has implemented three sediment catch/tile flow basins which function to neutralize and infiltrate tile water while also stabilizing concentrated flow areas. The first basin was created on approximately 1.5 acres of cropland and will intercept approximately 90 acres of agriculture land.

Another implemented wetland area is located on the southeast corner of the lake adjacent to state owned land and receives approximately 35 acres of tile and surface flow. The idea is to catch and hold the water to settle out the sediment and nutrients. Both of these wetland basins will directly benefit the lake by removing and reducing sediment delivery from approximately 165 acres of the agricultural watershed as well as nutrients from tile drainage which is roughly 38% of the agricultural land in the watershed.

To further eliminate sediment and nutrients from entering Little Clear Lake the Little Clear Lake Watershed Protection Project designated 5 sites for grade stabilization structures to eliminate head cutting up the shoreline from overland concentrated flow. The landowner targeted for 3 of these structures would not cooperate with the thinking that the natural buffer intercepts this.

