

Focus Area: Public Health/Bacteria

Phase: 2010 to 2015

Issue: Risk of getting sick if you swim in or otherwise contact the water

Goal: Greater water-based recreational opportunities

SEWRPC Regional Plan Goal: Pollutant load reduction for fecal coliform bacteria for entire watershed by year 2020 = 41% or 6,900 trillion cells

What Will Meeting this Goal Accomplish?: Significant reduction in total fecal coliform; reduced risk of getting sick; minimal improvement to meeting 2009 water quality standards

1	2	3	4 Primary Land Use the Action Addresses ^A						5	6	7 Geographic Concentration of Action and Relative Priority (Will extend priority ranking as we are able and explain basis for ranking in text)																		8				
Watershed Targets to be Accomplished by 2015	Actions	Measures ^D	Agriculture	Low Density Residential	High Density Residential	Commercial	Institutional & Governmental	Outdoor Recreation, Wetlands, Woodlands, and Open Space	Transportation	Manufacturing & Industrial	Responsible and/or Participating Organization	Relative Cost (More detailed cost data will be added based on SEWRPC's Regional Planning Report No. 50, Appendix R)	MN-1	MN-2	MN-3	MN-4	MN-5	MN-6	MN-7	MN-8	MN-9	MN-10	MN-11	MN-12	MN-13	MN-14	MN-15	MN-16	MN-17	MN-18	Potential Contribution Toward Achieving Watershed Target & Goal		
1. Identify unknown sources of bacteria, and correct/remove/ disconnect 17% of unknown sources of bacteria (was high priority in the SEWRPC Regional Plan)	1a. Do dry weather surveys to identify outfalls that have dry weather flows	1a. Number of stream miles surveyed		●	●	●	●			●	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Low	CR	CR	CR	CR	CR	BR	CR	CR	CR	AR	AR	BR	AR	AR	AR	AR	AR	AR	AR	10% reduction in total watershed loads by 2015; 19% reduction in total watershed loads by 2020 ^B	
	1b. Sample outfalls to determine which have human bacteria discharges (wet and dry weather samples)	1b. % of outfalls sampled		●	●	●	●			●	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Medium	CR	CR	CR	CR	CR	BR	CR	CR	CR	AR	AR	BR	AR	AR	AR	AR	AR	AR	AR		
	1c. Determine ownership/owner of outfalls that have dry weather flows and/or human bacteria	1c. % of owners identified		●	●	●	●			●	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Low	CR	CR	CR	CR	CR	BR	CR	CR	CR	AR	AR	BR	AR	AR	AR	AR	AR	AR	AR		AR
	1d. Initiate discussion w/ owner of outfall to begin determining corrective actions	1d. % of owners with whom discussions have been initiated		●	●	●	●			●	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Low	CR	CR	CR	CR	CR	BR	CR	CR	CR	AR	AR	BR	AR	AR	AR	AR	AR	AR	AR		AR
	1e. Implement projects to correct/remove/disconnect unknown sources of bacteria	1e. % of sources corrected		●	●	●	●			●	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Highly variable	CR	CR	CR	CR	CR	BR	CR	CR	CR	AR	AR	BR	AR	AR	AR	AR	AR	AR	AR		AR
2. Increase recreational use of watershed by some % or number of days (was not an action ranked in the SEWRPC Regional Plan)	2a. Identify recreational and body contact areas	2a. Stream miles of watershed surveyed	●	●	●	●	●	●	●	●	SWWT	Low	A (priorities can be set after survey data is obtained)																		Fill data gaps - use results to revise priorities on geographic concentration of Target 1 as data is developed		
	2b. Identify other areas suitable for recreation or body contact	2b. Stream miles suitable for recreation/body contact	●	●	●	●	●	●	●	SWWT	Low	A (priorities can be set after survey data is obtained)																					
	2c. Prioritize areas to restore for recreational use identified in Action 2b based on success of Action 1e.	2c. Stream miles restored for public access, recreational use or body contact	●	●	●	●	●	●	●	●	SWWT	Low	TBD																				
3. Reduce bacteria sources from land-based activities by some % or number? (actions were ranked medium to high in the SEWRPC Regional Plan)	3a. Identify where public ownership of land can serve as a starting point to increase riparian buffers	3a. Number of stream miles with 75 feet-wide buffers or greater					●	●			Milwaukee County, Municipalities, NGOs and SWWT	Low	B (priorities can be set after survey data is obtained)																		Site-specific		
	3b. Manage pet litter	3b. Number of municipalities with strengthened pet litter programs		●	●				●		Milwaukee County, Municipalities, NGOs and SWWT	Low	B (priorities can be set after survey data is obtained)																		3% reduction in total watershed loads		
	3c. Implement programs to discourage unacceptably high numbers of waterfowl from congregating near water features - identify areas and take action to discourage waterfowl feeding	3c. Number of areas documented, and successful implementation of programs to eliminate feeding or other food sources for waterfowl		●	●	●	●		●	●	Milwaukee County, Municipalities, NGOs and SWWT	Low	B (priorities can be set after survey data is obtained)																		Site-specific		
	3d. Implement projects to comply with MS4 permits	3d. Required reports and estimates of TSS reductions that will have some benefit for bacteria	--	●	●	●	●		--	●	●	WDNR and Municipalities	High	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	18% reduction in total watershed loads by 2020
	3e. Implement projects to comply with nonagricultural (urban) NR151 requirements	3e. Required reports and estimates of TSS reductions that will have some benefit for bacteria	--	●	●	●	●		--	●	●	WDNR and Municipalities	High	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	
3f. Initiate municipal, county and SWWT education programs	3f. Number of documented, successful education programs implemented		●	●	●	●		●	●	Milwaukee County, Municipalities, NGOs and SWWT	Low	B																		Not measurable			

TABLE 1

1	2	3	4							5	6	7																		8		
Watershed Targets to be Accomplished by 2015	Actions	Measures ^D	Primary Land Use the Action Addresses ^A							Responsible and/or Participating Organization	Relative Cost (More detailed cost data will be added based on SEWRPC's Regional Planning Report No. 50, Appendix R)	Geographic Concentration of Action and Relative Priority (Will extend priority ranking as we are able and explain basis for ranking in text)																		Potential Contribution Toward Achieving Watershed Target & Goal		
			Agriculture	Low Density Residential	High Density Residential	Commercial	Institutional & Governmental	Outdoor Recreation, Wetlands, Woodlands, and Open Space	Transportation			Manufacturing & Industrial	North Branch Menomonee River-Upper (a)	West Branch Menomonee River	Willow Creek	Menomonee River-Upper (b)	Nor-X Channel	Lily Creek	Butler Ditch	Menomonee River-Upper (c)	Little Menomonee Creek	Little Menomonee River	Menomonee River-Upper (d)	Underwood Creek-Upper	Underwood Creek-Lower	Menomonee River-Upper (e)	Honey Creek	Menomonee River-Lower (a-b)	Menomonee River-Lower (c)			
	3g. Provide 6 months manure storage	3g. Number of facilities with at least 6 months of manure storage capacity	●	--	--	--	--	--	--	Counties, DATCP, WDNR and USDA	High	D	A	B	B	D	A	D	--	C	A	C	--	--	--	--	--	--	--	--	--	<1% reduction in total watershed loads by 2020
	3h. Prevent cattle from directly accessing streams	3h. Percentage of stream miles adjacent to agricultural land with no access to cattle	●	--	--	--	--	--	--	Counties, DATCP and WDNR	Low - Medium	D	A	B	B	D	A	D	--	C	A	C	--	--	--	--	--	--	--	--	Site-specific	
	3i. Convert marginal crop land to wetland or prairie	3i. Number of acres converted.	●	--	--	--	--	--	--	Counties, WDNR, USDA and Land Trusts	High	A	A	A	A	A	A	A	A	A	A	A	--	A	A	--	--	A	--	Site-specific		
	3j. Preserve highly productive agriculture land	3j. Number of acres preserved	●	--	--	--	--	--	--	Ozaukee County Land Conservation	Highly variable	A	A	A	A	A	A	A	A	A	A	--	A	A	--	--	A	--	Site-specific			
	3k. Control barnyard runoff	3k. Number of facilities with barnyard runoff control measures	●	--	--	--	--	--	--	Counties, DATCP, WDNR and USDA	Medium	D	A	B	B	D	A	D	--	C	A	C	--	--	--	--	--	--		--		
3l. Maintain and preserve Environmentally Significant Lands	3l. Number of acres purchased or preserved	●	--	--	--	--	●	--	MMSD, SEWRPC, WDNR, and others such as land trusts	Highly variable	A	A	A	A	A	A	A	A	A	A	--	A	A	--	--	A	--	--	Site-specific			
4. Continue overall water quality monitoring to assess progress towards targets and goals (was high priority in the SEWRPC Regional Plan)	4a. Continue MMSD water quality monitoring program and expand it to include biotic sampling	4a. Continue existing level of water quality samples and parameters tested for if justified after annual review	Not Applicable							MMSD, WDNR, USGS and NGO's	Low	A																		Fill data gaps		
	4b. Continue involvement of USGS in MMSD Corridor Study	4b. Maintain existing funding level for continued USGS involvement	Not Applicable							USGS	Low	A																				
	4c. Coordinate WDNR sampling and monitoring programs with MMSD and USGS and integrate NGO sampling efforts (such as the efforts detailed in Target 1)	4c. Overall data collection program is integrated through the USGS corridor study or other means. SWWT serves as a vehicle to coordinate and prioritize data collection efforts.	Not Applicable							MMSD, WDNR, USGS and NGO's	Low	A																				
5. Achieve at least the 5 year LOP and strive for zero SSOs and continuous reduction of CSO (SSO was high priority in the SEWRPC Regional Plan and CSO was medium priority)	5a. Adaptive implementation of overflow control program	5a. Annual volume and frequency of CSO and SSO	--	●	●	●	●	●	●	WDNR, MMSD, and Municipalities	High	AR																		3% reduction in total watershed loads by 2020 ^C		
6. Development of better health indicator for human pathogens (was high priority in the SEWRPC Regional Plan)	6a. Research development of better indicator test than fecal coliform to assess risks of disease and determination of human sources (was high priority in the SEWRPC Regional Plan)	6a. Progress on the UWM GLI work on bacteriodes and other test parameters and development of human health water quality standards by WDNR and USEPA	Not Applicable							UWM GLWI, MMSD, Municipalities and NGOs	Medium	A																		Fill data gaps		

Footnotes:
A. Land use types are discussed in Chapter 4 of the WRP. Additional details on land use types can be found in Chapters 1 and 2 of SEWRPC's Technical Report No. 39.
B. Approximately 60% - 75% of the urban nonpoint source loads were determined to be from unknown sources. Considering the potential challenges associated with this work, the Regional Plan recommended 33% of these unknown sources be eliminated.
C. Goal from MMSD's 2020 Facilities Plan is 5-year LOP for SSO's
D. The ultimate measure is whether bacteria loads to the streams are being reduced.

LEGEND
A = Highest Priority
B = Next Highest Priority
R = Required by Law

TABLE 2

Focus Area: Habitat- Land Based Measures

Phase: 2010 to 2015

Issue: Mitigating the human influences on runoff from the land surface to the stream system.

Goal: Habitat improvement through reduction of land based detrimental influences on the watershed.

SEWRPC Regional Plan Goal: Achievement of the fishable and swimmable standards.

What Will Meeting this Goal Accomplish?: Improvement of water quality and hydrology to sustain a natural fishery and support a full range of recreational uses.

Habitat Dimension	1	2	3	5	6	7																						
						Tributary Reaches & Subwatersheds														Mainstem Reaches & Subwatersheds								
						MN-1	MN-2	MN-3	MN-4	MN-6	MN-10	MN-11	MN-7	MN-8	MN-13A	MN-13	MN-14A	MN-14	MN-16	MN-5	MN-9	MN-12	MN-17	MN-17A	MN-18	MN-19		
	Watershed Targets	Actions	Measures	Responsible and/or Participating Organization	Relative Cost (More detailed cost data will be added based on SEWRPC's Regional Planning Report No. 50, Appendix R)	North Branch Menomonee	Menomonee River-Upper (a)	West Branch Menomonee River	Willow Creek	Nor-X Channel	Little Menomonee Creek	Little Menomonee River	Lilly Creek	Butler Ditch	Dousman Ditch	Underwood Creek-Upper	South Branch Underwood Creek	Underwood Creek-Lower	Honey Creek	Menomonee River-Upper (b)	Menomonee River-Upper (c)	Menomonee River-Upper (d)	Menomonee River-Lower (a)	Menomonee River-Lower (b)	Menomonee River-Lower (c)	Menomonee River-Lower (d)		
Riparian Corridors	1. Expand riparian buffer width to a minimum of 75 feet	1a. Purchase lands identified on Map ___ through donation, grants, fee simple purchase, or acquisition of conservation easement.	1a. Stream miles of buffer width 75 feet or greater	Municipalities, SWWT, NGOs WDNr, and MMSD	High	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
		1b. Implement management activities to promote restoration.	1b. Tons of historic fill and/or trash removed and number of native species restored	Municipalities, SWWT, NGOs Universities, WDNr, and MMSD	Medium	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
			1b. Area of exotic invasive species removed	Municipalities, SWWT, NGOs Universities, WDNr, and MMSD	Low	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
			1b. Area of native wetland or upland reconstructed	Municipalities, SWWT, NGOs Universities, WDNr, and MMSD	Low-Medium	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
			1c. Conduct additional surveys to determine riparian buffer widths not yet inventoried.	1c. stream miles inventoried and area of potential buffer identified	Municipalities, SWWT, SEWRPC, WDNr, NGOs Universities, and MMSD	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	2. Expand riparian buffer continuity	2a. Purchase lands identified on Map ___ through donation, grants, fee simple purchase, or acquisition of conservation easement.	2a. Stream miles of continuous buffer widths of 75 feet or greater	Municipalities, SWWT, NGOs WDNr, and MMSD	High	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
		2b. Implement management activities to promote restoration.	2b. Number of stream channel crossings and/or impediments to flow removed and/or retrofitted to restore continuity of riparian buffers	Municipalities, SWWT, NGOs Universities, WDNr, and MMSD	Medium	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
		2c. Implement management activities to promote recreation.	2c. Miles of recreational trails created for public access, recreational use or body contact	Municipalities, SWWT, NGOs Universities, WDNr, and MMSD	Medium	B	B	A	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	
	3. Protection of high quality areas or environmentally sensitive lands	3a. Conduct additional surveys to determine riparian buffer widths not yet inventoried.	3a. stream miles inventoried and area of potential buffer identified	Municipalities, SWWT, SEWRPC, WDNr, NGOs Universities, and MMSD	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
		3b. Purchase of lands to expand buffers within the SEWRPC-delineated Primary and Secondary Environmental Corridors, especially along the mainstem and tributary stream courses	3b. stream miles or area of land protected	Municipalities, SWWT, NGOs WDNr, and MMSD	High	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
3c. Discourage any additional development within the floodplain.		3c. Continued enforcement of local zoning ordinances and, where applicable, ordinance revisions to require mitigative compensation for filling in the floodplain	Municipalities, County	Low	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		

TABLE 2

Habitat Dimension	1 Watershed Targets	2 Actions	3 Measures	5 Responsible and/or Participating Organization	6 Relative Cost (More detailed cost data will be added based on SEWRPC's Regional Planning Report No. 50, Appendix R)	7																					
						Tributary Reaches & Subwatersheds														Mainstem Reaches & Subwatersheds							
						MIN-1	MIN-2	MIN-3	MIN-4	MIN-6	MIN-10	MIN-11	MIN-7	MIN-8	MIN-13A	MIN-13	MIN-14A	MIN-14	MIN-16	MIN-5	MIN-9	MIN-12	MIN-17	MIN-17A	MIN-18	MIN-19	
						North Branch Menomonee	Menomonee River-Upper (a)	West Branch Menomonee River	Willow Creek	Nor-X Channel	Little Menomonee Creek	Little Menomonee River	Lilly Creek	Butler Ditch	Dousman Ditch	Underwood Creek-Upper	South Branch Underwood Creek	Underwood Creek-Lower	Honey Creek	Menomonee River-Upper (b)	Menomonee River-Upper (c)	Menomonee River-Upper (d)	Menomonee River-Lower (a)	Menomonee River-Lower (b)	Menomonee River-Lower (c)	Menomonee River-Lower (d)	
Hydrology	4. Moderate flow regimes to decrease flashiness	4a. Implement stormwater management practices at the subwatershed level	4a. numbers of detention and infiltration basins installed, drainage area controlled by regenerative stormwater practices that achieve quality and quantity control, area of permeable paving materials installed, acres of wetland and upland restored, area of low-impact development	MMSD, WDNR, Municipalities, Counties	High	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	
		4b. Implement stormwater management practices at the neighborhood level	4b. Number of raingardens or rainbarrels installed and downspouts disconnected, green roofs installed	MMSD, WDNR, Municipalities, Counties	Medium	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
		4c. Maintain stormwater management practices at all levels	4c. Drainage area controlled by regenerative stormwater practices that achieve quality and quantity control numbers of basins inspected and maintained	MMSD, WDNR, Municipalities, Counties	Low	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
		4d. Restore floodplain connectivity with the stream system	4d. Miles of stream connected with the floodplain.	MMSD, WDNR, NGOs, Municipalities, Counties	Medium-High	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water Quality and Quantity	5. Reduce water quality and quantity impacts from CSOs, SSOs and stormwater outfalls	5a. Provide adequate conveyance and storage volume through traditional (detention and infiltration basins) and innovative techniques (bio-infiltration, green infrastructure, etc.)	5a. Annual volume and frequency of CSO, SSO, and stormwater discharges, improvement of water quality during wet weather events	WDNR, MMSD, and Municipalities	High	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
		5b. Implement road salt reduction programs	5b. Reduced concentration of chlorides in streams	WDNR, MMSD, and Municipalities	High	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	6. Reduce localized erosion at CSO, SSO, stormwater outfall pipes	6a. Implement measures to reduce localized erosion and physically modify the most-active outfalls (i.e. those with the greatest effect on instream physical conditions)	6a. Number of flow deflectors installed, pipes cut back from stream bank, linear feet of riprap installed, or amount of land purchased to provide bio-infiltration	WDNR, MMSD, and Municipalities	Medium-High	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Monitoring and Information	7. Continue and expand monitoring and informational programming	7a. Continue maintenance of existing physical, chemical, and biological monitoring stations and develop new monitoring sites (including wildlife monitoring) in cooperation with citizen and other monitoring programs and share the knowledge with stakeholders	7a. Number of stations established and numbers of informational programs delivered	Universities, MMSD, WDNR, USGS, Municipalities and NGOs	Low-Medium	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	

Footnotes:

LEGEND
A = Highest Priority
B = Next Highest Priority
R = Required by Law

TABLE 3

Habitat Table 2 of 2

DRAFT SUMMARY MATRIX - FOR DISCUSSION PURPOSES ONLY
Menomonee River Watershed

10/26/2009

Focus Area: Habitat- Instream Based Measures

Phase: 2010 to 2015

Issue: Mitigating the human influences on instream fishery habitat and water quality.

Goal: Habitat improvement through reduction of instream based detrimental influences throughout the stream system.

SEWRPC Regional Plan Goal: Achievement of the fishable and swimmable standards.

What Will Meeting this Goal Accomplish?: Improvement of water quality and habitat to sustain a natural fishery and support a full range of recreational uses.

Habitat Dimension	Watershed Targets	Actions	Measures	Responsible and/or Participating Organization	Relative Cost (More detailed cost data will be added based on SEWRPC's Regional Planning Report No. 50, Appendix R)	7																					
						Tributary Reaches & Subwatersheds														Mainstem Reaches & Subwatersheds							
						MN-1	MN-2	MN-3	MN-4	MN-6	MN-10	MN-11	MN-7	MN-8	MN-13A	MN-13	MN-14A	MN-14	MN-16	MN-5	MN-9	MN-12	MN-17	MN-17A	MN-18	MN-19	
						North Branch Menomonee	Menomonee River-Upper (a)	West Branch Menomonee River	Willow Creek	Nor-X Channel	Little Menomonee Creek	Little Menomonee River	Lily Creek	Butler Ditch	Dousman Ditch	Underwood Creek-Upper	South Branch Underwood Creek	Underwood Creek-Lower	Honey Creek	Menomonee River-Upper (b)	Menomonee River-Upper (c)	Menomonee River-Upper (d)	Menomonee River-Lower (a)	Menomonee River-Lower (b)	Menomonee River-Lower (c)	Menomonee River-Lower (d)	
Aquatic Organism Passage	1. Restore fish and aquatic organism passage from Lake Michigan to the headwaters and tributaries (i.e. Follow 3-Tiered Prioritization Strategy as outlined in Figure __)	1a. Remove concrete within the lower reaches of the mainstem	1a. Stream miles of concrete removed, number of native species present (see Table __ for biological indicators)	Municipalities SWWT, NGOs with WDNR and MMSD	High	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	A	--	
		1b. Remove and/or retrofitting of five low-gradient structures within the vicinity North Menomonee River Parkway between Swan Boulevard and Harmon Avenue	1b. Number of structures removed or retrofitted, number of native species present (see Table __ for biological indicators)	Municipalities SWWT, NGOs with WDNR and MMSD	Medium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	A	--	--	
		1c. Remove additional obstructions on the mainstem or tributaries	1c. Number of structures removed or retrofitted, number of native species present (see Table __ for biological indicators)	Municipalities SWWT, NGOs with WDNR and MMSD	Medium	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A
		1d. Expand passage restoration efforts beyond the mainstem to the tributaries	1d. Stream miles of concrete removed, number of drop structures eliminated, miles of enclosed channel daylighted or retrofitted, number of bridge crossings retrofitted, and channel restored, number of Tributary miles connected to mainstem, number of native species present (see Table __ for biological indicators)	Municipalities SWWT, NGOs with WDNR and MMSD	Medium-High	B	B	B	B	B	B	B	B	B	B	B	A	A	A	--	--	--	--	--	--	--	--
Aquatic Habitat	2. Restore fish and aquatic organism habitat from Lake Michigan to the headwaters and tributaries (i.e. Follow 3-Tiered Prioritization Strategy as outlined in Figure __)	2a. Protect and expand existing highest quality remaining fishery and aquatic habitat (see Map __)	2a. Stream miles of habitat protected	Municipalities SWWT, NGOs with WDNR and MMSD	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A	
		2b. Provide instream habitat treatments including pool and riffle structure, substrates, and vegetation	2a. Stream miles of habitat created, number of native species present (see Table __ for biological indicators)	Municipalities SWWT, NGOs with WDNR and MMSD	Medium	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A
		2c. Restore connectivity with floodplain and recreate a more natural meandering stream (to be undertaken simultaneously with 2a) to provide for the life history of fish and aquatic organisms (rearing, feeding, breeding, and refuge areas)	2b. Number of miles connected and functional as fish and aquatic organism habitat, number of native species present (see Table __ for biological indicators)	Municipalities SWWT, NGOs with WDNR and MMSD	High	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A
		2d. Maintain water quality conditions conducive to a successful and sustainable fishery	2c. Thermal regime, oxygen concentrations, turbidity, chlorides, etc.	Municipalities SWWT, NGOs with WDNR and MMSD	Medium	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A

TABLE 3

Habitat Dimension	1 Watershed Targets	2 Actions	3 Measures	5 Responsible and/or Participating Organization	6 Relative Cost (More detailed cost data will be added based on SEWRPC's Regional Planning Report No. 50, Appendix R)	7																					
						Tributary Reaches & Subwatersheds														Mainstem Reaches & Subwatersheds							
						MN-1	MN-2	MN-3	MN-4	MN-6	MN-10	MN-11	MN-7	MN-8	MN-13A	MN-13	MN-14A	MN-14	MN-16	MN-5	MN-9	MN-12	MN-17	MN-17A	MN-18	MN-19	
						North Branch Menomonee	Menomonee River-Upper (a)	West Branch Menomonee River	Willow Creek	Nor-X Channel	Little Menomonee Creek	Little Menomonee River	Lilly Creek	Butler Ditch	Dousman Ditch	Underwood Creek-Upper	South Branch Underwood Creek	Underwood Creek-Lower	Honey Creek	Menomonee River-Upper (b)	Menomonee River-Upper (c)	Menomonee River-Upper (d)	Menomonee River-Lower (a)	Menomonee River-Lower (b)	Menomonee River-Lower (c)	Menomonee River-Lower (d)	
Aquatic Organisms	3. Restore a sustainable fishery	3a. Protect and expand remaining or existing highest quality aquatic communities (fisheries, macroinvertebrates, mussels) (see Map __)	3a. Number, type, and life stages of native species observed (see Table __ for biological indicators)	Municipalities SWWT, NGOs with WDNR and MMSD	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	
		3b. Reintroduction of native species	3b. Number, type, and life stages of native species observed (see Table __ for biological indicators)	SWWT, NGOs with WDNR and MMSD	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A
		3c. control and removal of non-native species	3c. Area cleared or tons removed of non-native species	Municipalities SWWT, NGOs with WDNR and MMSD	Low-Medium	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A
Monitoring and Information	4. Monitoring and Informational programming	4a. Continue and expand monitoring efforts and inventory maintenance for fish passage, habitat, aquatic organisms, and water quality	4a. Number of stations established and conditions documented and shared with stakeholders	Municipalities SWWT, NGOs Universities, USGS, SEWRPC, WDNR and MMSD	Low-Medium	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	
		4b. Develop new monitoring sites in cooperation with citizen and other monitoring programs and share the knowledge with stakeholders	4b. Number of stations established and numbers of informational programs delivered	Municipalities SWWT, NGOs Universities, USGS, SEWRPC, WDNR and MMSD	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A
Recreation	5. Improve recreational opportunities	5a. Maintain existing recreational opportunities	5a. Number of facilities maintained, public access sites	Counties, NGO's, municipalities, WDNR, local stakeholders	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	
		5b. Develop new and safe recreation opportunities such as linking water and land-based trail systems	5b. numbers of signs installed to identify unsafe navigational hazards, number of navigational hazards removed or retrofitted, number of new public access sites or facilities created, number of informational signs installed	Counties, NGO's, municipalities, WDNR, local stakeholders	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A
		5c. Maintain appropriate water quality conditions and create safe flow conditions conducive to full contact recreation	5c. Number of safe recreation days, number of areas identified as safe for recreation, number of safe exits constructed in confined channels	MMSD, WDNR, NGO's, municipalities, local stakeholders	Medium	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A
Aesthetics	6. Removal of trash	6a. Continue and expand trash and debris collection and disposal	6a. Tons of debris identified, collected, and disposed of	Municipalities SWWT, NGOs with WDNR and MMSD	Medium	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	

Footnotes: it is important to note that these instream actions and measures will require permits from the WDNR, municipalities, and/or Counties.

LEGEND
A = Highest Priority
B = Next Highest Priority
R = Required by Law

TABLE 4

Focus Area: Nutrients - Phosphorus

Phase: 2010 to 2015

Issue: Nutrient impacts on the watershed and discharge of nutrients from the watershed to Lake Michigan

Goal: Reduction of nutrient loads and impacts on water quality such as algae and cladophera

SEWRPC Regional Plan Goal: Pollutant load reduction for phosphorus for entire watershed by year 2020 = 32% or 17,190 pounds per year reduction

What Will Meeting this Goal Accomplish?: Significant reduction in nutrient pollution of the watershed including algae reduction and reduction of nutrient discharges to the Milwaukee Estuary and Lake Michigan

1	2	3	4								5	6	7																		8		
			Primary Land Use the Action Addresses ^A										Responsible and/or Participating Organization	Relative Cost (More detailed cost data will be added based on SEWRPC's Regional Planning Report No. 50, Appendix R)	Geographic Concentration of Action and Relative Priority (Will extend priority ranking as we are able and explain basis for ranking in text)																		
			Agriculture	Low Density Residential	High Density Residential	Commercial	Institutional & Governmental	Outdoor Recreation, Wetlands, Woodlands, and Open Space	Transportation	Manufacturing & Industrial					MN-1	MN-2	MN-3	MN-4	MN-5	MN-6	MN-7	MN-8	MN-9	MN-10	MN-11	MN-12	MN-13	MN-14	MN-15	MN-16		MN-17	MN-18
1. Reduce phosphorus loads from regulated discharges (actions were ranked low to high in the SEWRPC Regional Plan)	1a. Adaptive implementation of overflow control program	1a. Annual volume and frequency of CSO and SSO	--	●	●	●	●	--	●	●	WDNR, MMSD, and Municipalities	High	AR																		1% reduction in total watershed loads		
	1b. Implement projects to comply with MS4 permits	1b. Required reports and estimates of phosphorus reductions associated with TSS reduction	--	●	●	●	●	--	●	●	WDNR and Municipalities	High	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	9% reduction in total watershed loads by 2020
	1c. Implement projects to comply with NR151 requirements	1c. Required reports and estimates of phosphorus reductions associated with TSS reduction	--	●	●	●	●	--	●	●	WDNR and Municipalities	High	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	
	1d. Reduction of phosphorus loads due to the State ban of phosphorus in commercial fertilizers	1d. Required reports and estimates of phosphorus reductions	--	●	●	●	●	--	●	●	WDNR and Municipalities	Low	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	Estimated 4% reduction in total watershed loads based on literature
2. Reduce phosphorus sources from land-based activities by some % or number (was high priority in the SEWRPC Regional Plan)	2a. Identify where public ownership of land can serve as a starting point to increase riparian buffers	2a. Number of stream miles with 75 feet-wide buffers or greater where public ownership exists	All								Milwaukee County, Municipalities, NGOs, SWWT	Medium	A																		8% reduction in total watershed loads by 2020		
3. Continue overall water quality monitoring to assess progress towards targets and goals (was high priority in the SEWRPC Regional Plan)	3a. Continue MMSD water quality monitoring program and expand it to include biotic sampling	3a. Continue existing level of water quality samples and parameters tested for if justified after annual review	Not Applicable								MMSD, WDNR, USGS, NGO's	Low	A																		Fill data gaps		
	3b. Continue involvement of USGS in MMSD Corridor Study	3b. Maintain existing funding level for continued USGS involvement	Not Applicable								USGS	Low	A																				
	3c. Coordinate WDNR sampling and monitoring programs with MMSD and USGS and integrate NGO sampling efforts (such as the efforts detailed in Target 1)	3c. Overall data collection program is integrated through the USGS corridor study or other means. SWWT serves as a vehicle to coordinate and prioritize data collection efforts.	Not Applicable								MMSD, WDNR, USGS, NGO's	Low	A																				
4. Reduce use of phosphoric acid for control of lead and copper in drinking water systems	4a. Research development of alternatives to Phosphoric acid use by public and private researchers in area universities and industries	4a. Progress on public and private research in the Milwaukee area on development of better technology	Not Applicable								UWM GLWI, MMSD, Municipalities, Industries, Milwaukee 7, and NGOs	Medium	A																		11% reduction in total watershed loads (if phosphorus from all industrial noncontact cooling water sources eliminated) Alternative to Phosphoric acid would have regional, national and global impacts		

Footnotes:
A. Land use types are discussed in Chapter 4 of the WRP. Additional details on land use types can be found in Chapters 1 and 2 of SEWRPC's Technical Report No. 39.

LEGEND
A = Highest Priority
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R = Required by Law

CRITICAL ACTIONS TABLE

DRAFT SUMMARY MATRIX - FOR DISCUSSION PURPOSES ONLY

10/26/2009

Menomonee River Watershed

CRITICAL ACTIONS

Phase: 2010 to 2015

1	2	5	6	8
Watershed Targets to be Accomplished by 2015	Actions	Responsible and/or Participating Organization	Relative Cost (More detailed cost data will be added based on SEWRPC's Regional Planning Report No. 50, Appendix R)	Potential Contribution Toward Achieving Watershed Target & Goal
PUBLIC HEALTH/BACTERIA				
1. Identify unknown sources of bacteria, and correct/remove/ disconnect 17% of unknown sources of bacteria (was high priority in the SEWRPC Regional Plan)	1a. Do dry weather surveys to identify outfalls that have dry weather flows	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Low	10% reduction in total watershed loads by 2015; 19% reduction in total watershed loads by 2020 ^B
	1b. Sample outfalls to determine which have human bacteria discharges (wet and dry weather samples)	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Medium	
	1c. Determine ownership/owner of outfalls that have dry weather flows and/or human bacteria	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Low	
	1d. Initiate discussion w/ owner of outfall to begin determining corrective actions	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Low	
	1e. Implement projects to correct/remove/disconnect unknown sources of bacteria	Municipalities and NGOs with assistance from UWM GLWI and MMSD	Highly variable	
2. Increase recreational use of watershed by some % or number of days (was not an action ranked in the SEWRPC Regional Plan)	2a. Identify recreational and body contact areas	SWWT	Low	Fill data gaps - use results to revise priorities on geographic concentration of Target 1 as data is developed
	2b. Identify other areas suitable for recreation or body contact	SWWT	Low	
	2c. Prioritize areas to restore for recreational use identified in Action 2b based on success of Action 1e.	SWWT	Low	
3. Reduce bacteria sources from land-based activities by some % or number? (actions were ranked medium to high in the SEWRPC Regional Plan)	3a. Identify where public ownership of land can serve as a starting point to increase riparian buffers	Milwaukee County, Municipalities, NGOs and SWWT	Low	Site-specific
	3b. Manage pet litter	Milwaukee County, Municipalities, NGOs and SWWT	Low	3% reduction in total watershed loads
	3c. Implement programs to discourage unacceptably high numbers of waterfowl from congregating near water features - identify areas and take action to discourage waterfowl feeding	Milwaukee County, Municipalities, NGOs and SWWT	Low	Site-specific
	3d. Implement projects to comply with MS4 permits	WDNR and Municipalities	High	18% reduction in total watershed loads by 2020
	3e. Implement projects to comply with nonagricultural (urban) NR151 requirements	WDNR and Municipalities	High	
	3f. Initiate municipal, county and SWWT education programs	Milwaukee County, Municipalities, NGOs and SWWT	Low	Not measurable
	3g. Provide 6 months manure storage	Counties, DATCP, WDNR and USDA	High	<1% reduction in total watershed loads by 2020
	3h. Prevent cattle from directly accessing streams	Counties, DATCP and WDNR	Low - Medium	
	3i. Convert marginal crop land to wetland or prairie	Counties, WDNR, USDA and Land Trusts	High	Site-specific
	3j. Preserve highly productive agriculture land	Ozaukee County Land Conservation	Highly variable	
	3k. Control barnyard runoff	Counties, DATCP, WDNR and USDA	Medium	
3l. Maintain and preserve Environmentally Significant Lands	MMSD, SEWRPC, WDNR, and others such as land trusts	Highly variable		
HABITAT - LAND-BASED				
5. Reduce water quality and quantity impacts from CSOs, SSOs and stormwater outfalls	5a. Provide adequate conveyance and storage volume through traditional (detention and infiltration basins) and innovative techniques (bio-infiltration, green infrastructure, etc.)	WDNR, MMSD, and Municipalities	High	
	5b. Implement road salt reduction programs	WDNR, MMSD, and Municipalities	High	
HABITAT - INSTREAM-BASED				
1. Restore fish and aquatic organism passage from Lake Michigan to the headwaters and tributaries (i.e. Follow 3-Tiered Prioritization Strategy as outlined in Figure __)	1a. Remove concrete within the lower reaches of the mainstem	Municipalities SWWT, NGOs with WDNR and MMSD	High	
	1b. Restore connectivity with floodplain and recreate a more natural meandering stream (to be undertaken simultaneously with 1a) to restore stream hydrology dynamics	Municipalities SWWT, NGOs with WDNR and MMSD	Medium-High	
	1c. Expand passage restoration efforts beyond the mainstem to the tributaries	Municipalities SWWT, NGOs with WDNR and MMSD	Medium-High	
PHOSPHORUS				
1. Reduce phosphorus loads from regulated discharges (actions were ranked low to high in the SEWRPC Regional Plan)	1a. Adaptive implementation of overflow control program	WDNR, MMSD, and Municipalities	High	1% reduction in total watershed loads
	1b. Implement projects to comply with MS4 permits	WDNR and Municipalities	High	9% reduction in total watershed loads by 2020
	1c. Implement projects to comply with NR151 requirements	WDNR and Municipalities	High	
	1d. Reduction of phosphorus loads due to the State ban of phosphorus in commercial fertilizers	WDNR and Municipalities	Low	Estimated 4% reduction in total watershed loads based on literature