

# **Final Report**

## **Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds 2013 1318-007**

**January 1, 2014 – February 28, 2017**

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## **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 progress toward planned land treatment and water quality benefit goals for the *Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds 2013*. Specifically, WIRB funding helped the Alliance and its partners, including cooperating landowners, install best management practices (BMPs) in the South Fork Walker Branch and Middle Wolf Creek #1 targeted sub-watersheds of the Rathbun Lake watershed that will achieve 20% of the project's land treatment goal and 24% and 31% respectively of the project's goals for annual sediment and phosphorus reduction to Rathbun Lake.

The Alliance expended Watershed Improvement Funds for project activities in accordance with the grant agreement. 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>
Terraces	88,200.00	88,200.00	50,476.92	37,723.08
Grade Stabilization Structures	22,050.00	22,050.00	0.00	22,050.00
Water and Sediment Control Basins	15,000.00	15,000.00	4,195.75	10,804.25
Debris Basin	15,000.00	15,000.00	0.00	15,000.00
Priority Land Conversion	3,750.00	3,750.00	0.00	3,750.00
Totals	144,000.00	144,000.00	54,672.67	89,327.33
Difference				89,327.33

<sup>a</sup> The Alliance, partners, and landowners expended 38% of the available Watershed Improvement Funds. The primary factor which led to the expenditure of a smaller amount of funds than available was the need for additional time and effort to assist landowners with the process of evaluating, planning, and applying BMPs.

**FINANCIAL ACCOUNTABILITY contd.**

Funds and in-kind contributions provided by other Alliance partners in addition to the Iowa WIRB financial support were important to the progress made toward planned goals for the *Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds 2013*.

Alliance partners' financial and non-financial resources, including the Watershed Improvement Funds, were utilized for project activities as planned in the original application submitted to the Iowa WIRB. Please refer to the Summary of Total Project Funding in Table 2. A complete financial ledger for the term of the grant agreement accompanies this report.

<b>Table 2 Summary of Total Project Funding</b>						
<b>Funding Source</b>	<b>Cash</b>		<b>In-Kind Contributions</b>		<b>Total</b>	
	<b>Approved Application Budget (\$)</b>	<b>Actual (\$)</b>	<b>Approved Application Budget (\$)</b>	<b>Actual (\$)</b>	<b>Approved Application Budget (\$)</b>	<b>Actual (\$)<sup>a, b</sup></b>
WIRB	144,000.00	54,672.67	0.00	0.00	144,000.00	54,672.67
Landowners	134,875.00	61,247.33	0.00	0.00	134,875.00	61,247.33
DNR	144,000.00	64,748.09	222,155.00	222,155.00	366,155.00	286,903.09
DSC	130,775.00	19,023.64	0.00	0.00	130,775.00	19,023.64
RRWA	13,360.00	0.00	0.00	0.00	13,360.00	0.00
Totals	567,010.00	199,691.73	222,155.00	222,155.00	789,165.00	421,846.73

Watershed Improvement Fund contribution:     Approved application budget:     18%  
    Actual:   13%

<sup>a</sup> Even though the total amount of funds available from the Iowa WIRB and project partners was not expended as planned, it is important to note that the Alliance and partners will continue to work with landowners to apply BMPs in the targeted sub-watersheds beyond the end of this grant agreement's project period. Funds from partners' sources other than this WIRB grant will be used to share the cost of continuing to apply these practices with landowners.

<sup>b</sup> RRWA and partners contributed funds and in-kind assistance for the project's GIS analysis, water quality monitoring, and watershed outreach activities. These funds were not included as specific dollar amounts in the original application, but rather identified as a footnote to the application budget.

## **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 South Fork Walker Branch and Middle Wolf Creek #1 targeted sub-watersheds of the Rathbun Lake watershed. The original project goal was to assist landowners to apply BMPs for 1,000 acres, at least 500 acres of which would be priority land. These BMPs 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 1,500 tons and 5,000 pounds respectively. Table 3 presents a summary of the BMPs planned and applied.

<b>Practice or Activity and Units</b>	<b>Approved Application Goal</b>	<b>Planned Practices and Activities</b>	<b>Percent Planned</b>	<b>Completed Practices and Activities</b>	<b>Percent Completion</b>
Terraces (ft.)	56,000	41,275	74	19,415	34
Grade Stabilization Structures (no.)	6	1	17	1	17
Water / Sediment Control Basins (no.)	25	6	24	6	24
Debria Basins (no.)	1	0	0	0	0
Row Crop Conversion (ac.)	50	40	80	0	0

- <sup>a</sup> Accomplishment of the project's BMP application goals in these targeted sub-watersheds will require additional time and effort supporting landowners' decisions and actions to evaluate, plan, and install practices. As mentioned above, partners will continue to work with landowners to encourage and assist them with the application of these and other BMPs in the targeted sub-watersheds beyond the end of this grant agreement's project period.
- <sup>b</sup> GIS analysis, water quality monitoring, and watershed outreach activities were completed as proposed in the application.

**ENVIRONMENTAL ACCOUNTABILITY contd.**

The BMPs installed and supporting activities completed resulted in the treatment of close to 200 acres, of which about 175 acres were priority land. The BMPs will reduce the delivery of sediment and phosphorus to Rathbun Lake and tributaries in the lake’s watershed by an estimated 354 tons and 1,573 pounds per year respectively. Table 4 presents a summary of planned and achieved land treatment and water quality benefits.

Land Treatment, Water Quality Benefits, and Units	Approved Application Goal	Based on Planned Practices	Percent Based on Planned	Based on Completed Practices	Percent Based on Completed
Total Land Treated with BMPs (ac.)	1,000	517	52	197	20
Priority Land Treated with BMPs (ac.)	500	259	52	177	35
Reduced Annual Sediment Delivery (tn.)	1,500	776	52	354	24
Reduced Annual Phosphorus Delivery (lb.)	5,000	2,585	52	1,573	31

Mention should be made of the following factors that influence the implementation of project activities and the achievement of project goals:

**Effective Targeting of BMPs:** Even though the Alliance and its partners, including cooperating landowners, only made modest progress toward accomplishing project goals, the effectiveness of targeting BMPs for land with the highest rates of sediment and phosphorus delivery to Rathbun Lake was still apparent given the water quality benefits achieved relative to land treatment.

**Impact of Project Length:** As indicated, the Alliance and partners found that the accomplishment of project goals in these targeted sub-watersheds will require additional time and effort supporting landowners’ decisions and actions to evaluate, plan, and install BMPs. The Alliance and its other partners will continue to work with landowners on the application of practices for land in the two targeted sub-watersheds beyond the end of this grant agreement’s project period. The Alliance will also continue to track and report progress in applying BMPs 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.

## **ENVIRONMENTAL ACCOUNTABILITY contd.**

**Landowner BMP Preference:** Landowners in the Rathbun Lake watershed continue to demonstrate a strong preference for in-field BMPs, i.e., terraces, as opposed to practices such as grade stabilization structures and debris basins. As such, landowners in the targeted sub-watersheds primarily worked with project staff to apply these in-field BMPs and were less interested in other practices that they did not consider directly supportive of row crop production.

**Cost of BMPs:** The cost of constructing structural practices such as terraces, grade stabilization structures, and water and sediment control basins continues to be an important consideration for landowners. In spite of the effectiveness of these practices to reduce sediment and phosphorus delivery to Rathbun Lake, construction costs can limit landowners' ability to finance their portion of BMP installation which results in fewer practices applied with a given amount of financial support from other project partners.

Geographic information system (GIS) generated maps of the South Fork Walker Branch and Middle Wolf Creek #1 targeted sub-watersheds accompany this report. These maps present the results of GIS analysis performed to identify priority land. The maps also illustrate the locations of BMPs that have been applied for land in the targeted sub-watersheds. In addition, the maps present the results of GIS analysis that evaluated the water quality benefits associated with BMPs applied in each of the sub-watersheds, that is, the estimated reductions in annual sediment and phosphorus delivery to Rathbun Lake and its tributaries.

The Alliance and partners carried out water quality monitoring activities in Rathbun Lake and the lake's tributaries as planned during the project period. The program consisted of monthly and event sample collection from as many as 20 sites and analyses for sediment, nutrients, bacteria, and pesticides. Monitoring results are used to help identify water bodies in the Rathbun Lake watershed on Iowa's Section 303(d) List of Impaired Waters and to assess water bodies in the watershed as part of Iowa's 305(b) Water Quality Report. The Iowa DNR prepares an annual report that summarizes the findings of water quality monitoring activities in the lake and watershed. The Alliance can make copies of these reports available to the Iowa WIRB. The monitoring program is an effort that will be ongoing after the end of the project period. 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**

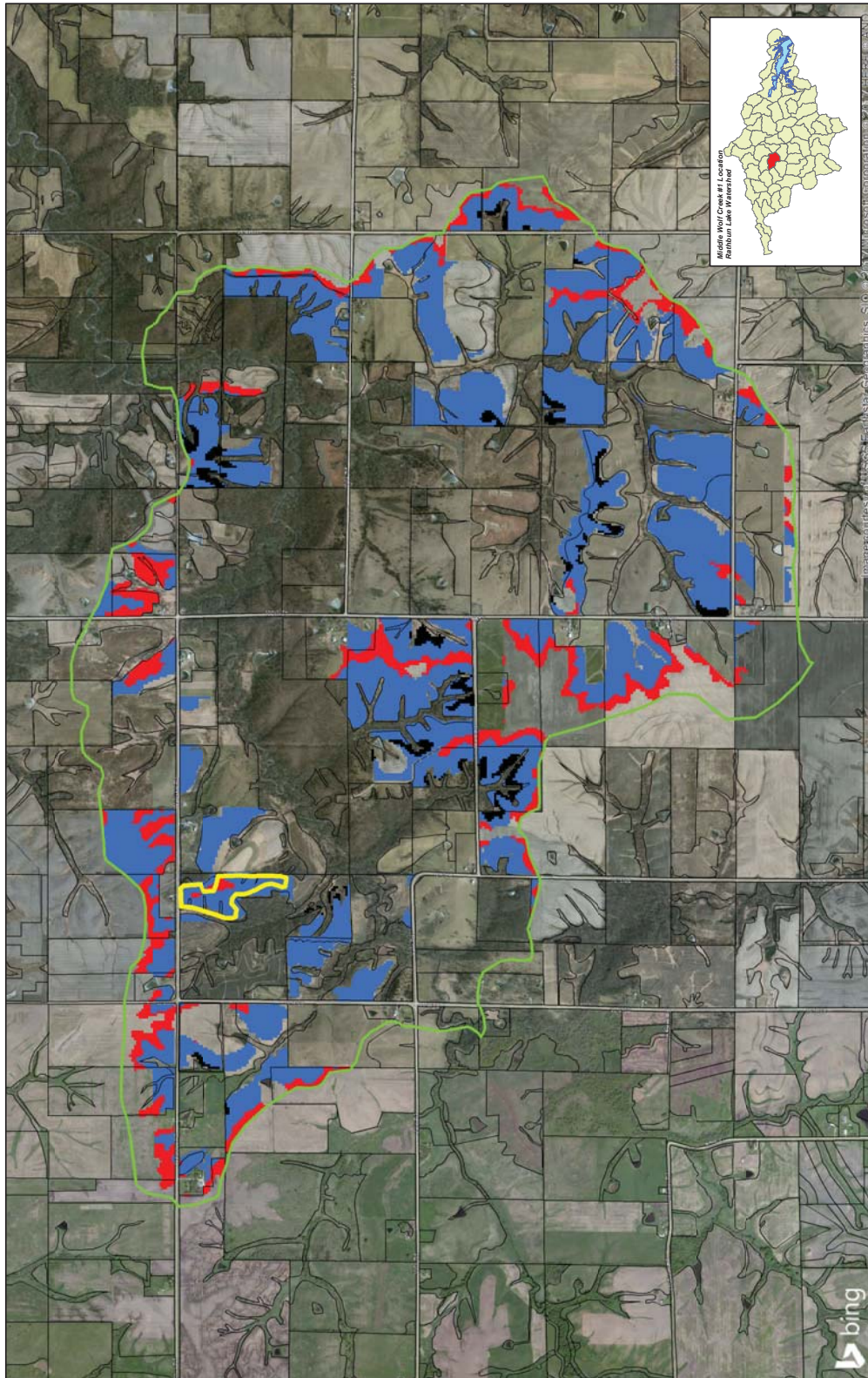
### **Activities to support the application of water quality improvement practices**

Alliance members and partners completed the following activities in support of the application of BMPs for priority land in the South Fork Walker Branch and Middle Wolf Creek #1 targeted sub-watersheds and the 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-watersheds, 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-watersheds which helped them evaluate, plan, and apply BMPs for this land;
- Completed activities of the *Rathbun Lake Protectors* watershed outreach program which included: (a) recognized 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 goals. The Alliance prepared and submitted the required project plan of work, narrative reports, and financial ledgers.



# Middle Wolf Creek #1 Sub-Watershed Priority Land Areas



Legend	
	Watershed Boundary
	Project Work Areas
<b>Status</b>	
	Completed
	In-Progress
	No Priority
	High Priority
	Highest Priority

Against Current (P/F) (Y/N)	
Cons. Erosion Before	116
Cons. Erosion After	74
Sediment Delivery Before	52
Sediment Delivery After	2
Phosphorus Delivery Before	152
Phosphorus Delivery After	175
Total Acres Benefited	21.3
Priority Acres Benefited	20

**Size: 4,317 Acres**  
**Priority Acres: 1,116 Acres**  
**Acres Benefiting: 21 Acres**  
**Priority Acres Benefiting: 20 Acres**  
**Approx. Sediment Del. Before Projects (Watershed): 5,620 Tons**  
**Approx. Sediment Del. After Projects (Watershed): 5,770 Tons**

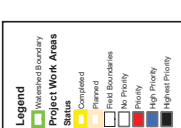
**Approx. Sediment Del. Reduction (Watershed): 50 Tons**  
**Average Sediment Del. Reduction Per Acre: 2.35 T/Acre/Year**  
**Approximate Phosphorus Del. Before Projects (Watershed): 20,710 Lbs.**  
**Approximate Phosphorus Del. After Projects (Watershed): 20,535 Lbs.**  
**Approximate Phosphorus Del. Reduction (Watershed): 175 Lbs.**  
**Average Phosphorus Del. Reduction Per Acre: 8.33 Lbs./Acre**

**Watershed Statistics**

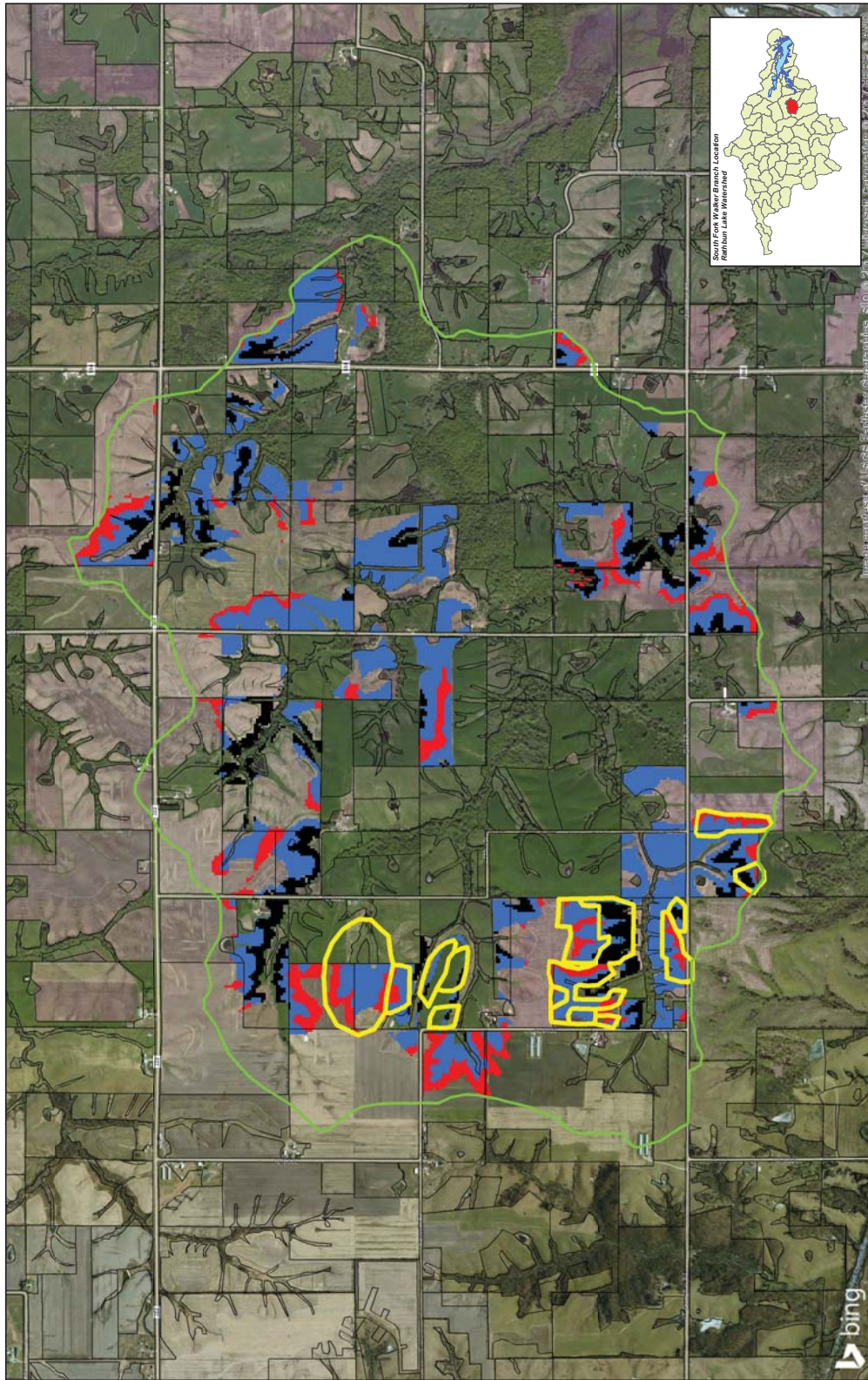
Scale: 0 0.25 0.5 1 Miles

Source: Remote Sensing and Water Atlas  
 GIS Data  
 2010  
 Prepared by: Tyler J. Jackson, Eastern Regional Water Association

Middle Wolf Creek #1 Location  
 Return, Lake Watershed



# South Fork Walker Branch Sub-Watershed Priority Land Areas



**Legend**

- Watershed Boundary
- Project Work Areas
- Status
- Completed
- Not Completed
- Final Boundaries
- No Priority
- High Priority
- Highest Priority

	Approved (7/16)	Applied (Compliance) (7/16)
Storm Erosion Before	386.0	727.0 Tons/yr
Storm Erosion Reduction	300.0	438.0 Tons/yr
Sediment Delivery Before	175.0	359.0 Tons/yr
Sediment Delivery After	8.0	7.0 Tons/yr
Phosphorus Delivery Before	170.0	342.0 Tons/yr
Phosphorus Delivery Reduction	89.0	153.4 lbs/year
Total Acres Benefitted	782.0	1573.2 lbs/year
Priority Acres Benefitted	85.8	191.4 acres
	75	171 acres

**Watershed Statistics (Completed + Planned)**

Size: 4,108 Acres

Priority Acres: 808 Acres

Acres Benefiting: 892 Acres

Priority Acres Benefiting: 171 Acres

Approx. Sediment Del. Before Projects (Watershed): 4354 Tons

Approx. Sediment Del. After Projects (Watershed): 4,012 Tons

Approx. Sediment Del. Reduction (Watershed): 342 Tons

Average Sediment Del. Reduction Per Acre: 1.78 T/Acre/Year

Approximate Phosphorus Del. Before Projects (Watershed): 20,070 Lbs.

Approximate Phosphorus Del. After Projects (Watershed): 18,497 Lbs.

Approximate Phosphorus Del. Reduction (Watershed): 1,573 Lbs.

Average Phosphorus Del. Reduction Per Acre: 7.98 Lbs./Acre

Source: Watershed Land Use and Watershed Boundaries

Map Date: 7/16/16

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Prepared by: Tyler J. Jackson, Station Regional Water Association