



# Lac qui Parle Yellow Bank Watershed Terrain Analysis



## Clean Water Funds: 2013

Clean Water Grant	\$66,572
Leveraged Funds*	\$16,643
Total Project Budget	\$83,215

\* Leveraged Funds include required 25% local match

### Project Sponsor:

Lac qui Parle-Yellow Bank Watershed District

### Grant Period:

January 2013—December 2015

### Project Contact:

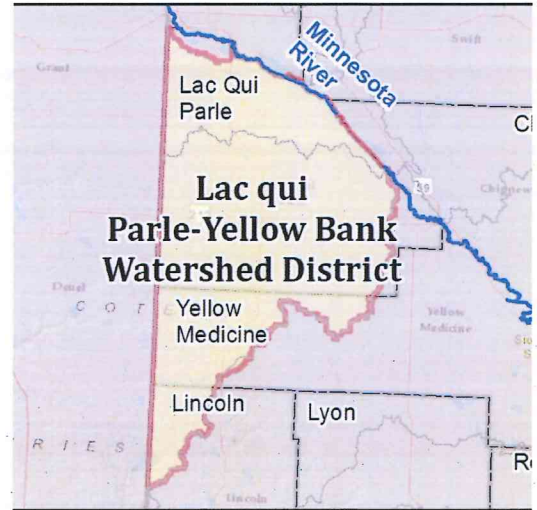
Mary Homan



Accelerated CWF13-132ed implementation

## Project Narrative

The Lac qui Parle-Yellow Bank Watershed District will contract with the Water Resource Center at the Minnesota State University in Mankato to complete a Geographic Information System (GIS) terrain analysis for the watershed. It will concentrate on the impaired reaches of the Lac qui Parle and Yellow Bank Rivers and tributaries. This inventory will utilize LiDAR elevation datasets to create many GIS datasets by spatially analyzing the elevation data. Multiple watershed maps will be developed and will show priority ranking of conservation practices and areas to target based on environmental sensitivity variables.



This analysis will provide valuable data for future planning and prioritizing of projects when partnering with Lac qui Parle, Yellow Medicine and Lincoln County Soil and Water Conservation Districts and Natural Resource Conservation Service offices. The precision conservation strategies involving LiDAR based DEM terrain analysis, will prove its worth in future planning with conservation efforts tailored to the specific landscapes and in the placement of practices within the critical source areas.

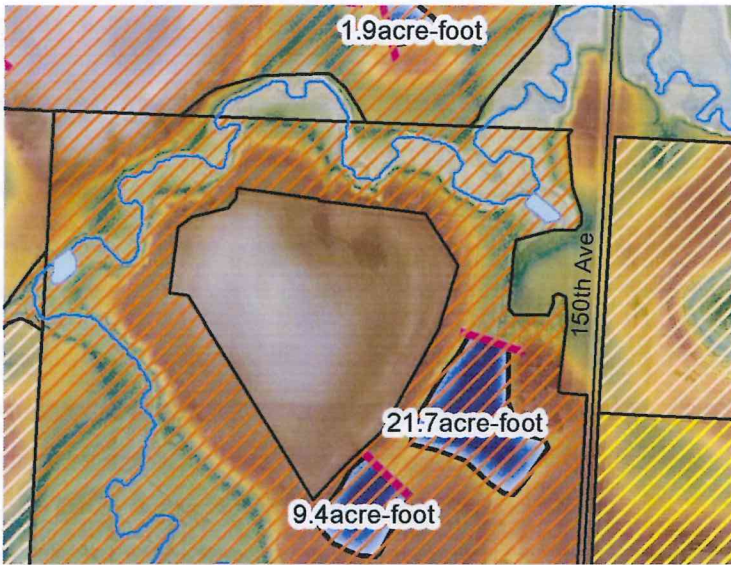
### Proposed Outcomes:

1. Create a LiDAR dataset that can be used to develop accurate hydrologic characteristics of the watershed.
2. Assess existing watershed conditions and identify critical source areas using Stream Power Index, the Compound Topographic Index, and Environmental Benefit Index
3. Share results with each county

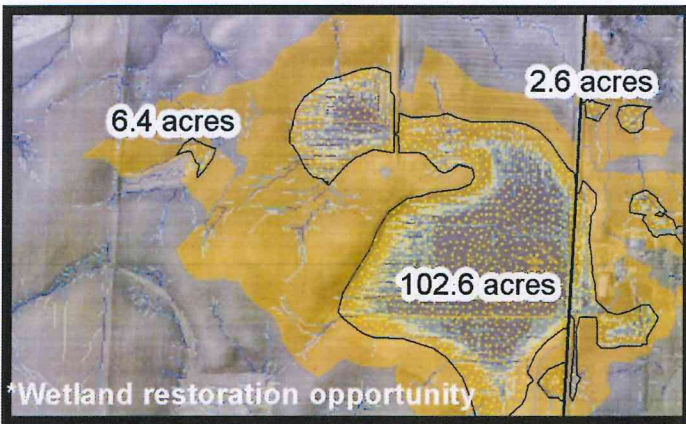
### Actual Outcomes:

1. A LiDAR and GIS dataset that accurately reflects the hydrologic characteristics of the watershed was completed.
2. Critical source areas have been identified in the watershed for erosion vulnerability, suitability of best management practices, streambank management, water storage and wetland restoration opportunities.
3. A training seminar for partnering agencies was provided with dataset on jump-drive, user manual, and technical document with maps for two subwatersheds.

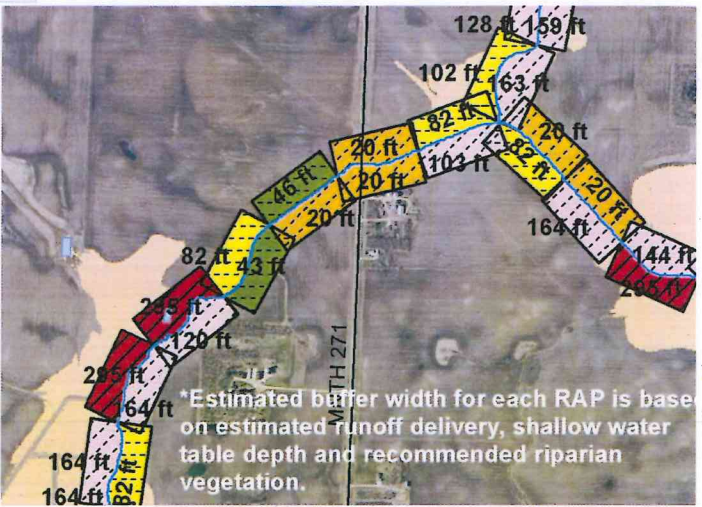




Illustrates placement and size of Water and Sediment Control Basins that has been identified as having a risk of "Critical" ranking.



Compound Topographic Index identifies water storage and wetland restoration opportunities by estimating ponding sites based on modeled overland surface flow.



Riparian zone management based on soil type, runoff and morphological features and identifies estimated widths of streambank management and prioritization.



# Lac qui Parle-Yellow Bank Watershed District – GIS Terrain Analysis FY 2014 Clean Water Fund, Accelerated Implementation Grant

<http://www.bwsr.state.mn.us/cleanwaterfund/stories/>



**Clean Water Fund Grant**  
Competitive Grant \$66,572.00

**Leveraged Funds**  
Match \$16,643.00

**Funds Returned to State**  
Type \$ .00  
Date Fund Returned: NA

**Grant Period (incl. extensions)**  
From: 2/12/2013  
To: 12/31/2015

## State Cost Share Expenditures by Category

### Administration/Technical

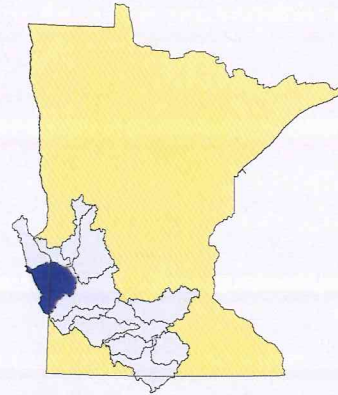
Administration/ Coordination	\$0
Technical/ Engineering Assistance Milestone 1	\$44,065.15
Technical/ Engineering Assistance Milestone 2	\$0
Technical/ Engineering Assistance Milestone 3	\$0

**Total Expenditures \$44,065.15**

### PROJECT CONTACT

Mary Homan,  
320-598-3319  
Mary.homan@lqpc.com

Lac qui Parle-Yellow Bank  
Highlighted in blue.



### Overall Project Description

The Lac qui Parle-Yellow Bank Watershed District has contracted services with the Water Resource Center at the Minnesota State University, Mankato, MN. Rick Moore, Watershed Research Scientist will complete the GIS terrain analysis. There are three milestones in this project. Milestone 1 includes the creation of burnlines/culvert inventory and hydrologically corrected digital elevation models (DEM's). From the burnlines, drain tiles and other data will be incorporated into the GIS database and will result in hydrologically corrected DEM's. A culvert verification was completed in May 2014 by LqP-YB staff and inputted into data to update conditioning of DEM's. NRCS watershed delineation tools have been used for additional identification and flowpaths on the land. Discussions held with Technical Service Area 5 and Houston Engineering led to additional training to identify non-contributing areas and analysis to identify depressions that will fill with water and not contribute in a rain event that is a 24 hour, 10 year event. This analysis will make data sets the same across southwest Minnesota. Ten Mile Creek had a more thorough analysis completed for a group presentation of this project. Milestone 2 includes the calculation of secondary attributes using the hydrologically corrected DEM's. These include stream power index (SPI) and compound topographic index (CTI) layers that will be used to determine locations of high erosion and depressional areas in the watershed. The indexes will be figured for each catchment area including bluff and ravine areas. Milestone 3 identifies focus areas for different conservation BMP's. This includes identifying the focus areas from the analysis completed earlier and will identify focus areas for different BMP's based on LiDAR analysis. It will identify sensitive focus areas from the SPI and CTI layer. No additional work has been completed in Milestone 2 and 3 except for the preliminary work in Ten Mile Creek. Administration and coordination of this project is in-kind from the Lac qui Parle-Yellow Bank Watershed District

Accelerated projects target Implementation





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### State Cost Share Expenditures by Category

#### Administration/Technical

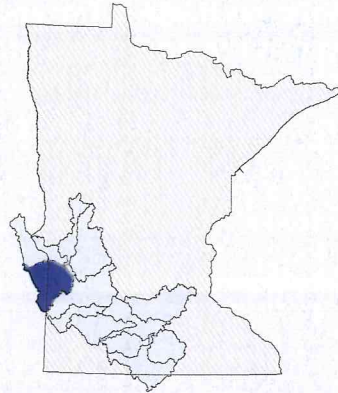
Administration/Coordination	\$0
Technical/Engineering Assistance Milestone 1	\$13,314.40
Technical/Engineering Assistance Milestone 2	\$0
Technical/Engineering Assistance Milestone 3	\$0

**Total Expenditures \$13,314.40**

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Accelerated projects target Implementation