

# **Final Report**

**Rathbun Lake Special Project:**  
**BMPs for Priority Land in**  
**Targeted Sub-Watersheds 2008**  
**8008-004**

**2009 - 2012**

## **Table of Contents**

### **FINANCIAL ACCOUNTABILITY**

**Expenditure of watershed improvement funds and total project funds**

### **ENVIRONMENTAL ACCOUNTABILITY**

**Water quality improvement practices applied and results achieved**

### **PROGRAM ACCOUNTABILITY**

**Activities to support the application of water quality improvement practices**

## **FINANCIAL ACCOUNTABILITY**

### **Expenditure of watershed improvement funds and total project funds**

Iowa Watershed Improvement Review Board (WIRB) financial support enabled the Rathbun Land and Water Alliance to make significant progress toward accomplishment of planned objectives for the *Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds 2008*. Specifically, WIRB funding helped the Alliance and its partners, including cooperating landowners, install best management practices (BMPs) in the Chariton River #2 targeted sub-watershed of the Rathbun Lake watershed that will achieve 75% of the project's priority land treatment objective. These BMPs will result in a substantial reduction in the estimated annual sediment and phosphorus delivery from this land to the lake and its tributaries (55% and 59% of project objectives respectively).

The Alliance expended Watershed Improvement Funds for project activities in accordance with the grant agreement as amended. Please refer to the Summary of Watershed Improvement Funds Approved, Expended, and Balance in Table 1. A complete financial ledger for the term of the grant agreement accompanies this report.

<b>Grant Agreement Budget Line Item</b>	<b>Total Funds Approved (\$)</b>	<b>Total Funds Approved - Amended (\$)</b>	<b>Total Funds Expended (\$)</b>	<b>Available Funds (\$) <sup>a</sup></b>
Contracted Assistance	32,250.00	10,300.00	2,575.00	7,725.00
Terraces	104,742.00	209,104.00	131,931.08	77,172.92
Structure (debris basin)	50,000.00	0.00	0.00	0.00
Grade Stabilization Structures	32,412.00	0.00	0.00	0.00
Water and Sediment Control Basins	19,296.00	19,296.00	10,246.57	9,049.43
Grassed Waterways	2,643.00	2,643.00	0.00	2,643.00
Priority Land Conversion	3,936.00	3,936.00	0.00	3,936.00
Totals	245,279.00	245,279.00	144,752.65	100,526.35
Difference				100,526.35

<sup>a</sup> The Alliance, partners, and landowners did not expend all of the available Watershed Improvement Funds. Factors which resulted in the expenditure of less funds than available were the length of the project period and landowner preference for in-field practices to support row crop production. More information on the impact of these factors on project activities will be presented in the Environmental Accountability section of this report.



## ENVIRONMENTAL ACCOUNTABILITY

### Water quality improvement practices applied and results achieved

The Alliance and its partners, with financial support from the Iowa WIRB, assisted landowners to apply BMPs for priority land in the Chariton River #2 targeted sub-watershed of the Rathbun Lake watershed. The original project objective was to assist landowners to apply BMPs for 1,450 acres, at least 725 acres of which would be priority land. The BMPs applied would reduce the annual amounts of sediment and phosphorus that are carried in runoff from priority land and impair water quality in the lake and its tributaries by 2,160 tons and 8,210 pounds respectively. Table 3 presents a summary of the BMPs planned and applied.

Practice or Activity and Units	Approved Application Goal	Amended Application Goal	Planned Practices and Activities	Percent Planned	Completed Practices and Activities	Percent Completion
Terraces (ft.)	75,660	117,500	68,200	58	65,970	56
Structure – Debris Basin (no.) <sup>b</sup>	1	0	0	0	0	0
Grade Stabilization Structures (no.)	15	0	0	0	0	0
Water and Sediment Control Basins (no.)	48	48	5	10	5	10
Grassed Waterways (ac.)	6	6	0	0	0	0
Priority Land Conversaion (ac.)	45	45	0	0	0	0
Contractual Assistance (hr.) <sup>c</sup>	2,280	700	700	100	360	51

<sup>a</sup> As mentioned, the length of project period and landowner preference for in-field practices to support row crop production were primary reasons that fewer units of planned practices were installed. Please refer to the additional information below.

<sup>b</sup> Staff assisted two landowners plan the construction of a debris basin to control runoff from 150 acres. Design and construction of the debris basin will require additional time and not be completed until after the end of the project period.

<sup>c</sup> Technical assistance in addition to that provided by project partners was not required to the extent originally planned.

**ENVIRONMENTAL ACCOUNTABILITY contd.**

The BMPs and activities completed resulted in the treatment of more than 640 acres, of which close to 500 acres were priority land. The practices will reduce the delivery of sediment and phosphorus to Rathbun Lake and tributaries in the lake’s watershed by an estimated 1,200 tons and 4,500 pounds per year respectively. Table 4 presents a summary of planned and achieved land treatment and water quality benefits.

Table 4 Summary of Land Treatment and Water Quality Benefits						
Land Treatment, Water Quality Benefit, and Units	Approved Application Goal	Amended Application Goal	Based on Planned Practices	Percent Based on Planned	Based on Completed Practices	Percent Based on Completed
Total Land Treated with BMPs (ac.)	1,450	1,305	662	51	642	49
Priority Land Treated with BMPs (ac.)	725	655	506	77	490	75
Reduced Annual Sediment Delivery (tn.)	2,160	2,170	1,320	61	1,202	55
Reduced Annual Phosphorus Delivery (lb.)	8,210	7,740	5,015	65	4,567	59

As indicated, the Alliance and partners, including cooperating landowners, made significant progress toward the accomplishment of, but did not achieve, anticipated levels of BMP application in terms of acres treated and sediment and phosphorus load reductions. Project length was the principal reason that the actual number of acres for which BMPs were applied and associated reductions in annual sediment and phosphorus delivery did not meet project objectives.

**Impact of Project Length:** As previously reported, the three-year period associated with early Iowa WIRB grant agreements did not provide the time required to fully implement the plan of work developed for this project. It is important to note, however, that the Alliance and its other partners will continue to work with landowners on the planned application of BMPs for priority land in the Chariton River #2 targeted sub-watershed beyond the end of this grant agreement’s project period. Funds from sources other than this WIRB grant which can be expended over a longer period of time than the initial three years of the project will be used to share the cost of continuing to apply these practices with landowners. The Alliance will continue to track and report progress in applying BMPs in the targeted sub-watershed and the associated reduction in sediment and phosphorus delivery to Rathbun Lake. The Alliance can make these reports of future project accomplishments available to the Iowa WIRB. The five-year project period which can now be allowed for Iowa WIRB grant agreements should facilitate the application of planned BMPs in these projects.

## **ENVIRONMENTAL ACCOUNTABILITY contd.**

Mention should also be made of two other factors that impacted the implementation of project activities and achievement of project objectives: landowner preference for in-field practices to support row crop production and increased costs of BMP application.

**Landowner Preference:** Relatively high prices for corn and soybeans in recent years have influenced land use and BMP decisions by many landowners in the Rathbun Lake watershed. The most notable impact on land use in the watershed has been the conversion of land previously enrolled in the Conservation Reserve Program (CRP) to row crops. Since 2006, an estimated 16,000 acres in the Rathbun Lake watershed have been converted from CRP to corn and soybean production. This land use conversion reduced the number of acres in the watershed enrolled in CRP by approximately one-third. At the same time, landowners in the Rathbun Lake watershed have demonstrated a strong preference for in-field BMPs that support row crop production, i.e., terraces, as opposed to practices that may reduce row crop acres or support alternative land uses, i.e., debris basins, grade stabilization structures, and priority land conversion. As such, landowners in the Chariton River #2 targeted sub-watershed worked with project staff to apply primarily terraces and were less interested in other practices they did not consider directly supportive of row crop production.

**Increased Costs:** The cost of constructing structural practices such as terraces, grade stabilization structures, and water and sediment control basins increased significantly during the three-year project period. As an example, the construction cost for terraces, the BMP most commonly applied by landowners, increased by close to 20% during this period from an average of \$6.73 per foot to \$7.98 per foot. Increased costs can limit landowners' ability to finance their portion of BMP installation and result in fewer practices that can be applied with a given amount of cost share funds from other project partners. In this way, increased costs of applying BMPs impact the achievement of project objectives for acres of land treatment and water quality benefits in terms of reduced sediment and phosphorus delivery to Rathbun Lake.

A geographic information system (GIS) map of the Chariton River #2 targeted sub-watershed accompanies this report. This map presents the results of GIS analysis performed to identify priority land. The map also illustrates the locations of BMPs that have been planned and applied for priority land. In addition, the map presents the results of GIS analysis that evaluated the water quality benefits associated with BMPs applied for priority land in the targeted sub-watershed, that is, the estimated reductions in annual sediment and phosphorus delivery to Rathbun Lake and its tributaries.

## **ENVIRONMENTAL ACCOUNTABILITY contd.**

The Alliance and partners' water quality monitoring activities in Rathbun Lake and the lake's tributaries were carried out during the project period. The program consisted of monthly and event sample collection from 20 sites and analyses for sediment, nutrients, bacteria, and pesticides. Monitoring results are used to help identify water bodies in the watershed on Iowa's Section 303(d) List of Impaired Waters and assess water bodies in the watershed as part of Iowa's 305(b) Water Quality Report. The monitoring program is an ongoing effort that will continue after project completion. The Alliance and partners will continue to use monitoring results to assess water quality conditions in Rathbun Lake and its tributaries as well as to plan BMP application and evaluate, to the extent possible, the effectiveness of practices to protect and improve water quality.

## **PROGRAM ACCOUNTABILITY**

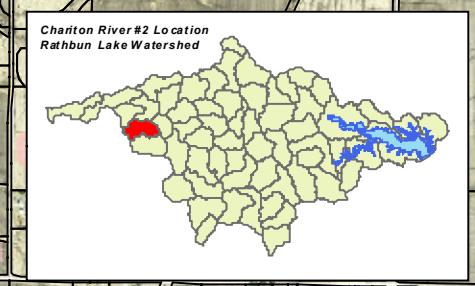
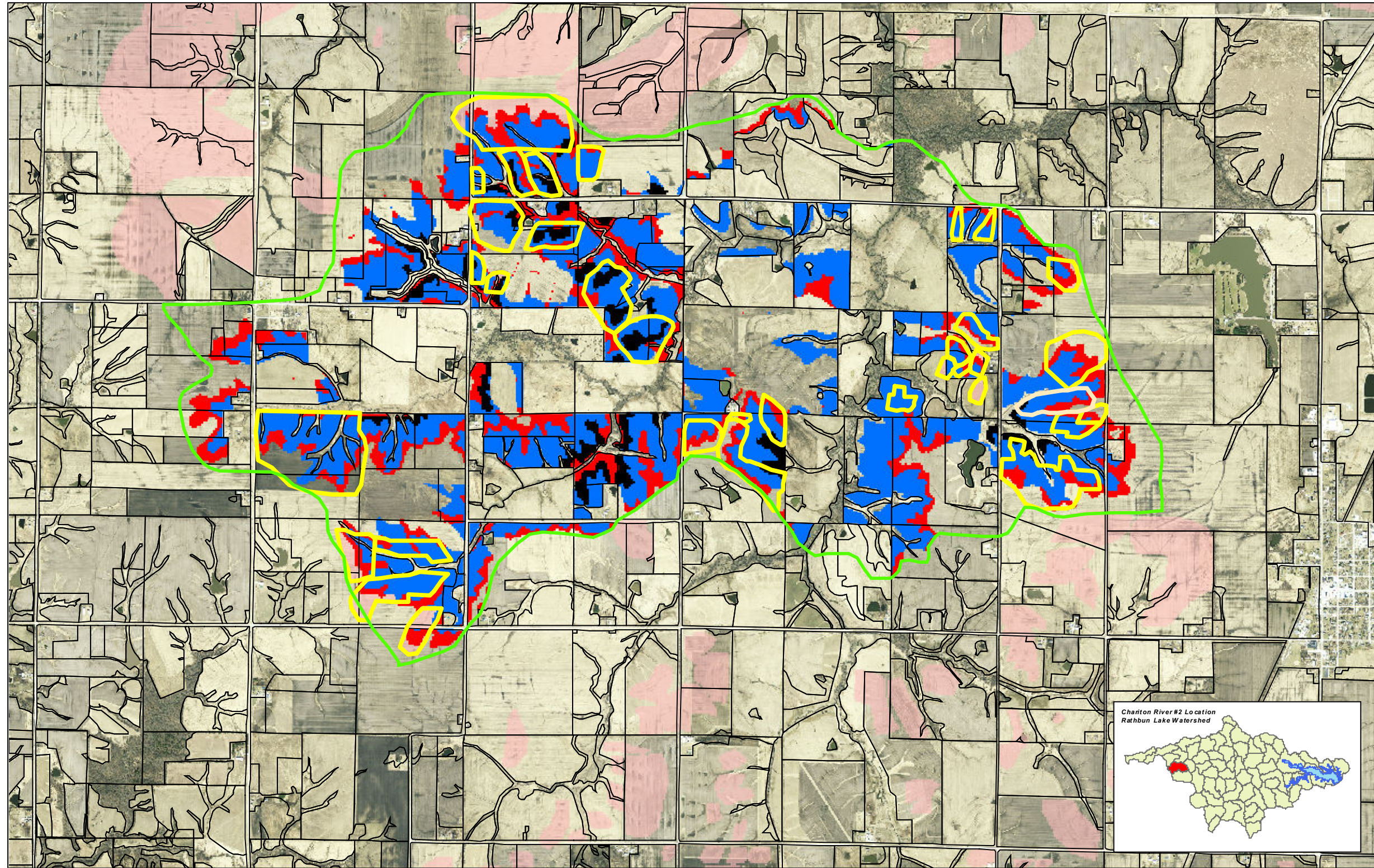
### **Activities to support the application of water quality improvement practices**

Alliance members and partners completed the following activities in support of the application of BMPs for priority land in the Chariton River #2 targeted sub-watershed and achievement of associated reductions in annual sediment and phosphorus delivery to Rathbun Lake and the lake's tributaries:

- Assembled a team of expert advisors and field staff with Alliance members and partner organizations who were responsible for planning, implementing, and assessing the completion and impact of project activities;
- Developed and utilized a GIS-based methodology to identify the location of priority land in the targeted sub-watershed, plan and track the application of BMPs, and estimate the water quality benefits associated with these practices;
- Provided one-on-one, on-farm, technical assistance to landowners who own and/or farm priority land in the targeted sub-watershed which helped them evaluate, plan, and apply BMPs for this land.
- Completed activities of the *Rathbun Lake Protectors* watershed outreach program which included: (a) recognition of landowners for their BMP application efforts as *Rathbun Lake Protectors* at the Alliance's annual *Protect Rathbun Lake* meetings; (b) coordinated interviews with landowners recognized as *Rathbun Lake Protectors* on WHO radio's daily farm show; (c) wrote feature articles that were published in *Wallaces Farmer* about landowners selected as *Rathbun Lake Protectors*; (d) installed and maintained *Rathbun Lake Protectors* on-farm signs and *Protect Rathbun Lake* roadside signs; (e) developed, exhibited, and presented project related displays and information at local and state events; (f) prepared and distributed a quarterly newsletter to Alliance members and partners; and (g) maintained the Alliance's Internet site at <http://www.rlwa.org/>.
- Alliance's board of directors, partner representatives, and project team members regularly reviewed progress in the implementation of project activities and accomplishment of project objectives. The Alliance prepared and submitted the required project plan of work, narrative reports, and financial ledgers.



## Chariton River #2 Sub-Watershed Priority Land Work



Legend	
	Watershed Boundary
	Project Work Areas
Status	
	Completed
	Planned
	Field Boundaries
Priority	
	No Priority
	Priority
	High Priority
	Highest Priority
	Associate Priority

	Applied SFY12	Applied Cumulative (FFY04-11)
Gross Erosion Before	734.0	2884.5 Tons/yr.
Gross Erosion After	326.0	1549.0 Tons/yr.
Gross Erosion Reduction	408.0	1335.5 Tons/yr.
Sediment Delivery Before	311.0	1272.0 Tons/yr.
Sediment Delivery After	14.0	70.0 Tons/yr.
Sediment Delivery Reduction	297.0	1202.0 Tons/yr.
Phosphorus Delivery Before	1181.8	4833.6 lbs/year
Phosphorus Delivery After	53.2	266.4 lbs/year
Phosphorus Delivery Reduction	1128.6	4567.2 lbs/year
Total Acres Benefitted	162.4	642.0 acres
Priority Acres Benefitted	129	488 acres

**Watershed Statistics (Completed + Planned)**

**Size: 4,816 Acres**

**Priority Acres: 1,760 Acres**

**Acres Benefiting: 662 Acres**

**Priority Acres Benefiting: 506 Acres**

**Approx. Sediment Del. Before Projects (Watershed): 6,454 Tons**

**Approx. Sediment Del. After Projects (Watershed): 5,222 Tons**

**Approx. Sediment Del. Reduction (Watershed): 1,232 Tons**

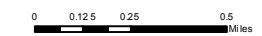
**Average Sediment Del. Reduction Per Acre: 1.86 T/Acre/Year**

**Approximate Phosphorus Del. Before Projects (Watershed): 24,626 Lbs.**

**Approximate Phosphorus Del. After Projects (Watershed): 19,926 Lbs.**

**Approximate Phosphorus Del. Reduction (Watershed): 4,700 Lbs.**

**Average Phosphorus Del. Reduction Per Acre: 7.10 Lbs./Acre**



Source: Rathbun Land and Water Alliance  
 DALS DSC  
 DNR Orthophotography, 2009  
 USDA FSA

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