Final Report

Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds 2007 7013-004

2008 - 2010

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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 the accomplishment of planned objectives for the *Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds.* Specifically, WIRB funding helped the Alliance and its partners, including cooperating landowners, install best management practices (BMPs) in four targeted sub-watersheds of the Rathbun Lake watershed that will achieve close to one-third 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 (32% and 41% of project objectives respectively).

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.

Table 1

Summary of Watershed Improvement Funds Approved, Expended, and Balance

Grant Agreement Budget Line Item	Total Funds Approved ($)	Total Funds Expended ($)	Available Funds ($) [a]
Contractual (Technical Assistance)	42,900.00	25,414.82	17,485.18
Terraces	330,600.00	291,702.93	38,897.07
Grade Stabilization Structures	87,720.00	42,510.03	45,209.97
Water and Sediment Control Basins	24,000.00	19,297.70	4,702.30
Priority Land Conversion	10,500.00	0.00	10,500.00
Totals	495,720.00	378,925.48	116,794.52
Difference			116,794.52

[a] The Alliance, its partners, and cooperating landowners did not expend all of the available Watershed Improvement Funds. The principal factors which resulted in the expenditure of less funds than available were the impact of weather on practice application and the length of the project period. More information on the impact of these factors on project activities will be presented in the Environmental Accountability section of this report.

FINANCIAL ACCOUNTABILITY contd.

Similar to the information presented above, funds and in-kind contributions provided by other partners in addition to the Iowa WIRB financial support were essential to the progress made toward accomplishment of planned goals for the *Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds.*

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.

Table 2

Summary of Total Project Funding

	Cash		In-Kind Contributions		Total	
Funding Source	**Approved Application Budget ($)**	**Actual ($)**	**Approved Application Budget ($)**	**Actual ($)**	**Approved Application Budget ($)**	**Actual ($)[a]**
WIRB	495,720.00	378,925.48	0.00	0.00	495,720.00	378,925.48
Landowners	587,850.00	285,344.88	0.00	0.00	587,850.00	285,344.88
DNR/DSC	708,273.00	92,529.68	110,385.00	151,225.00	818,658.00	243,754.68
NRCS	579,957.00	161,004.07	0.00	0.00	579,957.00	161,004.07
RRWA	101,440.00	43,114.82	0.00	0.00	101,440.00	43,114.82
Totals	2,473,240.00	960,918.93	110,385.00	151,225.00	2,583,625.00	1,112,143.93

Watershed Improvement Fund contribution: Approved application budget: 19%
Actual: 34%

[a] The information presented in Table 2 indicates that the actual amount of project funds expended by all partners has been less than originally planned. As mentioned on page 2, the impact of weather on practice application and length of project period were the principal factors which limited the expenditure of project funds. It is also important to note that the Alliance and its other partners will continue to assist landowners to apply BMPs in the targeted sub-watersheds beyond the end of this WIRB 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. More information 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 targeted sub-watersheds of Upper and Lower Dick Creek and Chariton River #4 and #8 in the Rathbun Lake watershed. The original project objective was to assist landowners to apply BMPs for 5,100 acres, at least 2,600 acres of which would be priority land. The 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 8,130 tons and 35,980 pounds respectively. Table 3 presents a summary of the BMPs planned and applied.

Table 3
Summary of Practices and Activities

Practice or Activity and Units	Approved Application Goal	Planned Practices and Activities	Percent Planned	Completed Practices and Activities	Percent Completion
Terraces (ft.)	300,000	141,096	47	99,282	33
Grade Stabilization Structures (no.)	51	11	22	5	10
Water and Sediment Control Basins (no.)	75	30	40	13	17
Priority Land Conversaion (ac.)	525	385	73	327	62
Grassed Waterways (ac.)	18	2	11	0	0
Improved Grazing Practices (ac.)	150	327	218	327	218
Contractual Technical Assistance (hr.)	3,120	3,120	100	1,848	59

The BMPs and activities completed resulted in the treatment of more than 1,300 acres, of which close to 800 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 2,632 tons and 14,892 pounds per year respectively. It is important to note that BMPs currently planned and still to be completed will result in the treatment of more than 1,000 additional acres and the added reduction in annual sediment and phosphorus delivery of an estimated 2,000 tons and 11,000 pounds respectively. As mentioned above, the principal factors that resulted in the actual application of BMPs not meeting project goals were the effects of weather on practice installation and the length of the project period. More information on the impact of these factors on project activities is provided below. Table 4 presents a summary of planned and achieved land treatment and water quality benefits.

ENVIRONMENTAL ACCOUNTABILITY contd.

Table 4
Summary of Land Treatment and Water Quality Benefits

Land Treatment, Water Quality Benefit, and Units	Approved Application Goal	Based on Planned Practices	Percent Based on Planned	Based on Completed Practices	Percent Based on Completion
Total Land Treated with BMPs (ac.)	5,100	2,800	55	1,360	27
Priority Land Treated with BMPs (ac.)	2,600	1,400	54	784	30
Reduced Annual Sediment Delivery (tn.)	8,130	4,600	57	2,632	32
Reduced Annual Phosphorus Delivery (tn.)	35,980	26,000	72	14,892	41

As indicated, the Alliance and partners, including cooperating landowners, made progress toward the accomplishment of, but did not achieve, anticipated levels of BMP application, acres treated, and sediment and phosphorus load reductions. Weather and length of project period were two principal factors that affected the accomplishment of goals for land treatment and water quality benefits.

Weather Impacts: Annual precipitation during the three-year project period was substantially above normal. In 2008, 2009, and 2010, the area of the state in which the Rathbun Lake watershed is located received rainfall amounts that were 16 inches, 8 inches, and 19 inches above average respectively. These relatively high precipitation amounts and associated wet soil conditions during the project period, particularly in the late fall and early winter, significantly impacted the planned installation of BMPs by cooperating landowners. In many cases, practice installation was prolonged, delayed, or canceled due to the unusually wetter than normal weather and soil conditions.

Project Length: The three-year period associated with early Iowa WIRB grant agreements did not provide the time required to fully implement the aggressive plan of work developed for this project, especially given the impact of relatively wet weather and soil conditions. 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 targeted sub-watersheds 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-watersheds 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.

In addition, mention should be made of the impact that increased costs have had on the application of BMPs. 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 30% during this period from an average of $5.51 per foot to $7.08 per foot. Similarly, the cost of earthwork to construct structures and basins increased by almost 60% from $1.27 per cubic yard to $2.00 per cubic yard. Increased costs can limit landowners' ability to finance their portion of BMP installation and, of course, result in fewer practices that can be applied with a given amount of cost share funds.

A set of geographic information system (GIS) generated maps accompany this report. These maps present the results of GIS analysis performed to determine the location of priority land in the four targeted sub-watersheds. The maps also identify the locations of BMPs that have been planned and applied for priority land in the four targeted sub-watersheds. In addition, the maps present the results of GIS analysis that evaluated the water quality benefits associated with the BMPs applied for priority land in the targeted sub-watersheds, that is, the estimated reductions in annual sediment and phosphorus delivery to Rathbun Lake and its tributaries.

The Alliance's and partners' comprehensive water quality monitoring program 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 have been used to help identify water bodies in the Rathbun Lake watershed that are 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. It is important to note that the water quality monitoring program is an ongoing effort that will continue after project completion. The Alliance and partners will continue to use past and future monitoring results to assess water quality conditions in Rathbun Lake and its tributaries as well as to plan the application of BMPs 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 four targeted sub-watersheds 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;

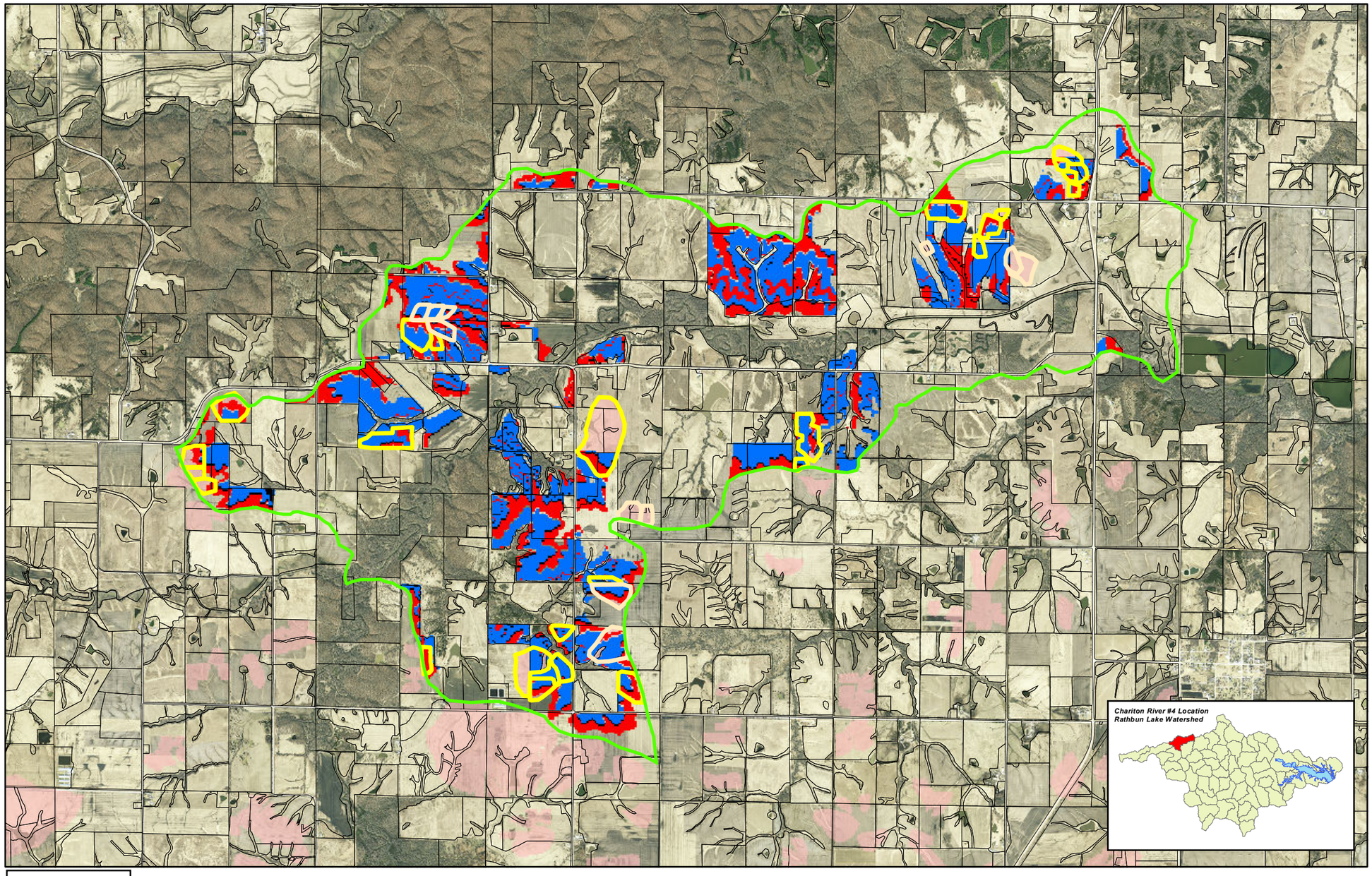
- Developed and utilized a GIS-based methodology to identify the location of priority land in the four targeted sub-watersheds, plan and track the application of BMPs, and estimate the water quality benefits associated with these practices;

- Provided one-on-one, on-farm, technical assistance to 50 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) 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 *Rathbun Lake Protectors* on-farm signs and *Protect Rathbun Lake* roadside signs; (e) developed and exhibited project related displays 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 #4 Sub-Watershed
Priority Land Work



Legend

- Watershed Boundary

Project Work Areas

- Completed
- Planned
- Field Boundaries

Priority Area Identification

- No Priority
- Priority
- High Priority
- Highest Priority
- Associate Priority

	Applied SFY11	Applied Cumulative (FFY04-10)
Gross Erosion Before	392.0	1287.0 Tons/yr.
Gross Erosion After	197.0	546.0 Tons/yr.
Gross Erosion Reduction	195.0	741.0 Tons/yr.
Sediment Delivery Before	175.0	676.0 Tons/yr.
Sediment Delivery After	10.0	28.0 Tons/yr.
Sediment Delivery Reduction	165.0	648.0 Tons/yr.
Phosphorus Delivery Before	927.5	3510.6 lbs/year
Phosphorus Delivery After	53.0	145.3 lbs/year
Phosphorus Delivery Reduction	874.5	3365.3 lbs/year
Total Acres Benefited	67.1	295.8 acres
Priority Acres Benefited	39	198 acres

Watershed Statistics (Completed + Planned)

Size: 6,059 Acres

Priority Acres: 1,673 Acres

Acres Benefiting: 375 Acres

Priority Acres Benefiting: 266 Acres

Approx. Sediment Del. Before Projects (Watershed): 6,301 Tons

Approx. Sediment Del. After Projects (Watershed): 5,534 Tons

Approx. Sediment Del. Reduction (Watershed): 767 Tons

Average Sediment Del. Reduction Per Acre: 2.05 T/Acre/Year

Approximate Phosphorus Del. Before Projects (Watershed): 33,995 Lbs.

Approximate Phosphorus Del. After Projects (Watershed): 29,857 Lbs.

Approximate Phosphorus Del. Reduction (Watershed): 4,138 Lbs.

Average Phosphorus Del. Reduction Per Acre: 11.03 Lbs./Acre

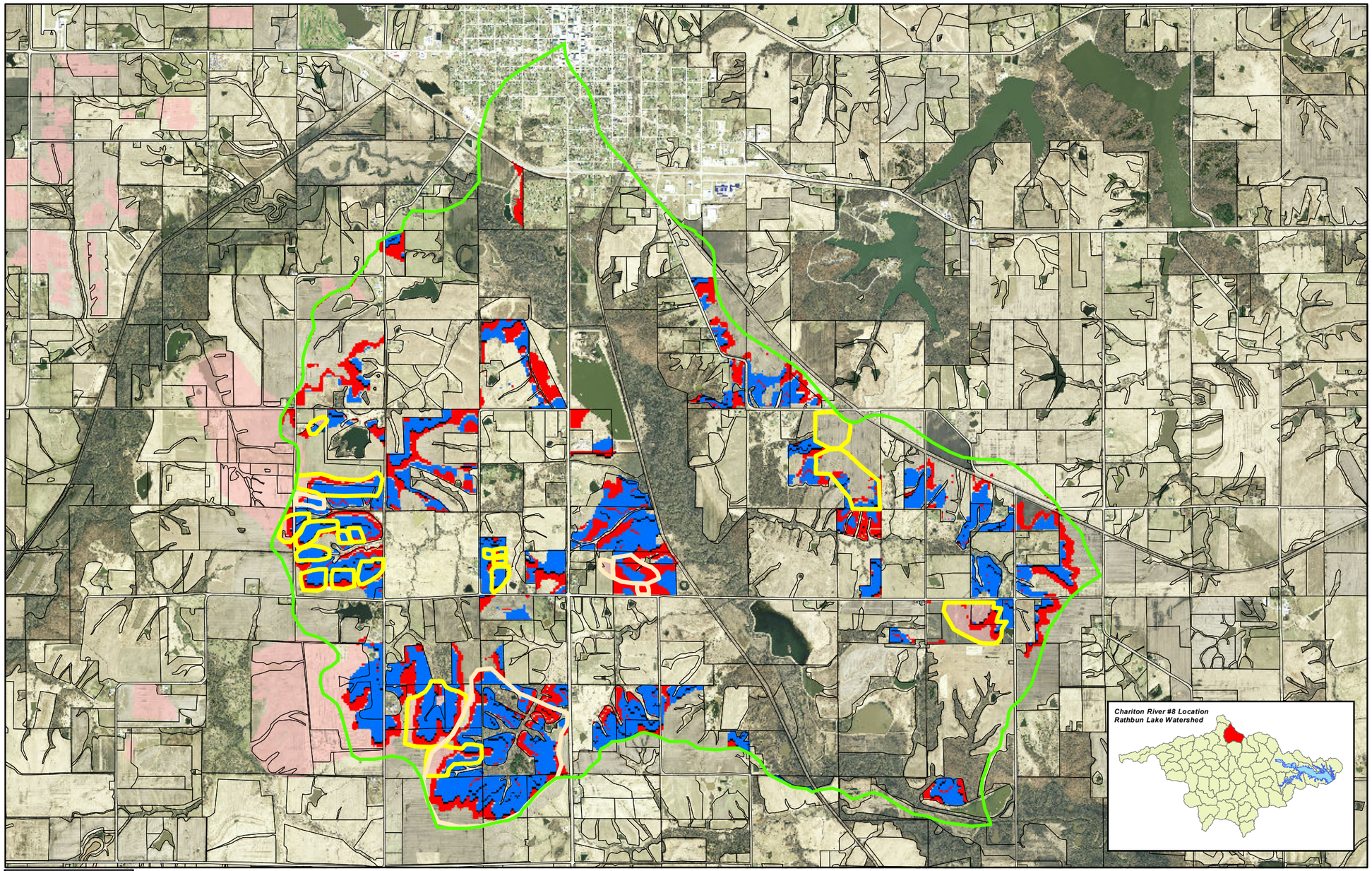
0 0.125 0.25 0.5 Miles

N

Source: Rathbun Land and Water Alliance
IDALS DSC
IDNR Orthophotography, 2009
USDA FSA

Prepared By: Tyler J. Jacobsen, Rathbun Regional Water Association

Chariton River #8 Sub-Watershed
Priority Land Work



Legend

- Watershed Boundary

Project Work Areas

- Completed
- Planned
- Field Boundaries

Priority Area Identification

- No Priority
- Priority
- High Priority
- Highest Priority
- Associate Priority

	Applied SFY11	Applied Cumulative (FFY04-10)
Gross Erosion Before	747.0	1512.0 Tons/yr.
Gross Erosion After	345.0	779.0 Tons/yr.
Gross Erosion Reduction	402.0	733.0 Tons/yr.
Sediment Delivery Before	337.0	749.0 Tons/yr.
Sediment Delivery After	16.0	35.0 Tons/yr.
Sediment Delivery Reduction	321.0	714.0 Tons/yr.
Phosphorus Delivery Before	1819.8	4012.2 lbs/year
Phosphorus Delivery After	86.4	189.0 lbs/year
Phosphorus Delivery Reduction	1733.4	3823.2 lbs/year
Total Acres Benefited	115.5	359.5 acres
Priority Acres Benefited	26	180 acres

Watershed Statistics (Completed + Planned)

Size: 7,370 Acres

Priority Acres: 1,088 Acres

Acres Benefiting: 684 Acres

Priority Acres Benefiting: 384 Acres

Approx. Sediment Del. Before Projects (Watershed): 7,443 Tons

Approx. Sediment Del. After Projects (Watershed): 6,242 Tons

Approx. Sediment Del. Reduction (Watershed): 1,201 Tons

Average Sediment Del. Reduction Per Acre: 1.76 T/Acre/Year

Approximate Phosphorus Del. Before Projects (Watershed): 40,234 Lbs.

Approximate Phosphorus Del. After Projects (Watershed): 33,292 Lbs.

Approximate Phosphorus Del. Reduction (Watershed): 6,492 Lbs.

Average Phosphorus Del. Reduction Per Acre: 9.49 Lbs./Acre

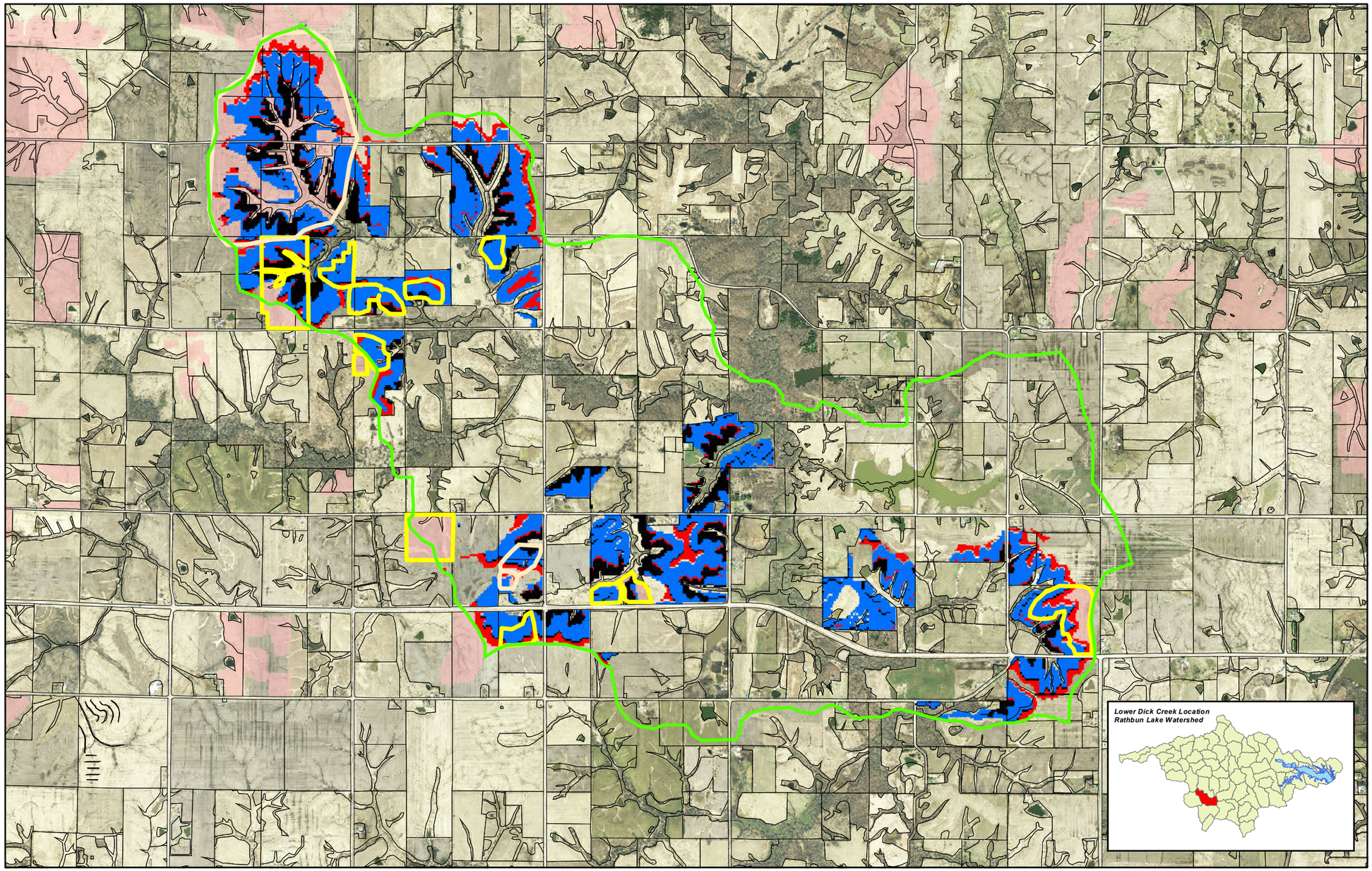
0 0.125 0.25 0.5 Miles

N

Source: Rathbun Land and Water Alliance
IDALS DSC
IDNR Orthophotography, 2009
USDA FSA

Prepared By: Tyler J. Jacobsen, Rathbun Regional Water Association

Lower Dick Creek Sub-Watershed
Priority Land Work



Legend

- Watershed Boundary

Project Work Areas

Status

- Completed
- Planned
- Field Boundaries

Priority Area Identification

- No Priority
- Priority
- High Priority
- Highest Priority
- Associate Priority

	Applied SFY11	Applied Cumulative (FFY04-10)
Gross Erosion Before	291.0	1466.0 Tons/yr.
Gross Erosion After	207.0	480.0 Tons/yr.
Gross Erosion Reduction	84.0	986.0 Tons/yr.
Sediment Delivery Before	135.0	617.0 Tons/yr.
Sediment Delivery After	10.0	37.0 Tons/yr.
Sediment Delivery Reduction	125.0	580.0 Tons/yr.
Phosphorus Delivery Before	638.9	3365.4 lbs/year
Phosphorus Delivery After	48.0	201.1 lbs/year
Phosphorus Delivery Reduction	590.9	3164.3 lbs/year
Total Acres Benefited	55.9	286.9 acres
Priority Acres Benefited	48	168 acres

Watershed Statistics (Completed + Planned)

Size: 5,955 Acres

Priority Acres: 1,378 Acres

Acres Benefiting: 755 Acres

Priority Acres Benefiting: 437 Acres

Approx. Sediment Del. Before Projects (Watershed): 6,789 Tons

Approx. Sediment Del. After Projects (Watershed): 5,507 Tons

Approx. Sediment Del. Reduction (Watershed): 1,282 Tons

Average Sediment Del. Reduction Per Acre: 1.70 T/Acre/Year

Approximate Phosphorus Del. Before Projects (Watershed): 27,102 Lbs.

Approximate Phosphorus Del. After Projects (Watershed): 21,984 Lbs.

Approximate Phosphorus Del. Reduction (Watershed): 5,118 Lbs.

Average Phosphorus Del. Reduction Per Acre: 6.78 Lbs./Acre

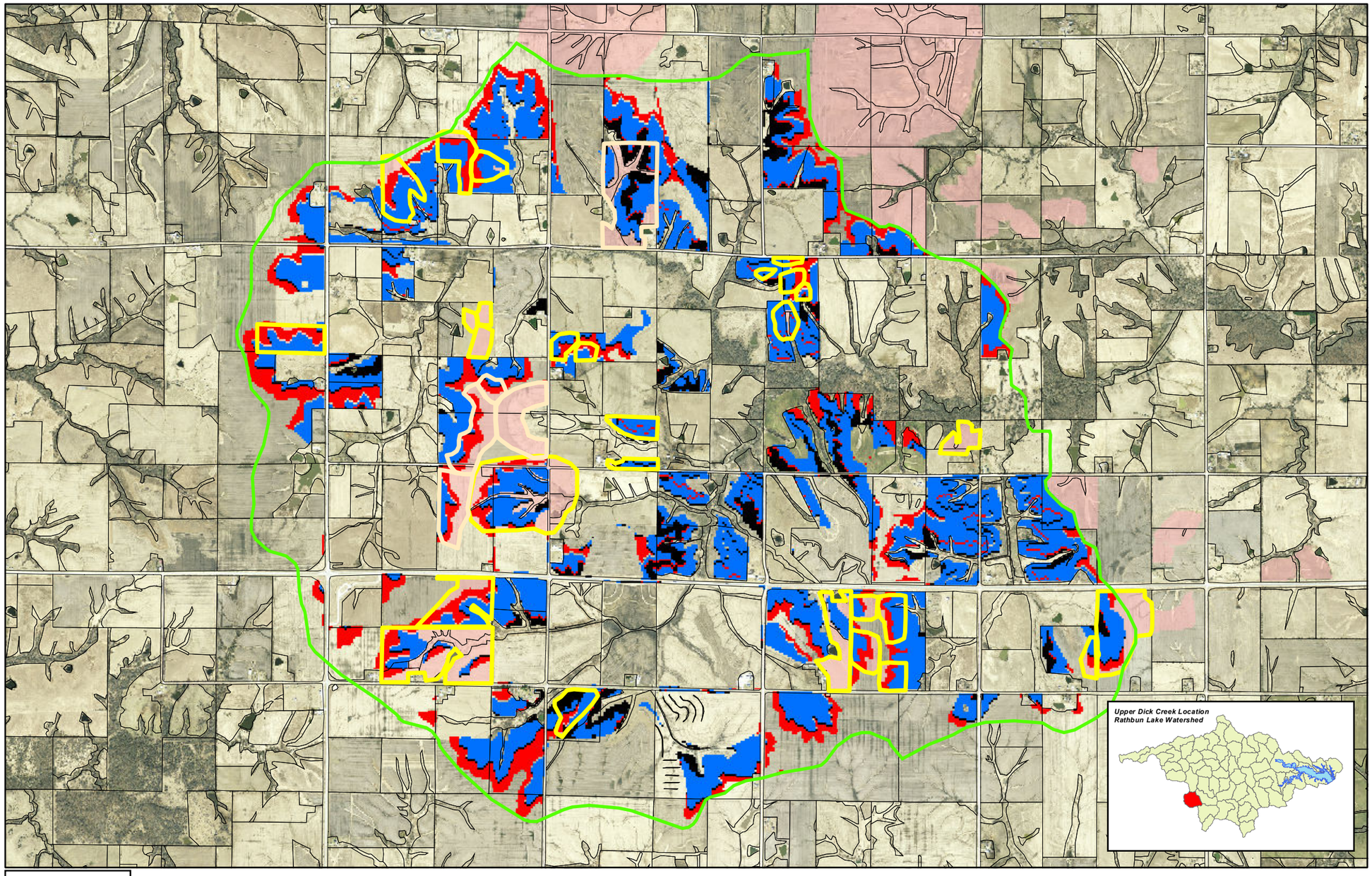
0 0.125 0.25 0.5 Miles

N

Source: Rathbun Land and Water Alliance
IDALS DSC
IDNR Orthophotography, 2009
USDA FSA

Prepared By: Tyler J. Jacobsen, Rathbun Regional Water Association

Upper Dick Creek Sub-Watershed
Priority Land Work



Legend

- Watershed Boundary

Project Work Areas

- Completed
- Planned
- Field Boundaries

Priority Area Identification

- No Priority
- Priority
- High Priority
- Highest Priority
- Associate Priority

	Applied SFY11	Applied Cumulative (FFY04-10)
Gross Erosion Before	362.0	2037.5 Tons/yr.
Gross Erosion After	239.0	958.0 Tons/yr.
Gross Erosion Reduction	123.0	1079.5 Tons/yr.
Sediment Delivery Before	168.0	873.0 Tons/yr.
Sediment Delivery After	11.0	57.0 Tons/yr.
Sediment Delivery Reduction	157.0	816.0 Tons/yr.
Phosphorus Delivery Before	1125.6	5756.9 lbs/year
Phosphorus Delivery After	73.7	373.7 lbs/year
Phosphorus Delivery Reduction	1051.9	5383.2 lbs/year
Total Acres Benefited	82.4	512.2 acres
Priority Acres Benefited	43	288 acres

Watershed Statistics (Completed + Planned)

Size: 6,500 Acres

Priority Acres: 1,697 Acres

Acres Benefiting: 675 Acres

Priority Acres Benefiting: 360 Acres

Approx. Sediment Del. Before Projects (Watershed): 6,630 Tons

Approx. Sediment Del. After Projects (Watershed): 5,570 Tons

Approx. Sediment Del. Reduction (Watershed): 1,060 Tons

Average Sediment Del. Reduction Per Acre: 1.57 T/Acre/Year

Approximate Phosphorus Del. Before Projects (Watershed): 44,457 Lbs.

Approximate Phosphorus Del. After Projects (Watershed): 37,349 Lbs.

Approximate Phosphorus Del. Reduction (Watershed): 7,108 Lbs.

Average Phosphorus Del. Reduction Per Acre: 10.53 Lbs./Acre

0 0.125 0.25 0.5 Miles

N

Source: Rathbun Land and Water Alliance
IDALS DSC
IDNR Orthophotography, 2009
USDA FSA

Prepared By: Tyler J. Jacobsen, Rathbun Regional Water Association