

APPENDIX TO RED LAKE RIVER ONE WATERSHED ONE PLAN:

Tailored Targeted Implementation Plan with Measurable Water Quality Outcomes

PURPOSE AND STRUCTURE

There are two components to targeted implementation:

1. **Management areas “implementation profiles”:** Planning region implementation profiles summarize current resource conditions and present information about the potential number, location, and types of management practices and structural BMPs for implementation. The implementation profile also presents information about the relationship between the fiscal investment to implement structural BMPs relative to the estimated cost-share available for implementation and stated surface water quality load reduction goals. The information within the implementation profile is useful for understanding whether surface water quality goals are achievable through activities that affect surface runoff and the estimated cost of achieving the goals.
2. A **“targeted implementation schedule”:** The targeted implementation schedule is comprised of a set of actions that—when implemented—are expected to make reasonable progress toward plan measurable goals.

DEVELOPING MANAGEMENT AREA IMPLEMENTATION PROFILES

This plan appendix presents an implementation profile for each management area to target the implementation of management practices and structural BMPs. Each implementation profile summarizes the following:

- Measurable goal for the management area
- The approach used for targeting practices
- Cost-effectiveness of conservation efforts within the management area (i.e., a conservation investment guide)
- Summary of targeted practices and their anticipated measurable water quality benefits
- A map of the management area and targeted practices
- A description of how the targeted implementation profile can be tailored for on-the-ground implementation

Sediment is one of the prominent issues that the Prioritize, Target, and Measure Application (PTMApp) analyzes that affect resources from overland runoff within each management area. Targeting specific conservation practices within a given management area was based upon a number of decisions made by members of the Red Lake River Watershed One Watershed One Plan, Planning Work Group. The decisions are summarized in **Table 1**. Goals for each management area were set based upon Section 3 of the Red Lake River Watershed One Watershed One Plan. Because goals for sediment reduction in Section 3 were set at the resource concern level (i.e. stream auid), the Planning Work Group made the

decision to target the most conservative sediment load reduction goal for each management area as this goal is achievable within the ten-year lifespan of plan.

It is important to note that all of the estimates developed for this Appendix were based upon information from PTMApp. PTMApp only accounts for overland sediment loading driven by the overland flow of water and therefore the targeting done for this analysis is not inclusive of all potential sediment sources within the planning area.

The Planning Workgroup decisions were then used to guide the selection of targeted conservation practices within each management area. The combined water quality benefits of the targeted conservation efforts were then estimated using PTMApp-Desktop.

Table 1. Decisions made by the Planning Work Group for targeting conservation practices in the Red Lake River Watershed.

Issue	Decision
How to estimate practice costs	Using 2016 EQIP costs based upon the assumption that this will be representative of the local cost-share investment needed for implementation.
Types of Practices (i.e.,PTMApp Treatment Groups)	Use all PTMApp Treatment groups when targeting conservation practices
Targeted Measurable Goal	Targeted a 10% sediment reduction for each management area consistent with Sections 5-7 of the Red Lake River One Watershed One Plan
Resource Targeting Location	Target practices that provide the best progress towards reducing sediment at the outlet of management areas
Estimating Measurable Outcomes	Utilize PTMApp-Desktop treatment trains to assess the combined water quality benefits of all targeted conservation practices.

It is also important to note that the PTMApp-Desktop data was updated after the Red Lake River 1W1P was completed to complete this appendix. These updates resulted in slight changes to the upstream drainage areas of the Management Areas and also allowed for inclusion of the effects of lakes on sediment, total nitrogen, and total phosphorus transport within the planning region. To account for this difference in the targeted implementation profiles, each profile shows:

- The original Management Area from the Red Lake River 1W1P.
- The total upstream drainage area contributing to the original Management Area from the Red Lake River 1W1P

USING THE MANAGEMENT AREA IMPLEMENTATION PROFILES

This section describes the information contained within the Targeted Implementation Profiles and is intended to serve as a guide for how the profiles can be used. The Management Areas, as defined in the Red Lake River One Watershed One Plan are shown in **Figure 1**. Below is an explanation of the elements contained within each Targeted Implementation Profile and how each element is intended to be used:

- **Measurable Goal** – the Measurable Goal section shows the existing load, based upon PTMApp, at the outlet of the management area, the targeted load reduction, and the cost of implementing the targeted conservation practices upstream of that management area based upon 2016 EQIP costs. This is the total cost, not an annualized cost. It is also important to note that the total cost of implementing practices upstream of a management area, may be inclusive of conservation practices that were also targeted for implementation in other management areas. In other words, there is some redundancy in total cost estimates between Management Areas. In addition, all loads and load reductions for this Appendix were estimated utilizing PTMApp-Desktop and are subject to the associated assumptions and limitations (i.e., <https://ptmapp.bwsr.state.mn.us/User/Documentation>).
- **Targeting Approach** – the targeting approach describes the information that was used to select the targeted practices from PTMApp-Desktop. This information also drove the types of practices (i.e., treatment groups) that were selected. As the Red Lake River 1W1P is implemented, it is likely that adjustments will be made to these targeting criteria based upon available funding and landowners who are willing to implement conservation practices. The targeting criteria are intended to guide decision making processes about conservation practices that would make for a wise fiscal investment for making progress towards the measurable goals of the Red Lake River 1W1P. Prior to targeting, potential practices are screened to remove erroneous data (e.g., practices that might treat an unrealistically large drainage area), which eliminates some practices that may have otherwise been identified as cost-effective.
- **Progress Towards Goal** – the progress towards goals provides an estimate of the total load reduction that would be realized at the outlet of the Management Area if all of the targeted conservation practices upstream of the Management Area were implemented. These load reductions will differ from the sum of the load reductions in the Practice Summary section as the Progress Towards Goals section is inclusive of upstream and downstream treatment by other conservation practices based upon PTMApp-Desktop treatment trains results. Treatment trains is an operation in PTMApp-Desktop that allows the user to estimate sediment, total phosphorus, and total nitrogen reduction benefits that result from conservation practices by accounting for the impacts of upstream and downstream treatment. In other words, the combined benefits of conservation practices.
- **Practice Summary** – the practice summary provides statistics on the number, cost, and load reduction benefits of the individual treatment groups from PTMApp, along with examples of the types of conservation practices that could be implemented within each treatment group. The benefits shown are an aggregate of the individual practices and not reflective of the treatment trains results.
- **Tailoring Implementation** – tailoring implementation provides suggestions as to how the data can be used to implement a conservation implementation program within the Management Area. It describes how critical sediment loss information might be used to tailor decisions on when and where to implement conservation practices and suggests optimal investment levels. Critical areas for sediment loss are the highest areas of sediment loss from overland flow as estimated by PTMApp-Desktop. The critical sediment loss areas are intended to represent areas where it may be wise to target management actions if the specific targeted practices can not be implemented. For example, side inlets area common practice in the planning region. Even if they are not specifically targeted through this analysis, they may provide a suitable practice for protecting erosion in critical sediment loss areas.
- **Cost-effectiveness for Sediment Reduction** – The cost-effectiveness curves serve two primary functions; 1. Identifying if the load reduction goals for the Management Area can be achieved through the practices targeted with PTMApp-Desktop, 2. Providing an estimate of a reasonable

return in sediment reduction for a given level of investment. It is important to note that the cost-effectiveness curves are generated from the full suite of potential practices within the Management Area. The targeted practices are a subset of the potential practice costs and load reductions shown on the cost-effectiveness curves. In addition, it is highly unlikely that the optimum performance (i.e. the curve itself) could ever be achieved during implementation. It is almost certain that the implementation performance (dollar per ton of sediment reduced) will fall well below the curve.

- **Management Area Map** – each targeted profile has a map of the targeted conservation practices, critical sediment loss areas, original Management Area from the Red Lake River 1W1P, and the upstream drainage area for the Management area.

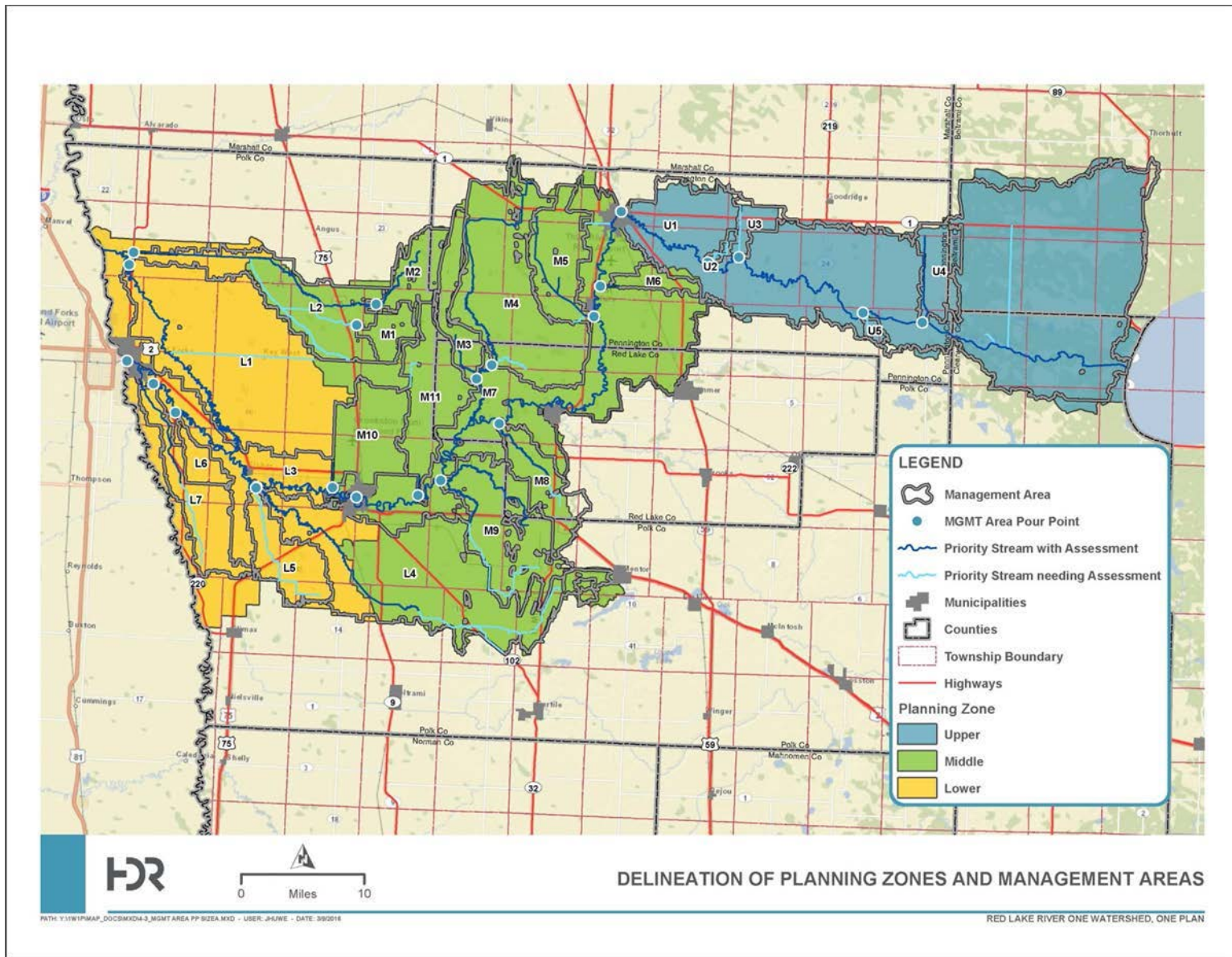


Figure 1. Management Areas as delineated for the Red Lake River, One Watershed One Plan.

LOWER PLANNING ZONE: MANAGEMENT AREA L1 – GRAND MARAIS CREEK

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 23,379 tons/yr.

Targeted Load Reduction at Outlet: 2,338 tons/yr.

Cost: \$1,508,184

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

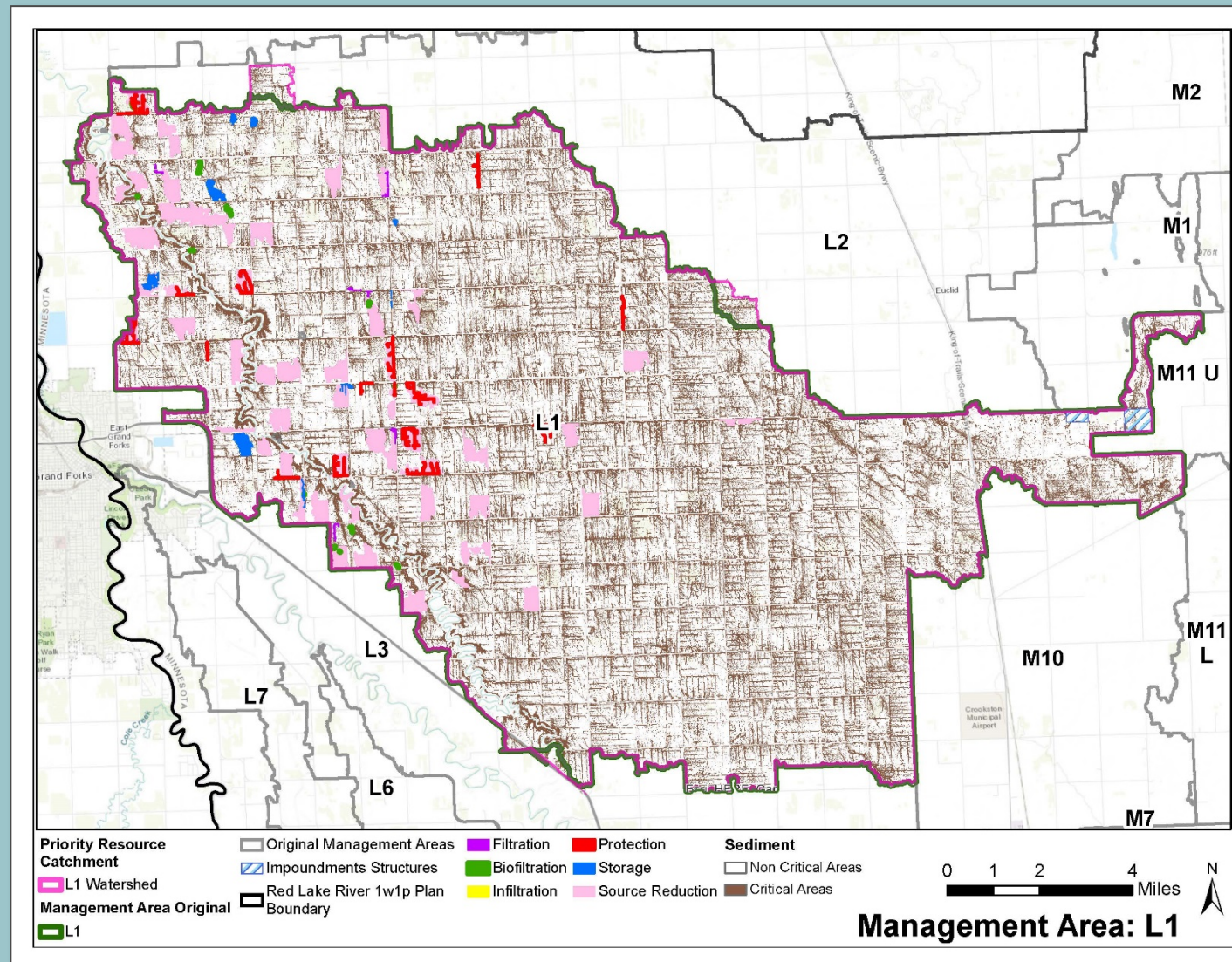
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	1,638		7%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group					Totals
	Storage	Filtration	Biofiltration	Protection	Source Reduction	
Count	7	6	9	15	47	84
Sediment Reduction, Tons/year	147	111	187	358	795	1,598
Cost	\$484,712	\$12,971	\$513,924	\$368,262	\$128,315	\$1,508,184
Ave. Cost-Effect. \$/ton/year	\$3,364	\$121	\$2,763	\$1,171	\$453	\$890
Standard Deviation Cost-Effect. \$/ton/year	\$2,476	\$53	\$884	\$731	\$220	\$4,364
Treatment Types						
Storage	Filtration	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/ Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



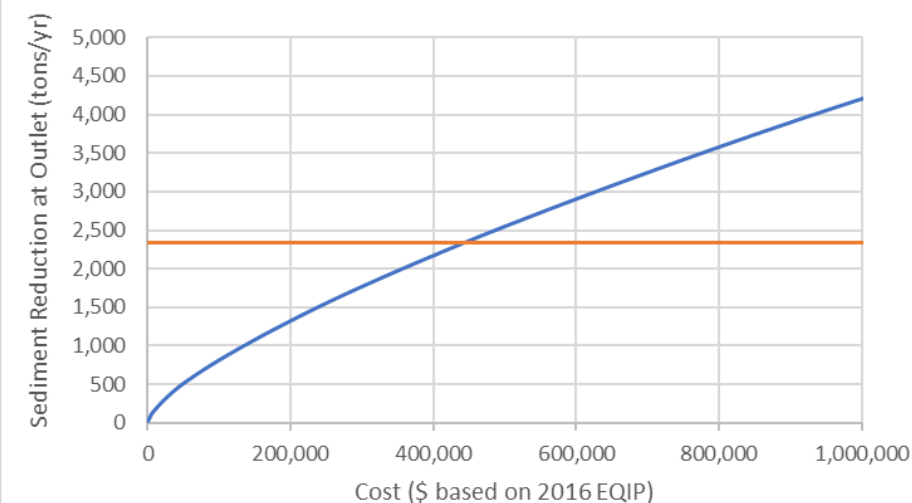
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area L1 were targeted.

The results suggest that **roughly 26% of land area** in L1 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 1,638 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



LOWER PLANNING ZONE: MANAGEMENT AREA L2 – POLK COUNTY DITCH 2 AND RLWD DITCH 15 DOWNSTREAM OF IMPOUNDMENTS

MEASURABLE GOAL

Goals Source: Planning Work Group
Existing Load at Management Area Outlet: 8,099
Targeted Load Reduction at Outlet: 810
Cost: \$1,071,237

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

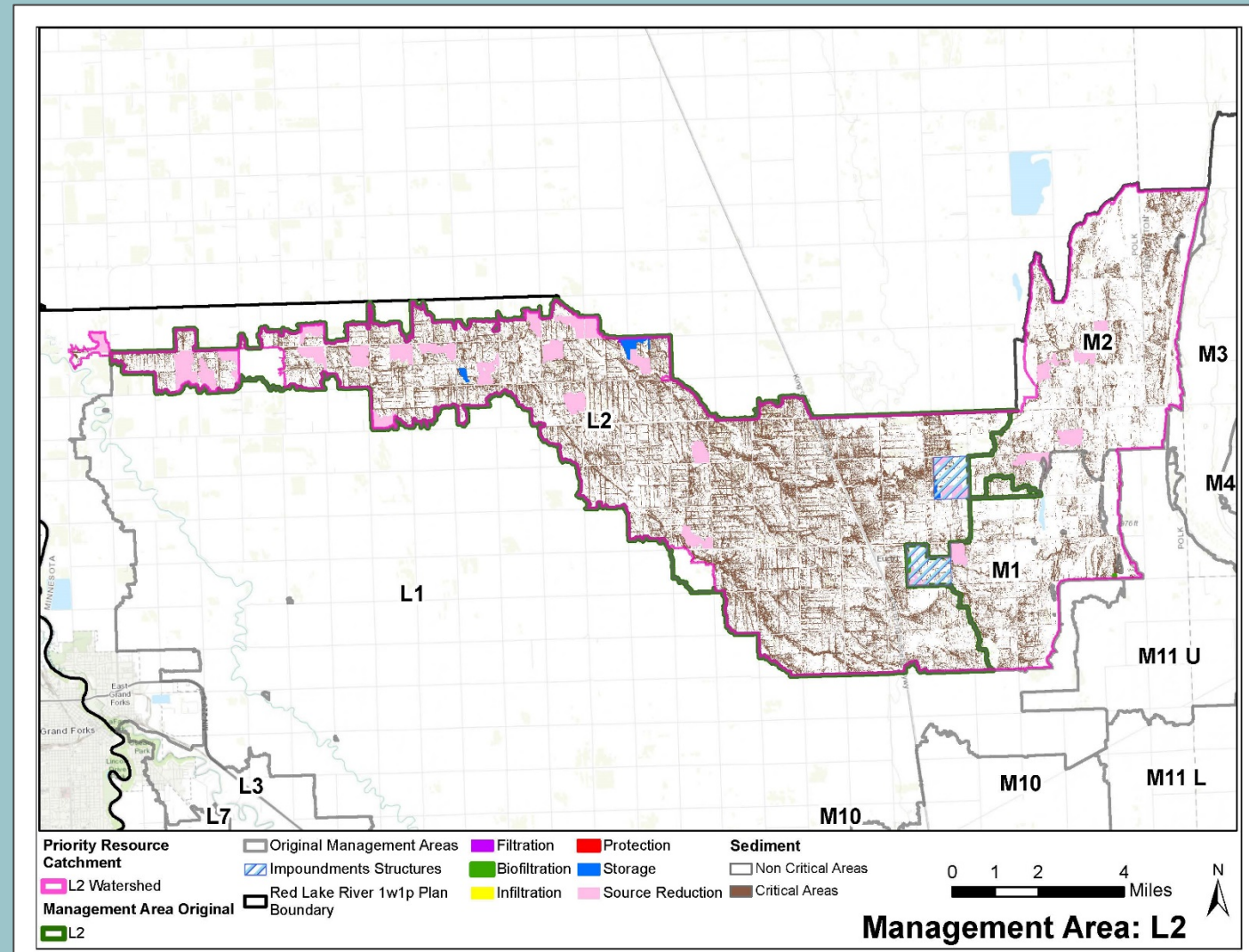
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results	Progress
	-----Sediment, tons/year-----	
Management Area Outlet	447	6%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group			
	Storage	Biofiltration	Source Reduction	Totals
Count	3	2	16	21
Sediment Reduction, Tons/year	130	90	219	439
Cost	\$714,452	\$300,694	\$56,091	\$1,071,237
Ave. Cost-Effect. \$/ton/year	\$5,857	\$3,331	\$259	\$1,351
Standard Deviation Cost-Effect. \$/ton/year	\$3,286	\$30	\$32	\$2,339
Treatment Types				
Storage	Biofiltration	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



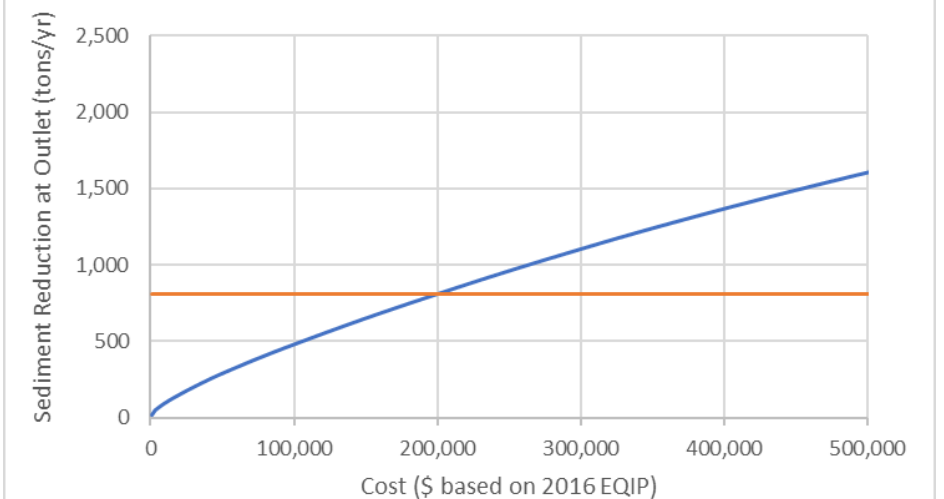
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area L2 were targeted.

The results suggest that **roughly 27% of land area** in L2 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 447 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



LOWER PLANNING ZONE: MANAGEMENT AREA L3 – (LOWER) RED LAKE RIVER DOWNSTREAM OF CROOKSTON

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 47,807 tons/yr.

Targeted Load Reduction at Outlet: 4,781 tons/yr.

Cost: \$2,132,599

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

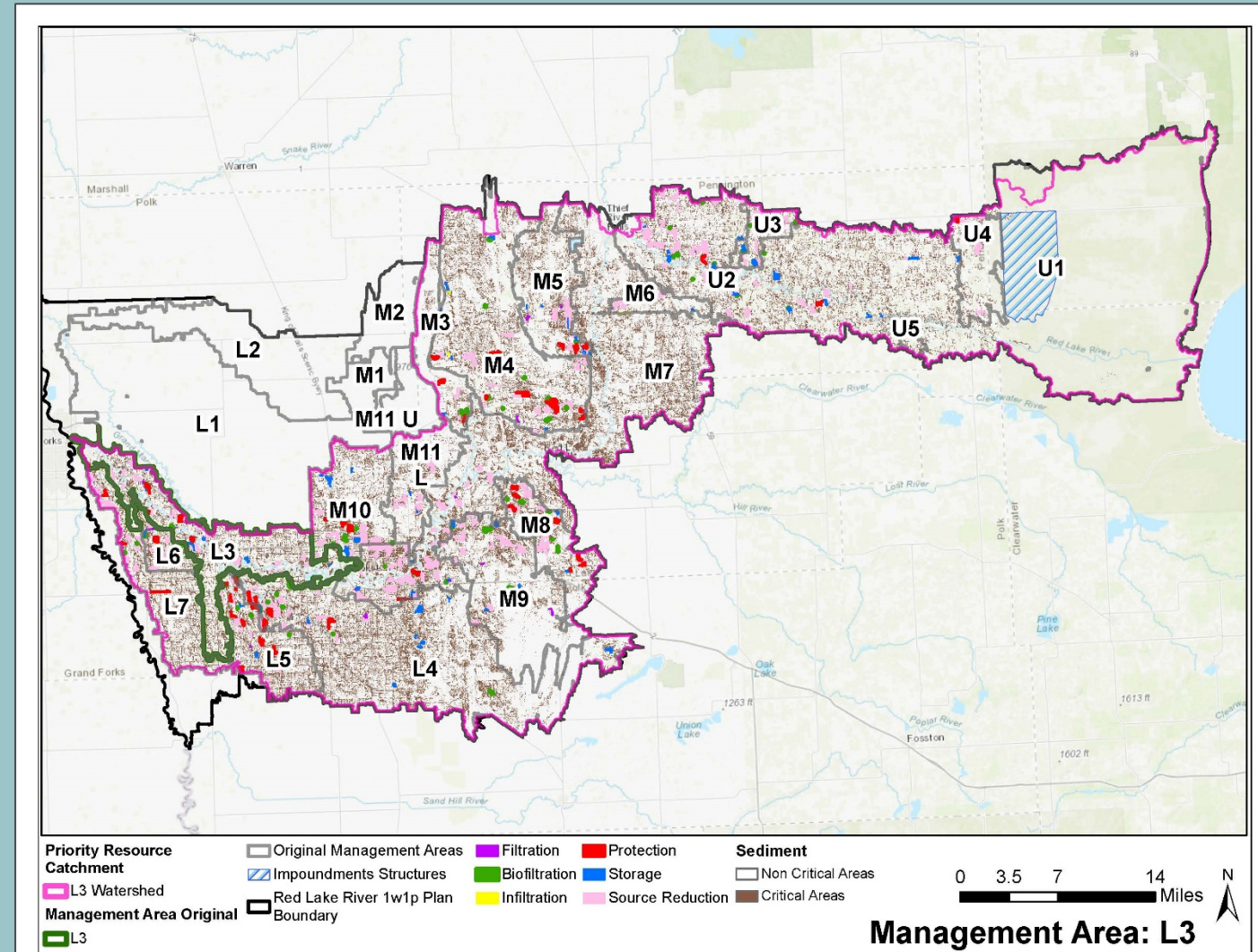
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	4,003		8%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group					Totals
	Storage	Filtration	Biofiltration	Protection	Source Reduction	
Count	12	4	7	5	38	61
Sediment Reduction, Tons/year	425	140	289	152	1,021	2,027
Cost	\$1,514,658	\$12,115	\$390,384	\$116,977	\$98,465	\$2,132,599
Ave. Cost-Effect. \$/ton/year	\$3,766	\$96	\$1,348	\$854	\$110	\$961
Standard Deviation Cost-Effect. \$/ton/year	\$2,268	\$70.6	\$313	\$476	\$54	\$1,683
Treatment Types						
Storage	Filtration	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



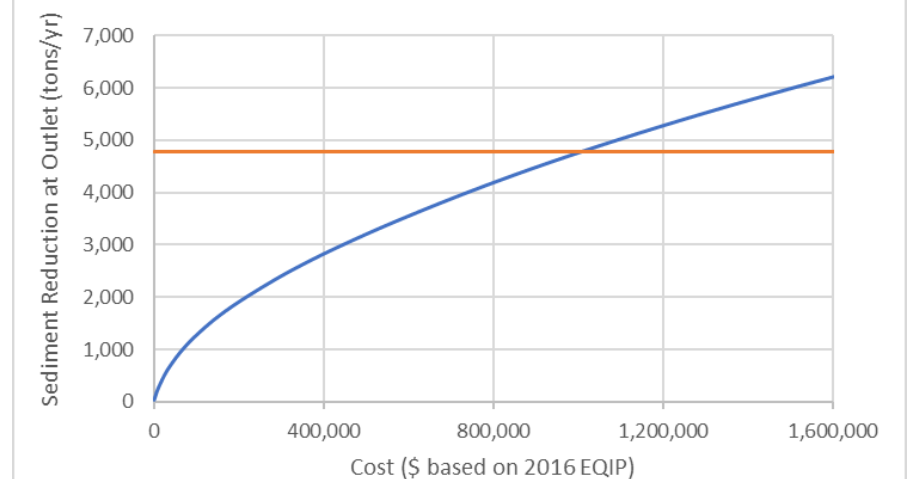
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area L3 were targeted.

The results suggest that **roughly 27% of land area** in L3 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 4,003 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



LOWER PLANNING ZONE: MANAGEMENT AREA L4 – BURNHAM CREEK

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 15,214

Targeted Load Reduction at Outlet: 1,521

Cost: \$1,757,056

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

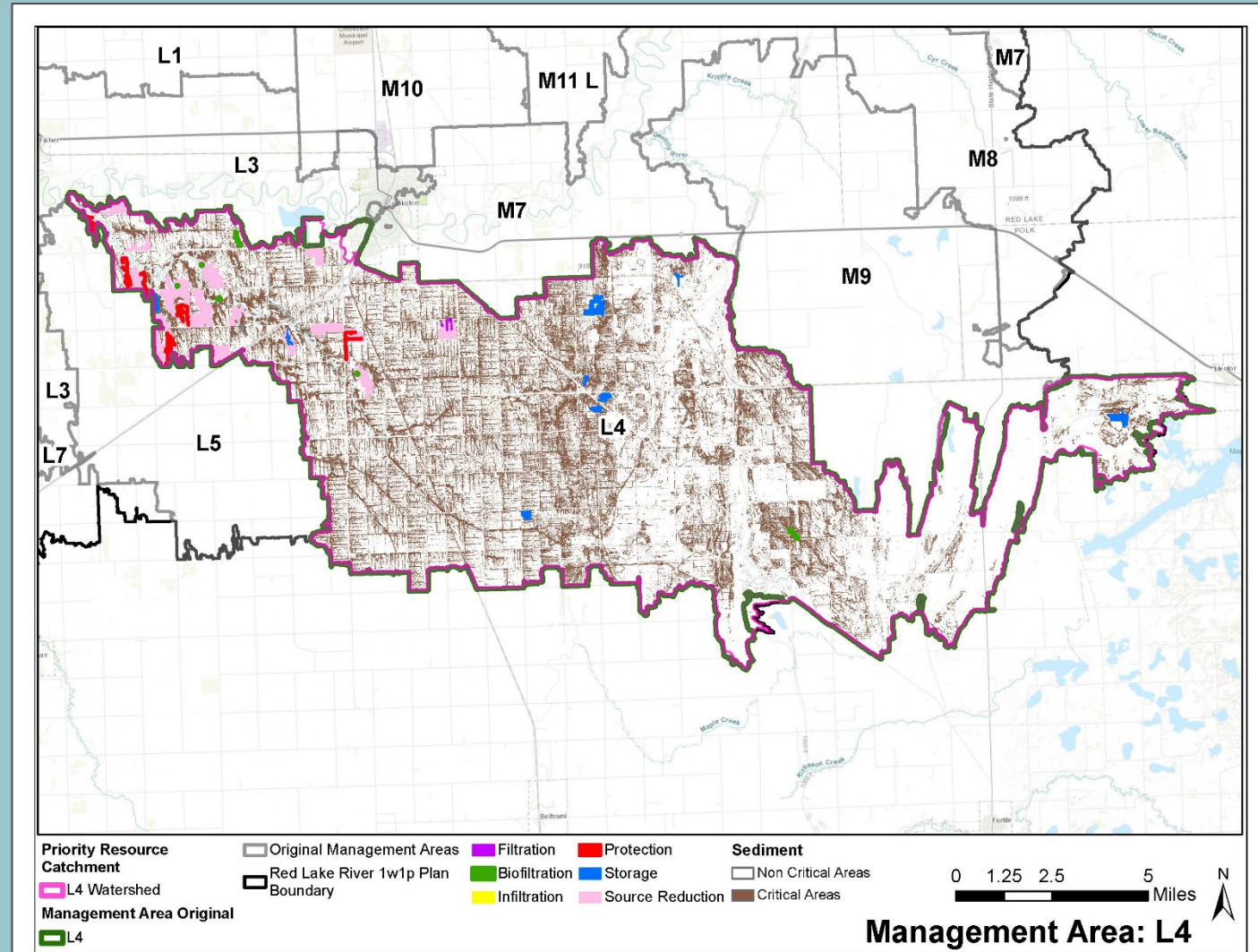
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results	Progress
	-----Sediment, tons/year-----	
Management Area Outlet	870	6%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group					Totals
	Storage	Filtration	Biofiltration	Protection	Source Reduction	
Count	9	1	6	5	19	40
Sediment Reduction, Tons/year	190	16	107	135	451	900
Cost	\$1,146,316	\$1,974	\$378,888	\$174,992	\$54,886	\$1,757,056
Ave. Cost-Effect. \$/ton/year	\$6,596	\$122	\$3,594	\$1,522	\$144	\$2,285
Standard Deviation Cost-Effect. \$/ton/year	\$5,905	N/A	\$687	\$762	\$63	\$3,775
Treatment Types						
Storage	Filtration	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area L4 were targeted.

The results suggest that **roughly 24% of land area** in L4 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 870 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



LOWER PLANNING ZONE: MANAGEMENT AREA L5 – POLK COUNTY DITCH 100/74/10/28

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 6,391 tons/yr.

Targeted Load Reduction at Outlet: 639 tons/yr.

Cost: \$433,900

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

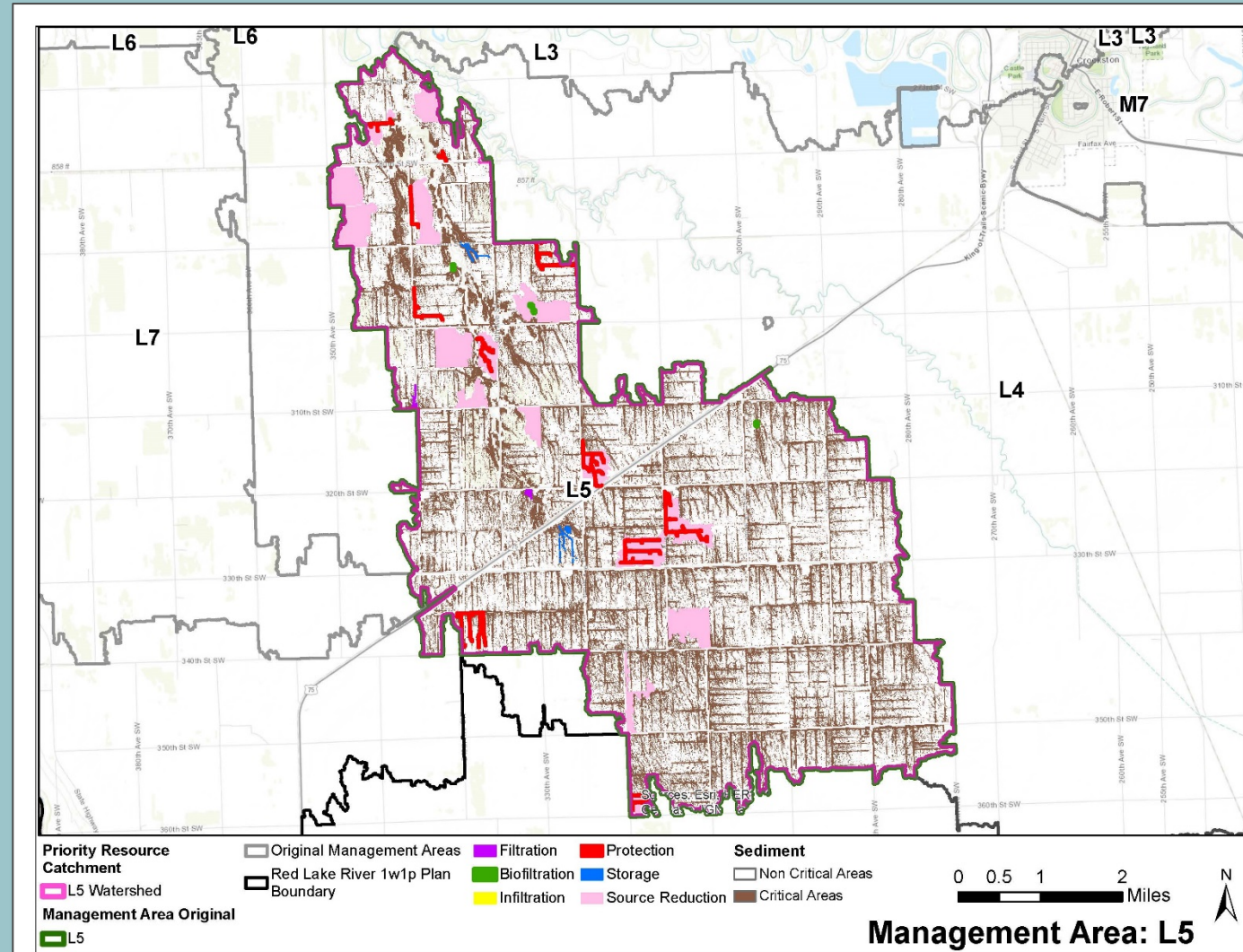
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	515		8%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group					Totals
	Storage	Filtration	Biofiltration	Protection	Source Reduction	
Count	2	1	3	8	13	27
Sediment Reduction, Tons/year	33	13	43	149	247	485
Cost	\$78,793	\$1,546	\$142,624	\$177,812	\$33,126	\$433,901
Ave. Cost-Effect. \$/ton/year	\$2,530	\$117	\$3,264	\$1,269	\$136	\$996
Standard Deviation Cost-Effect. \$/ton/year	\$1,886	N/A	\$1,660	\$842	\$58	\$1,318
Treatment Types						
Storage	Filtration	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



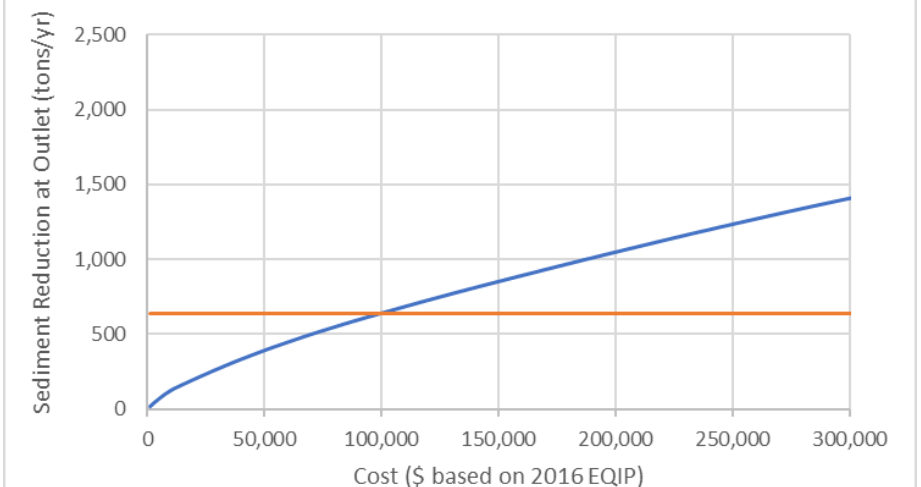
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area L5 were targeted.

The results suggest that **roughly 31% of land area** in L5 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 515 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



LOWER PLANNING ZONE: MANAGEMENT AREA L6 – POLK COUNTY DITCH 115/123/124/107/163

MEASURABLE GOAL

Goals Source: Planning Work Group
Existing Load at Management Area Outlet: 2,472 tons/yr.
Targeted Load Reduction at Outlet: 247 tons/yr.
Cost: \$169,221

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

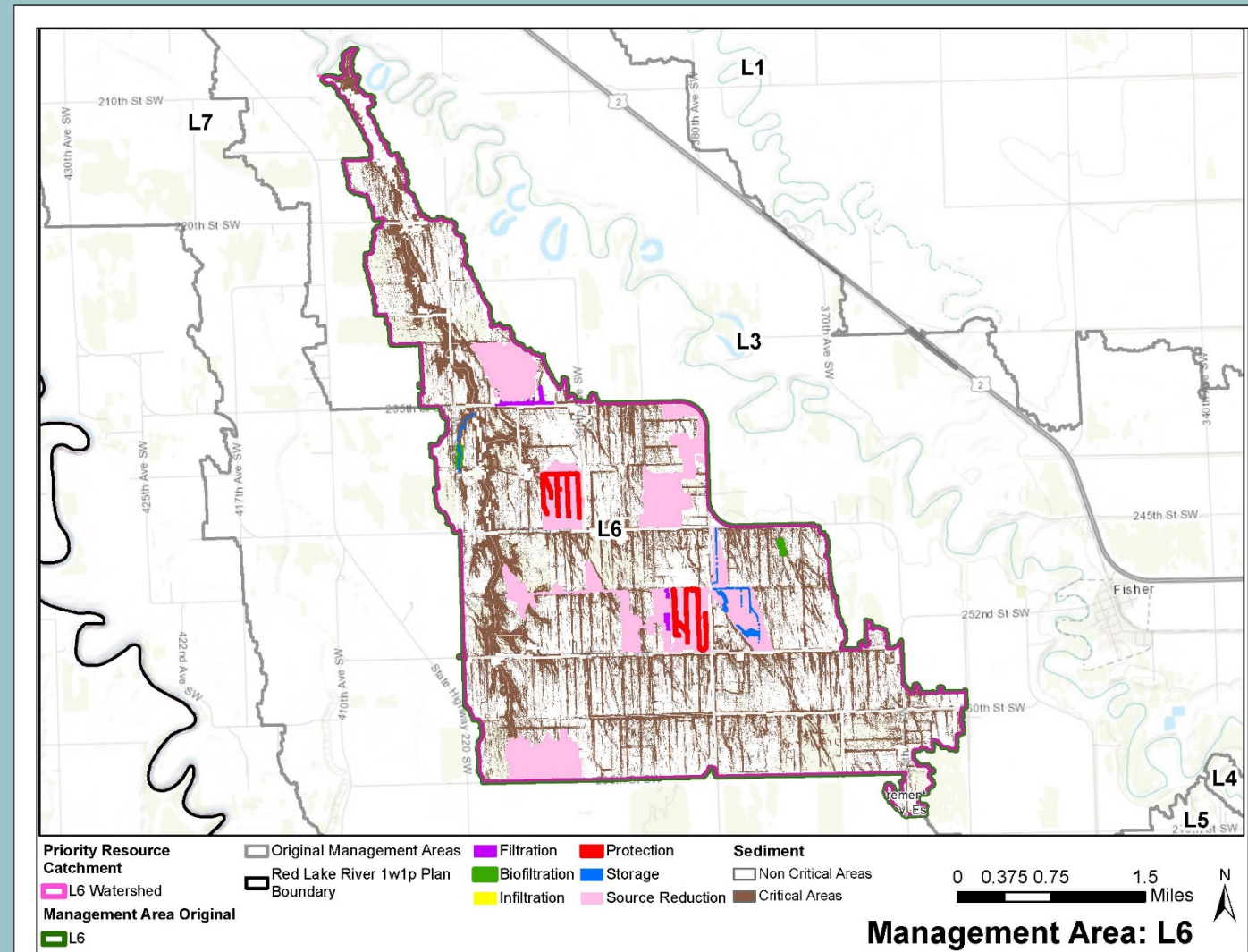
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	215		9%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group					Totals
	Storage	Filtration	Biofiltration	Protection	Source Reduction	
Count	2	2	1	1	6	12
Sediment Reduction, Tons/year	40	31	12	16	110	209
Cost	\$57,494	\$6,736	\$40,227	\$45,824	\$18,940	\$169,221
Ave. Cost-Effect. \$/ton/year	\$1,447	\$222	\$3,203	\$2,857	\$183	\$874
Standard Deviation Cost-Effect. \$/ton/year	\$684	\$47	N/A	N/A	\$61	\$1,137
Treatment Types						
Storage	Filtration	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



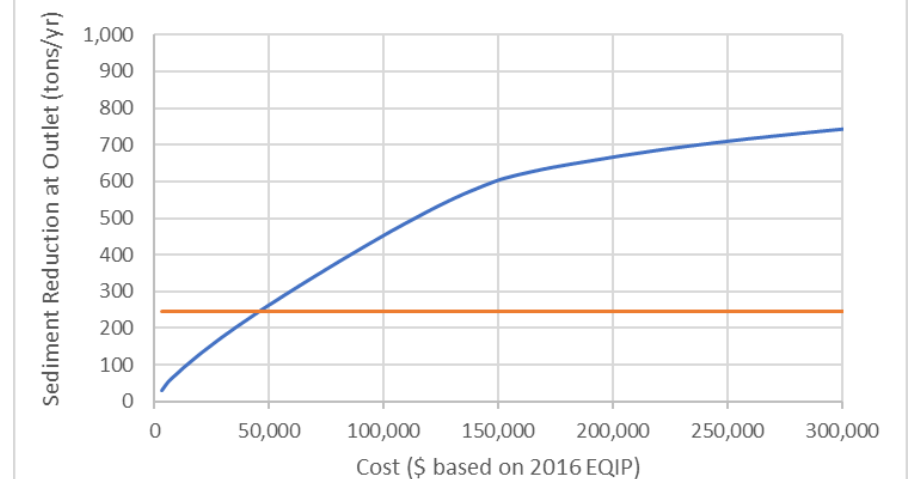
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area L6 were targeted.

The results suggest that **roughly 33% of land area** in L6 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 215 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



LOWER PLANNING ZONE: MANAGEMENT AREA L7 – HEARTSVILLE COULEE

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 6,637 tons/yr.

Targeted Load Reduction at Outlet: 664 tons/yr.

Cost: \$305,478

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

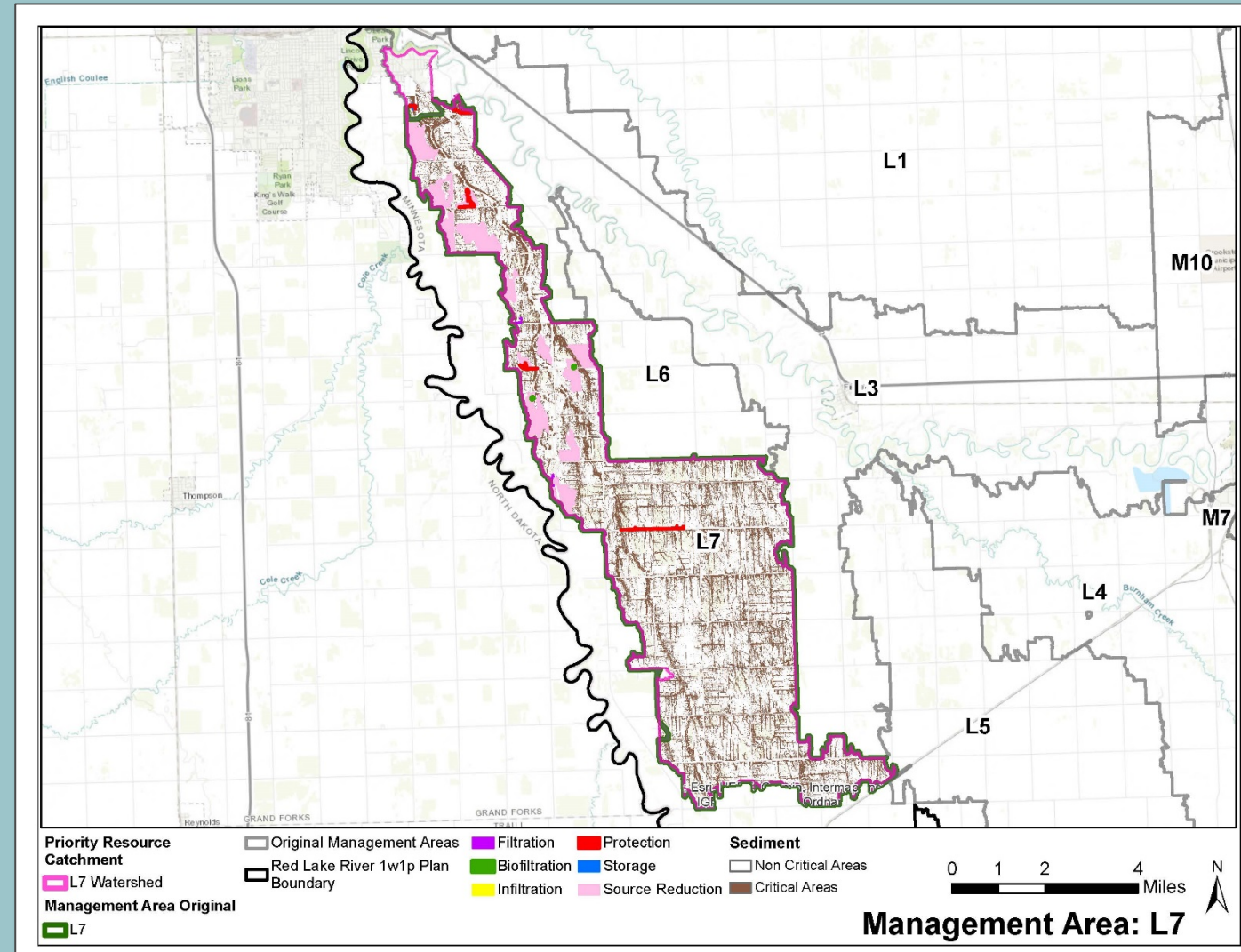
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	497		7%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group					Totals
	Storage	Filtration	Biofiltration	Protection	Source Reduction	
Count	1	1	2	4	15	23
Sediment Reduction, Tons/year	48	22	42	119	250	481
Cost	\$43,791	\$1,886	\$149,368	\$67,543	\$42,890	\$305,478
Ave. Cost-Effect. \$/ton/year	\$904	\$85	\$3,544	\$685	\$182	\$589
Standard Deviation Cost-Effect. \$/ton/year	N/A	N/A	\$332	\$518	\$79	\$985
	Treatment Types					
Storage	Filtration	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



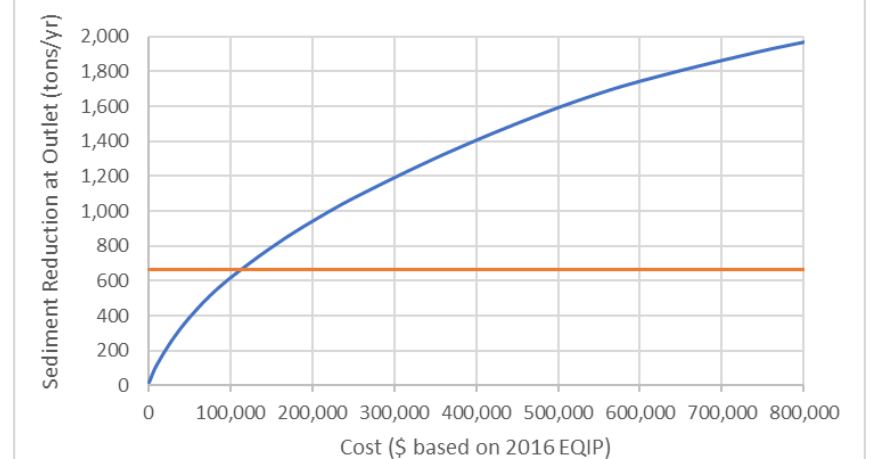
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area L7 were targeted.

The results suggest that **roughly 26% of land area** in L7 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 497 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M1 - EUCLID EAST IMPOUNDMENT

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 482 tons/yr.

Targeted Load Reduction at Outlet: 48 tons/yr.

Cost: \$66,527

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

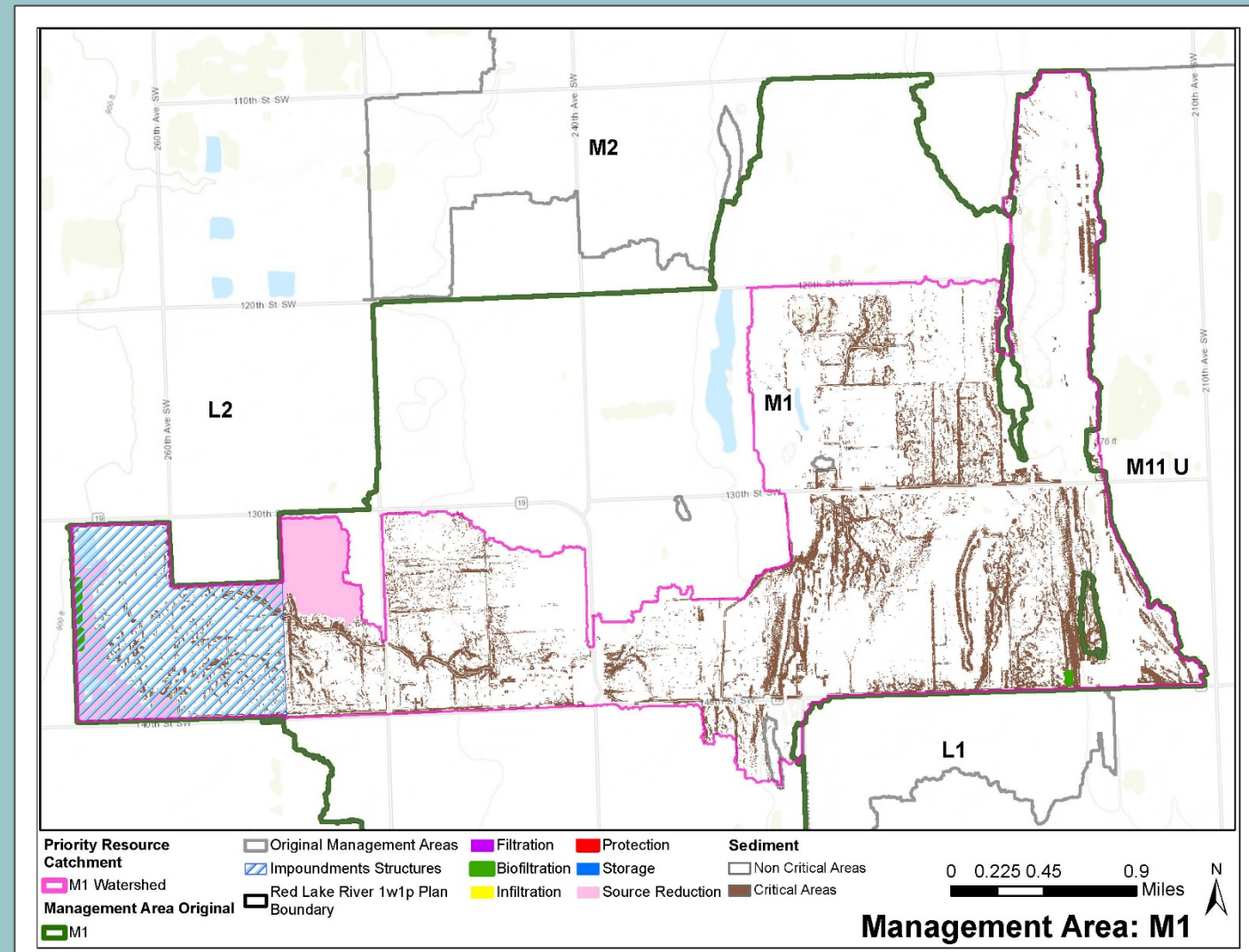
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	52		11%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group		
	Biofiltration	Source Reduction	Totals
Count	1	2	3
Sediment Reduction, Tons/year	19	29	48
Cost	\$60,206	\$6,321	\$66,527
Ave. Cost-Effect. \$/ton/year	\$3,144	\$217	\$1,193
Standard Deviation Cost-Effect. \$/ton/year	N/A	\$10	\$1,690
Treatment Types			
Biofiltration		Source Reduction	
<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 		<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 	

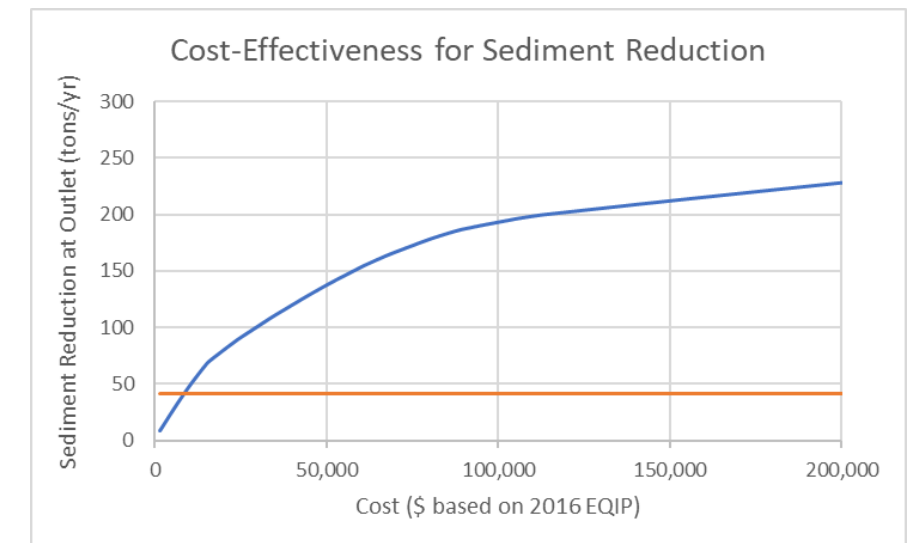


TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M1 were targeted.

The results suggest that **roughly 15% of land area** in M1 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 52 tons/year of sediment through the targeted practices and tailoring of the implementation approach.



MIDDLE PLANNING ZONE: MANAGEMENT AREA M2 – BRANDT IMPOUNDMENT

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 1,548 tons/yr.

Targeted Load Reduction at Outlet: 155 tons/yr.

Cost: \$940,967

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

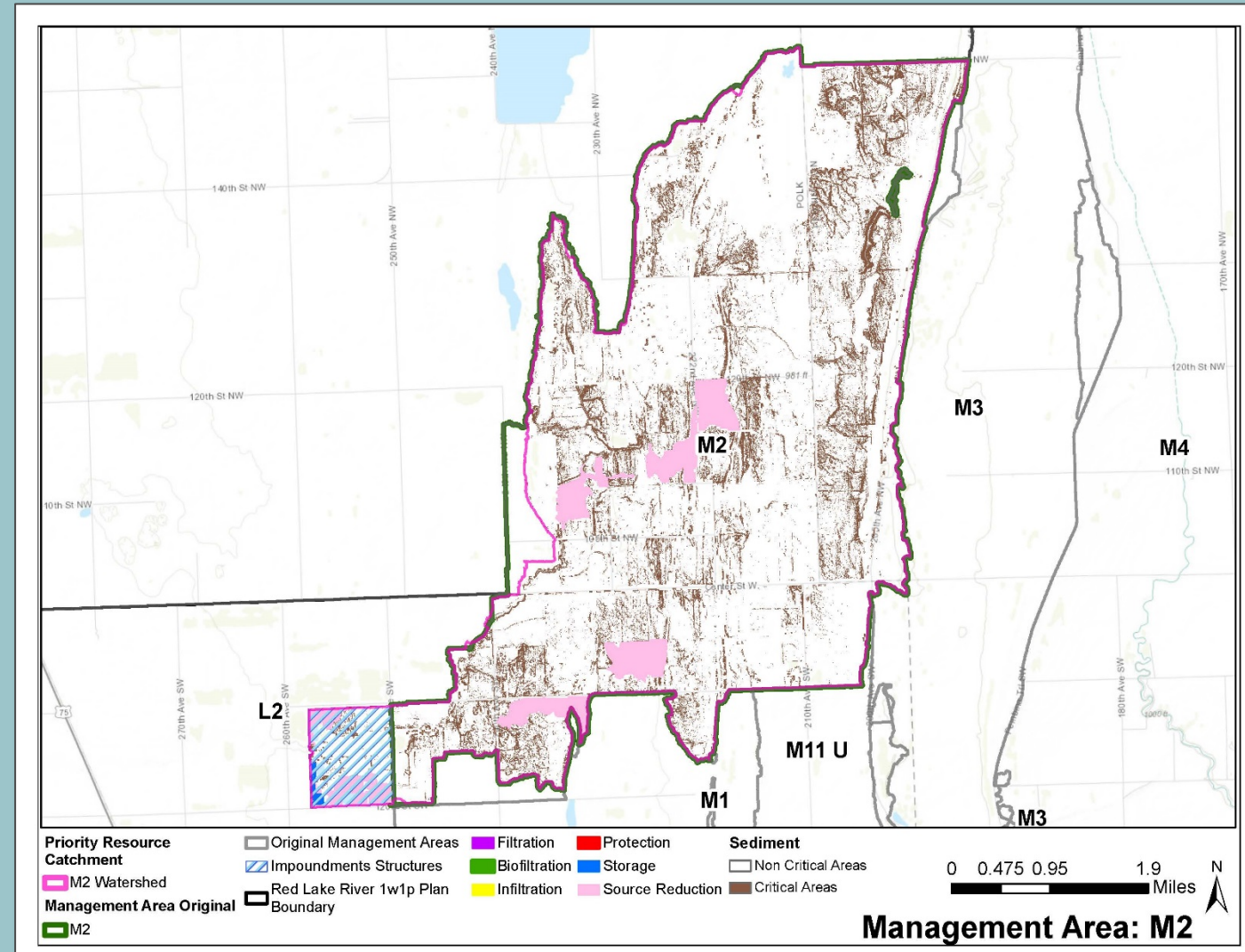
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	118		8%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group		
	Storage	Source Reduction	Totals
Count	2	4	6
Sediment Reduction, Tons/year	74	52	126
Cost	\$930,704	\$10,263	\$940,967
Ave. Cost-Effect. \$/ton/year	\$14,725	\$211	\$5,049
Standard Deviation Cost-Effect. \$/ton/year	\$10,053	\$101	\$8,740
Treatment Types			
Storage	<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 		
Source Reduction	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



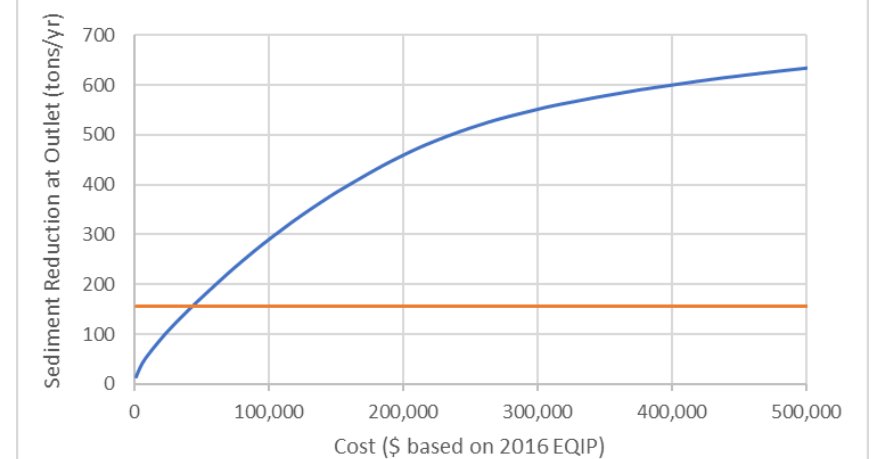
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M2 were targeted.

The results suggest that **roughly 14% of land area** in M2 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 118 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M3 – LITTLE BLACK RIVER

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 1,237 tons/yr.

Targeted Load Reduction at Outlet: 123 tons/yr.

Cost: \$205,769

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

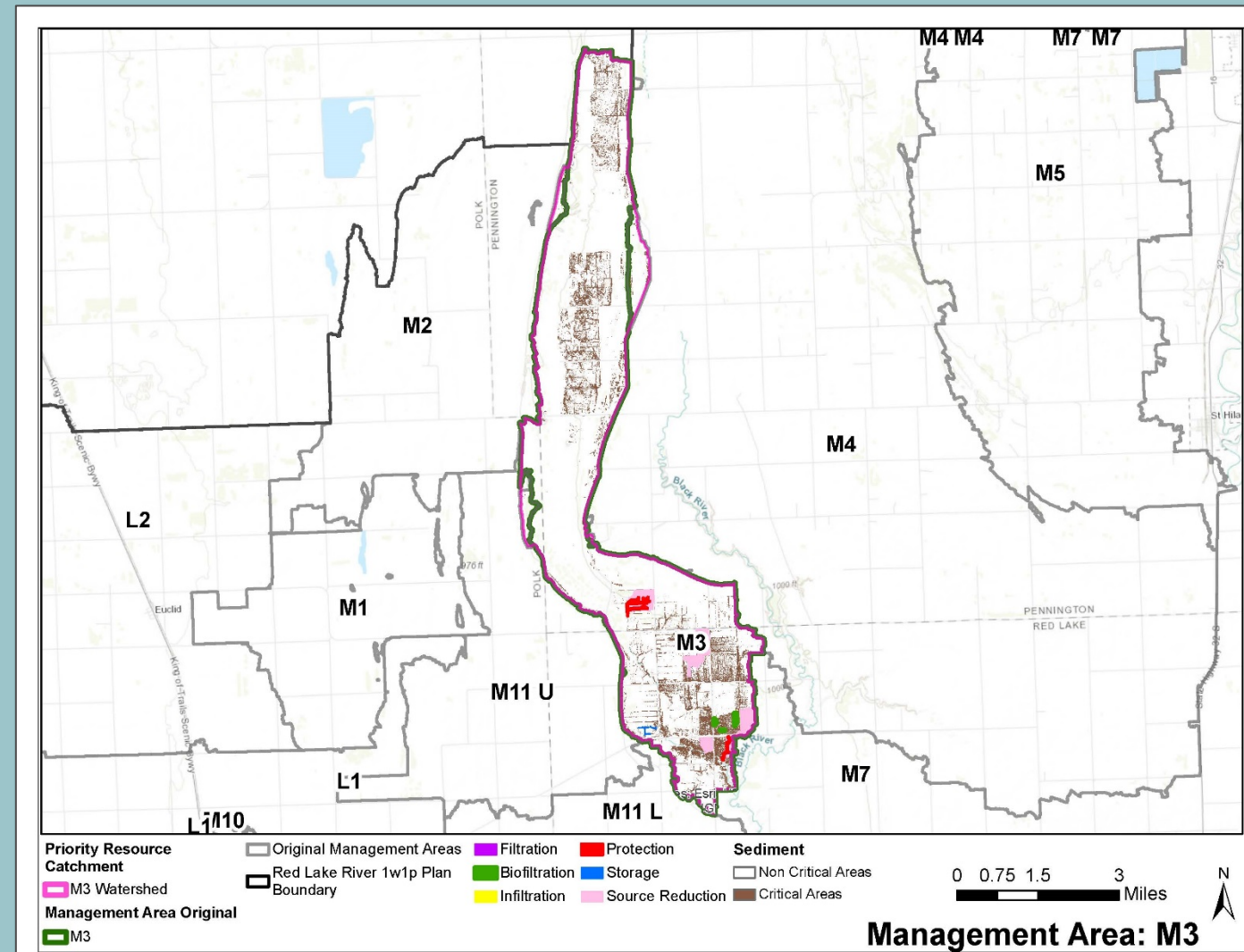
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	130		10%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group				Totals
	Storage	Biofiltration	Protection	Source Reduction	
Count	1	2	2	5	10
Sediment Reduction, Tons/year	11	26	23	68	128
Cost	\$12,206	\$128,872	\$53,006	\$11,685	\$205,769
Ave. Cost-Effect. \$/ton/year	\$1,088	\$5,209	\$2,219	\$176	\$1,682
Standard Deviation Cost-Effect. \$/ton/year	N/A	\$2,147	\$1,341	\$91	\$2,201
Treatment Types					
Storage	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



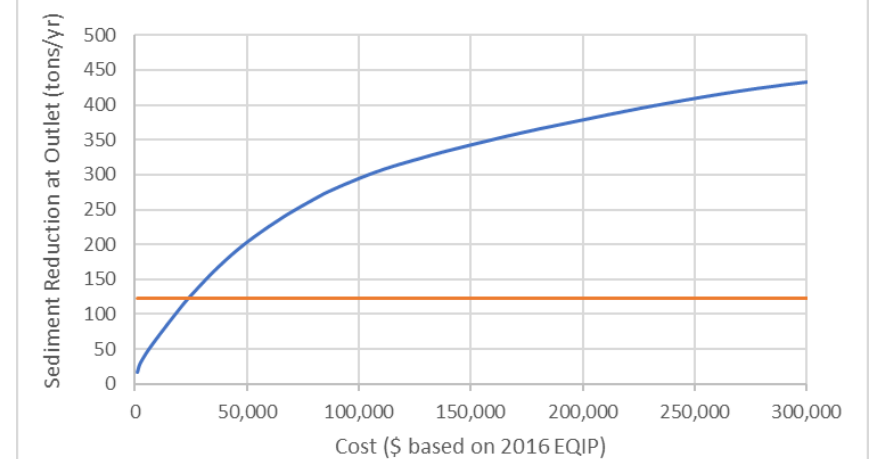
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M3 were targeted.

The results suggest that **roughly 12% of land area** in M3 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 130 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M4 – BLACK RIVER UPSTREAM OF SCHIRRICK DAM

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 10,588 tons/yr.

Targeted Load Reduction at Outlet: 1,059 tons/yr.

Cost: \$1,170,249

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	755		7%

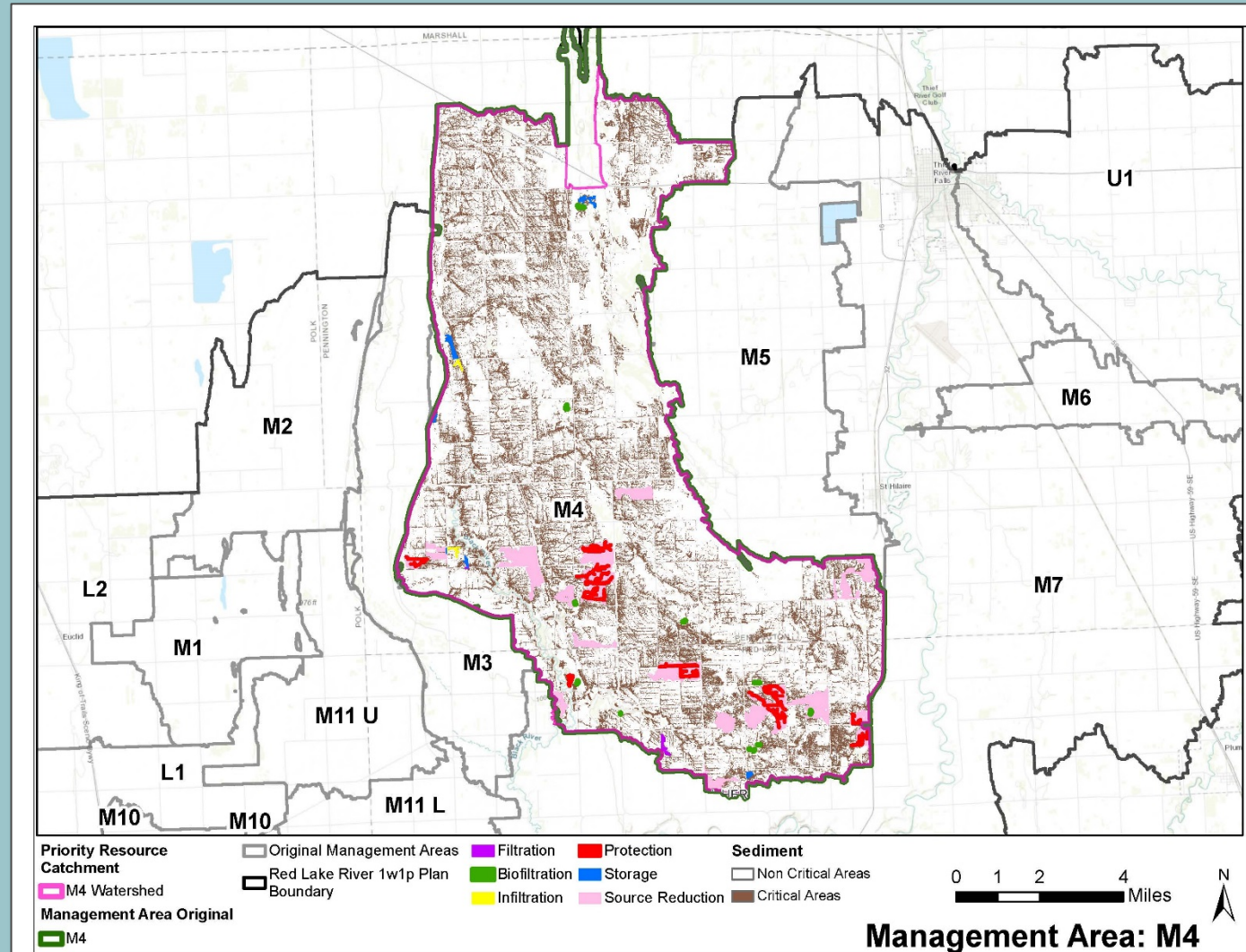
PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group						Totals
	Storage	Filtration	Biofiltration	Infiltration	Protection	Source Reduction	
Count	6	4	7	1	10	24	52
Sediment Reduction, Tons/year	79	54	80	10	136	379	738
Cost	\$314,850	\$10,095	\$325,733	\$125,516	\$321,134	\$72,921	\$1,170,249
Ave. Cost-Effect. \$/ton/year	\$4,263	\$183	\$4,063	\$12,756	\$2,508	\$197	\$1,871
Standard Deviation Cost-Effect. \$/ton/year	\$3,627	\$105	\$1,092	N/A	\$976	\$51	\$2,622

Treatment Types

Storage	Filtration	Biofiltration	Infiltration	Protection	Source Reduction
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Multi-stage Ditch • Infiltration Trench or small basin 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/ Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management



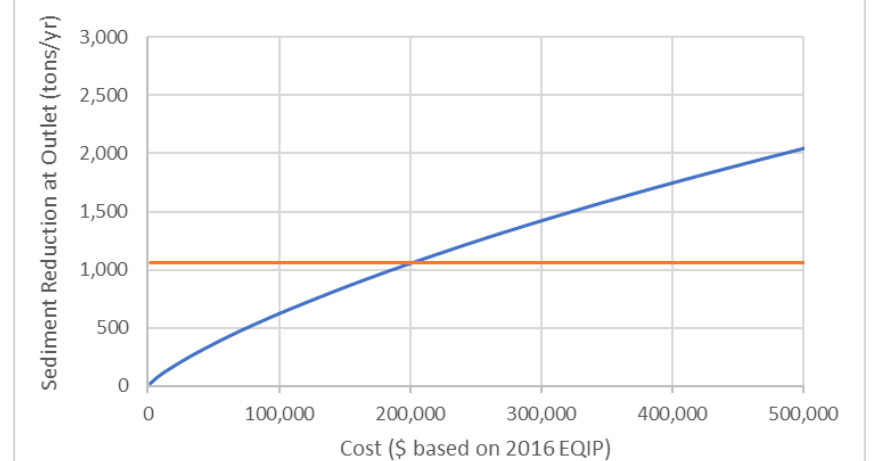
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M4 were targeted.

The results suggest that **roughly 22% of land area** in M4 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 755 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M5 – PENNINGTON COUNTY DITCH 96

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 5,074 tons/yr.

Targeted Load Reduction at Outlet: 507 tons/yr.

Cost: \$391,951

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

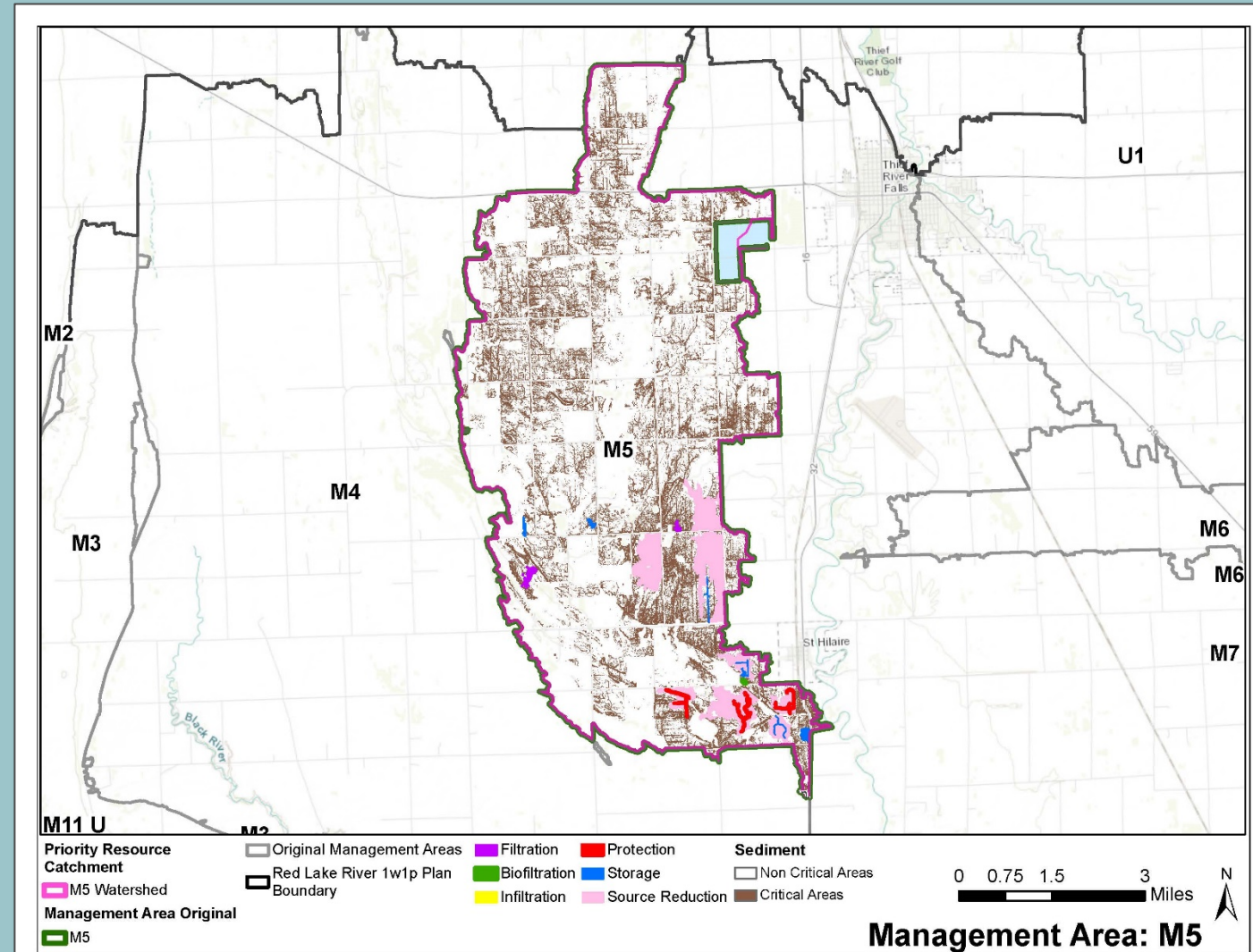
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	458		9%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group					Totals
	Storage	Filtration	Biofiltration	Protection	Source Reduction	
Count	5	2	1	2	11	21
Sediment Reduction, Tons/year	117	34	20	40	226	437
Cost	\$235,416	\$7,284	\$56,890	\$60,808	\$31,553	\$1391,951
Ave. Cost-Effect. \$/ton/year	\$1,990	\$216	\$2,802	\$1,592	\$143	\$854
Standard Deviation Cost-Effect. \$/ton/year	\$1,109	\$157	N/A	\$717	\$42	\$1,077
Treatment Types						
Storage	Filtration	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



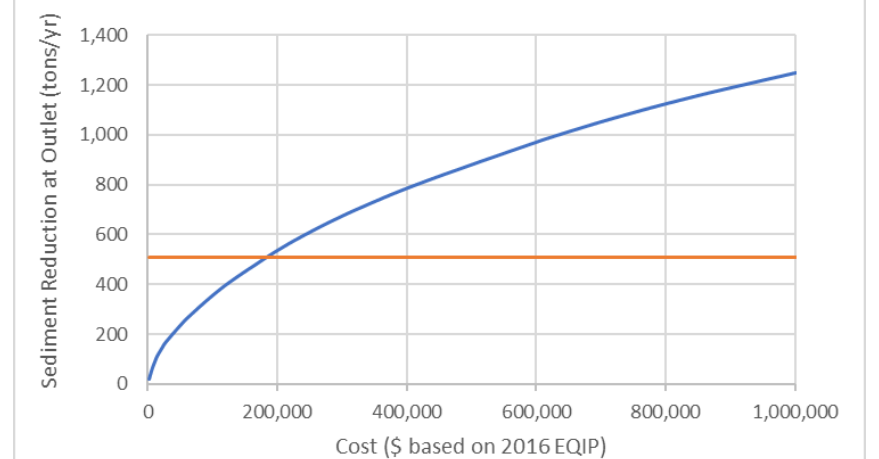
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M5 were targeted.

The results suggest that **roughly 23% of land area** in M5 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 458 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M6 – PENNINGTON COUNTY DITCH 21

MEASURABLE GOAL

Goals Source: Planning Work Group
Existing Load at Management Area Outlet: 1,080 tons/yr.
Targeted Load Reduction at Outlet: 108 tons/yr.
Cost: \$336,690

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

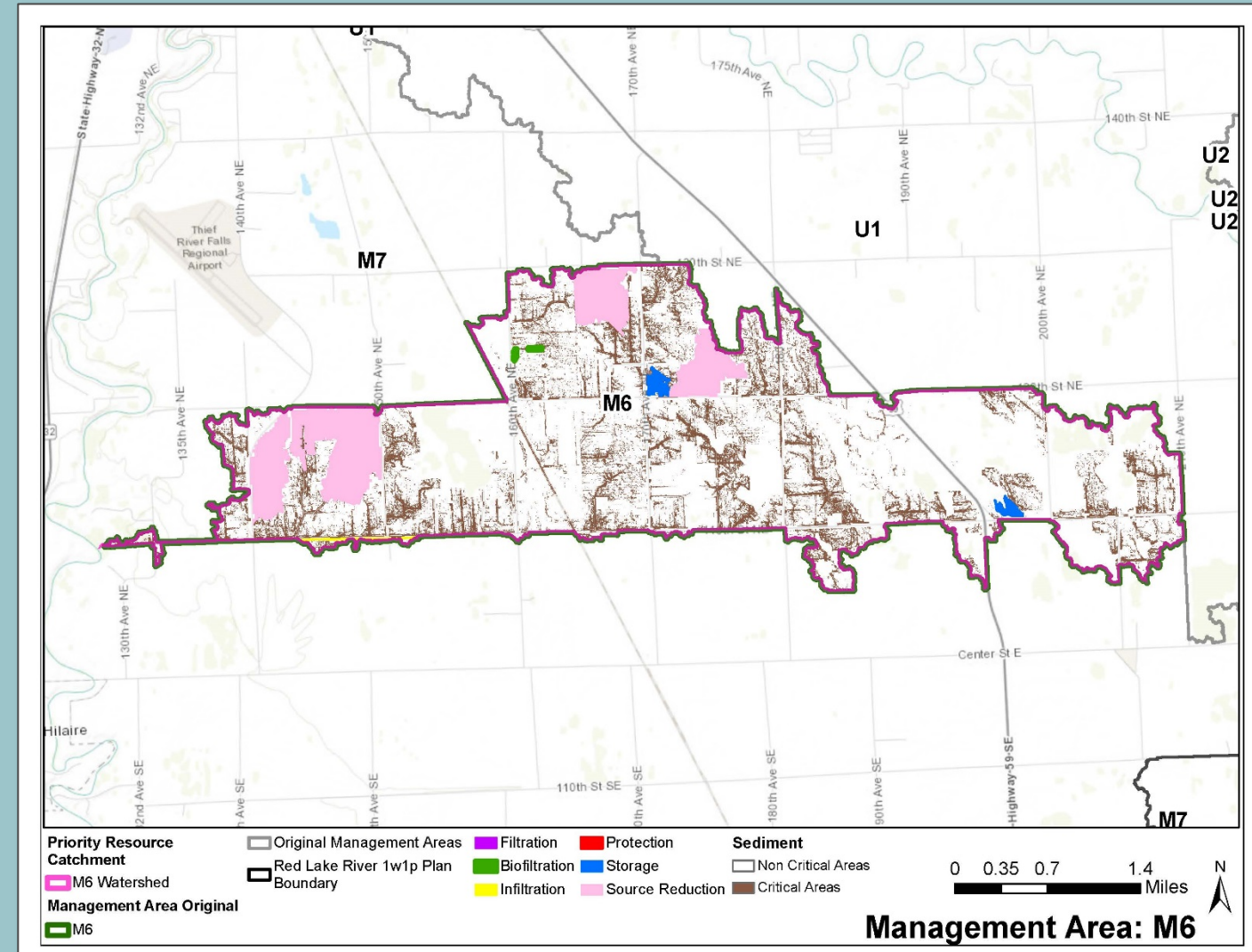
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	104		10%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group				Totals
	Storage	Biofiltration	Infiltration	Source Reduction	
Count	2	1	1	4	8
Sediment Reduction, Tons/year	33	10	8	50	101
Cost	\$159,104	\$44,093	\$120,140	\$13,353	\$336,690
Ave. Cost-Effect. \$/ton/year	\$6,026	\$4,564	\$14,407	\$271	\$4,014
Standard Deviation Cost-Effect. \$/ton/year	\$3,935	N/A	N/A	\$35	\$5,182
Treatment Types					
Storage	Biofiltration	Infiltration	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Multi-stage Ditch • Infiltration Trench or small basin 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



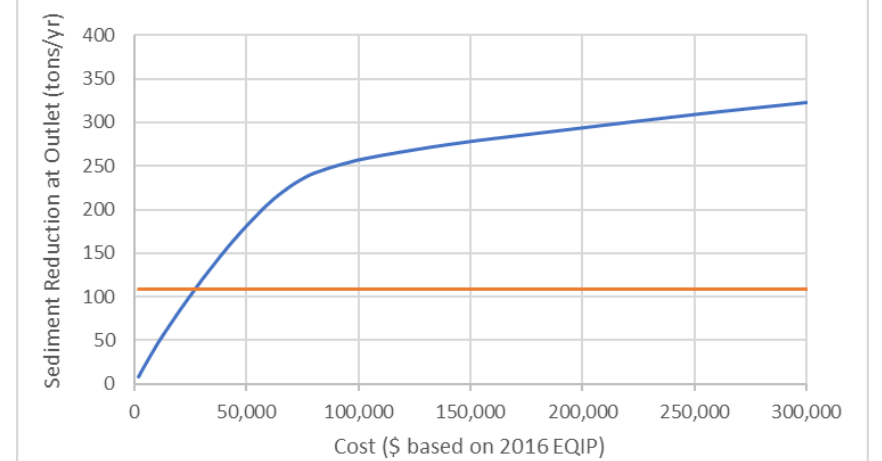
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M6 were targeted.

The results suggest that **roughly 17% of land area** in M6 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 104 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M7 – (MIDDLE) RED LAKE RIVER BETWEEN THE THIEF RIVER AND CROOKSTON

MEASURABLE GOAL

Goals Source: Planning Work Group
Existing Load at Management Area Outlet: 39,302 tons/yr.
Targeted Load Reduction at Outlet: 3,930 tons/yr.
Cost: \$873,652

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

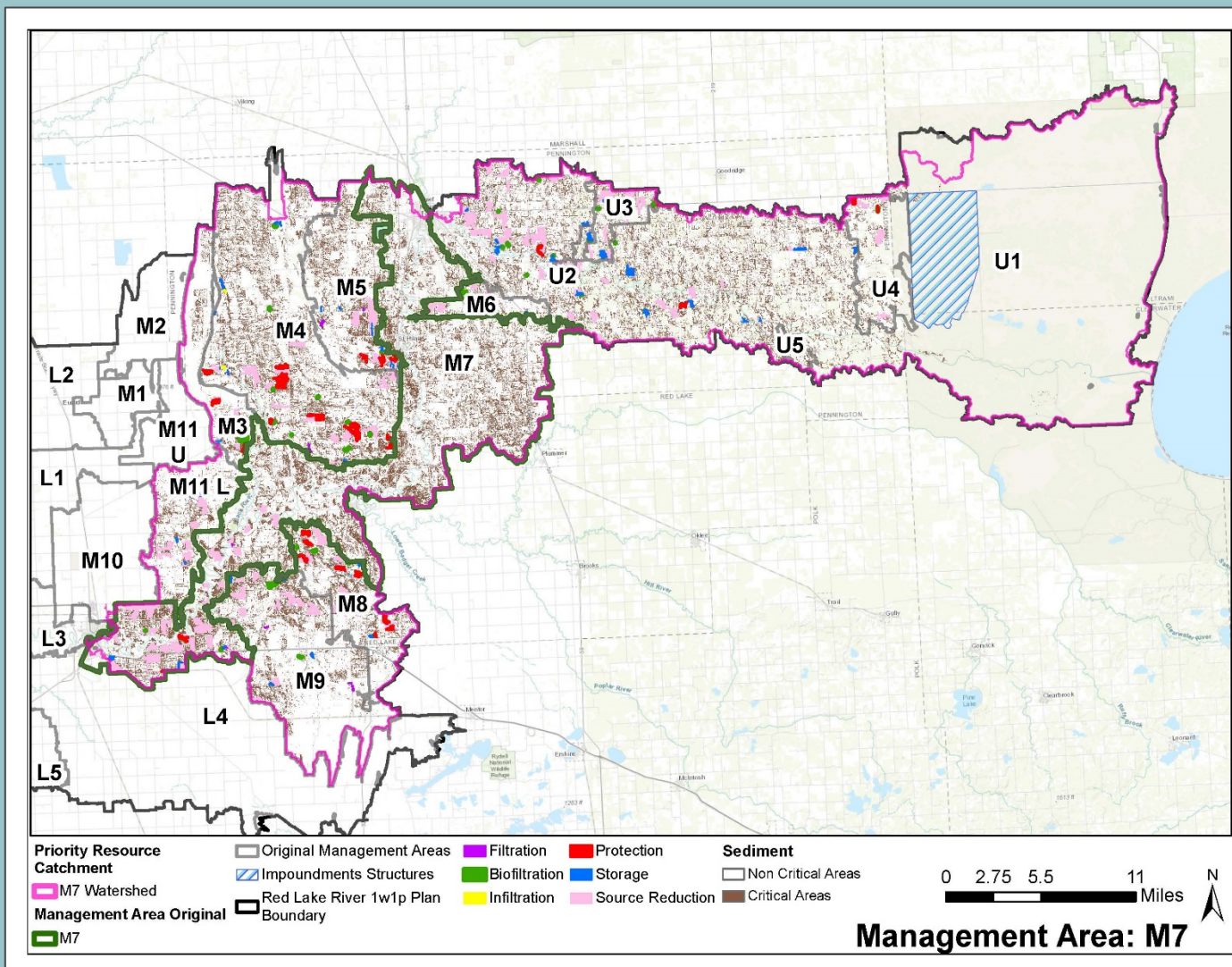
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results	Progress
	-----Sediment, tons/year-----	
Management Area Outlet	3,265	8%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group				Totals
	Storage	Filtration	Biofiltration	Source Reduction	
Count	4	4	4	33	45
Sediment Reduction, Tons/year	338	260	439	1,032	2,069
Cost	\$582,217	\$9,052	\$198,009	\$84,374	\$873,652
Ave. Cost-Effect. \$/ton/year	\$1,861	\$33	\$444	\$101	\$282
Standard Deviation Cost-Effect. \$/ton/year	\$907	\$9	\$60	\$54	\$564
Treatment Types					
Storage	Filtration	Biofiltration	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



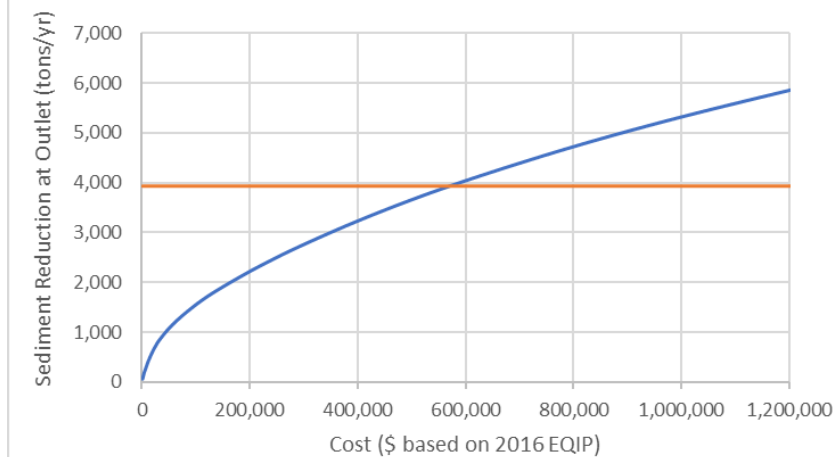
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M7 were targeted.

The results suggest that **roughly 24% of land area** in M7 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 3,265 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M8 - CYR CREEK

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 4,282 tons/yr.

Targeted Load Reduction at Outlet: 428 tons/yr.

Cost: \$1,346,055

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

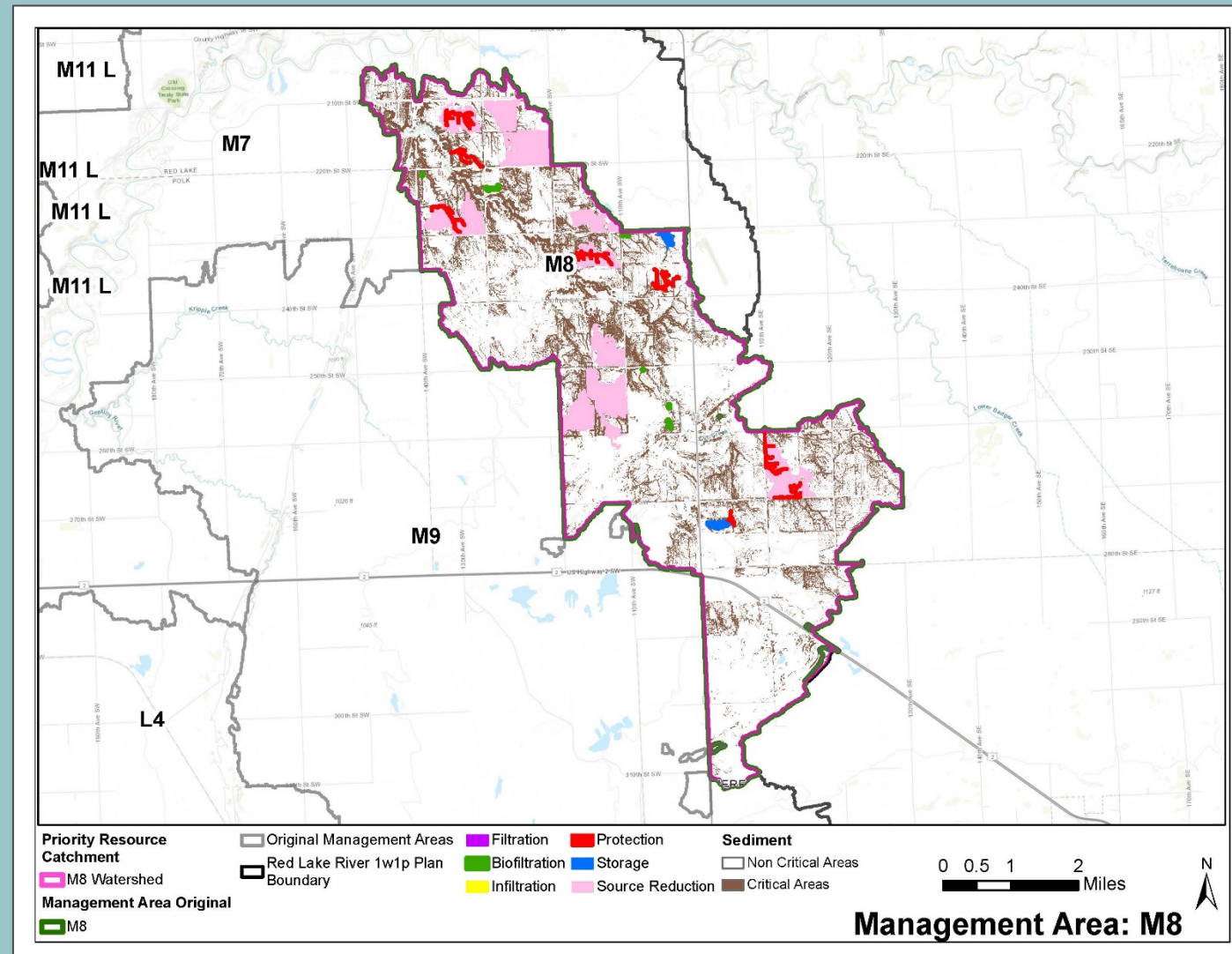
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	378		9%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group				Totals
	Storage	Biofiltration	Protection	Source Reduction	
Count	2	5	6	11	24
Sediment Reduction, Tons/year	38	67	75	185	365
Cost	\$905,923	\$247,964	\$155,104	\$37,014	\$1,346,055
Ave. Cost-Effect. \$/ton/year	\$19,034	\$3,665	\$2,066	\$211	\$2,963
Standard Deviation Cost-Effect. \$/ton/year	\$22,477	\$817	\$211	\$51	\$6,972
Treatment Types					
Storage	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



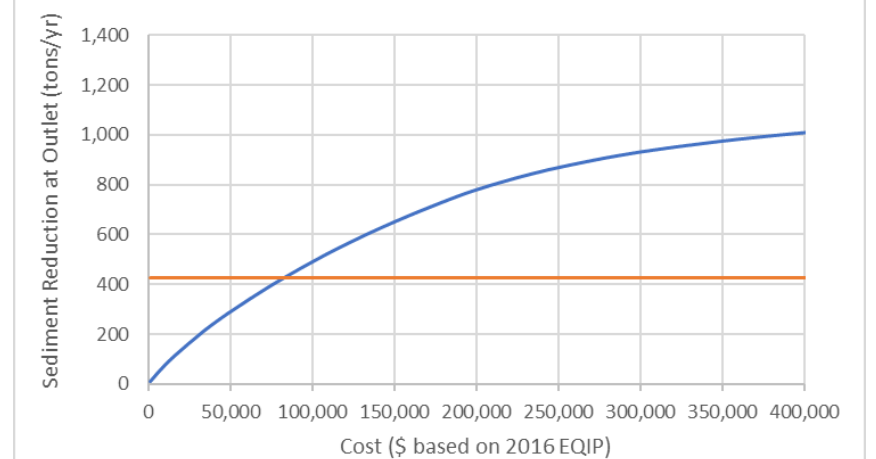
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M8 were targeted.

The results suggest that **roughly 21% of land area** in M8 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 378 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M9 – GENTILLY RIVER AND KRIPPLE CREEK DRAINAGE AREA

MEASURABLE GOAL

Goals Source: Planning Work Group
Existing Load at Management Area Outlet: 5,506 tons/yr.
Targeted Load Reduction at Outlet: 551 tons/yr.
Cost: \$693,125

TARGETING APPROACH

- Structural Practices**
- Half of total reduction goal
- Field Management**
- Half of total reduction goal, >10 acres in size
- All Practices**
- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

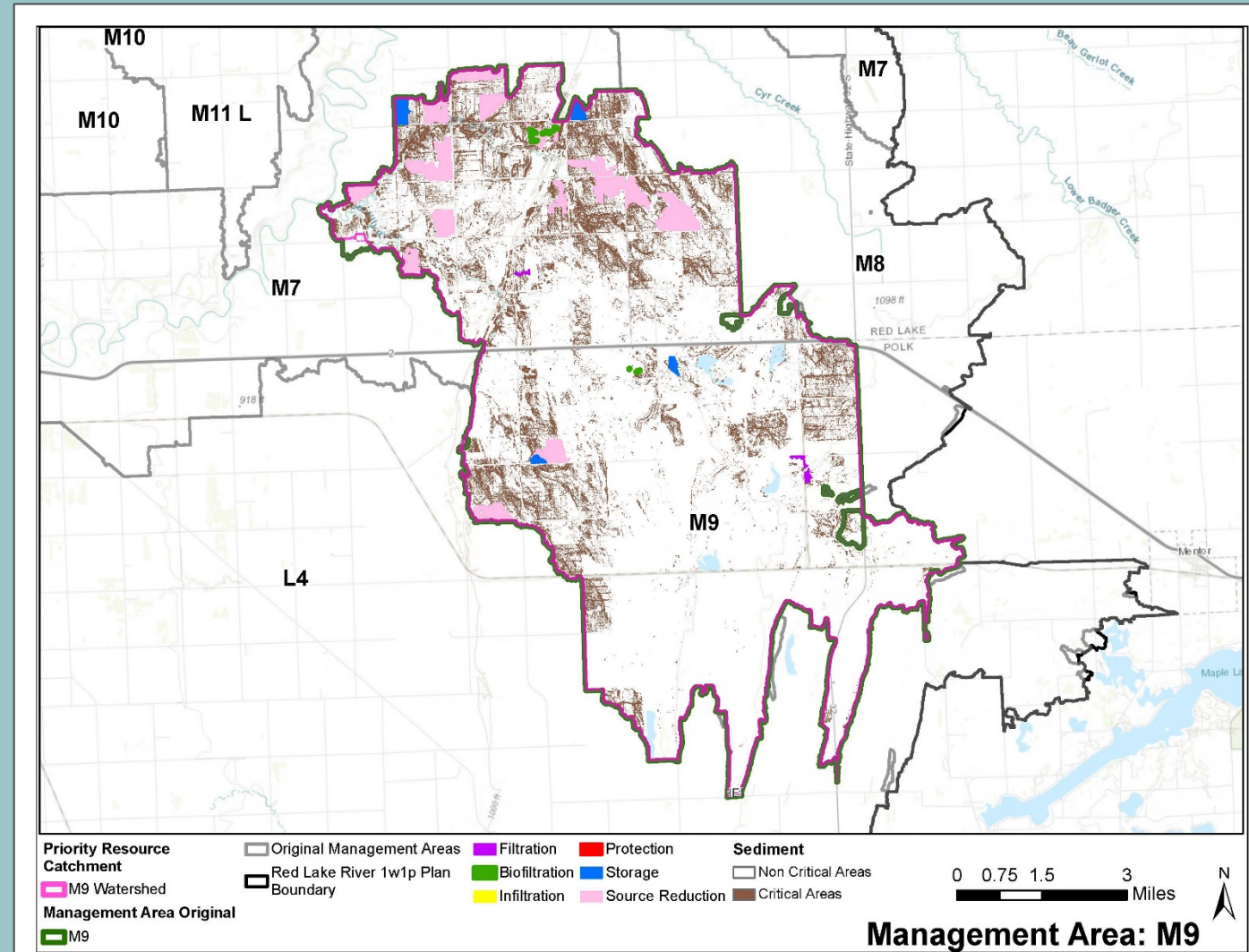
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	407		7%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group				Totals
	Storage	Filtration	Biofiltration	Source Reduction	
Count	3	1	6	15	25
Sediment Reduction, Tons/year	52	18	144	223	437
Cost	\$274,628	\$2,293	\$372,294	\$43,910	\$693,125
Ave. Cost-Effect. \$/ton/year	\$5,442	\$130	\$2,560	\$202	\$1,394
Standard Deviation Cost-Effect. \$/ton/year	\$5,081	N/A	\$639	\$51	\$2,362
Treatment Types					
Storage	Filtration	Biofiltration	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Conservation Cover • Cover Crop • Filter Strips • Grassed Waterway • Riparian Buffers 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



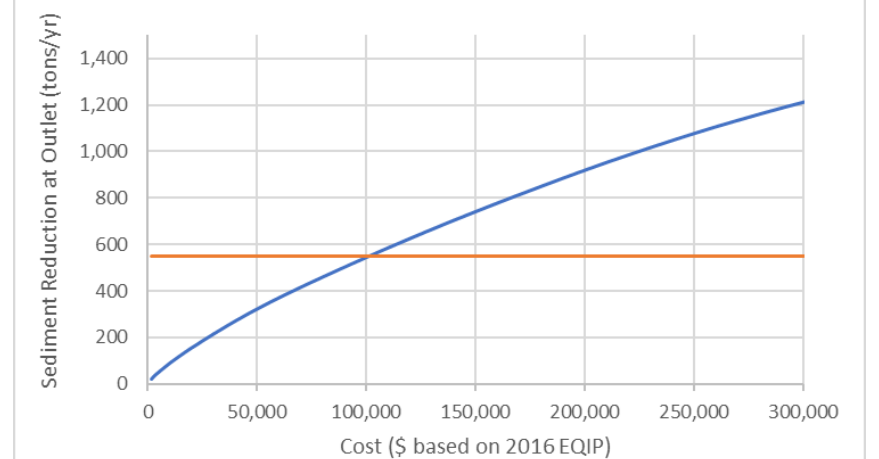
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M9 were targeted.

The results suggest that **roughly 16% of land area** in M9 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 407 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA M10 – POLK COUNTY DITCH 1

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 5,363 tons/yr.

Targeted Load Reduction at Outlet: 536 tons/yr.

Cost: \$860,687

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

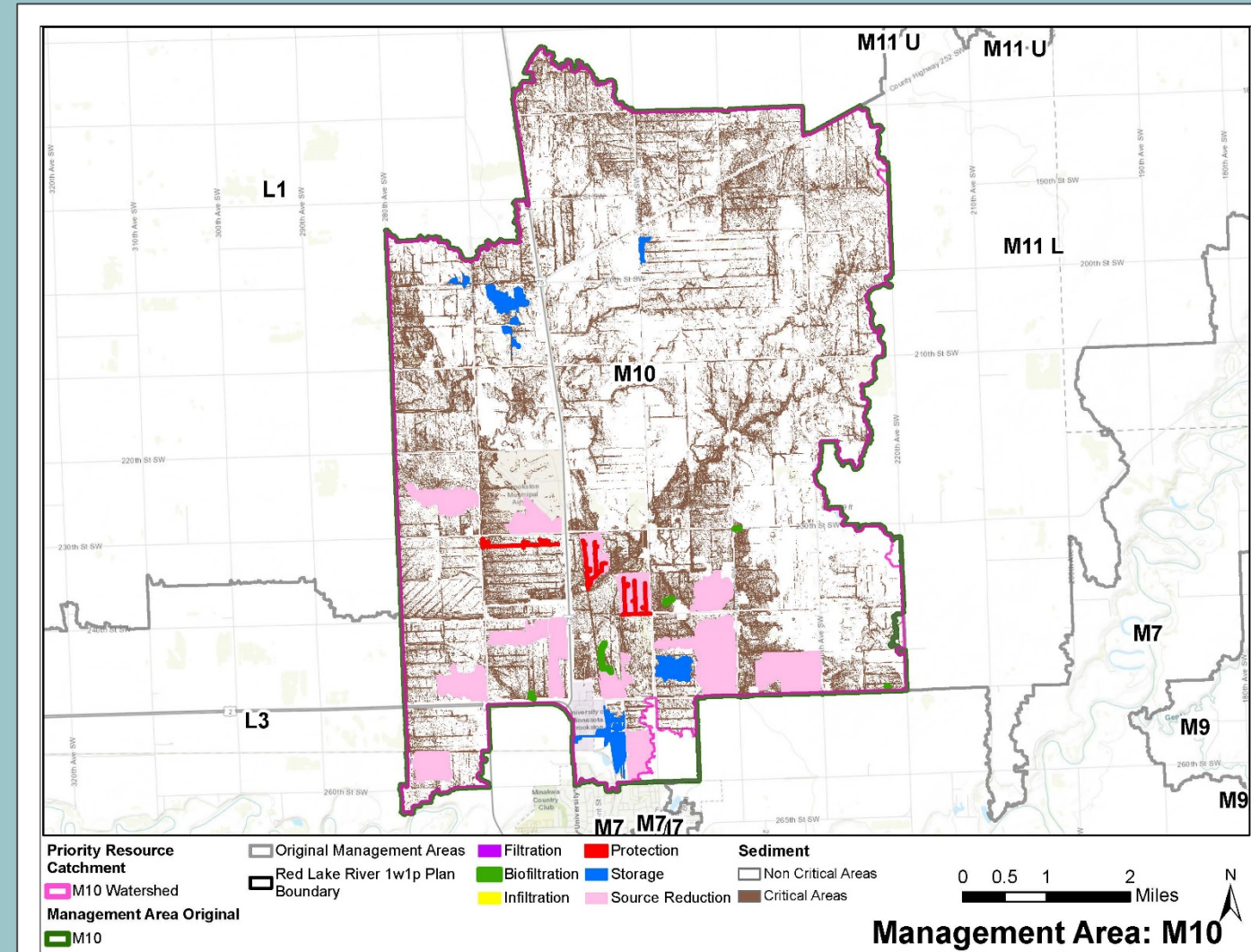
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results	Progress
	-----Sediment, tons/year-----	
Management Area Outlet	470	9%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group				Totals
	Storage	Biofiltration	Protection	Source Reduction	
Count	5	4	2	13	24
Sediment Reduction, Tons/year	111	61	28	214	414
Cost	\$555,260	\$193,359	\$70,178	\$41,890	\$860,687
Ave. Cost-Effect. \$/ton/year	\$5,216	\$3,203	\$2,473	\$199	\$1,935
Standard Deviation Cost-Effect. \$/ton/year	\$4,924	\$1,164	\$169	\$42	\$2,957
Treatment Types					
Storage	Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



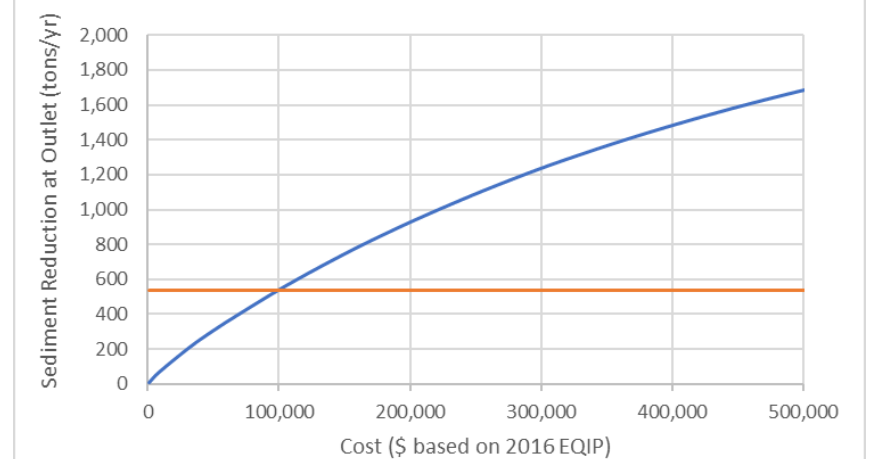
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area M10 were targeted.

The results suggest that **roughly 25% of land area** in M10 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas are in almost every parcel of the area. This indicates that most of the watershed has opportunities to treat areas that could have critical sediment loss.

Implementation within this management area could result in a reduction of 470 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA LOWER M11 – JUDICIAL DITCH 60

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 2,642 tons/yr.

Targeted Load Reduction at Outlet: 264 tons/yr.

Cost: \$119,331

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

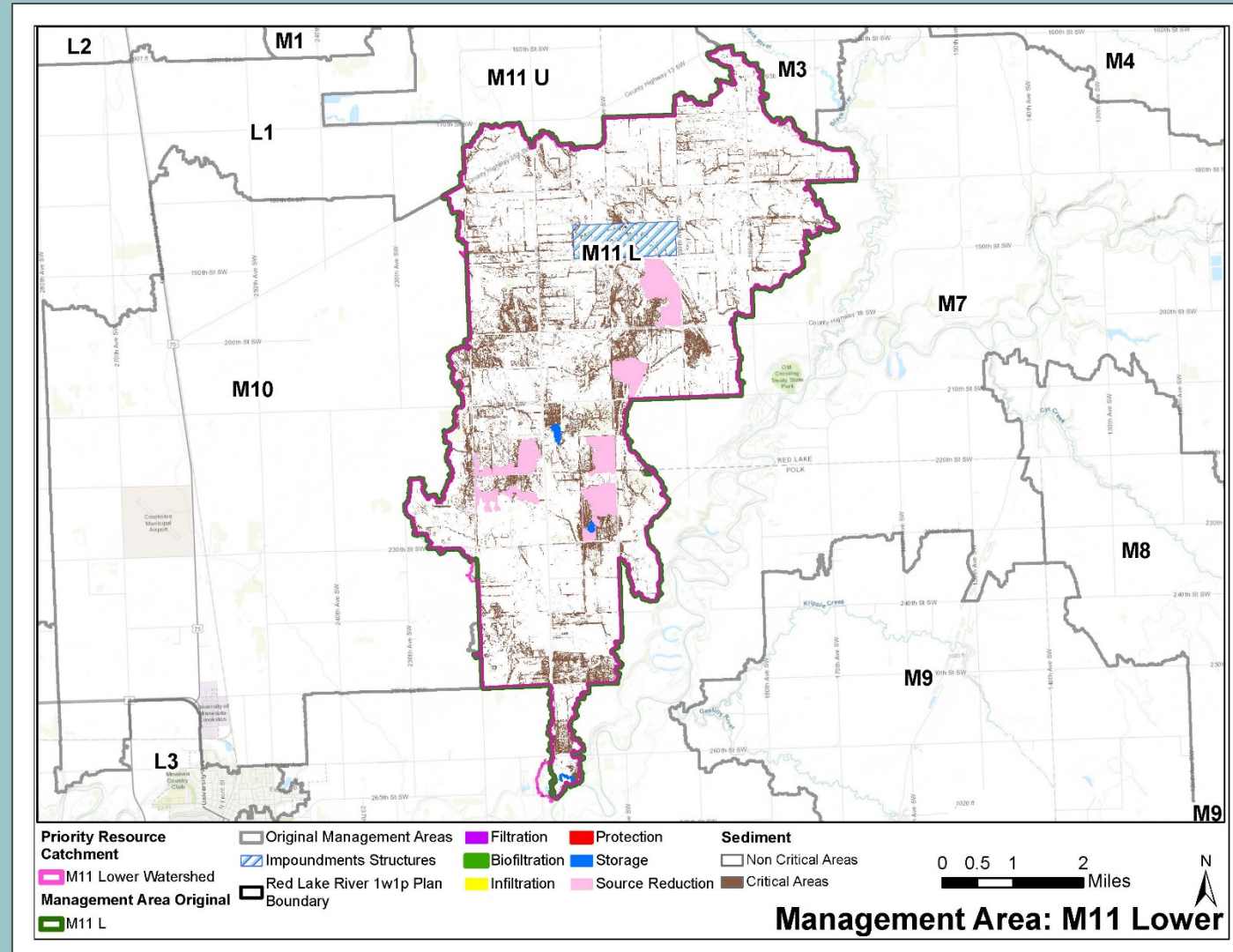
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	224		8%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group		
	Storage	Source Reduction	Totals
Count	2	6	8
Sediment Reduction, Tons/year	101	100	201
Cost	\$101,660	\$17,671	\$119,331
Ave. Cost-Effect. \$/ton/year	\$913	\$182	\$364
Standard Deviation Cost-Effect. \$/ton/year	\$510	\$65	\$393
Treatment Types			
Storage		Source Reduction	
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 		<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 	



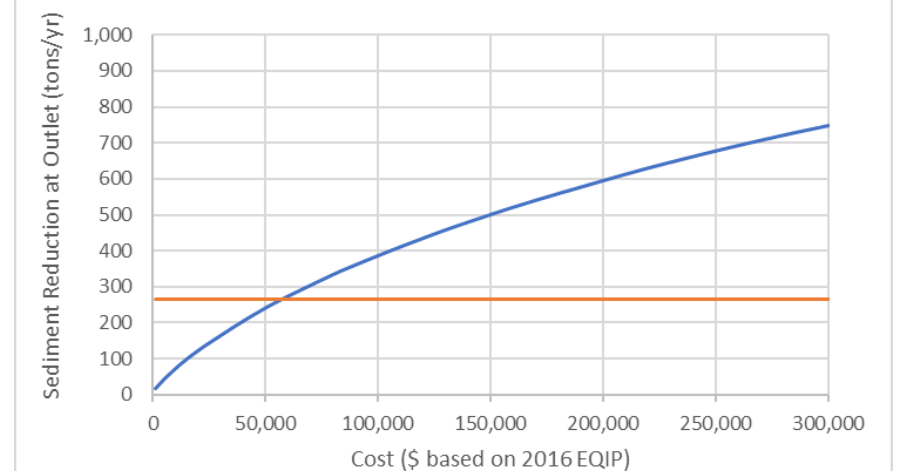
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area Lower M11 were targeted.

The results suggest that **roughly 25% of land area** in Lower M11 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 224 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



MIDDLE PLANNING ZONE: MANAGEMENT AREA UPPER M11 – JUDICIAL DITCH 60

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 1,396 tons/yr.

Targeted Load Reduction at Outlet: 140 tons/yr.

Cost: \$653,693

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

PROGRESS TOWARDS GOAL

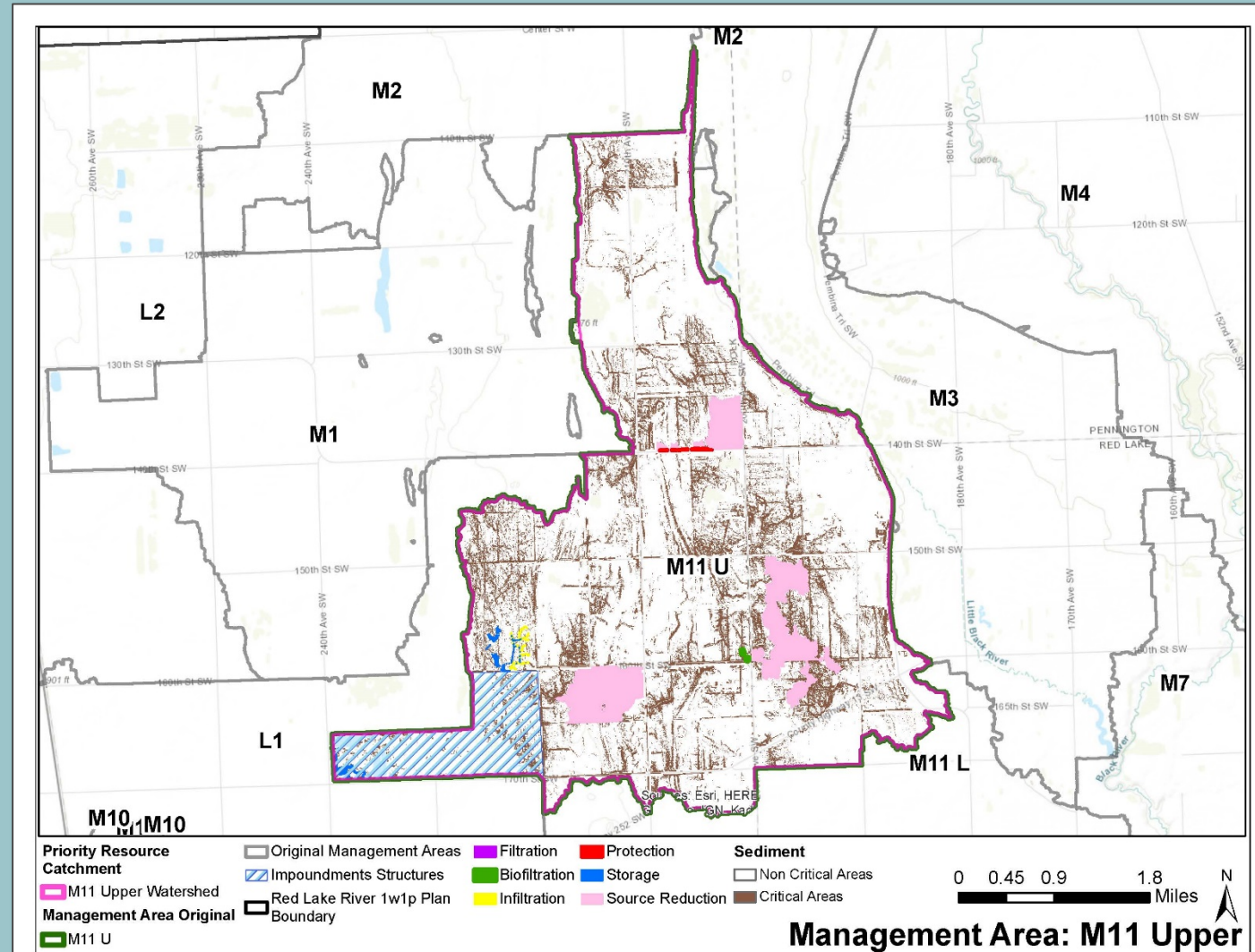
Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	129		9%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group			Totals
	Storage	Infiltration	Source Reduction	
Count	4	1	4	9
Sediment Reduction Tons/year	47	11	60	118
Cost	\$456,807	\$182,646	\$14,240	\$653,693
Ave. Cost-Effect. \$/ton/year	\$10,657	17,321	\$246	\$6,770
Standard Deviation Cost-Effect. \$/ton/year	\$17,052	N/A	\$57	\$12,320

Treatment Types		
Storage	Infiltration	Source Reduction
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Multi-stage Ditch • Infiltration Trench or small basin 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management



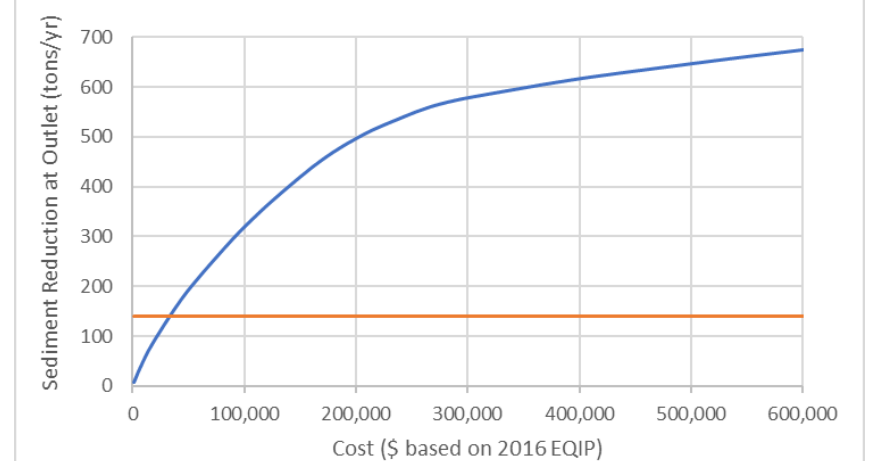
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area Upper M11 were targeted.

The results suggest that **roughly 18% of land area** in Upper M11 may contain a critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 129 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



UPPER PLANNING ZONE: MANAGEMENT AREA U1 – (UPPER) RED LAKE RIVER UPSTREAM OF THE THIEF RIVER CONFLUENCE

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 14,133 tons/yr.

Targeted Load Reduction at Outlet: 1,413 tons/yr.

Cost: \$3,138,405

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results	Progress
	-----Sediment, tons/year-----	
Management Area Outlet	960	7%

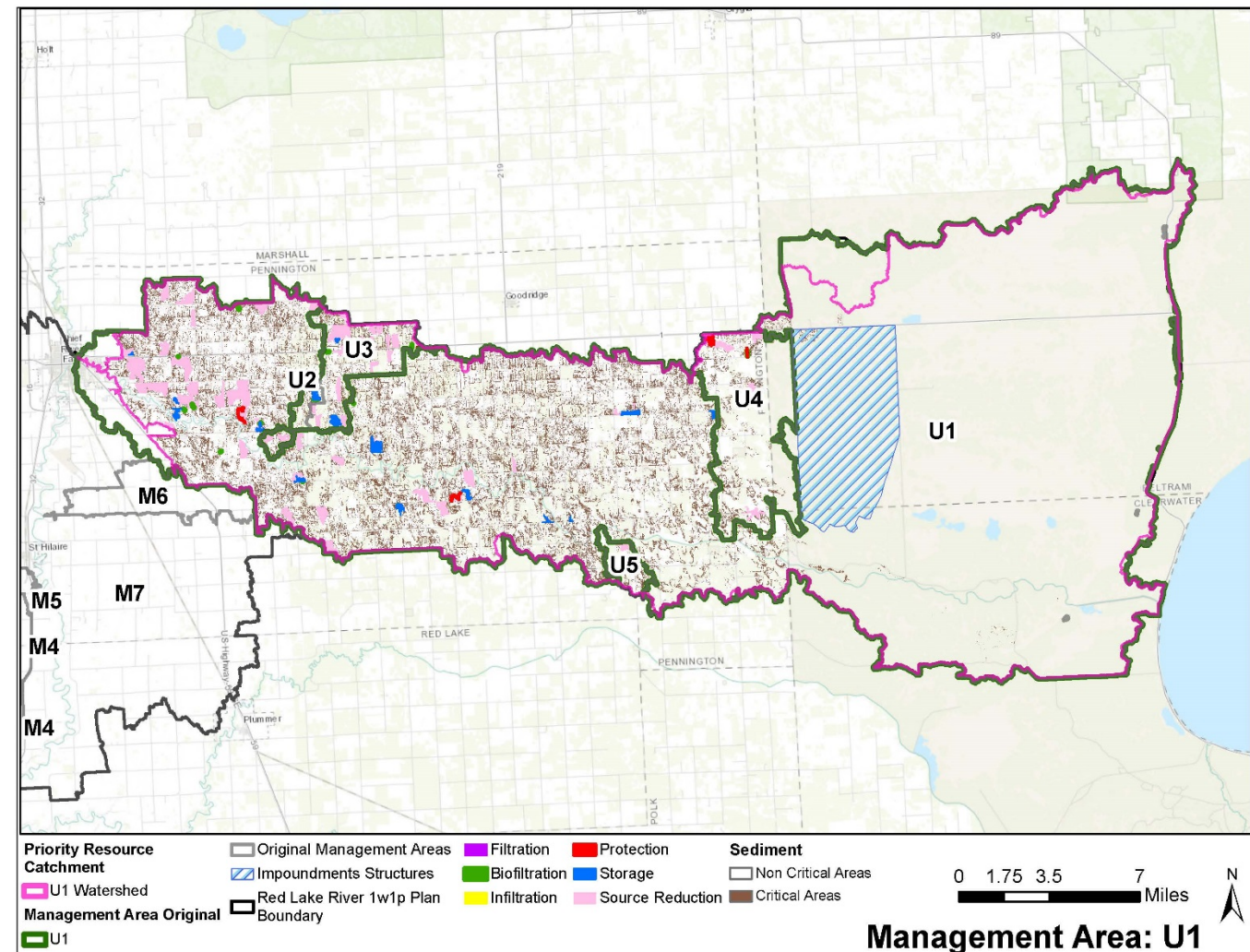
PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group				Totals
	Storage	Bio-Filtration	Protection	Source Reduction	
Count	11	8	1	34	54
Sediment Reduction, Tons/year	242	129	24	411	807
Cost	\$2,486,389	\$522,632	\$23,973	\$105,411	\$3,138,405
Ave. Cost-Effect. \$/ton/year	\$10,700	\$4,068	\$1,001	\$262	\$2,966
Standard Deviation Cost-Effect. \$/ton/year	\$11,494	\$680	NA	\$66	\$6,508

Treatment Types

Storage	Biofiltration	Protection	Source Reduction
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management



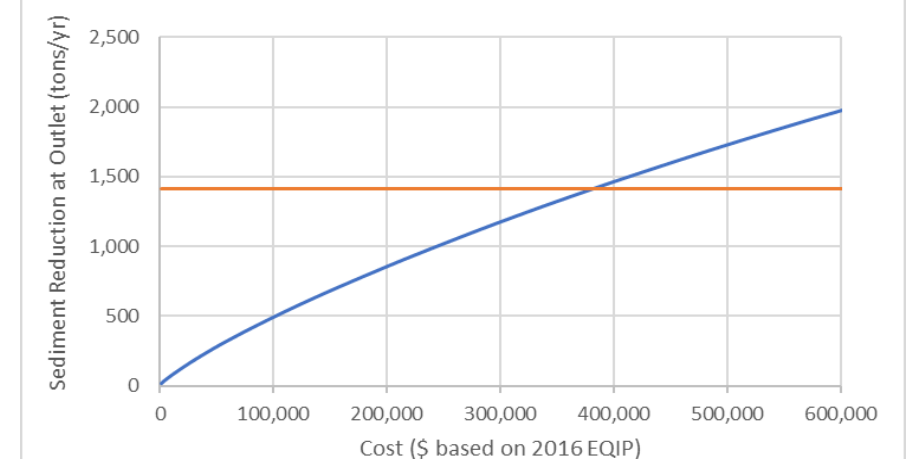
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area U1 were targeted.

The results suggest that **roughly 8% is considered** critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 960 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



UPPER PLANNING ZONE: MANAGEMENT AREA U2 – PENNINGTON COUNTY DITCH 35

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 281 tons

Targeted Load Reduction at Outlet: 28 tons

Cost: \$85,319

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

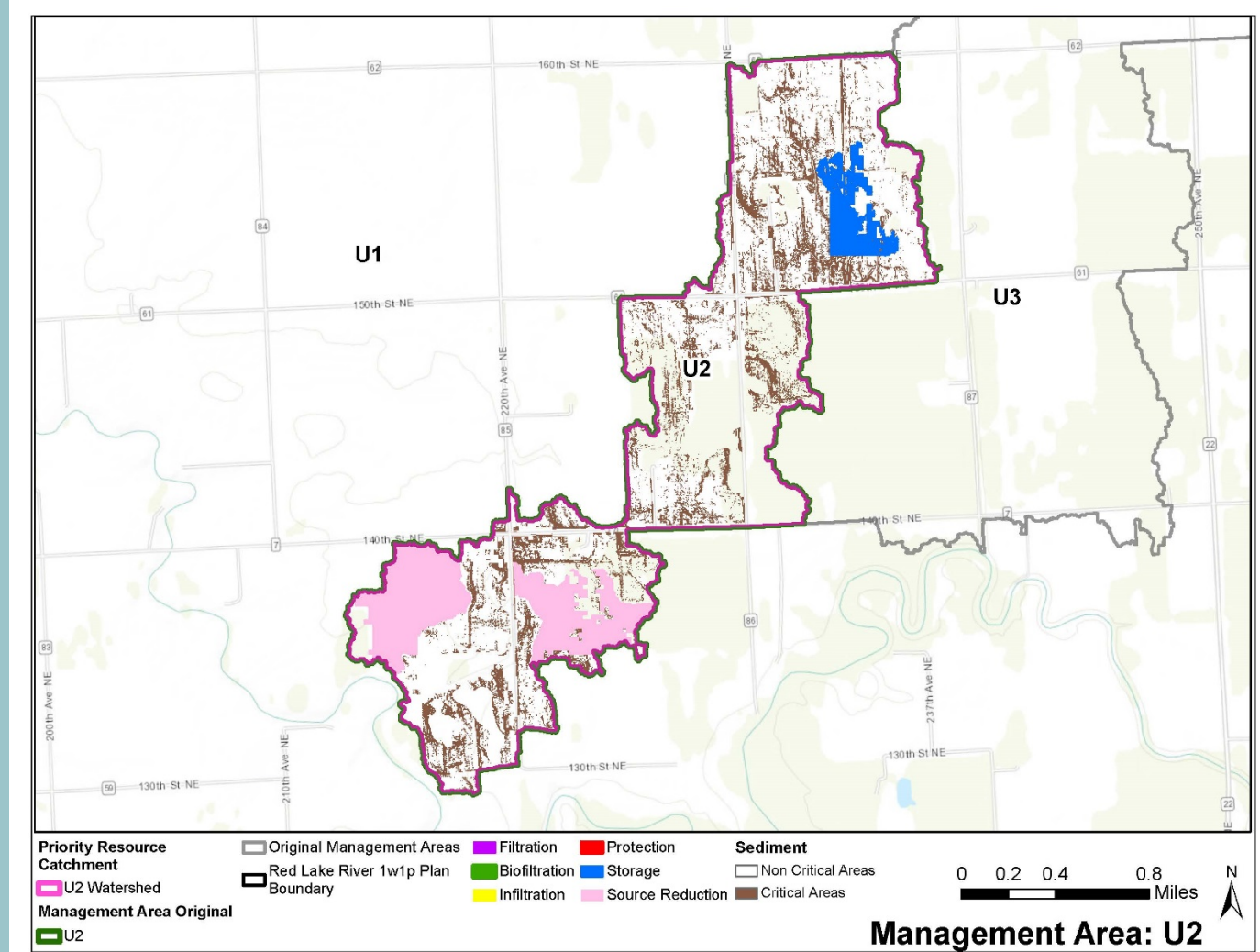
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results	Progress
	-----Sediment, tons/year-----	
Management Area Outlet	37	13%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group		
	Bio-Filtration	Source Reduction	Totals
Count	1	2	3
Sediment Reduction, Tons/year	15	19	34
Cost	\$79,937	\$5,382	\$85,319
Ave. Cost-Effect. \$/ton/year	\$5,512	\$282	\$2,025
Standard Deviation Cost-Effect. \$/ton/year	N/A	\$68	\$3,020
Treatment Types			
	Biofiltration	Source Reduction	
	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 	

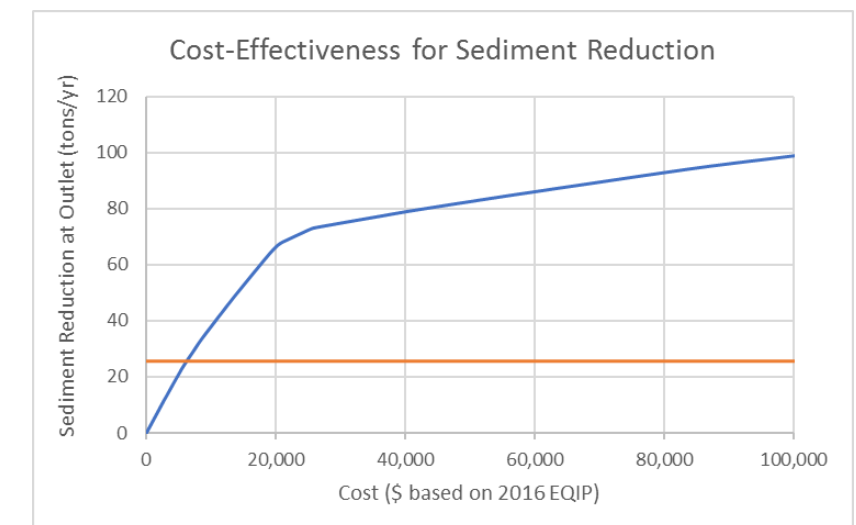


TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area U2 were targeted.

The results suggest that **roughly 19% is considered** critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 37 tons/year of sediment through the targeted practices and tailoring of the implementation approach.



UPPER PLANNING ZONE: MANAGEMENT AREA U3 – PENNINGTON COUNTY DITCH 44

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 1,207 tons/yr.

Targeted Load Reduction at Outlet: 121 tons/yr.

Cost: \$194,896

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

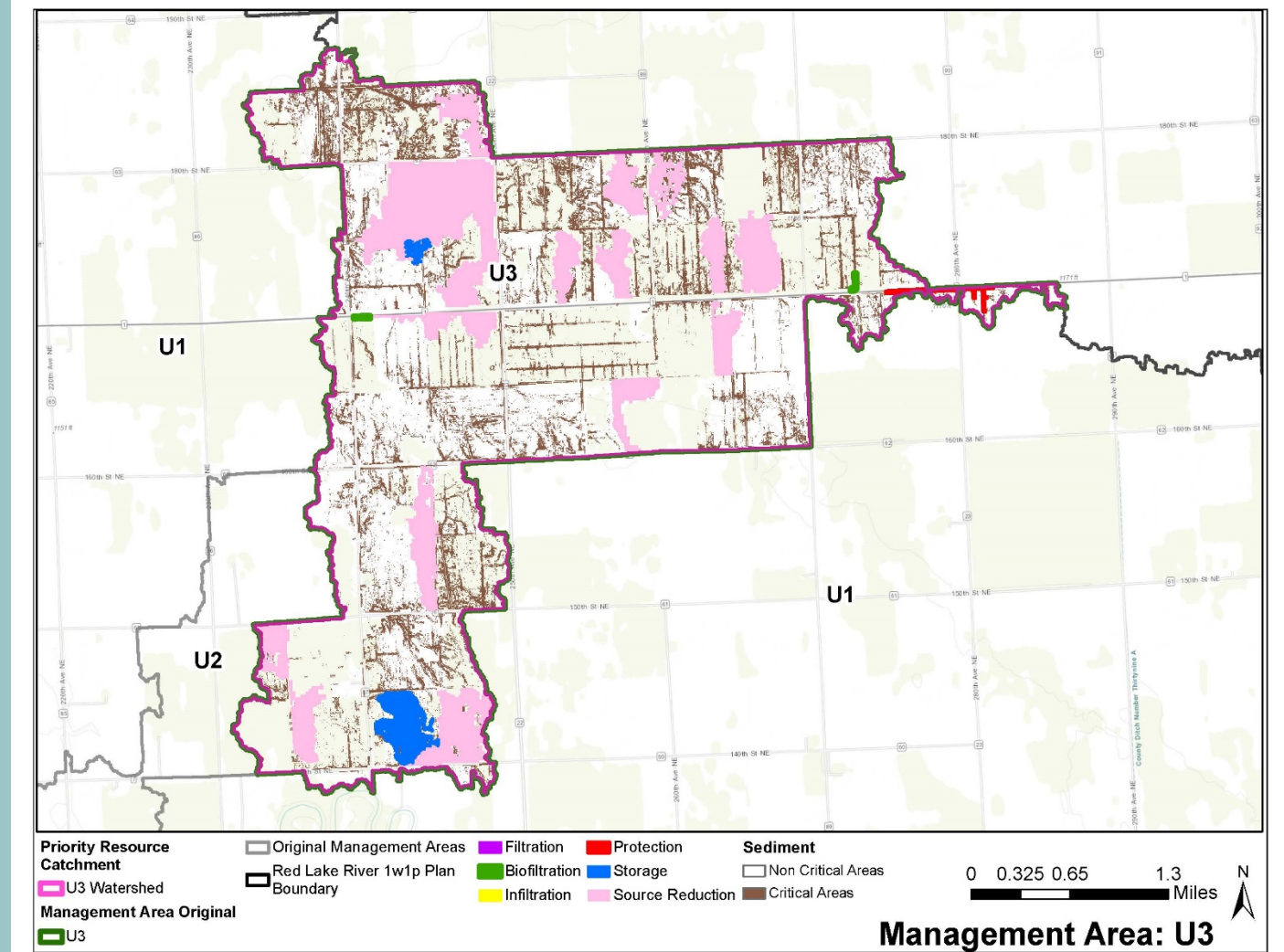
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results	Progress
	-----Sediment, tons/year-----	
Management Area Outlet	168	14%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group			Totals
	Storage	Bio-Filtration	Source Reduction	
Count	2	1	4	7
Sediment Reduction, Tons/year	34	13	60	107
Cost	\$98,019	\$82,917	\$13,960	\$194,896
Ave. Cost-Effect. \$/ton/year	\$3,110	\$6,228	\$233	\$1,911
Standard Deviation Cost-Effect. \$/ton/year	\$1,368	N/A	\$26	\$2,403
Treatment Types				
Storage	Biofiltration	Source Reduction		
<ul style="list-style-type: none"> • Drainage Water Management • Wetland Restoration • Water Control Structures • Water and Sediment Control Basins • Diversion 	<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		



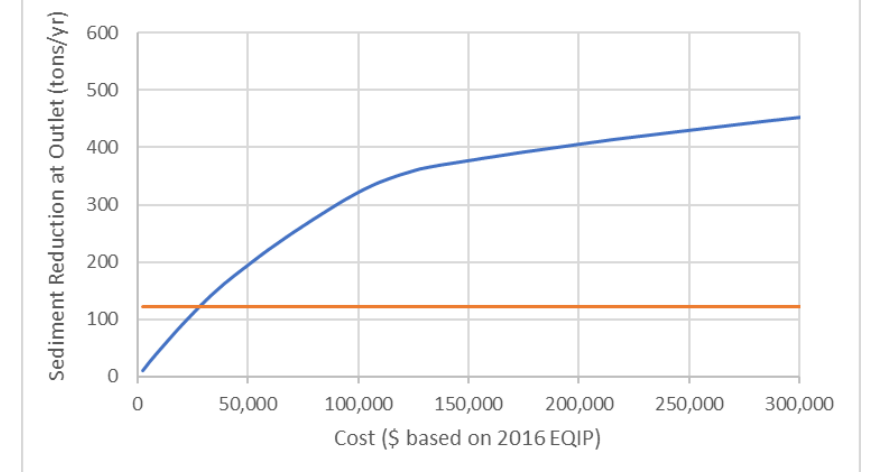
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area U3 were targeted.

The results suggest that **roughly 18% is considered** critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 168 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



UPPER PLANNING ZONE: MANAGEMENT AREA U4 – PENNINGTON COUNTY DITCH 43

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 1,255 tons/yr.

Targeted Load Reduction at Outlet: 126 tons/yr.

Cost: \$157,290

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

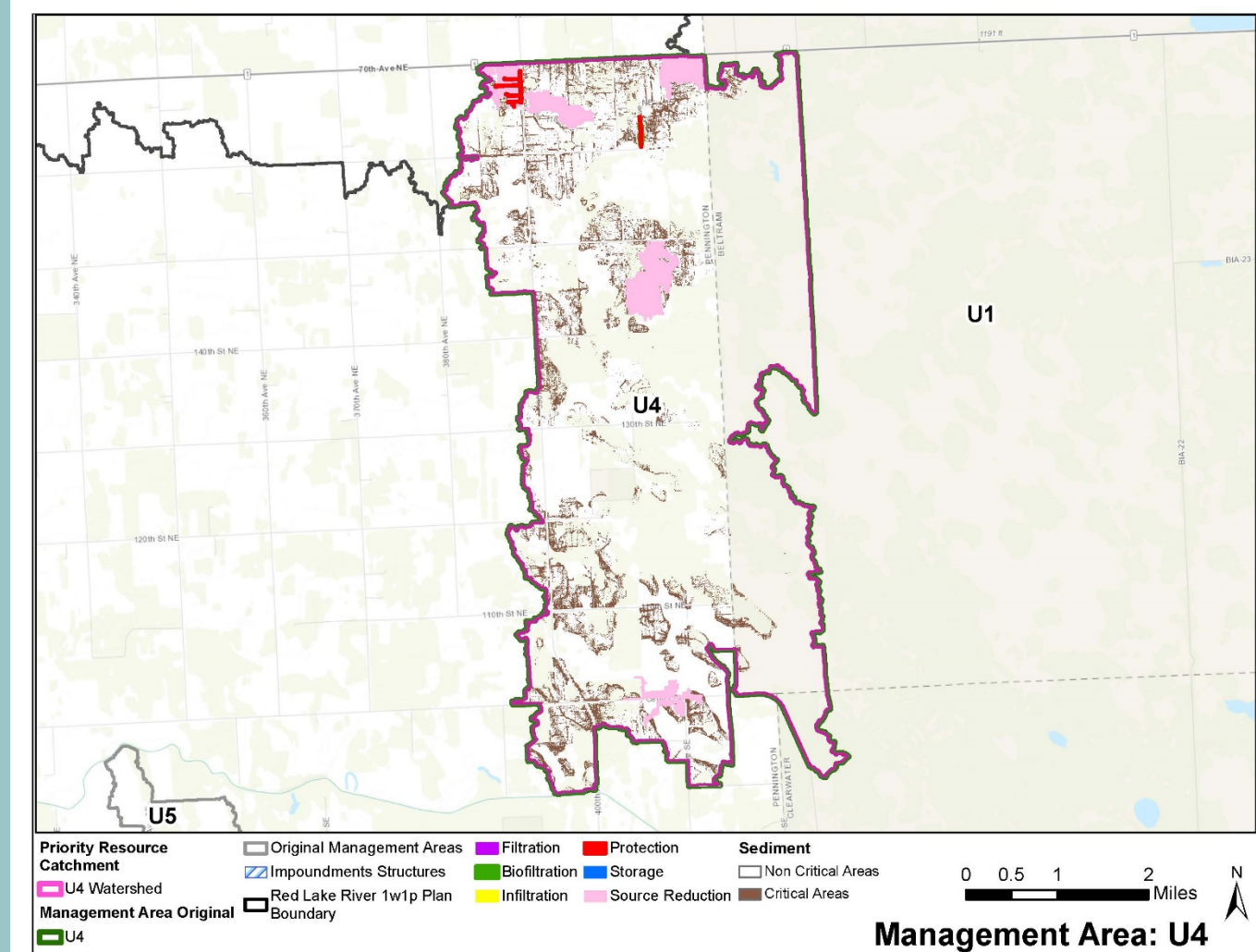
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	97		8%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group			
	Bio-Filtration	Protection	Source Reduction	Totals
Count	2	1	5	8
Sediment Reduction, Tons/year	30	18	60	109
Cost	\$114,919	\$28,599	\$13,773	\$157,290
Ave. Cost-Effect. \$/ton/year	\$3,819	\$1,567	\$248	\$1,306
Standard Deviation Cost-Effect. \$/ton/year	\$415	NA	\$85	\$1,625
Treatment Types				
Biofiltration	Protection	Source Reduction		
<ul style="list-style-type: none"> • Denitrifying Bioreactor • Saturated Buffer 	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/ Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 		

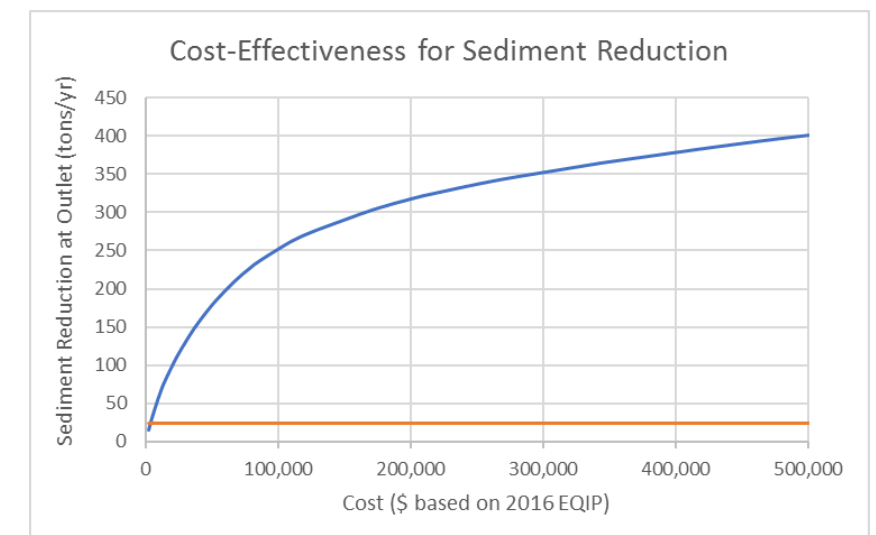


TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area U4 were targeted.

The results suggest that **roughly 9% is considered** critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 97 tons/year of sediment through the targeted practices and tailoring of the implementation approach.



(UPPER PLANNING ZONE: MANAGEMENT AREA U5 – PENNINGTON COUNTY DITCH 55)

MEASURABLE GOAL

Goals Source: Planning Work Group

Existing Load at Management Area Outlet: 243 tons/yr

Targeted Load Reduction at Outlet: 24 tons/yr

Cost: \$25,709

TARGETING APPROACH

Structural Practices

- Half of total reduction goal

Field Management

- Half of total reduction goal, >10 acres in size

All Practices

- >\$1000 in BMP total cost, <\$50,000 per ton per year, >0.5 tons of sediment removed per year

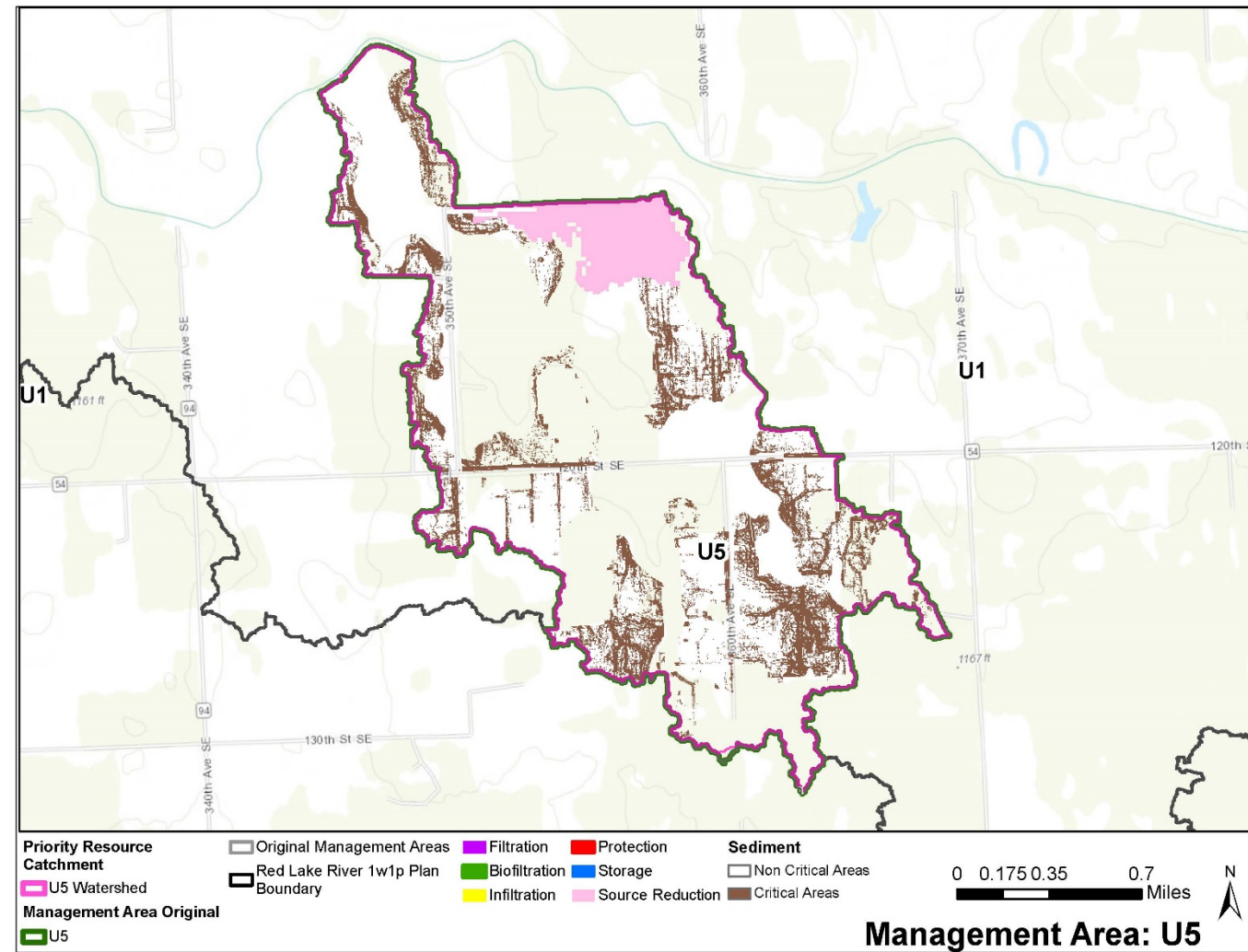
PROGRESS TOWARDS GOAL

Priority Resource	Targeting Results		Progress
	-----Sediment, tons/year-----		
Management Area Outlet	14		6%

PRACTICE SUMMARY

Below is a summary of targeted conservation practices based on aggregated individual benefits and costs, and the specific types of practices that will be targeted within treatment groups.

	Treatment Group		
	Protection	Source Reduction	Totals
Count	1	1	2
Sediment Reduction, Tons/year	9	14	23
Cost	\$22,668	\$3,041	\$25,709
Ave. Cost-Effect. \$/ton/year	\$2,449	\$225	\$1,337
Standard Deviation Cost-Effect. \$/ton/year	N/A	N/A	\$1,573
Treatment Types			
	Protection	Source Reduction	
	<ul style="list-style-type: none"> • Critical Area Planting • Grad Stabilization Structure • Tree/Shrub Establishment • Well Sealing • Septic System Upgrades • Upland Wildlife Habitat Management • Restoration and Management of Rare/ Declining Habitat • Prescribed Burning • Gravel Pit Reclamation 	<ul style="list-style-type: none"> • Residue and Tillage Management • Nutrient Management 	



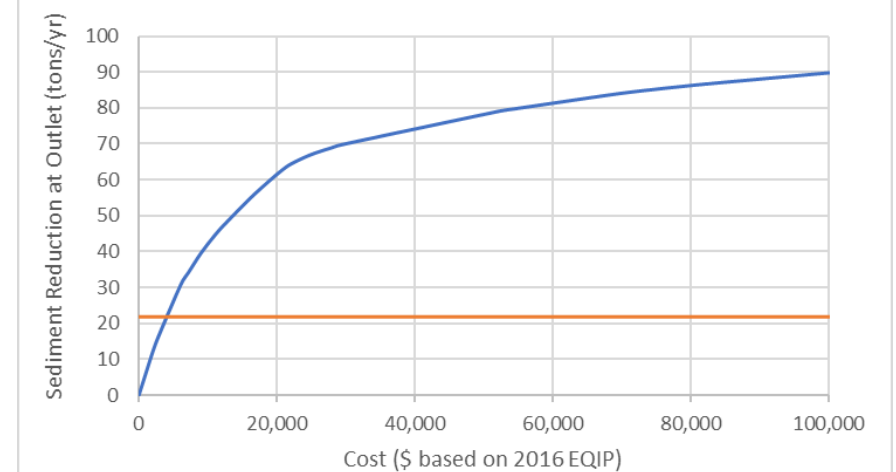
TAILORING IMPLEMENTATION

While the targeted practices from this assessment should provide sufficient progress for reaching sediment management goals, there is no guarantee that all practices can be implemented. To address this issue, critical areas for sediment loss within Management Area U5 were targeted.

The results suggest that **roughly 16% is considered** critical area for sediment loss and delivery to a concentrated flow path. These critical areas identify other locations in the Management Area not identified in the targeted set of practices that have opportunities for implementation.

Implementation within this management area could result in a reduction of 14 tons/year of sediment through the targeted practices and tailoring of the implementation approach.

Cost-Effectiveness for Sediment Reduction



TARGETED IMPLEMENTATION SCHEDULE

The targeted implementation approach for targeted conservation practices is summarized in **Table 2**. Included in this table are the costs and cumulative anticipated benefits of the targeted conservation practices within each management area. During implementation, the locations of specific practices will differ because of several factors including landowner willingness to participate in a conservation practice.

The benefits of implementing the targeted conservation practices in the targeted implementation approach are expressed in **Table 2** relative to the load reduction goals for sediment.

The types, numbers, and locations of targeted conservation practices in the targeted implementation approach are not final and will inevitably shift during plan implementation. Factors that may cause the types, locations, and numbers of targeted conservation practices for implementation to change include, but are not limited to:

- Potential for voluntary participation by landowners and residents;
- Amount of funding available for implementation;
- New data on resource conditions;
- Proximity to streams that are nearly or barely impaired;
- Practices/projects ready to implement (overlay these with management practices and structural BMPs identified by PTMApp); and
- Effectiveness of education and outreach and research initiatives.

Table 2. Targeted Implementation Schedule.

Lower Planning Region													
Management Area	Treatment Group Type (Count)	2016 EQIP Cost	Average Cost-Effectiveness (\$/ton)	Parameter	Unit	Existing Condition at Management Area Outlet	Load Reduction Goal			Load Reduction Expected from Targeted Implementation	Load Reduction Expected from Targeted Implementation (%)	Start	End
							Metric	Amount (%)	Target Load Reduction				
L1 – Grand Marais Creek	Storage (7) Filtration (6) Biofiltration (9) Protection (15) Source Reduction (47)	\$1,508,184	\$890	Sediment	Tons/yr.	23,379	Annual Load	10	2,338	1,638	7%	Year 1	Year 10
L2 – Polk County Ditch 2 and RLWD Ditch 15 downstream of impoundments	Storage (3) Biofiltration (2) Source Reduction (16)	\$1,071,237	\$1,351	Sediment	Tons/yr.	8,099	Annual Load	10	810	447	6%	Year 1	Year 10
L3 – (Lower) Red Lake River downstream of Crookston	Storage (12) Filtration (4) Biofiltration (7) Protection (5) Source Reduction (38)	\$2,132,599	\$961	Sediment	Tons/yr.	47,807	Annual Load	10	4,781	4,003	8%	Year 1	Year 10
L4 – Burnham Creek	Storage (9) Filtration (1) Biofiltration (6) Protection (5) Source Reduction (19)	\$1,757,056	\$2,285	Sediment	Tons/yr.	15,214	Annual Load	10	1,521	870	6%	Year 1	Year 10
L5 – Polk Count Ditch 100/74/10/28	Storage (2) Filtration (1) Biofiltration (3) Protection (8) Source Reduction (13)	\$433,900	\$996	Sediment	Tons/yr.	6,391	Annual Load	10	639	515	8%	Year 1	Year 10
L6 – Polk County Ditch 115/123/124/107/163	Storage (2) Filtration (2) Biofiltration (1) Protection (1) Source Reduction (6)	\$169,221	\$847	Sediment	Tons/yr.	2,472	Annual Load	10	247	215	9%	Year 1	Year 10
L7 – Heartsville Coulee	Storage (1) Filtration (1) Biofiltration (2) Protection (4) Source Reduction (15)	\$305,478	\$589	Sediment	Tons/yr.	6,637	Annual Load	10	664	497	7%	Year 1	Year 10

Middle Planning Region													
Management Area	Treatment Group Type (Count)	2016 EQIP Cost	Average Cost-Effectiveness (\$/ton)	Parameter	Unit	Existing Condition at Management Area Outlet	Load Reduction Goal			Load Reduction Expected from Targeted Implementation	Load Reduction Expected from Targeted Implementation (%)	Start	End
							Metric	Amount (%)	Target Load Reduction				
M1 – Euclid East Impoundment	Biofiltration (1) Source Reduction (2)	\$66,527	\$1,193	Sediment	Tons/yr.	482	Annual Load	10	48	52	11%	Year 1	Year 10
M2 – Brandt Impoundment	Storage (2) Source Reduction (4)	\$940,967	\$5,049	Sediment	Tons/yr.	1,548	Annual Load	10	155	118	8%	Year 1	Year 10
M3 – Little Black River	Storage (1) Biofiltration (2) Protection (2) Source Reduction (5)	\$205,769	\$1,682	Sediment	Tons/yr.	1,237	Annual Load	10	123	130	10%	Year 1	Year 10
M4 – Black River upstream of Schirrick Dam	Storage (6) Filtration (4) Biofiltration (7) Infiltration (1) Protection (10) Source Reduction (24)	\$1,170,249	\$1,871	Sediment	Tons/yr.	10,588	Annual Load	10	1,059	755	7%	Year 1	Year 10
M5 – Pennington County Ditch 96	Storage (5) Filtration (2) Biofiltration (1) Protection (2) Source Reduction (11)	\$391,951	\$854	Sediment	Tons/yr.	5,074	Annual Load	10	507	458	9%	Year 1	Year 10
M6 – Pennington County Ditch 21	Storage (2) Biofiltration (1) Infiltration (1) Source Reduction (4)	\$336,690	\$4,014	Sediment	Tons/yr.	1,080	Annual Load	10	108	104	10%	Year 1	Year 10

Middle Planning Region													
M7 – (Middle) Red Lake River between the Thief River and Crookston	Storage (4) Filtration (4) Biofiltration (4) Source Reduction (33)	\$873,652	\$282	Sediment	Tons/yr.	39,302	Annual Load	10	3,930	3,265	8%	Year 1	Year 10
M8 – Cyr Creek	Storage (2) Biofiltration (5) Protection (6) Source Reduction (11)	\$1,346,055	\$2,963	Sediment	Tons/yr.	4,282	Annual Load	10	428	378	9%	Year 1	Year 10
M9 – Gentilly River and Kripple Creek Drainage Area	Storage (3) Filtration (1) Biofiltration (6) Source Reduction (15)	\$693,125	\$1,394	Sediment	Tons/yr.	5,506	Annual Load	10	551	407	7%	Year 1	Year 10
M10 – Polk County Ditch 1	Storage (5) Biofiltration (4) Protection (2) Source Reduction (13)	\$860,687	\$1,935	Sediment	Tons/yr.	5,363	Annual Load	10	536	470	9%	Year 1	Year 10
Lower M11 – Judicial Ditch 60	Storage (2) Source Reduction (6)	\$119,331	\$364	Sediment	Tons/yr.	2,642	Annual Load	10	264	224	8%	Year 1	Year 10
Upper M11 – Judicial Ditch 60	Storage (4) Infiltration (1) Source Reduction (4)	\$653,693	\$6,770	Sediment	Tons/yr.	1,396	Annual Load	10	140	129	9%	Year 1	Year 10

Upper Planning Region													
Management Area	Treatment Group Type (Count)	2016 EQIP Cost	Average Cost-Effectiveness (\$/ton)	Parameter	Unit	Existing Condition at Management Area Outlet	Load Reduction Goal			Load Reduction Expected from Targeted Implementation	Load Reduction Expected from Targeted Implementation (%)	Start	End
							Metric	Amount (%)	Target Load Reduction				
U1 – (Upper) Red Lake River upstream of the Thief River confluence	Storage (11) Biofiltration (8) Protection (1) Source Reduction (34)	\$3,138,405	\$2,966	Sediment	Tons/yr.	14,133	Annual Load	10	1,413	960	7%	Year 1	Year 10
U2 – Pennington County Ditch 35	Biofiltration (1) Source Reduction (2)	\$85,319	\$2,025	Sediment	Tons/yr.	281	Annual Load	10	28	37	13%	Year 1	Year 10
U3 – Pennington County Ditch 44	Storage (2) Biofiltration (1) Source Reduction (4)	\$194,896	\$1,911	Sediment	Tons/yr.	1,207	Annual Load	10	121	168	14%	Year 1	Year 10
U4 – Pennington County Ditch 43	Biofiltration (2) Protection (1) Source Reduction (5)	\$157,290	\$1,306	Sediment	Tons/yr.	1,255	Annual Load	10	126	97	8%	Year 1	Year 10
U5 – Pennington County Ditch 55	Protection (1) Source Reduction (1)	\$25,709	\$1,337	Sediment	Tons/yr.	243	Annual Load	10	24	14	6%	Year 1	Year 10