

100% of municipalities with identified bacteria impairments are implementing plans to reduce bacteria in surface waters.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Replace/upgrade 14 of the identified 21 sewer lines in Keene Creek subwatershed	C	Baseline/ Other	14 projects implemented	Keene Creek		City of Duluth	✓	✓	✓	✓	✓	
Address sanitary sewer stream crossings within the City of Hermantown and City of Duluth.	C	Other	X projects implemented	Keene Creek		City of Duluth, City of Hermantown						
Coordinate implementation of bacteria reduction strategies among communities	C	WBIF	8 meetings held	Keene Creek		DUWAC			✓			
Follow recommendations outlined in the Duluth Streams Bacterial Source Identification Study Final Report (Burns McDonnell).	C	WBIF	X projects implemented	Keene Creek		City of Duluth		✓	✓			
Ensure the MS4 members uphold their permit requirements	Data	Baseline	3 MS4s are in compliance	Keene Creek		MPCA	✓	✓	✓	✓	✓	
Update SSTS in upper watersheds in Duluth area	C	Baseline / WBIF	X systems updated	Keene Creek		St. Louis County						
Reduce sediment input by connecting the stream to the floodplain to minimize fine sediment for E. coli regrowth.	C	WBIF	X linear feet of stream bank restored	Lower Keene Creek		South St. Louis SWCD and City of Duluth						

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Provide outreach to municipalities for the MPCA Green Steps and Adopt a Drain programs	E&O	WBIF	2 programs adopted	Keene Creek	SLN	North St. Louis SWCD	✓	✓	✓	✓	✓	

Manage chlorides reaching surface and ground water from road salts and water softener salts by ensuring 100% of municipalities have Smart Salt Certified Staff, 100% Communities achieved Level 2 Certified & education & outreach to 100% of priority landowners.

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Education and outreach campaign is developed and implemented to property owners with three acres or more of impervious surface and provide training to commercial landowner employees on salt application and storage	E&O	WBIF	1 plan developed and implemented	Keene Creek Watershed		RSPT municipalities		✓				
Review Chloride TMDL and participate in MPCA led meetings for Keene Creek for potential implementation projects	C	Other	1 Implementation List	Keene Creek		South St. Louis SWCD / Municipalities/ MPCA/DUWAC or Sea Grant		✓				
Help municipalities secure grant funds to increase their street sweeping programs and purchase sweeper to improve local programs	C	WBIF / Other	1 grant coordination meeting	Keene Creek		DUWAC and RSPT / St. Louis County, City of Duluth, or City of Hermantown						
Promote purchase of salt reducing equipment, like brine application	C	WBIF	1 Promotional Campaign	Keene Creek		RSPT						
Fund DUWAC group coordination as a place to share knowledge and promote education opportunities	E&O	WBIF	2 mtgs/Yr focused on Keene Cr	Keene Creek		DUAWC	✓	✓	✓	✓	✓	

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Evaluate road authority's salt training with Smart Salt training and identify gaps.	D	WBIF	1 report	Watershed Wide	Watershed Wide	RSPT / municipalities	✓					
Development & implement a salt use reduction education and outreach campaign	E&O	WBIF	1 campaign implemented	Keene Creek	Watershed Wide	RSPT / municipalities	✓	✓	✓	✓	✓	
Track salt use to determine salt trends	D	Baseline	Continued Local Program	Watershed Wide	Watershed Wide	Counties	✓	✓	✓	✓	✓	

Promote the implementation of low impact development techniques to reduce stormwater runoff, volume and rate control in 100% of communities

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Build capacity for green infrastructure projects to be implemented, especially when eligible for outside grant funding	C	Other		Keene		City of Duluth						
Integrate with USEPA VELMA modeling into stormwater management for Keene Creek	Data	Other	1 model completed & incorporated into planning documents	Keene Creek		DUWAC and EPA	✓					
Review ordinances and remove barriers to low impact development.	Data	WBIF/ Other	1 ordinance study completed	Duluth Urban Area		DUWAC		✓				
Coordinate and develop stormwater management plans for Keene Creek that considers different watersheds for stormwater infrastructure vs. surface water runoff.	C	WBIF	1 plan developed	Keene Creek		DUWAC			✓			
Implement a Keene Creek stormwater management plan.	C	WBIF	X BMPs implemented from the plan	Keene Creek		St. Louis County and the Cities of Duluth and Hermantown				✓		

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Develop and implement an educational and outreach campaign for the effects of stormwater on Keene Creek that includes TV and radio commercials and post signage in public spaces. Share the results of the TMDL and new impairments	E&O		1 campaign developed and implemented	Keene Creek		DUWAC		✓				
Utilize the DUWAC (Duluth urban watershed advisory committee) and RSPT (Regional Stormwater Protection Team) to coordinate the actions of MS4 agencies in the Keene Creek watershed.	E&O	Baseline / WBIF	1 meeting / year	Duluth Urban Area		DUWAC & RSPT / , County, Cities, Townships, State Agencies	✓	✓	✓	✓	✓	
Incorporate stormwater implementation into planned road construction projects	C		X projects completed	Duluth Urban Area		St. Louis County, City of Duluth and City of Hermantown (road authorities).	✓	✓	✓	✓	✓	
Develop and implement an education and outreach campaign that could include: -Promote and educate public on project success, such as the restoration of the coastal wetland - green infrastructure promotion	E&O		1 campaign developed and implemented	Duluth Urban Area		Sea Grant						

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Develop and implement a homeowner program for help with design and implementation of BMPs's such as rain gardens and urban forestry	C	WBIF	1 program implemented	Keene Creek	DUA, SLS	North St. Louis SWCD	✓	✓	✓	✓	✓	
Look for opportunities to reduce flood risk and associated infrastructure damage	C	Other		Watershed Wide	Watershed Wide	North St. Louis SWCD						
Work with road authorities to educate and implement stormwater BMPs associated with roadside ditches to help slow the flow and minimize will minimize un-vegetated channels and associated erosion	C	WBIF	5 projects implemented	Keene Creek	DUA, SLS	North St. Louis SWCD North St. Louis SWCD	✓	✓	✓	✓	✓	

Reconnect 18 miles of priority streams and tributaries to benefit aquatic life and improve water quality.

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Outreach to local groups for Keene Creek Park MNDOT Dam Stream restoration and removing MNDOT dam.	E&O	WBIF	3 public meetings	Keene Creek		SWCD and City of Duluth		✓	✓	✓		
Design and implement 2 priority connectivity projects in Keene Creek: Priority crossings in Keene: 1) Okerstrom Road in the park, 2) South central Ave, 3) Keene Creek Park MNDOT Dam	C	WBIF	2 completed designs	Keene Creek		SWCD		✓	✓	✓		
Design and implement 2 high priority fish friendly crossings in the Sucker Watershed: Priority Crossings in Sucker (2 mainstem and 2 tributary crossings) - crossings are prioritized now.	C	WBIF	2 completed projects	Sucker River		SWCD		✓	✓			
Use road authorities 5–10-year plans to coordinate with crossing upgrades	C	Baseline	Annual Plan Review	Trout Streams & Tributaries	Watershed Wide	Counties / SWCDs	✓	✓	✓	✓	✓	

Restore stream reaches that have been altered by human activity, including impounded, straightened, and incised stream reaches on 11,500 Linear Feet of high priority streams and tributaries.

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Complete designs and construct 2 priority stream restoration projects in Keene Creek	C	WBIF	2 projects implemented	Keene Creek		SWCD			✓	✓		
Coordinate with utilities and municipalities on project planning	C	Other	3 project meetings	Keene Creek		SWCD, City of Duluth, DNR - fisheries	✓	✓	✓			
Complete designs and construct 2 prioritized stream restoration projects in Sucker River	C	WBIF / Other	2 projects implemented	Sucker River		SWCD				✓	✓	
Coordinate with Keene Creek partners to continue to plan for restoration in the lower reaches of the watershed (below Grand Ave)		Other	3 planning meetings	Keene Creek		City of Duluth / DNR	✓		✓		✓	

Maintain acre/feet of watershed storage by restoring wetlands in identified priority areas where they have been lost and/or altered due to ditching or development activities.

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Protect non-developed land for watershed storage.	C		X acres protected	Keene Creek		City of Duluth and City of Hermantown						
Coordinate the Keene Creek Implementation table with the partners.	Data	WBIF	5 meetings	Keene Creek		SWCD / DUWAC	✓	✓	✓	✓	✓	

Protect & manage 2050 acres of private owned forests in areas that protect surface water, drinking/groundwater water quality and riparian habitat.

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Develop woodland stewardship plans for 10 parcels (greater than 20 acres)	C	WBIF / Other	10 plans developed	Sucker River		SWCD / Private foresters, NRCS, DNR	✓	✓	✓	✓	✓	
Protect 2050 acres of private forests with SFIA or Easements on parcels with a RAQ of 10	C	Other	2050 acres protected	Sucker River		SWCD / DNR NRCS		✓	✓	✓	✓	
Provide technical assistance to forest landowners with less than 20 acres	C	WBIF	X plans developed	Sucker River		SWCD	✓	✓	✓	✓	✓	
Develop and implement an education and outreach campaign for forest landowners.	E&O	WBIF	1 outreach campaign developed and implemented	Sucker River	Watershed Wide	St. Louis & Carlton SWCDs/DNR/ NRCS	✓	✓	✓	✓	✓	
Coordinate forestry activities within the watershed to promote forest health for water quality	C	WBIF	Ongoing coordination	Sucker River	Watershed Wide	SWCD / DNR & NRCS	✓	✓	✓	✓	✓	

Identify and manage 20 high priority sites/resources for invasive species.

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Work with 10 landowners on invasive species management or prevention in forests (Emerald Ash Borer (EAB) (could include understory plantings), Buckthorn) Focus on invasives that have a connection to water quality/quantity issues	C	WBIF / Other	10 projects implemented	Sucker River		SWCD		✓	✓			
Work together with Cooperative Invasive Species Management Area to identify priority locations to implement invasive species control projects.	C	Other	X meetings	Keene Creek		SWCD	✓	✓	✓	✓	✓	

11,500 feet of shoreline in prioritized lakes and streams have natural buffers and near shore areas are protected and restored to reduce erosion using bank stabilization, bioengineering, etc. techniques..

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Complete 2 shoreline stabilization projects in conjunction with stream restoration projects in Keene Creek	C	WBIF / Other	2 projects completed	Keene Creek		SWCD		✓	✓	✓		
Complete 2 stream stabilization projects in conjunction with stream restorations in Sucker River	C	WBIF / Other	2 projects completed	Sucker River		SWCD				✓	✓	
Enforce shoreland setbacks/buffers in all parts of the watershed	Policy	Baseline	Continued Local Program	Watershed Wide	Watershed Wide	Counties, Cities, Townships	✓	✓	✓	✓	✓	
Develop and implement a BMP education and outreach campaign to shoreline landowners in targeted areas	E&O	WBIF	1 Campaign implemented	Trout Streams & Tributaries, Wild Rice Waters	Watershed Wide	SWCD	✓	✓	✓	✓	✓	
Use RIM program to protect indicator species habitat	C	Other	See Forest Protection Action	Trout Streams & Tributaries, Wild Rice Waters, wood turtle	Watershed Wide	SWCD	✓	✓	✓	✓	✓	