

**Table 8. Implementation Project Cost Estimates**

Priority Management Area	Project	Cost per Area	Estimated Area	Total Cost Range	Estimated % Removal P	Estimated % Removal TSS	Estimated % Removal TN
A	Livestock Exclusion at Lake				50-90	50-90	
	Fencing	\$1-\$2/ft	850 ft	\$ 850 \$ 1,700			
	Design & Oversight			\$ 400 \$ 1,000			
	Seeding	\$100 - 150	.5 acre	\$ 50 \$ 75			
	<b>SUBTOTAL</b>			<b>\$ 1,300 \$ 2,775</b>			
B	Wetland Restoration-Dance Hall Creek				0-60	40-95	
	Landowner Payments	\$600 - \$2000/ac	30 acres	\$ 18,000 \$ 60,000			
	Construction	\$2000-\$5000	dike	\$ 2,000 \$ 5,000			
	Design & Oversight	\$2000 - \$3000		\$ 2,000 \$ 3,000			
	Optional alum treatment	\$700 - \$900/ha	10 ha	\$ 7,000 \$ 9,000			
	<b>SUBTOTAL</b>			<b>\$ 22,000 \$ 68,000</b>			
	<b>SUBTOTAL W/ ALUM</b>			<b>\$ 29,000 \$ 77,000</b>			
C	NURP Pond Expansion	3 cell pond	1 pond	\$ 15,000 \$ 25,000	55 - 65	70 - 90	
D	Livestock Exclusion-Stream				90-100	90-100	90-100
	Tile Installation	\$4 -\$6/ft	400 feet	\$ 1,600 \$ 2,400			
	Design & Oversight			\$ 1,500 \$ 3,000			
	<b>SUBTOTAL</b>			<b>\$ 3,100 \$ 5,400</b>			
E	Diversion/restoration-Loretto Creek		13 acres		0 - 50	75 - 95	10
	Design & Planning	\$9000 - \$10,000		\$ 9,000 \$ 10,000			
	Construction	\$12,000 - \$15,000		\$ 12,000 \$ 15,000			
	Seeding	\$1000 - \$2000		\$ 1,000 \$ 2,000			
	<b>SUBTOTAL</b>			<b>\$ 22,000 \$ 27,000</b>			

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Priority Management Area	Project	Cost per Area	Estimated Area	Total Cost Range	Estimated % Removal P	Estimated % Removal TSS	Estimated % Removal TN
F	Buffer/Filter Strips		38 acres		60-70	75-90	70-90
	Seeding	\$50 - \$150/acre		\$ 1,900 \$ 5,700			
	Land Owner Payments	\$50 - \$100/acre/yr	15 years	\$ 28,500 \$ 57,000			
	Planning & Oversight	\$100 - \$200/acre		\$ 3,800 \$ 7,600			
	SUBTOTAL			\$ 34,200 \$ 70,300			
F	Streambank Stabilization				50-90	50-90	50-90
	Construction	\$10 - \$50/ft	1000 feet	\$ 10,000 \$ 50,000			
	Planning & Oversight	\$10 - \$20/ft		\$ 10,000 \$ 20,000			
	SUBTOTAL			\$ 20,000 \$ 70,000			
G	Field Strips		10 - 30 ac		60-70	75-90	70-90
	Construction	\$380 - \$450/mile	5 miles	\$ 1,900 \$ 2,250			
	Planning & Oversight	\$100 - \$200/mile		\$ 500 \$ 1,000			
	Land owner payments	\$50 - \$100 ac/yr	15 years	\$ 7,500 \$ 45,000			
	SUBTOTAL			\$ 9,900 \$ 48,250			
G	Tile Inlet Filters		20 inlets		50-90	75-90	70-90
	Land owner payments	\$50 - \$100 ac/yr	15 years	\$ 750 \$ 1,500			
	Prep & Seeding	\$100 - \$200 each	20 inlets	\$ 2,000 \$ 4,000			
	Planning & Assistance	\$100 - \$200 each		\$ 2,000 \$ 4,000			
	SUBTOTAL			\$ 4,750 \$ 9,500			
G	Grassed Waterways					60-80	
	Construction	\$500 - \$1000/acre	10 acres	\$ 5,000 \$ 10,000			
	Planning & Assistance	\$500 - \$1000/site	5 sites	\$ 2,500 \$ 5,000			
	SUBTOTAL			\$ 7,500 \$ 15,000			
G	Conservation Tillage		200 acres		70 - 90	70	70
	No - Till Drill Use	\$10 - \$15/acre/yr	10 years	\$ 20,000 \$ 24,000			
	Planning & Assistance	\$5 - \$10/acre/yr	10 years	\$ 10,000 \$ 20,000			
	SUBTOTAL			\$ 30,000 \$ 44,000			

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Priority Management Area	Project	Cost per Area	Estimated Area	Total Cost Range	Estimated % Removal P	Estimated % Removal TSS	Estimated % Removal TN
G	Backyard Livestock Management	\$200 - \$3000		\$ 2,000 \$ 3,000	50-90	50-90	50-90
G	Ordinance Development	\$10000-\$20000		\$ 10,000 \$ 20,000			
G	Training - Construction Site Erosion Control Inspections	\$200 - \$500/time	2 times	\$ 400 \$ 1,000	50-95	50-95	50-95
G	Wetland Restorations				0-60	40-95	
	Land Owner Payments	\$600 - \$2000/ac	50 acres	\$ 30,000 \$ 100,000			
	Construction	\$1000-\$5000	project	\$ 8,000 \$ 40,000			
	Design & Oversight	\$2000 - \$3000	8 projects	\$ 2,000 \$ 3,000			
	<b>SUBTOTAL</b>			\$ 40,000 \$ 143,000			
H	Phosphorus Inactivation Design & Oversight Testing	\$700 - \$1300/ha	120 ha	\$ 84,000 \$ 156,000	70-100		
				\$ 4,000 \$ 5,000			
				\$ 3,000 \$ 4,000			
	<b>SUBTOTAL</b>			\$ 91,000 \$ 165,000			
H	Aquascaping Demonstration Site	\$1000/lot	1 - 2 lots	\$ 1,000 \$ 2,000	60-70	75-90	70-90
H,G	Soil Testing Days	\$150- \$200/time	2 times	\$ 300 \$ 400			
H,G	Education Program	multiple projects	3 -5 years	\$ 10,000 \$ 15,000			
<b>TOTAL</b>				\$ 324,450 \$ 743,625			

**Table 9. Change in property value due to water quality**

<b>Change in transparency</b>	<b>Change in property value (per foot lake frontage)</b>	<b>Estimated change in Lake Sarah property value</b>
↑ 1 meter (3.3 feet)	↑ \$18 - \$50	\$2 - \$4.2 million (\$13,500 - \$29,000/home)
↓ 1 meter (3.3 feet)	↓ \$65 - \$140	\$0.5 - \$1.5 million (\$3,700 - \$10,400/home)

Based on research conducted by the University of Maine (James et. al., 1995)

Either a decrease or improvement in water quality would result in a significant loss or gain of tax revenue to the cities and county as well as affect the property owners. The cost estimates for completing multiple lake improvement projects on Lake Sarah range from \$324,000 to \$744,000. Although these figures are high, the figures listed above demonstrate the high dollar losses that may and have occurred due to degrading water quality in Lake Sarah.

## **10.0 CONCLUSIONS**

Eight priority management areas were identified within the Lake Sarah watershed. Although a few site specific projects were identified to reduce pollutant loading to Lake Sarah, the majority of the loading is from agricultural land. The implementation plan recommendations focus on resolving the known site specific problems and reducing the overall impact of farm land on the lake through best management practices and education. Since Lake Sarah is normally phosphorus limited, the practices focus on removing phosphorus from the tributaries entering the lake. The implementation projects will also reduce loading of sediment, nitrogen and other pollutants to the lake. A combination of agricultural, educational, administrative and in-lake practices are needed to improve the water quality of Lake Sarah.

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