Memorandum

Lower Minnesota River East - Advisory Committee

To:	Lower MN River East Watershed Advisory Committee
From:	Bailey Griffin, Project Manager; Sarah Boser, Watershed Planner - ISG
Date:	December 21st, 2022
Subject:	Priority Resources

The following memo provides a summary of take-away items from the October AC meeting and November PC meeting. The bulk of the meeting and memo provides data and criteria for determining priority resources in the Planning Area.

REVISED ISSUE STATEMENTS

After the October AC meeting, draft issue statements were provided in a survey for individuals to provide comments and feedback. A detailed memo of the survey results is included in an attachment with this memo. Based on the results of the survey and Steering Team discussion, the following issue statements were established. The issue statements were presented to the PC and approved to move forward with development of Plan content.

Surface Water - Hydrology

Hydrology has been significantly altered within the watershed due to land use changes which has altered flow rates, drainage, volumes, and storage causing flooding, erosion, and downstream impacts.

Surface water – Water Quality

Lakes, streams, creeks, wetlands, and the Minnesota River are threatened or impaired by various pollutants which cause harmful impacts to aquatic life, habitat, and recreation.

Groundwater – Quality

Groundwater quality is impacted by naturally occurring and human-introduced pollutants which impacts the safety of drinking water supplies.

Groundwater – Quantity / knowledge, data, and understanding

There is insufficient knowledge, data, and understanding of groundwater quality and quantity which is needed in order to protect vulnerable areas, resources, and communities within the watershed.

Habitat and Natural Resources – Protection & Preservation

Habitat that contains high ecological value is threatened due to land use changes, poor water quality, and altered hydrology. These impacts affect all existing natural habitat types especially aquatic habitat, forests, native prairies, trout streams, and wetlands/fens.

Habitat and Natural Resources – Restoration

All existing habitat types within the watershed, especially lakes, rivers, streams, wetlands/fens, forests, and prairies, have been reduced, degraded, and fragmented due to land use practices, pollutants, altered hydrology, and invasive species.

LAND AND WATER RESOURCES NARRATIVE

The land and water resources narrative underwent review from the AC during October. Based on the review, revisions were incorporated into the narrative. The land and water resources narrative was presented at the November PC meeting and approved. The most up to date version of the land and water resources narrative is included as an attachment in this memo.

PRIORITY RESOURCES

Now that we have determined priority issues, the next step in the planning process is to determine priority resources such as lakes and streams. In determining priority resources, we will be establishing where the partnership will focus restoration and protection efforts. Many different criteria can be used to determine priority resources such as water quality monitoring data, recreation data, and professional judgement. Water quality data and recreational data were collected from available sources, while professional judgement data has been collected through a survey from the AC members.

To ensure a clear process for determining priority resources for staff, elected officials, and the public, it is important to establish a process in which priority resources are determined. Table 1 and Table 2 below outline criteria used to prioritize lakes and streams. The criteria includes water quality, recreation, and professional judgment criteria categories. Each criteria category has sub-categories that add up to a total of 100 points for the overall category. An average score for the criteria categories was calculated and provided an overall rank for the resource. Additional consideration may need to be considered for streams under the water quality category, as streams are complex and have tributaries that may overlap or influence the water quality of other reaches.

Tiering can be considered for priority resources to further prioritize resources in the Planning Area. Tiering priorities provides flexibility to the planning effort knowing that implementation is on a voluntary basis. Tiering may also provide ease of update during 5-year assessment and end of 10-year plan.

During the meeting, we will be asking for feedback on the criteria used, weighting of the rankings, and tiering criteria.

LAKE PRIORITIZATION

TABLE 1: LAKE PRIORITIZATION CRITERIA

Criteria	Definition
Water Quality Criteria	
TMDL Status	Lakes with approved TMDLs have been studied and modeled to better understand sources of loading. Lakes with completed TMDLs will be prioritized. • 20 points – completed and approved TMDL for nutrients • 10 points – impaired status and approved to move forward with TMDL study • 0 points – no TMDL
Lake size to drainage area ratio	The ratio of lake area to watershed drainage area. Values ranged from 3 to 123. Lake to watershed drainage ratio can be used to assess

	groundwater dominance and influence on external loading and impacts. • 20 Points – Lake size to drainage areas is <5 • 10 Points – Lake size to drainage areas is 5-10 • 5 Points - Lake size to drainage areas is >10
Lake Phosphorus Sensitivity Significance (LPSS) Priority Class	The LPSS priority class is a function of phosphorus sensitivity, lake size, lake total phosphorus concentration, proximity to the MPCA's phosphorus impairment threshold and watershed disturbance. Based on the results of the assessment, waterbodies are ranked as high, higher, and highest priority. • 20 Points – highest priority • 15 Points – higher priority • 10 Points – high priority • 5 points - impaired
Lake Benefit Cost Assessment (LBCA) Priority Class	The LBCA priority class is a function of phosphorus sensitivity, lake size, and catchment disturbance. The classes algin with the state's priority of focusing on high quality high value lakes that likely produce the greatest return on investment. • 20 Points – highest priority • 15 Points – higher priority • 10 Points – high priority
Lake Health Score	The lake health score provides generalized health assessment of a lake and its watershed. Lake health score above 80 indicates good health and those below 70 indicate poor health. • 20 Points – >80 • 15 Points – 71-79 • 10 Points – 61-70 • 5 Points - <60
Recreational Criteria	
Public accesses	The ability for citizens in the watershed to access the lake. • 50 Points – at least one public access point
Parks or Public Land Adjacent to Lake	Public parks such as regional, county, or city parks adjacent to lake provide recreation benefit to the public. WMA, WPA, WRA provide wildlife benefits to the lake as well as public access and recreational value for hunting, hiking, and nature access to the public. If both public park and other public land are present, a maximum score of 50 will be awarded.

	• 50 Points – Public park adjacent to lake • 20 Points – WMA, WPA, WRA or other public land adjacent to lake
Professional Judgement	
Momentum towards goals	Lakes with momentum to improving water quality will be prioritized. LGU staff were asked to provide their professional judgement to assess based on the definitions provided below. Scores were averaged based on LGU staff responses. • 33 Points - Studies/project identification/outreach/ BMPs have been implemented already and initiatives have been undertaken to support continued implementation. • 22 Points - Activities (studies, project id, outreach, etc.) have been or are in the planning and development stages but have not been implemented yet. Funding has been secured or is being pursued. • 11 Points - No recent activity has taken place.
Local support	Lakes with local support for improving water quality will be prioritized. LGU staff were asked to provide their professional judgement to assess based on the definitions provided below. Scores were averaged based on LGU staff responses. • 33 Points - Landowners are seeking out/taking initiative; there is an active support network; there are local champions; local match/contribution is secured. • 22 Points - Landowners will attend meetings or request information; the lake association is a social group and is not particularly interested in environmental issues. • 11 Points - Little to no contact with landowners, no lake association or local champions.
Political support	Lakes with political support for improving water quality will be prioritized. LGU staff were asked to provide their professional judgement to assess based on the definitions provided below. Scores were averaged based on LGU staff responses. • 33 Points - Elected officials have provided substantial staff and financial resources, voiced political support, and worked to build community support. • 22 Points - Elected officials have provided some staff and financial resources, voiced political support, and worked to build community support. • 11 Points - Elected officials have voiced political support and worked to build community support.

STREAM PRIORITIZATION

TABLE 2: STREAM PRIORITIZATION CRITERIA

Criteria	Definition
Water Quality Criteria	
TMDL Status	Streams with approved TMDLs have been studies and modeled to better understand sources of loading. Streams with completed TMDLs will be prioritized. • 20 points – completed and approved TMDL for nutrients • 10 points – impaired status and approved to move forward with TMDL study • 0 points – no TMDL
TSS Score	Since streams can have multiple tributaries, only major tributaries that drain into the Minnesota River were analyzed. Additional targeting and prioritization may take place with subsequent tributaries. Loading determinations were based on HSPF modeled values. • 20 Points – Loading to Minnesota River > 10,000 tons/year • 15 Points – Loading to Minnesota River > 750 tons/year • 10 Points – Loading to Minnesota River > 300 tons/year • 5 Points – Loading to Minnesota River < 300 tons/year
TP Score	Since streams can have multiple tributaries, only major tributaries that drain into the Minnesota River were analyzed. Additional targeting and prioritization may take place with subsequent tributaries. Loading determinations were based on HSPF modeled values. • 20 Points – Loading to Minnesota River > 30,000 lb/year • 15 Points – Loading to Minnesota River > 5,000 lb/year • 10 Points – Loading to Minnesota River > 2,250 lb/year 5 Points – Loading to Minnesota River < 2,250 lb/year
Drains to or Through Priority Lake	Streams can influence water quality and recreational value of lakes. The above-mentioned priority lakes and criteria for prioritization. Streams that can impact priority lakes will be prioritized.

	• 20 Points – Flows through priority lake with average ranking of >75 • 15 Points – Flows through priority lake with average ranking of >50 • 0 Points – Does not impact priority lake
Flooding Related Concerns	Streams with concerns with flooding will be prioritized. Water quantity and rate and have an influence on water quality. • 20 Points – Flooding concerns • 0 Points – No flooding concerns
Recreational Criteria	
Public accesses	The ability for citizens in the watershed to access the stream. • 50 Points – at least one public access point • 0 Points – no public access
Parks or Public Land Adjacent to Stream	Public parks such as regional, county, or city parks adjacent to streams provide recreation benefit to the public. WMA, WPA, WRA provide wildlife benefits to the stream as well as public access and recreational value for hunting, hiking, and nature access to the public. If both public park and other public land are present, a maximum score of 50 will be awarded. • 50 Points – Public park adjacent to stream • 20 Points – WMA, WPA, WRA or other public land adjacent to stream • 0 Points – no public park or land adjacent to stream
Professional Judgement	
Momentum towards goals	Streams with momentum to improving water quality will be prioritized. LGU staff were asked to provide their professional judgement to assess based on the definitions provided below. Scores were averaged based on LGU staff responses. • 33 Points - Studies/project identification/outreach/ BMPs have been implemented already and initiatives have been undertaken to support continued implementation. • 22 Points - Activities (studies, project id, outreach, etc.) have been or are in the planning and development stages but have not been implemented yet. Funding has been secured or is being pursued. • 11 Points - No recent activity has taken place.
Local support	Streams with local support to improving water quality will be prioritized. LGU staff were asked to provide their professional

	judgement to assess based on the definitions provided below. Scores were averaged based on LGU staff responses. • 33 Points - Landowners are seeking out/taking initiative; there is an active support network; there are local champions; local match/contribution is secured. • 22 Points - Landowners will attend meetings or request information, the support network is a social group and is not particularly interested in environmental issues. • 11 Points - Little to no contact with landowners, no support network, or local champions.
Political support	Streams with political support to improving water quality will be prioritized. LGU staff were asked to provide their professional judgement to assess based on the definitions provided below. Scores were averaged based on LGU staff responses. • 33 Points - Elected officials have provided substantial staff and financial resources, voiced political support, and worked to build community support. • 22 Points - Elected officials have provided some staff and financial resources, voiced political support, and worked to build community support. • 11 Points - Elected officials have voiced political support and worked to build community support.

NEXT STEPS: TARGETING & MEASURABLE GOALS

Next, the Advisory Committee will work on determining targeting criteria (where necessary) and establishing measurable goals (ex. 10% reduction in total phosphorus). Each issue must have goals. ISG will start with drafting targeting criteria and measurable goals that have already been established in existing county water plans and studies such as the WRAPS for the Advisory Committee to review and discuss. The discussion will include initial direction and input on strategies for implementation actions (ex. cover crops). Each issue statement will be addressed independently to ensure the framework is logical.

Lake ID	Lake_Name	County	Depth Class	LAKE Acres	Watershed Acres	Nutrient Impaired (Y/N)?	TMDL Status	Ecoregion	% Forested/ Wetland	% Disturbed Land Use	Mean TP (ug/L)	Years TP	Mean Secchi (m)	Presence of Water Clarity Trend
70-0091-00	Cedar	Scott	shallow	793	2480	Y	TMLD Approved - Nutrients / eutrophication	NCHF	26%	46%	185	16	1.17	Degrading
40-0079-00	Clear	Le Sueur	deep	279	2972	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	11%	72%	334	2	1.07	Insufficient Data
70-0022-00	Cleary	Scott	shallow	145	5255	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	35%	32%	144	19	1.08	No Trend
66-0061-00	Cody	Rice	shallow	259	13634	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	12%	67%	344	4	0.42	Insufficient Data
70-0061-00	Crystal	Scott	deep	31	1249	N		NCHF	34%	40%	55	3	1.63	Insufficient Data
70-0052-00	Cynthia	Scott	shallow	196	12812	Y	TMLDL In Progress - Nutrient / eutrophication	NCHF	23%	51%	391	2	0.98	Insufficient Data
70-0069-00	Fish	Scott	deep	176	700	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	20%	41%	47	21	1.36	No Trend
40-0020-00	Greenleaf	Le Sueur	deep	302	1182	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	14%	73%	112	2	0.68	Insufficient Data
70-0019-00	Hanrahan	Scott	shallow	91	927	N		NCHF	86%	8%	37	1	1.67	Insufficient Data
19-0055-00	Lemay	Rice	deep	36	229	N		NCHF	2%	97%	61	19	1.77	No Trend
70-0026-00	Lower Prior	Scott	deep	956	18887	N		NCHF	21%	61%	25	21	2.38	Improving
70-0050-00	McMahon	Scott	shallow	187	578	N	TMDL Approved - Nutients / eutrophication; Delisted in 2018	NCHF	34%	44%	70	16	1.18	Improving
66-0064-00	Metogga	Rice	shallow	86	290	N		NCHF	15%	70%	643	1	0.46	Insufficient Data
70-0010-00	Murphy	Scott	deep	45	398	N		NCHF	72%	14%	28	7	2.67	Improving
70-0095-00	O'Dowd	Scott	deep	301	782	N		NCHF	31%	51%	46	17	1.34	Improving
40-0028-00	Pepin	Le Sueur	shallow	403	5112	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	12%	79%	328	2	0.82	Insufficient Data
66-0062-00	Phelps	Rice	shallow	303	1445	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	15%	55%	390	3	0.65	Insufficient Data
70-0076-00	Pike	Scott	shallow	49	1127	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	21%	65%	177	15	0.64	No Change

Lake ID	Lake_Name	County	Depth Class	LAKE Acres	Watershed Acres	Nutrient Impaired (Y/N)?	TMDL Status	Ecoregion	% Forested/ Wetland	% Disturbed Land Use	Mean TP (ug/L)	Years TP	Mean Secchi (m)	Presence of Water Clarity Trend
70-0098-00	Pleasant	Scott	shallow	289	917	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	34%	56%	130	5	0.51	No Change
40-0016-00	Rice	Le Sueur	shallow	182	22275	N		NCHF	14%	66%	692	1	NA	NA
40-0027-00	Sanborn	Le Sueur	shallow	344	2371	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	22%	54%	187	7	0.46	Insufficient Data
70-0054-00	Spring	Scott	deep	592	8050	Y	TMDL Approved - Nutients / eutrophication	NCHF	19%	65%	90	20	1.20	No Trend
70-0120-01	Thole	Scott	shallow	119	1812	Y	TMDL In Progress - Nutrients / eutrophication	NCHF	22%	59%	104	12	0.89	No Trend
70-0078-00	Unnamed (Hass)	Scott	shallow	26	176	N		NCHF	27%	69%	44	7	0.87	Insufficient Data
70-0011-02	Unnamed (South Portic	Scott	deep	38	2632	N		NCHF	33%	59%	38	6	2.84	No Trend
70-0072-00	Upper Prior	Scott	deep	386	16048	Y	TMDL Approved - Nutients / eutrophication	NCHF	23%	57%	72	21	1.02	No Change

Lake ID	Lake_Name	County	Predicted Pre-disturbance TP (ug/l)	Target TP (ug/L)	Predicted Load (pounds/ year)	Load Target (pounds/ year)	Load Goal (pounds/ year)	Load Reduction Goal (pounds/ year)	Sensitivity Index (S)	LPSS Priority Score	LPSS Priority Rank	LPSS Priority Class	LBCA Priority Score	LBCA Priority Rank	LBCA Priority Class	W:L ratio	WL Class	Watershed Transport Capacity Class
70-0091-00	Cedar	Scott	88	155	1,301	1,094	1,236	65	1	21	484	Impaired	23	876	High	3	<5	1
40-0079-00	Clear	Le Sueur	106	279	4,032	3,377	3,830	202	0	0	2777	Impaired	9	2337	High	11	>10	6
70-0022-00	Cleary	Scott	86	120	2,640	2,187	2,508	132	1	0	2331	Impaired	7	2611	High	36	>10	6
66-0061-00	Cody	Rice	117	288	15,582	13,003	14,803	779	0	0	2794	Impaired	5	2755	High	53	>10	7
70-0061-00	Crystal	Scott	29	46	276	228	262	14	8	2	1628	High	10	2220	High	40	>10	5
70-0052-00	Cynthia	Scott	174	327	16,499	13,721	15,674	825	0	0	2791	Impaired	3	2867	High	65	>10	7
70-0069-00	Fish	Scott	25	39	132	111	126	7	20	35	261	Impaired	27	607	Higher	4	<5	1
40-0020-00	Greenleaf	Le Sueur	35	94	470	393	447	24	4	1	1980	Impaired	25	756	High	4	<5	1
70-0019-00	Hanrahan	Scott	33	31	124	102	118	6	19	1	1860	High	13	1846	High	10	>10	5
19-0055-00	Lemay	Rice	13	51	60	50	57	3	21	0	2430	High	18	1326	High	6	5-10	3
70-0026-00	Lower Prior	Scott	10	21	1,874	1,586	1,780	94	3	30	315	Highest	37	246	Highest	20	>10	7
70-0050-00	McMahon	Scott	35	59	127	106	121	6	15	18	594	Highest	26	697	Higher	3	<5	1
66-0064-00	Metogga	Rice	209	538	719	589	683	36	1	0	2783	High	7	2569	High	3	<5	1
70-0010-00	Murphy	Scott	23	24	44	36	42	2	40	3	1484	High	14	1754	High	9	5-10	3
70-0095-00	O'Dowd	Scott	20	39	96	80	91	5	24	65	102	Highest	38	209	Highest	3	<5	1
40-0028-00	Pepin	Le Sueur	92	274	6,074	5,065	5,771	304	0	0	2784	Impaired	9	2389	High	13	>10	7
66-0062-00	Phelps	Rice	162	327	2,045	1,702	1,943	102	0	0	2758	Impaired	9	2342	High	5	<5	2
70-0076-00	Pike	Scott	62	148	834	686	792	42	1	0	2529	Impaired	7	2623	High	23	>10	5

Lake ID	Lake_Name	County	Predicted Pre-disturbance TP (ug/l)	Target TP (ug/L)	Predicted Load (pounds/ year)	Load Target (pounds/ year)	Load Goal (pounds/ year)	Load Reduction Goal (pounds/ year)	Sensitivity Index (S)	LPSS Priority Score	LPSS Priority Rank	LPSS Priority Class	LBCA Priority Score	LBCA Priority Rank	LBCA Priority Class	W:L ratio	WL Class	Watershed Transport Capacity Class
70-0098-00	Pleasant	Scott	53	108	359	299	341	18	4	3	1539	Impaired	22	921	High	3	<5	1
40-0016-00	Rice	Le Sueur	242	579	45,315	37,297	43,049	2,266	0	0	2816	High	1	2923	High	123	>10	7
40-0027-00	Sanborn	Le Sueur	79	157	1,534	1,271	1,457	77	1	0	2264	Impaired	13	1881	High	7	5-10	4
70-0054-00	Spring	Scott	32	75	2,912	2,461	2,766	146	1	1	1939	Impaired	18	1345	High	14	>10	7
70-0120-01	Thole	Scott	40	87	742	615	705	37	2	1	2020	Impaired	12	2037	High	15	>10	5
70-0078-00	Unnamed (Hass)	Scott	14	37	30	24	28	1	32	4	1312	Higher	15	1570	High	7	5-10	3
70-0011-02	Unnamed (South Portic	Scott	15	32	358	296	340	18	9	1	1947	High	9	2383	High	69	>10	6
70-0072-00	Upper Prior	Scott	29	60	3,821	3,201	3,630	191	1	1	1917	Impaired	15	1571	High	42	>10	7

Lake ID	Lake_Name	County	Lake Watershed Health Index	Lake Health Score	Designated Wildlife Lakes	WMA / WPA Adjacent	Number of Public Access	Invasive Infested Waters	Parks	Momentum Towards Goals	Local Support	Political Support
70-0091-00	Cedar	Scott	83	65			2		Cedar Lake Regional Park	3	3	3
40-0079-00	Clear	Le Sueur	46	60			1		Clear Lake Park	1	2	2
70-0022-00	Cleary	Scott	76	65			1		Cleary Lake Regional Park	2	2	2
66-0061-00	Cody	Rice	41	60			1			1	1	1
70-0061-00	Crystal	Scott	75	65						0	0	0
70-0052-00	Cynthia	Scott	56	65						2	1	2
70-0069-00	Fish	Scott	85	70			1			2.5	2.5	2.5
40-0020-00	Greenleaf	Le Sueur	73	65			1			1	2	2
70-0019-00	Hanrahan	Scott	95	70					Murphy - Hanrehan Park Reserve	2	2	2
19-0055-00	Lemay	Rice	64	65						0	0	0
70-0026-00	Lower Prior	Scott	47	65			1	Eurasian watermilfoil; Zebra Mussels		3	3	3
70-0050-00	McMahon	Scott	83	65			1	Eurasian watermilfoil		3	3	3
66-0064-00	Metogga	Rice	74	65						0	0	0
70-0010-00	Murphy	Scott	95	70				Eurasian watermilfoil	Murphy - Hanrehan Park Reserve	1	1	1
70-0095-00	O'Dowd	Scott	81	65			1	Eurasian watermilfoil		2	2	2
40-0028-00	Pepin	Le Sueur	31	60			1			1	1	1
66-0062-00	Phelps	Rice	79	65		WMA	1			1	1	1
70-0076-00	Pike	Scott	59	65						1	1.5	1

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70-0098-00	Pleasant	Scott	79	65			1			1	1	1
40-0016-00	Rice	Le Sueur	43	60		WPA	1			1	1	2
40-0027-00	Sanborn	Le Sueur	73	65	Yes	WMA	1			2	2	3
70-0054-00	Spring	Scott	43	65			1	Eurasian watermilfoil; Zebra Mussels	Spring Lake Regional Park	3	3	3
70-0120-01	Thole	Scott	63	65			1	Eurasian watermilfoil		2	2	2
70-0078-00	Unnamed (Hass)	Scott	74	65						1	1	1
70-0011-02	Unnamed (South Portic	Scott	56	65					Murphy - Hanrehan Park Reserve	1	1	1
70-0072-00	Upper Prior	Scott	50	65			1	Eurasian watermilfoil; Zerba Mussels		3	3	3

Lake ID	Lake_Name	County	TMDL Status Score	LPSS Priority Class Score	LBCA Priority Class Score	Lake Size to Watershed Score	Lake Health Score	Public Access Score	Public Park and Public Land Score	Momentum Toward Goal Score	Local Support Score	Political Support Score
70-0091-00	Cedar	Scott	20	5	10	20	10	50	50	33	33	33
70-0054-00	Spring	Scott	10	5	10	5	10	50	50	33	33	33
70-0050-00	McMahon	Scott	20	20	15	20	10	50	0	33	33	33
70-0022-00	Cleary	Scott	10	5	10	5	10	50	50	22	22	22
70-0026-00	Lower Prior	Scott	0	20	20	5	10	50		33	33	33
70-0072-00	Upper Prior	Scott	20	5	10	5	10	50	0	33	33	33
70-0069-00	Fish	Scott	10	5	15	20	15	50	0	28	28	28
40-0027-00	Sanborn	Le Sueur	10	5	10	10	10	50	25	22	22	33
40-0079-00	Clear	Le Sueur	10	5	10	5	5	50	50	11	22	22
70-0095-00	O'Dowd	Scott	0	20	20	20	10	50	0	2	22	22
66-0062-00	Phelps	Rice	10	5	10	20	10	50	25	11	11	11
40-0020-00	Greenleaf	Le Sueur	10	5	10	20	10	50	0	11	22	22
70-0120-01	Thole	Scott	10	5	10	5	10	50	0	22	22	22
70-0019-00	Hanrahan	Scott	0	10	10	5	15	0	50	22	22	22
40-0016-00	Rice	Le Sueur	0	10	10	5	5	50	25	11	11	22
70-0098-00	Pleasant	Scott	10	5	10	20	10	50	0	11	11	11

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70-0010-00	Murphy	Scott	0	10	10	10	15	0	50	11	11	11
66-0061-00	Cody	Rice	10	5	10	5	5	50	0	11	11	11
40-0028-00	Pepin	Le Sueur	10	5	10	5	5	50	0	11	11	11
70-0011-02	Unnamed (South Portic	Scott	0	10	10	5	10	0	50	11	11	11
70-0052-00	Cynthia	Scott	10	5	10	5	10	0	0	22	11	22
70-0076-00	Pike	Scott	10	5	10	5	10	0	0	11	17	11
70-0078-00	Unnamed (Hass)	Scott	0	15	10	10	10	0	0	11	11	11
66-0064-00	Metogga	Rice	0	10	10	20	10	0	0	0	0	0
19-0055-00	Lemay	Rice	0	10	10	10	10	0	0	0	0	0
70-0061-00	Crystal	Scott	0	10	10	5	10	0	0	0	0	0

Lake ID	Lake_Name	County	**Recreational Score**	**Water Quality Score**	**Professional Judgement Score**	**Overall Average Score**
70-0091-00	Cedar	Scott	100	65	100	88
70-0054-00	Spring	Scott	100	40	100	80
70-0050-00	McMahon	Scott	50	85	100	78
70-0022-00	Cleary	Scott	100	40	67	69
70-0026-00	Lower Prior	Scott	50	55	100	68
70-0072-00	Upper Prior	Scott	50	50	100	67
70-0069-00	Fish	Scott	50	65	83	66
40-0027-00	Sanborn	Le Sueur	75	45	78	66
40-0079-00	Clear	Le Sueur	100	35	56	64
70-0095-00	O'Dowd	Scott	50	70	47	56
66-0062-00	Phelps	Rice	75	55	33	54
40-0020-00	Greenleaf	Le Sueur	50	55	56	54
70-0120-01	Thole	Scott	50	40	67	52
70-0019-00	Hanrahan	Scott	50	40	66	52
40-0016-00	Rice	Le Sueur	75	30	44	50
70-0098-00	Pleasant	Scott	50	55	33	46

Lake ID	Lake_Name	County	**Recreational Score**	**Water Quality Score**	**Professional Judgement Score**	**Overall Average Score**
70-0010-00	Murphy	Scott	50	45	33	43
66-0061-00	Cody	Rice	50	35	33	39
40-0028-00	Pepin	Le Sueur	50	35	33	39
70-0011-02	Unnamed (South Portic	Scott	50	35	33	39
70-0052-00	Cynthia	Scott	0	40	56	32
70-0076-00	Pike	Scott	0	40	39	26
70-0078-00	Unnamed (Hass)	Scott	0	45	33	26
66-0064-00	Metogga	Rice	0	50	0	17
19-0055-00	Lemay	Rice	0	40	0	13
70-0061-00	Crystal	Scott	0	35	0	12

Water Body Name	Water Body Description	County	Affected Designated Use	Pollutant or Stessor	Candidate Stressor on Biology	Inconclusive Stressors	TMDL Developed
Big Possum Creek	Unnamed Creek to Minnesota R	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli
County Ditch 10	CD 3 to Raven Street	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments	Nitrates, Habitat	Eutrophication, Flow Alteration/ Connectivity	
			Aquatic Recreation	Fecal coliform			TMDL In Progress - E Coli
County Ditch 34	Unnamed Ditch to Forest Prairie Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	*WRAPS assessment was inconclusive*	Dissolved Oxygen, Eutrophication, Chloride, Flow Alterations/ Connectivity	
County Ditch 42	School Lake to Clear Lake Outlet	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Dissolved Oxygen, Eutrophication, Nitrate, Habitat, Flow Alterations / Connectivity	Chloride	
Credit River	-93.3526 44.7059 to Minnesota River	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments	Dissolved Oxygen, Eutrophication		TMDL In Progress - Chloride
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli
Eagle Creek	Headwaters to Minnesota River	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Forest Prairie Creek	CD 29 to Le Sueur Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Nitrate, Flow Alterations / Connectivity	Eutrophication, Chloride	
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Judicial Ditch 4	Unnamed Ditch to Forest Prairie Creek	Le Sueur	Aquatic Life	Fish bioassessments	Nitrate, Suspended Sediment, Habitat	Dissolved Oxygen, Eutrophication, Chloride, Flow Alteration / Connectivity	
Le Sueur Creek	CD 23 to West Prairie Stream	Le Sueur	Aquatic Life	Fish bioassessments	Eutrophication, Suspended Sediment, Habitat	Nitrate, Chloride, Flow Alteration / Connectivity	
	West Prairie Stream to Forest Prairie Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Eutrophication, Nitrate, Habitat, Flow Alteration / Connectivity	Chloride	
			Aquatic Recreation	Escherichia coli (E. coli)			
Minnesota River	Cherry Creek to High Island Creek	Le Sueur	Aquatic Life	Turbidity; Nutrients			TMDL In Progress - Nutrient / Eutrophication, Tss / Turbidity
			Aquatic Recreation	Fecal Coliform			TMDL Approved - E Coli
	High Island Creek to	Scott	Aquatic Life	Turbidity; Nutrients			TMDL In Progress - Nutrient / Eutrophication, Tss / Turbidity

Water Body Name	Water Body Description	County	Affected Designated Use	Pollutant or Stessor	Candidate Stressor on Biology	Inconclusive Stressors	TMDL Developed
	Carver Creek	Scott	Aquatic Recreation	Fecal Coliform			TMDL Approved - E Coli
	Carver Creek to RM 22	Scott	Aquatic Life	Turbidity; Nutrients			TMDL In Progress - Nutrient / Eutrophication, Tss / Turbidity;
Picha Creek	Unnamed Creek to	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Dissolved Oxygen, Eutrophication, Habitat, Flow Alteration / Connectivity	Chloride	
	Unnamed Creek to Sand Creek	Scott	Aquatic Life	Fish bioassessments	Habitat	Dissolved Oxygen, Eutrophication, Chloride, Flow alteration / Connectivity	
Porter Creek	Fairbanks Avenue to 250th Street East	Scott	Aquatic Life	Turbidity	*Assessment not included in WRAPS*	*Assessment not included in WRAPS*	TMDL In Progess - TSS / Turbidity
	Langford Road/MN Highway 13 to Sand Creek	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments; Turbidity	Suspended Sediment, Habitat	Eutrophication, Chloride, Flow Alteration / Connectivity	TMDL In Progress - E Coli. and TSS / Turbidity
			Aquatic Recreation	Escherichia coli (E. coli)			
Raven Stream	East Branch Raven Stream to Sand Creek	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments	Eutrophication, Nitrate, Suspended Sediment, Habitat	Chloride	TMDL Approved - Chloride
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL Approved - E Coli
Raven Stream, East Branch	-93.6106 44.5532 to 255th Street West	Scott	Aquatic Life	Chloride	*Assessment not included in WRAPS*	*Assessment not included in WRAPS*	
Raven Stream, West Branch	270th Street to East Branch Raven Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Dissolved Oxygen, Eutrophication, Nitrate, Habitat	Chloride, Flow Alteration / Connectivity	
			Aquatic Recreation	Fecal coliform			TMDL In Progress - E Coli
Robert Creek	Unnamed Creek to Unnamed Creek (at Belle Plaine Sewage Ponds)	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments; Total suspended solids (TSS)	Eutrophication, Nitrate, Suspended Sediment, Habitat	Chloride	TMDL In Progress - TSS / Turbidity
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli

Water Body Name	Water Body Description	County	Affected Designated Use	Pollutant or Stessor	Candidate Stressor on Biology	Inconclusive Stressors	TMDL Developed
Sand Creek	Porter Creek to Minnesota River	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments; Nutrients; Turbidity	Eutrophication, Suspended Sediment, Habitat, Flow Alteration / Connectivity	Dissolved Oxygen, Chloride, Temperature	TMDL In Progrss - Nutirent / eurtrophication, TSS / Turbidity, TMDL Approved - Chloride
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli
	Raven Stream to Porter Creek	Scott	Aquatic Life	Fish bioassessments; Turbidity	Suspended Sediment	Eutrophication, Habitat, Chloride	TMDL In Progress - TSS / Turbidity
	T112 R23W S23, south line to -93.5454 44.5226	Le Sueur	Aquatic Life	Chloride; Fish bioassessments; Nutrients; Turbidity	Dissolved Oxygen, Eutrophication, Suspended Sediment, Habitat, Flow Alteration / Connectivity	Chloride	TMDL In Progress - TSS / Turbidity and Nutient / Eutrophicaion and Chloride
	-93.5454 44.5226 to Raven Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments; Nutrients; Turbidity	Dissolved Oxygen, Eutrophication, Suspended Sediment, Habitat	Chloride, Flow Alteration / Connectivity	TMDL In Progress - Nutrient / Eutrophication, TSS / Turbidity; TMDL Approved - Chloride
Unnamed Creek	Headwaters to Sand Creek	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Habitat	Dissolved Oxygen, Eutrophication, Nitrate, Suspended Sediment, Chloride, Flow Alteration / Connectivity	
Unnamed Creek	Headwaters to Unnamed Creek	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Unnamed Creek	Headwaters to Unnamed Creek	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Unnamed Creek	Headwaters to Minnesota River	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Unnamed Creek	Unnamed Creek to JD 2	Le Sueur	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Unnamed Creek	CD 56 to Le Sueur Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Nitrate, Flow Alterations / Connectivity	Eutrophication, Habitat, Chloride	
Unnamed Creek	Railroad Bridge to East Branch Raven Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Eutrophication, Habitat, Chloride, Flow Alteration / Connectivity	Dissolved Oxygen	
Unnamed Creek	Unnamed Ditch to -93.4251 44.6206	Scott	Aquatic Life	Fish bioassessments	Dissolved Oxygen, Habitat	Eutrophication, Nitrate, Suspended Sediment, Chloride, Flow Alteration / Connectivity	
Unnamed Creek (Brewery Creek)	US Highway 169 to Minnesota River	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Habitat, Flow Alteration / Connectivity	Eutrophication, Chloride	TMDL In Progress - E Coli.
			Aquatic Recreation	Escherichia coli (E. coli)			

Water Body Name	Water Body Description	County	Affected Designated Use	Pollutant or Stessor	Candidate Stressor on Biology	Inconclusive Stressors	TMDL Developed
Unnamed Creek (County Ditch 13)	Unnamed Ditch to Spring Lake (70-0054-00)	Scott	Aquatic Life	Fish bioassessments	Dissolved Oxygen, Eutrophication, Habitat, Flow Alteration / Connectivity	Nitrate, Chloride	
Unnamed Creek (Prior Lake Outlet Channel)	Dean Lake to Blue Lake	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Eutrophication, Flow Alteration / Connectivity	Dissolved Oxygen, Chloride	
Unnamed Ditch	Unnamed Ditch to Forest Prairie Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Nitrate, Habitat	Dissolved Oxygen, Eutrophication, Suspended Sediment, Chloride, Flow Alteration / Connectivity	
County Ditch 8/53	Unnamed ditch to CD 34		Protection	-	-	-	-
Unnamed Creek							
Eagle Creek		Scott					
County Ditch 3	Unnamed Ditch to CD 10	Scott	Protection	-	-	-	-

Water Body Name	Water Body Description	County	TSS Load to MN River (tons / yr)	TP Loading to MN River(lb/yr)	Drains to or through priority Lake	Flooding Concerns	Public Access	Parks	WMA / WPA	Special Use	Momentum Toward Goal	Local Support	Political Support
Big Possum Creek	Unnamed Creek to Minnesota R	Scott									1	1	1
County Ditch 10	CD 3 to Raven Street	Scott									3	2	3
County Ditch 34	Unnamed Ditch to Forest Prairie Creek	Le Sueur									1	2	1
County Ditch 42	School Lake to Clear Lake Outlet	Le Sueur									1	2	1
Credit River	-93.3526 44.7059 to Minnesota River	Scott	996.6	7,782				Murphy - Hanrehan Park Reserve			2	3	2
Eagle Creek	Headwaters to Minnesota River	Scott	181	1,416							2.7	2.5	2
Forest Prairie Creek	CD 29 to Le Sueur Creek	Le Sueur									1	2	2
Judicial Ditch 4	Unnamed Ditch to Forest Prairie Creek	Le Sueur									1	2	1
Le Sueur Creek	CD 23 to West Prairie Stream	Le Sueur	33327	34,648		Yes					1	2	2
	West Prairie Stream to Forest Prairie Creek	Le Sueur											
Minnesota River	Cherry Creek to High Island Creek	Le Sueur				Yes	4	Blakely Bluffs Regional Park; Minnesota Valley National Wildlife Refuge			2	2.5	2
	High Island Creek to	Scott						Blakely Bluffs Regional Park; Minnesota Valley					

Water Body Name	Water Body Description	County	TSS Load to MN River (tons / yr)	TP Loading to MN River(lb/yr)	Drains to or through priority Lake	Flooding Concerns	Public Access	Parks	WMA / WPA	Special Use	Momentum Toward Goal	Local Support	Political Support
	Carver Creek	Scott											
							2	National Wildlife Refuge; Minnesota State Valley Recreation Area					
	Carver Creek to RM 22	Scott					3	Regional Park; Minnesota Valley State Recreation Area					
Picha Creek	Unnamed Creek to	Scott									3	3	3
	Unnamed Creek to Sand Creek	Scott											
Porter Creek	Fairbanks Avenue to 250th Street East	Scott									3	2	3
	Langford Road/MN Highway 13 to Sand Creek	Scott											
Raven Stream	East Branch Raven Stream to Sand Creek	Scott									3	3	3
Raven Stream, East Branch	-93.6106 44.5532 to 255th Street West	Scott									2	2	3
Raven Stream, West Branch	270th Street to East Branch Raven Stream	Scott							Marsh WMA		3	2	3
Robert Creek	Unnamed Creek to Unnamed Creek (at Belle Plaine Sewage Ponds)	Scott	763	5,686							3	2	3

Water Body Name	Water Body Description	County	TSS Load to MN River (tons / yr)	TP Loading to MN River(lb/yr)	Drains to or through priority Lake	Flooding Concerns	Public Access	Parks	WMA / WPA	Special Use	Momentum Toward Goal	Local Support	Political Support
Sand Creek	Porter Creek to Minnesota River	Scott	13027	78,623							2.5	2.5	2.5
	Raven Stream to Porter Creek	Scott											
	T112 R23W S23, south line to -93.5454 44.5226	Le Sueur											
	-93.5454 44.5226 to Raven Stream	Scott											
Unnamed Creek	Headwaters to Sand Creek	Scott									0	0	0
Unnamed Creek	Headwaters to Unnamed Creek	Scott											
Unnamed Creek	Headwaters to Unnamed Creek	Scott											
Unnamed Creek	Headwaters to Minnesota River	Scott											
Unnamed Creek	Unnamed Creek to JD 2	Le Sueur	272	4,069									
Unnamed Creek	CD 56 to Le Sueur Creek	Le Sueur									1	2	2
Unnamed Creek	Railroad Bridge to East Branch Raven Stream	Scott											
Unnamed Creek	Unnamed Ditch to -93.4251 44.6206	Scott						Doyle-Kennefick Regional Park					
Unnamed Creek (Brewery Creek)	US Highway 169 to Minnesota River	Scott									1	1	1

Water Body Name	Water Body Description	County	TSS Load to MN River (tons / yr)	TP Loading to MN River(lb/yr)	Drains to or through priority Lake	Flooding Concerns	Public Access	Parks	WMA / WPA	Special Use	Momentum Toward Goal	Local Support	Political Support
Unnamed Creek (County Ditch 13)	Unnamed Ditch to Spring Lake (70-0054-00)	Scott			Spring Lake						2.5	1	3
Unnamed Creek (Prior Lake Outlet Channel)	Dean Lake to Blue Lake	Scott	405	4,736							3	3	3
Unnamed Ditch	Unnamed Ditch to Forest Prairie Creek	Le Sueur									1	2	1
County Ditch 8/53	Unnamed ditch to CD 34												
Unnamed Creek													
Eagle Creek		Scott						Minnesota Valley National Wildlife Refuge		Trout Stream			
County Ditch 3	Unnamed Ditch to CD 10	Scott									1	1	3

Water Body Name	Water Body Description	County	Affected Designated Use	Pollutant or Stessor	Candidate Stressor on Biology	Inconclusive Stressors	TMDL Developed
Big Possum Creek	Unnamed Creek to Minnesota R	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli
County Ditch 10	CD 3 to Raven Street	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments	Nitrates, Habitat	Eutrophication, Flow Alteration/ Connectivity	
			Aquatic Recreation	Fecal coliform			TMDL In Progress - E Coli
County Ditch 34	Unnamed Ditch to Forest Prairie Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	*WRAPS assessment was inconclusive*	Dissolved Oxygen, Eutrophication, Chloride, Flow Alterations/ Connectivity	
County Ditch 42	School Lake to Clear Lake Outlet	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Dissolved Oxygen, Eutrophication, Nitrate, Habitat, Flow Alterations / Connectivity	Chloride	
Credit River	-93.3526 44.7059 to Minnesota River	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments	Dissolved Oxygen, Eutrophication		TMDL In Progress - Chloride
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli
Eagle Creek	Headwaters to Minnesota River	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Forest Prairie Creek	CD 29 to Le Sueur Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Nitrate, Flow Alterations / Connectivity	Eutrophication, Chloride	
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Judicial Ditch 4	Unnamed Ditch to Forest Prairie Creek	Le Sueur	Aquatic Life	Fish bioassessments	Nitrate, Suspended Sediment, Habitat	Dissolved Oxygen, Eutrophication, Chloride, Flow Alteration / Connectivity	
Le Sueur Creek	CD 23 to West Prairie Stream	Le Sueur	Aquatic Life	Fish bioassessments	Eutrophication, Suspended Sediment, Habitat	Nitrate, Chloride, Flow Alteration / Connectivity	
	West Prairie Stream to Forest Prairie Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Eutrophication, Nitrate, Habitat, Flow Alteration / Connectivity	Chloride	
			Aquatic Recreation	Escherichia coli (E. coli)			
	Cherry Creek to High Island Creek	Le Sueur	Aquatic Life	Turbidity; Nutrients			TMDL In Progress - Nutrient / Eutrophication, Tss / Turbidity
			Aquatic Recreation	Fecal Coliform			TMDL Approved - E Coli

Water Body Name	Water Body Description	County	Affected Designated Use	Pollutant or Stessor	Candidate Stressor on Biology	Inconclusive Stressors	TMDL Developed
Minnesota River	High Island Creek to Carver Creek	Scott	Aquatic Life	Turbidity; Nutrients			TMDL In Progress - Nutrient / Eutrophication, Tss / Turbidity
			Aquatic Recreation	Fecal Coliform			TMDL Approved - E Coli
	Carver Creek to RM 22	Scott	Aquatic Life	Turbidity; Nutrients			TMDL In Progress - Nutrient / Eutrophication, Tss / Turbidity;
Picha Creek	Unnamed Creek to	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Dissolved Oxygen, Eutrophication, Habitat, Flow Alteration / Connectivity	Chloride	
	Unnamed Creek to Sand Creek	Scott	Aquatic Life	Fish bioassessments	Habitat	Dissolved Oxygen, Eutrophication, Chloride, Flow alteration / Connectivity	
Porter Creek	Fairbanks Avenue to 250th Street East	Scott	Aquatic Life	Turbidity	*Assessment not included in WRAPS*	*Assessment not included in WRAPS*	TMDL In Progess - TSS / Turbidity
	Langford Road/MN Highway 13 to Sand Creek	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments; Turbidity	Suspended Sediment, Habitat	Eutrophication, Chloride, Flow Alteration / Connectivity	TMDL In Progress - E Coli. and TSS / Turbidity
			Aquatic Recreation	Escherichia coli (E. coli)			
Raven Stream	East Branch Raven Stream to Sand Creek	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments	Eutrophication, Nitrate, Suspended Sediment, Habitat	Chloride	TMDL Approved - Chloride
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL Approved - E Coli
Raven Stream, East Branch	-93.6106 44.5532 to 255th Street West	Scott	Aquatic Life	Chloride	*Assessment not included in WRAPS*	*Assessment not included in WRAPS*	
Raven Stream, West Branch	270th Street to East Branch Raven Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Dissolved Oxygen, Eutrophication, Nitrate, Habitat	Chloride, Flow Alteration / Connectivity	
			Aquatic Recreation	Fecal coliform			TMDL In Progress - E Coli
Robert Creek	Unnamed Creek to Unnamed Creek (at Belle Plaine Sewage Ponds)	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments; Total suspended solids (TSS)	Eutrophication, Nitrate, Suspended Sediment, Habitat	Chloride	TMDL In Progress - TSS / Turbidity
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli

Water Body Name	Water Body Description	County	Affected Designated Use	Pollutant or Stessor	Candidate Stressor on Biology	Inconclusive Stressors	TMDL Developed
Sand Creek	Porter Creek to Minnesota River	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments; Nutrients; Turbidity	Eutrophication, Suspended Sediment, Habitat, Flow Alteration / Connectivity	Dissolved Oxygen, Chloride, Temperature	TMDL In Progrss - Nutirent / eurtrophication, TSS / Turbidity, TMDL Approved - Chloride
			Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli
	Raven Stream to Porter Creek	Scott	Aquatic Life	Fish bioassessments; Turbidity	Suspended Sediment	Eutrophication, Habitat, Chloride	TMDL In Progress - TSS / Turbidity
	T112 R23W S23, south line to -93.5454 44.5226	Le Sueur	Aquatic Life	Chloride; Fish bioassessments; Nutrients; Turbidity	Eutrophication, Suspended Sediment, Habitat, Flow Alteration / Connectivity	Chloride	TMDL In Progress - TSS / Turbidity and Nutient / Eutrophicaion and Chloride
	-93.5454 44.5226 to Raven Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments; Nutrients; Turbidity	Dissolved Oxygen, Eutrophication, Suspended Sediment, Habitat	Chloride, Flow Alteration / Connectivity	TMDL In Progress - Nutrient / Eutrophication, TSS / Turbidity; TMDL Approved - Chloride
Unnamed Creek	Headwaters to Sand Creek	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Habitat	Dissolved Oxygen, Eutrophication, Nitrate, Suspended Sediment, Chloride, Flow Alteration / Connectivity	
Unnamed Creek	Headwaters to Unnamed Creek	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Unnamed Creek	Headwaters to Unnamed Creek	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Unnamed Creek	Headwaters to Minnesota River	Scott	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Unnamed Creek	Unnamed Creek to JD 2	Le Sueur	Aquatic Recreation	Escherichia coli (E. coli)			TMDL In Progress - E Coli.
Unnamed Creek	CD 56 to Le Sueur Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Nitrate, Flow Alterations / Connectivity	Eutrophication, Habitat, Chloride	
Unnamed Creek	Railroad Bridge to East Branch Raven Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Eutrophication, Habitat, Chloride, Flow Alteration / Connectivity	Dissolved Oxygen	
Unnamed Creek	Unnamed Ditch to -93.4251 44.6206	Scott	Aquatic Life	Fish bioassessments	Dissolved Oxygen, Habitat	Eutrophication, Nitrate, Suspended Sediment, Chloride, Flow Alteration / Connectivity	

Water Body Name	Water Body Description	County	Affected Designated Use	Pollutant or Stessor	Candidate Stressor on Biology	Inconclusive Stressors	TMDL Developed
Unnamed Creek (Brewery Creek)	US Highway 169 to Minnesota River	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Habitat, Flow Alteration / Connectivity	Eutrophication, Chloride	TMDL In Progress - E Coli.
			Aquatic Recreation	Escherichia coli (E. coli)			
Unnamed Creek (County Ditch 13)	Unnamed Ditch to Spring Lake (70-0054-00)	Scott	Aquatic Life	Fish bioassessments	Dissolved Oxygen, Eutrophication, Habitat, Flow Alteration / Connectivity	Nitrate, Chloride	
Unnamed Creek (Prior Lake Outlet Channel)	Dean Lake to Blue Lake	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Eutrophication, Flow Alteration / Connectivity	Dissolved Oxygen, Chloride	
Unnamed Ditch	Unnamed Ditch to Forest Prairie Creek	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments	Nitrate, Habitat	Dissolved Oxygen, Eutrophication, Suspended Sediment, Chloride, Flow Alteration / Connectivity	
County Ditch 8/53	Unnamed ditch to CD 34		Protection	-	-	-	-
Unnamed Creek			Protection				
County Ditch 3	Unnamed Ditch to CD 10	Scott	Protection	-	-	-	-

Water Body Name	Water Body Description	County	TMDL Status Score	TSS Score	TP Score	Drains to or through Priority Lake Score	Flooding Concern Score	Public Access Score	Parks Score	Public Land Score	Special Use Score	Momentum Towards Goal Score	Local Support Score
Big Possum Creek	Unnamed Creek to Minnesota R	Scott	10									11	11
County Ditch 10	CD 3 to Raven Street	Scott	10									33	22
County Ditch 34	Unnamed Ditch to Forest Prairie Creek	Le Sueur										11	22
County Ditch 42	School Lake to Clear Lake Outlet	Le Sueur										11	22
Credit River	-93.3526 44.7059 to Minnesota River	Scott	10	15	15				50			22	33
Eagle Creek	Headwaters to Minnesota River	Scott	10	5	5				50		50	30	28
Forest Prairie Creek	CD 29 to Le Sueur Creek	Le Sueur										11	22
Judicial Ditch 4	Unnamed Ditch to Forest Prairie Creek	Le Sueur										11	22
Le Sueur Creek	CD 23 to West Prairie Stream	Le Sueur		20	20		20					11	22
	West Prairie Stream to Forest Prairie Creek	Le Sueur											
	Cherry Creek to High Island Creek	Le Sueur											

Water Body Name	Water Body Description	County	TMDL Status Score	TSS Score	TP Score	Drains to or through Priority Lake Score	Flooding Concern Score	Public Access Score	Parks Score	Public Land Score	Special Use Score	Momentum Towards Goal Score	Local Support Score
Minnesota River	High Island Creek to Carver Creek	Scott	20				20	50	50			22	28
	Carver Creek to RM 22	Scott											
Picha Creek	Unnamed Creek to	Scott										33	33
	Unnamed Creek to Sand Creek	Scott											
Porter Creek	Fairbanks Avenue to 250th Street East	Scott	10									33	22
	Langford Road/MN Highway 13 to Sand Creek	Scott											
Raven Stream	East Branch Raven Stream to Sand Creek	Scott	20									33	33
Raven Stream, East Branch	-93.6106 44.5532 to 255th Street West	Scott											22
Raven Stream, West Branch	270th Street to East Branch Raven Stream	Scott	10							20		33	22
Robert Creek	Unnamed Creek to Unnamed Creek (at Belle Plaine Sewage Ponds)	Scott	10	15	15							33	22

Water Body Name	Water Body Description	County	TMDL Status Score	TSS Score	TP Score	Drains to or through Priority Lake Score	Flooding Concern Score	Public Access Score	Parks Score	Public Land Score	Special Use Score	Momentum Towards Goal Score	Local Support Score
Sand Creek	Porter Creek to Minnesota River	Scott	20	20	20							28	28
	Raven Stream to Porter Creek	Scott											
	T112 R23W S23, south line to -93.5454 44.5226	Le Sueur											
	-93.5454 44.5226 to Raven Stream	Scott											
Unnamed Creek	Headwaters to Sand Creek	Scott											
Unnamed Creek	Headwaters to Unnamed Creek	Scott	10										
Unnamed Creek	Headwaters to Unnamed Creek	Scott	10										
Unnamed Creek	Headwaters to Minnesota River	Scott	10										
Unnamed Creek	Unnamed Creek to JD 2	Le Sueur	10	5	10								
Unnamed Creek	CD 56 to Le Sueur Creek	Le Sueur										11	22
Unnamed Creek	Railroad Bridge to East Branch Raven Stream	Scott											
Unnamed Creek	Unnamed Ditch to -93.4251 44.6206	Scott							50				

Water Body Name	Water Body Description	County	TMDL Status Score	TSS Score	TP Score	Drains to or through Priority Lake Score	Flooding Concern Score	Public Access Score	Parks Score	Public Land Score	Special Use Score	Momentum Towards Goal Score	Local Support Score
Unnamed Creek (Brewery Creek)	US Highway 169 to Minnesota River	Scott	10									11	11
Unnamed Creek (County Ditch 13)	Unnamed Ditch to Spring Lake (70-0054-00)	Scott				20						28	11
Unnamed Creek (Prior Lake Outlet Channel)	Dean Lake to Blue Lake	Scott		10	10							33	33
Unnamed Ditch	Unnamed Ditch to Forest Prairie Creek	Le Sueur										11	22
County Ditch 8/53	Unnamed ditch to CD 34												
Unnamed Creek													
County Ditch 3	Unnamed Ditch to CD 10	Scott										11	11

Water Body Name	Water Body Description	County	Political Support Score	Water Quality	Recreational Score	Professional Judgement Score	Average Total Score
Big Possum Creek	Unnamed Creek to Minnesota R	Scott	11	10	0	33	14
County Ditch 10	CD 3 to Raven Street	Scott	33	0	0	89	30
County Ditch 34	Unnamed Ditch to Forest Prairie Creek	Le Sueur	11	0	0	44	15
County Ditch 42	School Lake to Clear Lake Outlet	Le Sueur	11	0	0	44	15
Credit River	-93.3526 44.7059 to Minnesota River	Scott	22	40	50	78	56
Eagle Creek	Headwaters to Minnesota River	Scott	22	20	100	80	67
Forest Prairie Creek	CD 29 to Le Sueur Creek	Le Sueur	22	0	0	56	19
Judicial Ditch 4	Unnamed Ditch to Forest Prairie Creek	Le Sueur	11	0	0	44	15
Le Sueur Creek	CD 23 to West Prairie Stream	Le Sueur	22	60	0	56	39
	West Prairie Stream to Forest Prairie Creek	Le Sueur					
	Cherry Creek to High Island Creek	Le Sueur					

Water Body Name	Water Body Description	County	Political Support Score	Water Quality	Recreational Score	Professional Judgement Score	Average Total Score
Minnesota River	High Island Creek to Carver Creek	Scott	22	40	100	72	71
	Carver Creek to RM 22	Scott					
Picha Creek	Unnamed Creek to	Scott	33	0	0	100	33
	Unnamed Creek to Sand Creek	Scott					
Porter Creek	Fairbanks Avenue to 250th Street East	Scott	33	10	0	89	33
	Langford Road/MN Highway 13 to Sand Creek	Scott					
Raven Stream	East Branch Raven Stream to Sand Creek	Scott	33	20	0	100	40
Raven Stream, East Branch	-93.6106 44.5532 to 255th Street West	Scott	33	0	0	56	19
Raven Stream, West Branch	270th Street to East Branch Raven Stream	Scott	33	10	20	89	40
Robert Creek	Unnamed Creek to Unnamed Creek (at Belle Plaine Sewage Ponds)	Scott	33	40	0	89	43

Water Body Name	Water Body Description	County	Political Support Score	Water Quality	Recreational Score	Professional Judgement Score	Average Total Score
Sand Creek	Porter Creek to Minnesota River	Scott	28	60	0	83	48
	Raven Stream to Porter Creek	Scott					
	T112 R23W S23, south line to -93.5454 44.5226	Le Sueur					
	-93.5454 44.5226 to Raven Stream	Scott					
Unnamed Creek	Headwaters to Sand Creek	Scott		0	0	0	0
Unnamed Creek	Headwaters to Unnamed Creek	Scott		10	0	0	3
Unnamed Creek	Headwaters to Unnamed Creek	Scott		10	0	0	3
Unnamed Creek	Headwaters to Minnesota River	Scott		10	0	0	3
Unnamed Creek	Unnamed Creek to JD 2	Le Sueur		25	0	0	8
Unnamed Creek	CD 56 to Le Sueur Creek	Le Sueur	22	0	0	56	19
Unnamed Creek	Railroad Bridge to East Branch Raven Stream	Scott		0	0	0	0
Unnamed Creek	Unnamed Ditch to -93.4251 44.6206	Scott		0	50	0	17

Water Body Name	Water Body Description	County	Political Support Score	Water Quality	Recreational Score	Professional Judgement Score	Average Total Score
Unnamed Creek (Brewery Creek)	US Highway 169 to Minnesota River	Scott	11	10	0	33	14
Unnamed Creek (County Ditch 13)	Unnamed Ditch to Spring Lake (70-0054-00)	Scott	33	20	0	72	31
Unnamed Creek (Prior Lake Outlet Channel)	Dean Lake to Blue Lake	Scott	33	20	0	100	40
Unnamed Ditch	Unnamed Ditch to Forest Prairie Creek	Le Sueur	11	0	0	44	15
County Ditch 8/53	Unnamed ditch to CD 34			0	0	0	0
Unnamed Creek				0	0	0	0
County Ditch 3	Unnamed Ditch to CD 10	Scott	33	0	0	56	19

Memorandum

Lower Minnesota River East - Advisory Committee

To:	Lower MN River East Watershed Advisory Committee
From:	Bailey Griffin, Project Manager; Sarah Boser, Watershed Planner - ISG
Date:	November 11, 2022
Subject:	Priority Issues – Survey Results and Recommended Changes

INTRODUCTION

Issue statement development took place during the Advisory Committee (AC) Meeting on October 14th, 2022. Following the meeting, a survey was completed by AC members to provide recommendations and comments for confirmation. Below provides a summary of the survey responses. Each issue reviews the original statement as provided in the survey followed by a revised statement based on comments received in the survey. Next, each issue provides a summary of the average ranking for priority areas of focus based on the survey. High priority rankings received a score of 5, medium priority ranking received a score of 3, and low priority ranking received a score of 1. The rankings will provide guidance for areas of focus as we move into the next steps for determining priority resources, measurable goals, and implementation actions. All written comments for each issue received are included in the summary.

The revised issue statements will be presented to the Policy Committee (PC) during the November 18th, 2022 meeting to consider approval. As we continue to move through the planning process, continual refinement and revisions may take place based on those further discussions. Priority areas of focus will not be presented to the PC and will be primarily used for guidance through the next steps in the planning process. Comments and questions on this portion of the survey will be reviewed with the AC before finalizing.

SURFACE WATER - HYDROLOGY

Issue Statement

Original Statement: Land use changes have altered urban and rural drainage, flow rates, volumes, and storage causing flooding, erosion, and downstream impacts. These impacts may be exacerbated by the effects of a changing climate.

Revised Statement: Land use changes alter flow rates, drainage, volumes, and storage causing flooding, erosion, and downstream impacts. These effects will be exacerbated by larger, more frequent, and more intense rain events in part due to a changing climate.

Priority Areas of Focus

Priority Area of Focus	Average Ranking
Wetland	4.8
Land Use	4.5
Flooding	4.3
Drainage	4.2
Increased Volume	4.2
Altered Hydrology	3.3
Increased Rate	2.8
Urban Stormwater	2
Changing Climate	1.5

Comments

"I like the first sentence, but I do not agree with including the 'second may' sentence. The potential impacts of climate change can and should be addressed in the narrative; however, it's unquantified and seems more a looming threat than an issue that has created the problems we're trying to address. As such I don't think it should be included as part of the issue statement. One could argue the entire LMR valley and landscape was shaped by the results of climate change. It's the fact that we have altered it and have now built and live in vulnerable places, etc. that make it an issue."

"We suggest dropping urban and rural from the statement because they seem redundant and since those are the only two major land use types in our area: Land use changes have altered drainage, flow rates, volumes, and storage causing flooding, erosion, and downstream impacts. These impacts may be exacerbated by the effects of a changing climate."

"Is this trying to get too much in at once?"

SURFACE WATER – WATER QUALITY

Issue Statement

Original Statement: Lakes, streams, wetlands, and the Minnesota River are threatened or impaired by various pollutants such as sediment, nutrients, E.coli, and chloride which cause algal blooms and other harmful impacts to aquatic life, habitat, and recreation.

Revised Statement: Lakes, streams, wetlands, and the Minnesota River are threatened or impaired by various pollutants such as sediment, nutrients, E. coli, and chloride, causing harmful impacts to aquatic life, habitat, and recreation.

Priority Areas of Focus

Priority Areas of Focus	Average Ranking
Sediment and Erosion	5
Nutrients	5
Chloride	2.8
AIS	2.3
Biota	2.3
Water Quality Impairments	2
Geologic Setting	1.2
Recreation	1
Mercury	1
Rule Enforcement	1
Point Sources	1.3

Comments

"May want to revisit this issue statement once priority waterbodies and measurable goals are selected to see if the example list of pollutants makes sense still."

"Lakes, streams, wetlands, and the Minnesota River are threatened or impaired by various pollutants such as sediment, nutrients, E.coli, and chloride which can cause algal blooms and other harmful impacts to aquatic life, habitat, and recreation. (added word 'can' before cause – I don't seem to be able to highlight or format it)."

"Only stating one cause by nutrients, and nothing for the other impairments. Change to "Lakes, streams, wetlands, and the Minnesota River are threatened or impaired by various pollutants such as sediment, nutrients, E.coli, causing harmful impacts to aquatic life, habitat, and recreation."

GROUNDWATER – QUALITY

Issue Statement

Original Statement: Groundwater quality is impacted by naturally occurring and human-introduced pollutants such as arsenic, pesticides, and nitrogen. Protecting groundwater resources is essential for the safety of drinking water supplies.

Revised Statement: Groundwater quality is impacted by naturally occurring pollutants such as arsenic and human-introduced pollutants such as nitrates, pesticides, and chloride which alter the safety of drinking water supplies.

Priority Areas of Focus

Priority Area of Focus	Average Ranking
Nitrogen	4.8
Private Well Protection	4.6
Sealing Abandoned/Unused Wells	4.5
DWSMAs	4.3
Source Water Protection	3.2
Groundwater/Surface Water Connections	3
Pesticide Control	2.4
Protect Drinking Water through Land Use	2.6
Arsenic	1.9
Chloride	1.7
Radium	1

Comments

"The second sentence is more a value or goal statement, making it a bit inconsistent with other issue statements. I'd suggest removing it, and also clarifying which are the natural pollutants vs the human introduced. Conflating them makes a difference because we don't have control over them all."

"Would be helpful to have an AC conversation about whether to include pesticides and arsenic."

"Chloride should be named as a human introduced pollutant."

GROUNDWATER – QUANTITY

Issue Statement

Original Statement: Groundwater supplies are at risk of depletion due to drinking water use, irrigation use, and climate change.

Revised Statement: Long-term groundwater supplies are at risk of depletion in localized areas of the watershed due to withdrawal rates for residential, commercial, industrial, and agricultural uses exceeding the rate aquifers can naturally recharge. In addition, land use changes including urban development and agricultural expansion reduce the ability to recharge groundwater aquifers.

Priority Areas of Focus

Priority Area of Focus	Average Ranking
Groundwater Supply	4.7
Climate Change/Drought	2.7

Comments

"I agree with this being an issue statement, but quantity is NOT at risk due to 'drinking water' use. By rights all uses are 'drinking water' uses because they all tap the same potable water supply. Uses are typically categorized by type, such as residential, commercial, agricultural, etc. Further, I think we'd be hard-pressed to show supplies are currently at risk across the watershed; from what I've seen it's more localized in the for northeast around Savage, and we simply don't have heavy reliance on irrigation. Suggest a more generalized statement, e.g. 'Long term, groundwater supplies are at risk of depletion in localized areas of the watershed due withdrawal rates - primarily associate with turf and cropland irrigation, exceeding the rate aquifers can naturally recharge.' Quantity issues have existed all across the country long before climate change concerns came on the scene, so I'm not sure that can be stated with objectivity; though it's fair to say it may exacerbate things in the future, but that's more a pending threat than issue."

"Would be helpful to see the data so we know if drinking water use and climate change are actually causing groundwater supply issues."

"I don't know enough about the status of the groundwater supply in the watershed to verify that the supply is at risk of depletion. I'd like to see some data that confirms this before supporting this statement."

"Is there industrial use as well?"

"Development and land-use also impacts the quantity of groundwater. Urban development and agricultural drainage can interfere with recharge to the aquifers."

HABITAT AND NATURAL RESOURCES – PROTECTION & PRESERVATION

Issue Statement

Original Statement: High quality habitat in the watershed is at risk of degradation and destruction due to land use changes, poor water quality, altered hydrology, and a changing climate. These impacts affect all existing natural habitat types within the watershed, especially aquatic habitat, forests, trout streams, and wetlands/fens, which should be protected and preserved.

Revised Statement: High quality habitat in the watershed has been significantly degraded due to land use changes, poor water quality, and altered hydrology. These impacts affect all existing natural habitat types especially aquatic habitat, forests, native prairies, trout streams, and wetlands/fens.

Priority Areas of Focus

Priority Area of Focus	Average Ranking
Native Vegetation	4.5
Protection of High-Quality Habitat	4.8
Soil Health	5
Areas of Cultural Significance	3.2

Comments

"Suggest 'Quality habitat in the watershed has been significantly degraded due to land use changes, poor water quality, and altered hydrology. These impacts affect all existing natural habitat types within the watershed, especially aquatic habitat, forests, trout streams, and wetlands/fens.' Do we have evidence climate change has destroyed habitat? Is so let's include: if not leave out. Similar to other issues climate is a potential threat and challenge we need to account for. Also, with regard to the statement 'which should be protected and preserved' this is again more a value statement and should not be included in the issue statement."

"Would be nice to know what is meant by aquatic habitats and forests that need to be protected. Need more specificity in order to develop goals and select priority geographic areas. How about prairies?"

"I think a different word besides 'destruction' should be used, but I don't have a suggestion at the moment."

"I am not sure of the wording of this statement. I am concerned with habitat and natural resource protection/preservation, but I don't know that this statement is how I would frame the concern."

HABITAT AND NATURAL RESOURCES – RESTORATION

Issue Statement

Original Statement: Existing habitat has been reduced, degraded, and fragmented due to urban development, agricultural expansion, and changing climate.

Revised Statement: Existing aquatic and terrestrial habitats have been reduced, degraded, and fragmented due to urban development, agricultural expansion, and invasive species.

Priority Areas of Focus

Priority Areas of Focus	Average Ranking
Native Vegetation	4.8
Aquatic Health	4.5
Reforestation	3.5
Channel Alterations	3.2
Road/Transportation	1.2

Comments

"See above regarding the inclusion of climate change."

"Need to define 'habitat' – what types? Need this in order to prioritize locations and goals. Need a definition for 'existing habitat.' Recommend some wording changes – has existing habitat been reduced? Climate change instead of changing climate?"

"I disagree with including the phrase 'and changing climate' in this statement. Unless someone can give a good example to support that, I think it should be removed. Through studies and assessments, we have found that existing habitat has been impacted by changes to streamside vegetation, channel alterations, ditching and wetland drainage, which mostly relate to agriculture and urban development."

"Could also add invasive species to the list of causes of habitat degradation."

OVERALL COMMENTS

Are there any high priority issues missing from the list above?

Comments

"It may be included with the issues above, but I want to make sure that the Bluffs in Le Sueur County are identified. This is something that has been talked about for some time and would really be disappointed if we missed this opportunity."

'Maybe drought, but I'm not sure if it should be high priority or exactly how the plan could address it. Maybe fish or fisheries should be specifically mentioned under aquatic health."

"Stream restorations of impaired watersheds due to sediment."

"1.) Many of the concerns listed under #14-16 are similar - aren't land-use, drainage increased volume, altered hydrology and urban stormwater all related to the same concern?

2.) #23 & #24 Isn't climate change/drought a threat to the groundwater supply rather than a separate concern? Just like population growth is a threat to groundwater supply and not necessarily a separate concern.

3.) Shouldn't "Areas of Cultural Significance" be a separate concern rather than listed under "Habitat & Natural Resources". Places it under "Habitat & Natural Resources" does not acknowledge the human component to cultural significance.

4.) What is meant by Road/Transportation? I am not sure I understand what this concern is."

Is there anything else you want to tell us at this time?

Comments

"One topic that was brought up at our steering team meeting that we really didn't dive into at the Advisory Committee meeting was mining activities. Mining (silica and aggregate) does have presence in both Scott and Le Sueur Counties. I think staff don't have the best understanding of how this impacts the watershed. It would be worth bringing to see if this is something we want to include within the plan."

"Well Sealing (20) is a solution, not an issue to address. Not sure how DWSMA fits in…they are defined areas of protection so not an issue to address, per se. Likewise with "Source area protection" (21); DWSMA's are examples of SWP."

"With regard to climate…I'm not suggesting by some of my comments it isn't a threat or potential threat (not a denier!). I just want us to keep it in context. All the issues we're dealing with began and exist today because of human alterations to the landscape starting with settlement. To say climate has contributed to them is speculative if not disingenuous. In general, I think it's more appropriate to address climate as a challenge and complicating issue for implementation. The fact is there are many other significant threats, yet those are not mentioned in the statements like climate change is. That's why I think it's out of place. Things like ag economy, culture, tradition, urban growth, population, and the list goes on, all impact our resources and/or our ability to address them. Pointing out/emphasizing just one overly simplifies the challenges we face, if not takes to focus off the things we actually have more control over."

"Since there are a couple mines in the watershed, i think we need to identify them in the plan."

"Issue statements are pretty good and most seem ready to go onto the next step (e.g., picking priority waterbodies/locations and measurable goals). However, the prioritization section of the survey (Q14-31) was really confusing since there are issues, strategies, and other types of items listed. Not sure this is a true ranking of issues since some were duplicative, some were not issues, etc. This will need to be revisited at the next meeting. Might be good just to look at what ranked high/medium and see if it is already in the issue statement or not. Then talk about what to do with "low" topics (put in another part of the plan for now to address as future topics or something). Or look at the priority issue statements themselves and see if these need to be ranked and if so, for what reason."

"Good survey questions!"

"I think our geologic setting in Scott County with the incised Minnesota River valley and glacial till geology created a setting of streams and tributaries, bluffs and ravines that are naturally highly erosive and very susceptible to increased erosion and mass wasting as indicated in our current Watershed Plan. This geologic setting affects the natural condition of our water resources and makes them more susceptible to impact in addition to human induced impacts. We have this called out as a separate issue in our Watershed Plan. Maybe this is more appropriate as part of the description of some issues in this Plan, but it definitely impacts our current state of impairments and improving waterbodies to meet water quality standards."

"It seems like many of the concerns are causes rather than a concern. As an example: Why is land-use a concern? Why is urban storm water a concern? Isn't it the consequences of land-use and urban stormwater that is the concern?"

Chapter 1 : Land and Water Resources Narrative

The Lower Minnesota River East planning area (planning area) includes portions of Scott, Le Sueur, and Rice counties. The planning area covers approximately 405,789 acres (634 square miles) and is within the Minnesota River Basin in southcentral Minnesota. For planning purposes, the Lower Minnesota River HUC 8 watershed used in the Minnesota Pollution Control Agency (MPCA)'s Watershed Restoration and Protection Strategy (WRAPS) and other state planning and modeling efforts was divided into two sections, the eastern and western planning areas. The Minnesota River drains into the Mississippi River and ultimately to the Gulf of Mexico. The planning area's largest city is Shakopee, which is located southwest of the Twin Cities Metropolitan Area along the Minnesota River. Other cities within the Planning Area include Prior Lake, Savage, Jordan, New Prague, Le Sueur, Le Center, Hidelberg, Montgomery and portions of Lonsdale and Elko New Market.

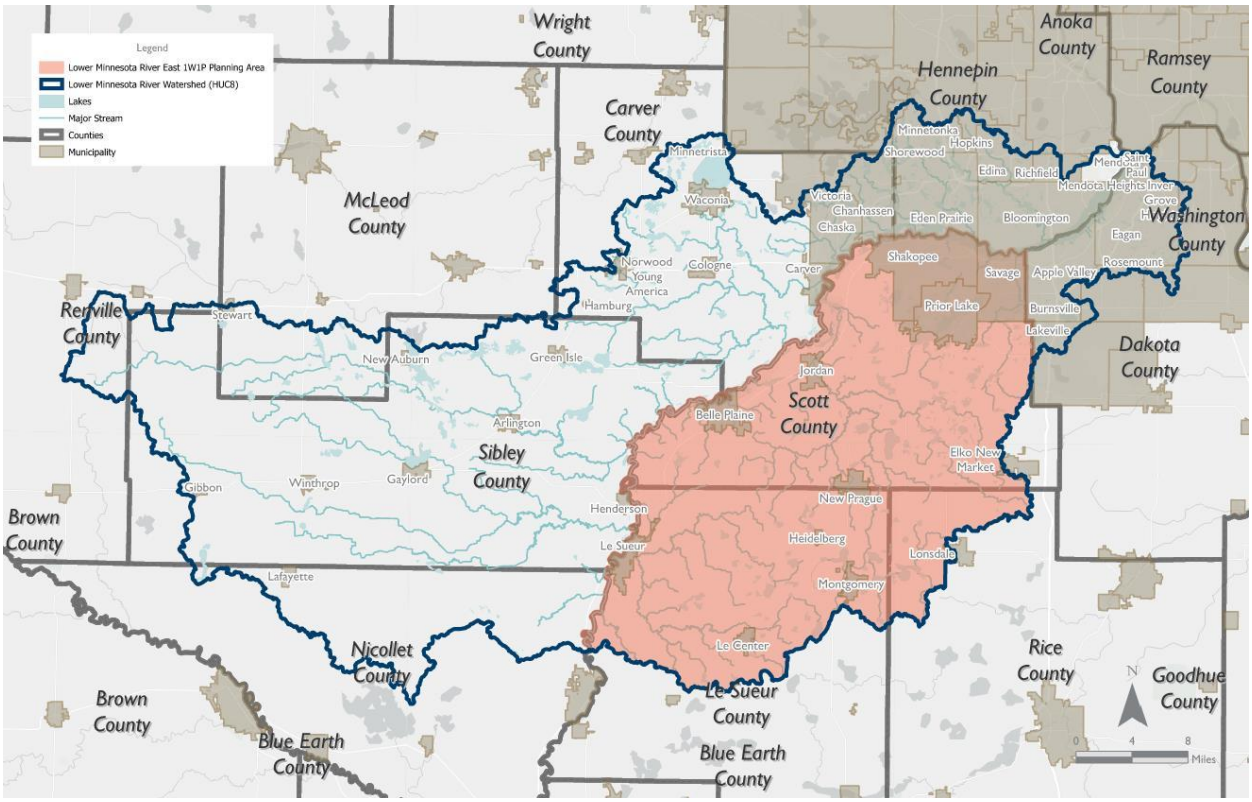


Figure 1-1: Lower Minnesota River Watershed (HUC8) and Lower Minnesota River East 1W1P Planning Area

Stakeholders within the planning area includes the Native American Tribe of the Shakopee Mdewakanton Sioux Community (a community of the Dakota people), two watershed districts, the Lower Minnesota River Watershed District and the Prior Lake-Spring Lake Watershed District, and one Watershed Management Organization (WMO), Scott County WMO, along with county and Soil and Water Conservation District (SWCD) entities for Rice, Scott, and Le Sueur counties. Each of these local groups were invited to participate in the planning process, though Shakopee Mdewakanton Sioux Community, Prior Lake-Spring Lake Watershed District, and all municipalities within the planning area opted to participate in an advisory role. Staff from the Prior Lake-Spring Lake Watershed District have committed to attending and participating in advisory committee meetings, despite the fact that they have opted not to have a representative on the policy committee.

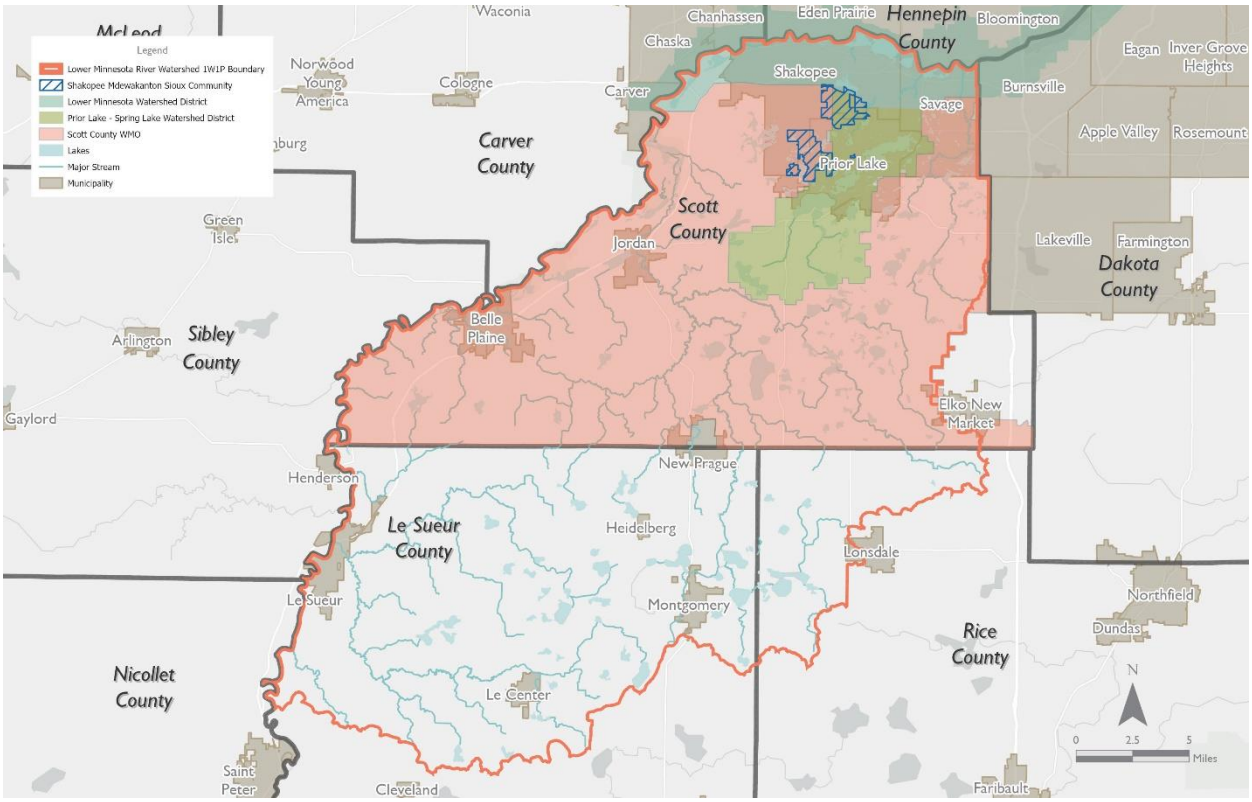


Figure 1-2: Lower Minnesota River East CWMP Planning Area

1.0 Cultural Heritage

This Plan aims to protect and restore natural resources in the planning area for future generations. In planning for the future, it's also important to remember that the resources in the planning area have been important to past generations. These vital resources have provided a continuum of use for generations and have endured numerous events shaping environmental, social, and economic drivers for the region.

The Minnesota River Valley has been home to the Dakota people for thousands of years. The river's name is derived from the Dakota word Mni Sota Wakpa which translates to cloudy waters (Peterson and LaBatte, 2022). The Dakota people live in harmony with the world around them and for generations have fished from the river, gathered rice from area lakes, and hunted game on the prairies in the river valley woodlands (Minnesota Indian Affairs Council, 2021). Many names that we see today are reminders of Dakota leaders, whose villages were located along the lower Minnesota River such as Black Dog, Shakopee, and Mazomani (State of Minnesota Parks, 2022).

In the early 1600s, European explorers, fur traders, and missionaries traveled the Minnesota River and by the 1860's built homesteads and farmed along the river's fertile banks. After failed treaty promises, the US-Dakota War took place in 1862. The Dakota battled for their homelands, their way of life, and their culture. As a result of the battle, the US Congress rescinded all treaties and exiled all Dakota from Minnesota. A majority were sent to Crow Creek, South Dakota while others migrated to Canada. Some remained or re-settled in Minnesota in present day Shakopee and other communities in Minnesota. In 1969, the Shakopee Mdewakanton Sioux Community was given federal recognition as a Native American tribe. The Shakopee Mdewakanton Sioux Community continue to be good stewards of the earth through many conservation and green initiatives some of which include the use of renewable energy, recycling plant-based materials at the Organics Recycling Facility, and use of state-of-the-art technologies in drinking water and wastewater treatment facility to reduce pollutants.

1.1 Land Use

The predominant land use within the planning area is agricultural with 52% cultivated crops and 13% hay and pasture. The next most predominant land use is urban development at 13% (USGS, 2016). The southern portion of the planning area is primarily agricultural with traditional row crops including corn, soybeans, and small grains. Based on averages within each county from the United States Department of Agriculture, there are approximately 855 farms that are an average of 200 acres in size within the planning area (USDA, 2017).

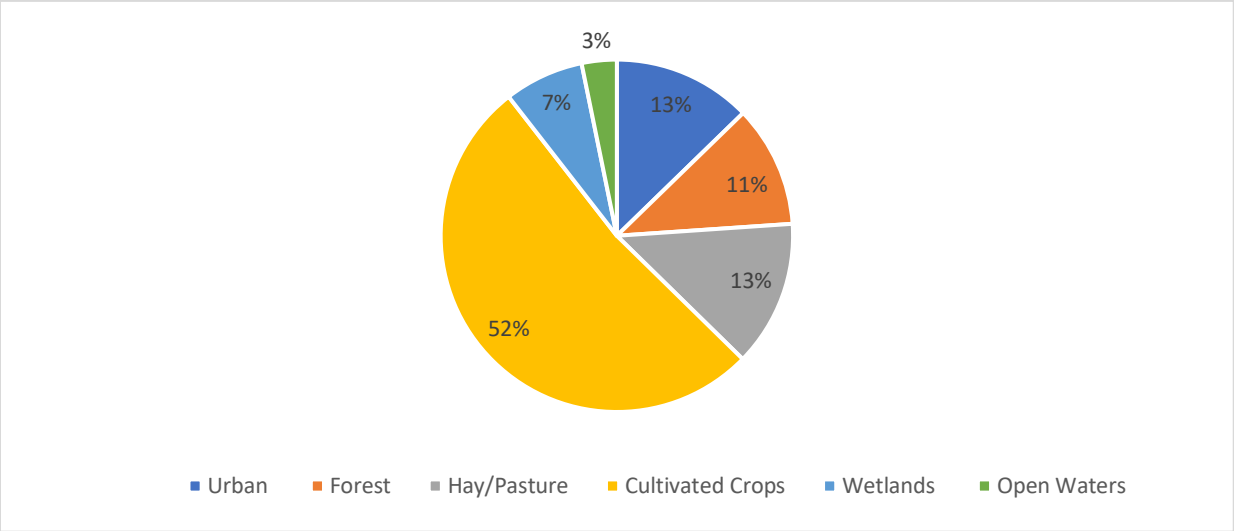


Figure 1-3: Land Use Distribution

The northern portion of the planning area is primarily urban landscape and lies within the greater Twin Cities Metropolitan Area including the cities of Shakopee, Prior Lake, and Savage. The Twin Cities Metropolitan Area is expected to expand south and southwest (MPCA, 2020b). The total estimated population within the planning area based on the 2020 census was 166,298 and is projected to increase 0.71% from 2022-2027 (US Census Bureau, 2020).

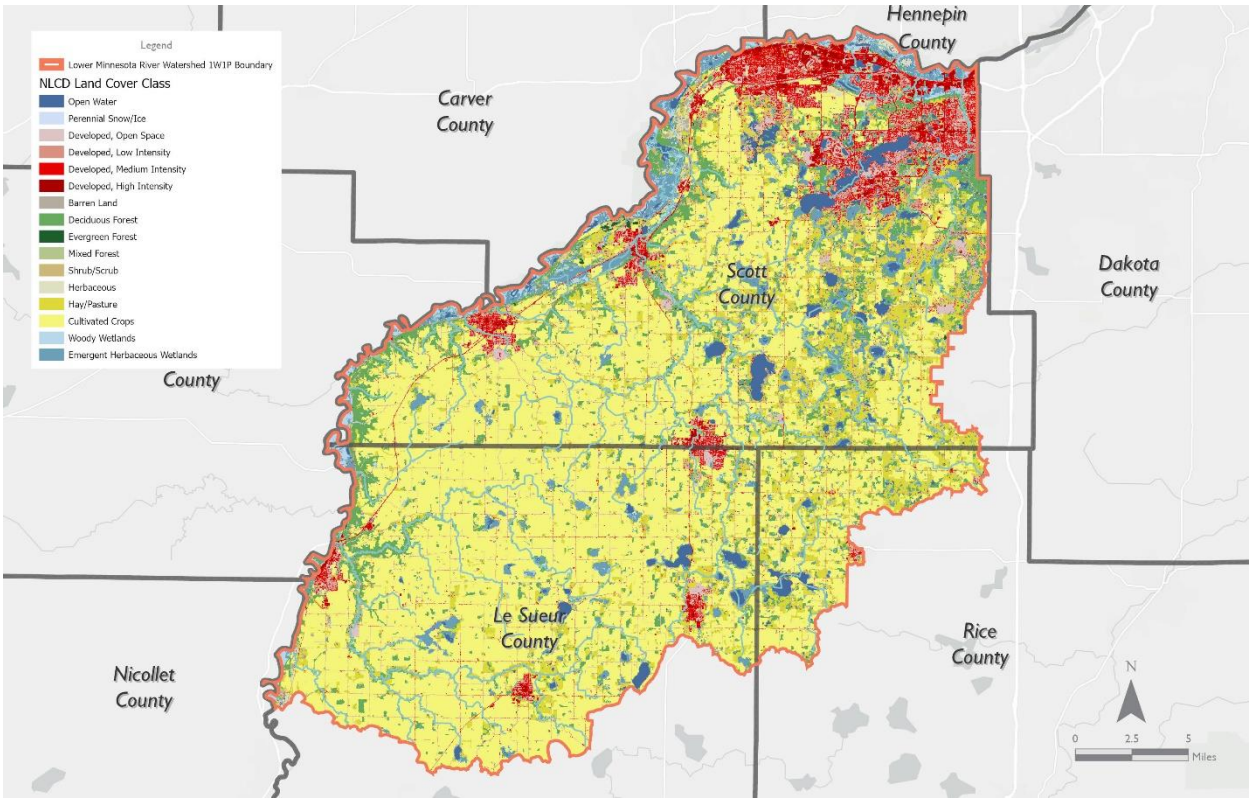


Figure 1-4: Land Cover (NLCD, 2019)

This area has multiple municipal separate storm sewer systems (MS4). These entities must satisfy the requirements of the MPCA's MS4 general permit to manage pollutants associated with stormwater runoff. MS4 areas include:

- Prior Lake City MS4
- Savage City MS4
- Shakopee City MS4
- Credit River Township MS4
- Jackson Township MS4
- Louisville Township MS4
- Spring Lake Township MS4
- Scott County MS4
- Prior Lake-Spring Lake Watershed District MS4
- MNDOT Metro District MS4
- Portions of Elko New Market City MS4

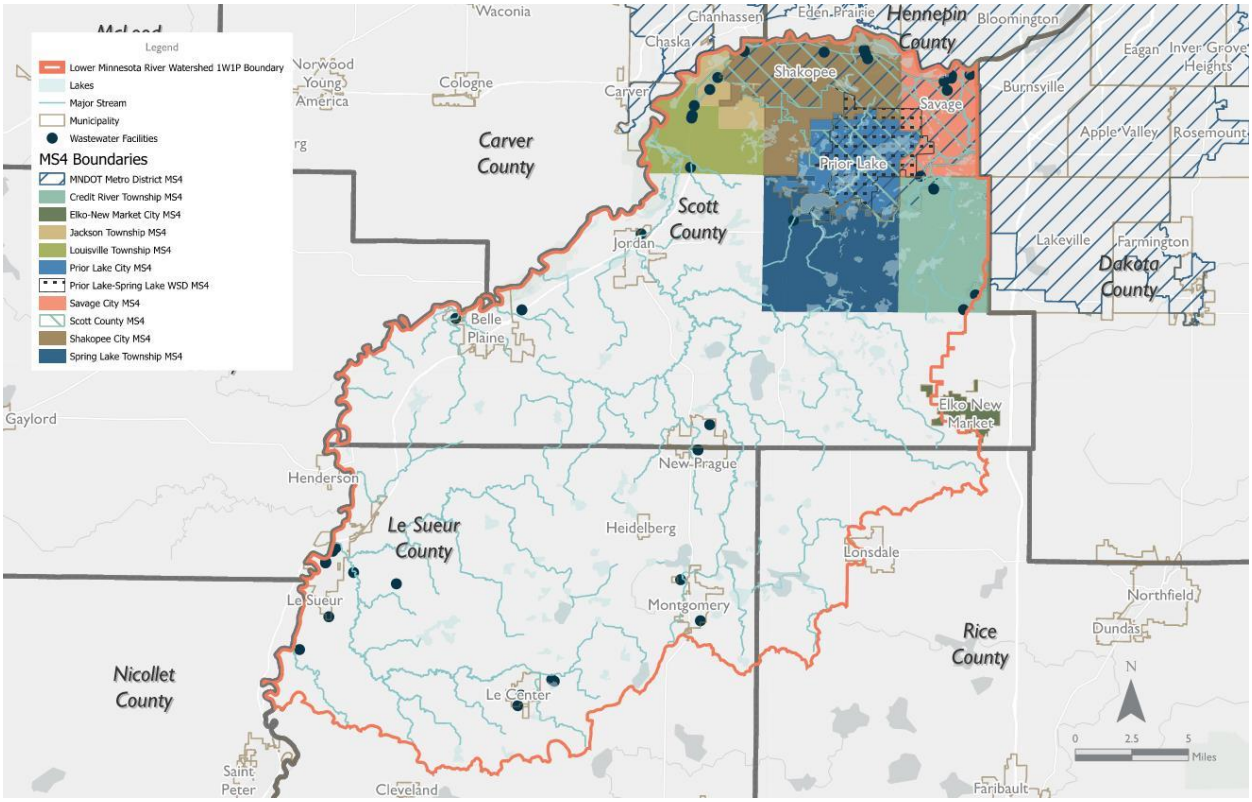


Figure 1-5. MS4 Boundaries and Wastewater Facilities

After agriculture and urban, remaining land uses include natural features such as woodlands (11%), wetlands (7%), and open waters (3%) (USGS, 2016). The planning area's natural features occur primarily within protected conservation areas along riparian corridors. The most predominant protection corridor within the planning boundary is located along the Minnesota Valley National Wildlife Refuge and Minnesota Valley State Recreation Area. The areas connect communities with nature and wildlife while providing educational and recreational opportunities such as walking/hiking, biking, hunting, cross country skiing, horseback riding, and more (USFWS, 2022b) (DNR,2022).

There are 285 active feedlots in the planning area (Figure 1-6). Approximately 78% of the feedlots have less than 300 animal units, and there are 10 confined animal feeding operations (CAFO). While the total number of feedlots is decreasing over time, the size of those that remain is growing. This correlates with a larger trend in agriculture where smaller family farms are being replaced by larger corporate operations (MPCA, 2020a).

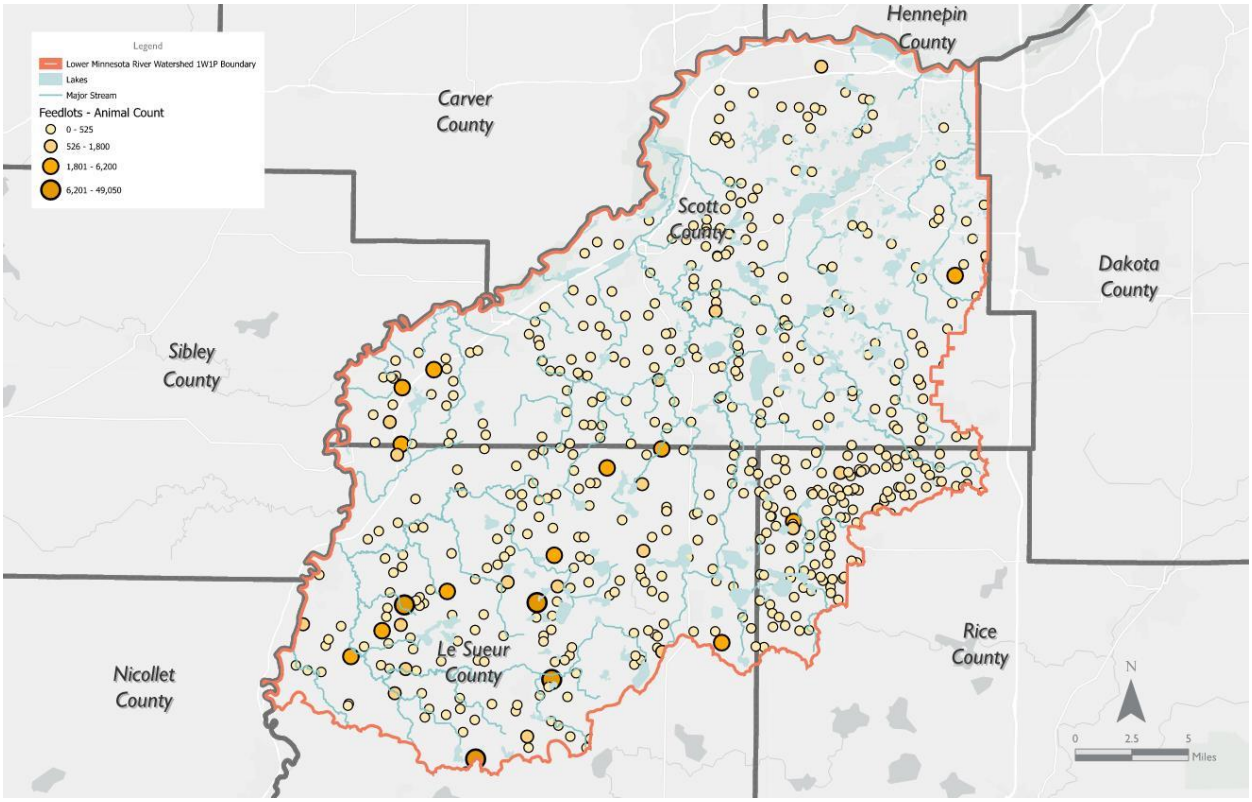


Figure 1-6. Feedlots

1.2 Surface Water

There are roughly 800 stream miles within the planning area. The main tributaries within the planning area include Le Sueur Creek, Roberts Creek, Sand Creek, and Credit River. The planning area also includes 70 stream miles of the Minnesota River. The Minnesota River has been identified as a major contributor of sediment and nutrients to the Mississippi River, impacting downstream waters such as Lake Pepin and ultimately the Gulf of Mexico. There are no water control structures, such as dams, on the Minnesota River within the planning area however, during low flows the lock and dammed Mississippi can experience backflow into the Minnesota River, creating lake-like conditions. These conditions favor the production of algae and result in low dissolved oxygen levels. While most of the Minnesota River is not typically used for navigation, the Minnesota River from Savage (river mile 14.9) to its outlet into the Mississippi River is dredged to provide a nine-foot-deep channel and a 4-foot channel to river mile 25 for commercial barge navigation as authorized by the Federal Rivers and Harbor Act.

There are 117 lakes in the planning area that provide recreational opportunities and waterfowl habitat. Popular recreational lakes include Spring Lake, Prior Lake, Cedar Lake, and O'Dowd Lake. Water control structures are commonly found controlling the outlets of lakes and wetlands within the planning area. Wetlands account for approximately 7% of the total planning area (USGS, 2016) with a large portion of the wetlands present along the Minnesota River and its floodplain.

Public and private drainage is present in the planning area, mostly in the southern portion of the planning area where the need for artificial drainage is necessary to allow for productive agricultural lands. There are 46 public drainage systems, including approximately 150 miles of open ditch and 23 miles of tile. Private drainage systems and tiles are not accounted for in these figures. The significant change in landscape from both urban development and drained agricultural landscapes contributed to the significant amount of wetland loss since pre-settlement (Figure 1-7). The reduction in wetlands and altering of natural watercourse contributes to the impacts of altered hydrology within the planning area.

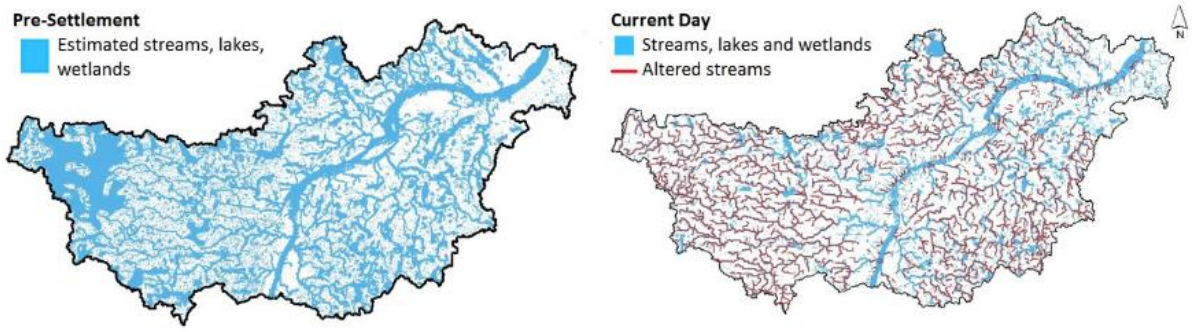


Figure 1-7: Pre-settlement (estimation) and current location of streams, Lake, and Wetland in the Lower Minnesota River Watershed (HUC 8) (MPCA, 2020)

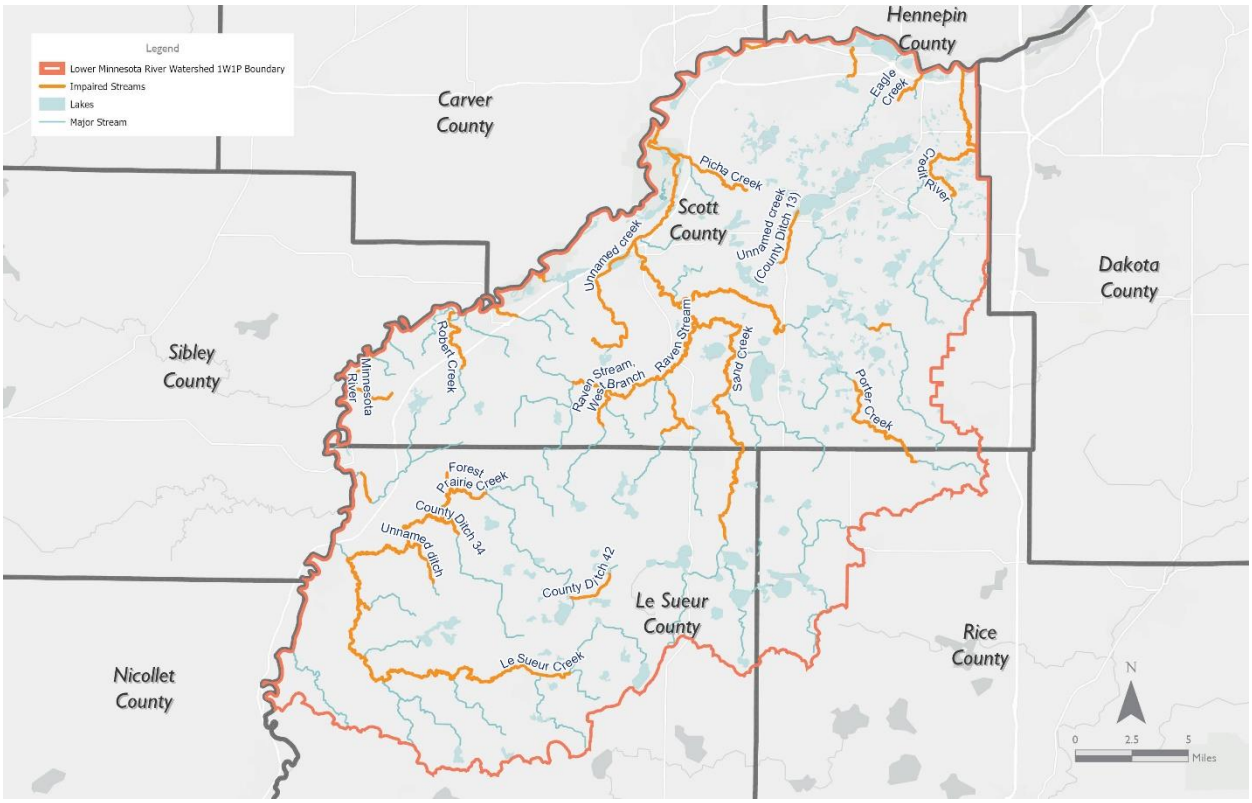


Figure 1-8: Impaired Streams

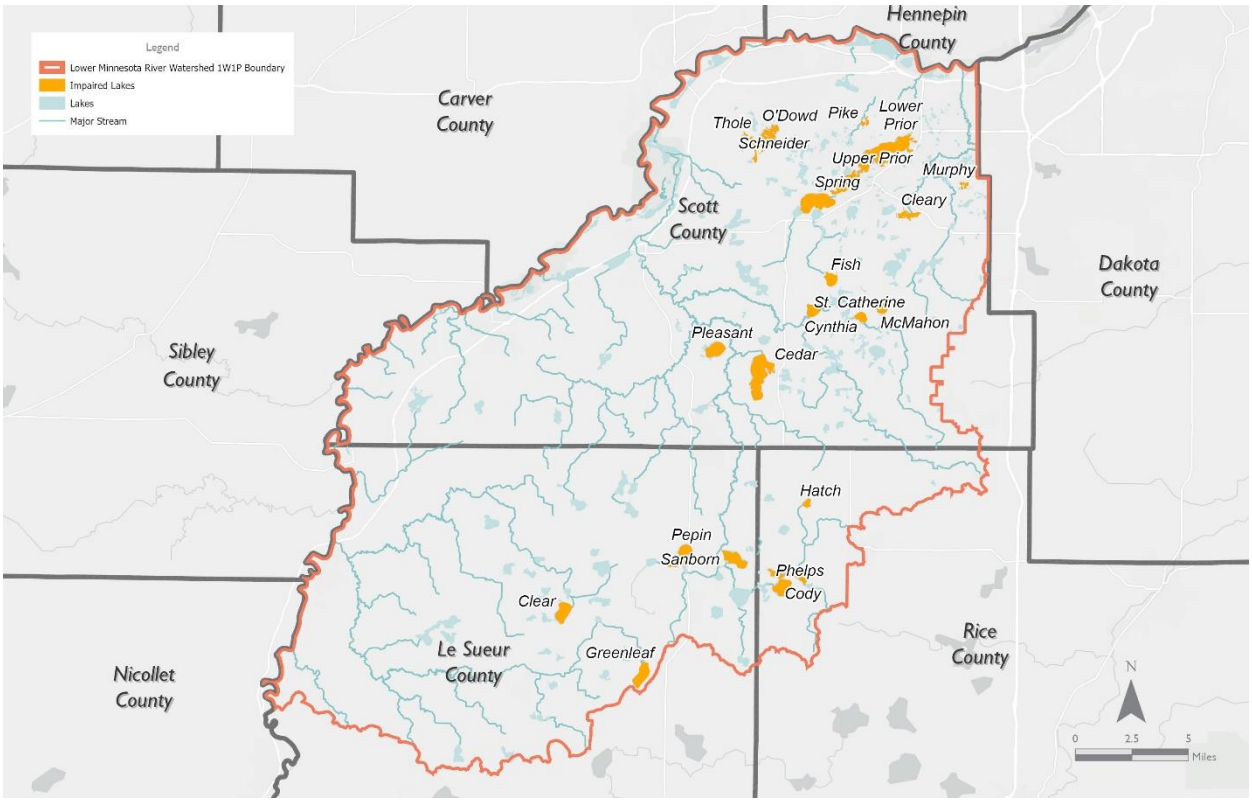


Figure 1-9: Impaired Lakes

Water Quantity

There are two streamflow gaging stations along the Minnesota River within the planning area with one located near Henderson which is managed by the Minnesota Department of Natural Resources (DNR) and one near Jordan which is managed by the United State Geologic Survey (USGS). An additional stream gauge is located near Fort Snelling and is managed by USGS. Water quality and quantity samples are measured and compared between the Jordan and Fort Snelling monitoring stations to evaluate loading, flow, and volume and provide valuable planning data for the Minnesota River before its outlet into the Mississippi River. Long term monitoring records from these sites show annual peak flow increases by 80% as compared to historic records that date back to 1935 (DNR, 2022). Additional water quantity monitoring occurs within the Watershed and will be discussed in the monitoring section of this plan.

There is risk of flooding from the 100-year rain event, particularly along the Minnesota River. Primary areas at risk include transportation structures such as bridges and roadways along the Minnesota River. Local flooding areas are mapped for much of planning area through FEMA delineated maps.

The changes to the hydrology noted above can be attributed to increases in precipitation (both amount and intensity of precipitation events), land conversion, development, and artificial drainage. Altered hydrology has been identified as one of the primary stressors of biotic impairments in the planning area. Due to the complexity and connection of altered hydrology to other issues within the Watershed, this topic will be discussed in detail throughout the plan document.

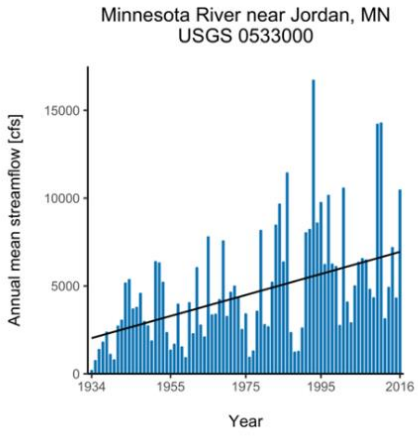


Figure 1-10: Annual Mean Streamflow for the Minnesota River Near Jordan, Minnesota (Jennings, 2016)

Water Quality

The Minnesota Pollution Control Agency (MCPA) conducts water quality assessments as a part of its intensive watershed monitoring program to determine the condition of the surface waters in the state. The assessments show that surface waters in the planning area face stresses common to the region with elevated nutrients, and fish and macroinvertebrate bioassessment, resulting in the majority of the impairments. Water quality monitoring show that most of the waterbodies have declining water quality trends. In total, there are 96 impairments from 28 streams and 19 lakes that are listed as impaired. These impairments are summarized in Table 1-1 and Table 1-3 below and shown in Figure 1-8and Figure 1-9 (MPCA, 2022b).

Table 1-1: Summary of Impaired Streams and Lakes in Planning Area (does not include mercury impairments)

Water Body Type	Pollutant or Stressor	Number of Impairments
Streams	Bethic macroinvertebrates bioassessments	19
	Fish bioassessments	25
	Escherichia coli (E.coli)	14
	Fecal coliform	4
	Turbidity	9
	Total Suspended Solids (TSS)	1
	Chloride	6
	Nutrients	6
Lakes	Fish bioassessments	3
	Nutrients	17

Table 1-2. Impaired Streams in the Planning Area (does not include mercury impairments)

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated \Use	Pollutant or Stressor
Big Possum Creek	Unnamed Creek to Minnesota R	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated \Use	Pollutant or Stressor
County Ditch 10	CD 3 to Raven Street	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments
				Aquatic Recreation	Fecal coliform
County Ditch 34	Unnamed Ditch to Forest Prairie Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
County Ditch 42	School Lake to Clear Lake Outlet	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Credit River	-93.3526 44.7059 to Minnesota River	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Eagle Creek	Headwaters to Minnesota River	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
Forest Prairie Creek	CD 29 to Le Sueur Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Judicial Ditch 4	Unnamed Ditch to Forest Prairie Creek	Stream	Le Sueur	Aquatic Life	Fish bioassessments
Le Sueur Creek	CD 23 to West Prairie Stream	Stream	Le Sueur	Aquatic Life	Fish bioassessments
	West Prairie Stream to Forest Prairie Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated \Use	Pollutant or Stressor
Minnesota River	Cherry Creek to High Island Creek	Stream	Le Sueur	Aquatic Life	Turbidity; Nutrients
				Aquatic Recreation	Fecal Coliform
	High Island Creek to Carver Creek		Scott	Aquatic Life	Turbidity; Nutrients
				Aquatic Recreation	Fecal Coliform
	Carver Creek to RM 22		Scott	Aquatic Life	Turbidity; Nutrients
Picha Creek	Unnamed Creek to	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
	Unnamed Creek to Sand Creek	Stream	Scott	Aquatic Life	Fish bioassessments
Porter Creek	Fairbanks Avenue to 250th Street East	Stream	Scott	Aquatic Life	Turbidity
	Langford Road/MN Highway 13 to Sand Creek	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments; Turbidity
				Aquatic Recreation	Escherichia coli (E. coli)
Raven Stream	East Branch Raven Stream to Sand Creek	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Raven Stream, East Branch	-93.6106 44.5532 to 255th Street West	Stream	Scott	Aquatic Life	Chloride

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated \Use	Pollutant or Stressor
Raven Stream, West Branch	270th Street to East Branch Raven Stream	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	Fecal coliform
Robert Creek	Unnamed Creek to Unnamed Creek (at Belle Plaine Sewage Ponds)	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments; Total suspended solids (TSS)
				Aquatic Recreation	Escherichia coli (E. coli)
Sand Creek	Porter Creek to Minnesota River	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments; Nutrients; Turbidity
				Aquatic Recreation	Escherichia coli (E. coli)
	Raven Stream to Porter Creek	Stream	Scott	Aquatic Life	Fish bioassessments; Turbidity
	T112 R23W S23, south line to -93.5454 44.5226	Stream	Le Sueur	Aquatic Life	Chloride; Fish bioassessments; Nutrients; Turbidity
	-93.5454 44.5226 to Raven Stream	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments; Nutrients; Turbidity
Unnamed Creek	Headwaters to Sand Creek	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated \Use	Pollutant or Stressor
Unnamed Creek	Headwaters to Unnamed Creek	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek	Headwaters to Unnamed Creek	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek	Headwaters to Minnesota River	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek	Unnamed Creek to JD 2	Stream	Le Sueur	Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek	CD 56 to Le Sueur Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Unnamed Creek	Railroad Bridge to East Branch Raven Stream	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Unnamed Creek	Unnamed Ditch to -93.4251 44.6206	Stream	Scott	Aquatic Life	Fish bioassessments
Unnamed Creek (Brewery Creek)	US Highway 169 to Minnesota River	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek (County Ditch 13)	Unnamed Ditch to Spring Lake (70-0054-00)	Stream	Scott	Aquatic Life	Fish bioassessments
Unnamed Creek (Prior Lake Outlet Channel)	Dean Lake to Blue Lake	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Unnamed Ditch	Unnamed Ditch to Forest Prairie Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments

Table 1-3. Impaired Lakes in the Planning Area (does not include mercury impairments)

Water Body name	Water Body Type	County	Affected Designated Use	Pollutant or Stressor
Cedar	Lake	Scott	Aquatic Recreation	Nutrients
Clear	Lake	Le Sueur	Aquatic Recreation	Nutrients
Cleary	Lake	Scott	Aquatic Recreation	Nutrients
Cody	Lake	Rice	Aquatic Recreation	Nutrients
Cynthia	Lake	Scott	Aquatic Recreation	Nutrients
Fish	Lake	Scott	Aquatic Recreation	Nutrients
Greenleaf	Lake	Le Sueur	Aquatic Recreation	Nutrients
Hatch	Lake	Rice	Aquatic Recreation	Nutrients
Lower Prior	Lake	Scott	Aquatic Life	Fish bioassessments
O'Dowd	Lake	Scott	Aquatic Life	Fish bioassessments
Pepin	Lake	Le Sueur	Aquatic Recreation	Nutrients
Phelps	Lake	Rice	Aquatic Recreation	Nutrients
Pike	Lake	Scott	Aquatic Recreation	Nutrients
Pleasant	Lake	Scott	Aquatic Recreation	Nutrients
Sanborn	Lake	Le Sueur	Aquatic Recreation	Nutrients
Spring	Lake	Scott	Aquatic Life	Fish bioassessments
			Aquatic Recreation	Nutrients
St. Catherine	Lake	Scott	Aquatic Recreation	Nutrients
Thole	Lake	Scott	Aquatic Recreation	Nutrients
Upper Prior	Lake	Scott	Aquatic Recreation	Nutrients

Aquatic life impairments, which include fish bioassessment and benthic macroinvertebrates bioassessment impairments, are determined through biologic monitoring and assessments. Assessment of aquatic life provides an overall measure of community and stream health. Stressor identification is a formal and rigorous process that

identifies stressors to biological impairments, a key component in the MCPA WRAPS process. Stressors can be physical, chemical, or biological. Table 1-4 displays the identified stressors for the 28 reaches with aquatic life impairments. One reach may have multiple identified stressors (MPCA, 2018).

Table 1-4: Stressor Identification Summary for the Aquatic Life Impaired Streams in the Planning Area (MPCA, 2018)

Stressor	Number of Reaches
Altered hydrology / connectivity	8
Poor habitat	18
Low dissolved oxygen	8
Eutrophication	12
High turbidity/TSS	7
High Nitrates	9
Chloride	1

1.3 Surface Water

Groundwater is the primary source of drinking water for the planning area. The major bedrock aquifers underlying the planning area include the Prairie Du Chien-Jordan Aquifer and the Franconia-Ironton-Galesville Aquifer (also called the Tunnel City-Wonewoc aquifer). Most domestic, municipal, and commercial wells in the planning areas draw water from these aquifers.

The planning area crosses three of Minnesota's groundwater provinces, including Province I (east-central) in the northern part of the planning area, Province 2 (south-central) in the southern half of the planning area, and a small portion of Province 3: Karst along the Minnesota River (DNR, 2021).

Province I: East-central:

- Buried sand aquifers and extensive surficial sand plains
- Thick layer of sediment deposited by glaciers over the bedrock
- Good aquifer properties

Province 2: South-central:

- Thick loam and clay loam glacial sediment
- Fine-grained and limited extents of surficial and buried sand aquifers
- Contains sedimentary bedrock aquifers that are commonly used

Province 3: Karst:

- Glacial sediment is thin or absent
- Aquifers closest to the land surface
- Often impacted by human activities

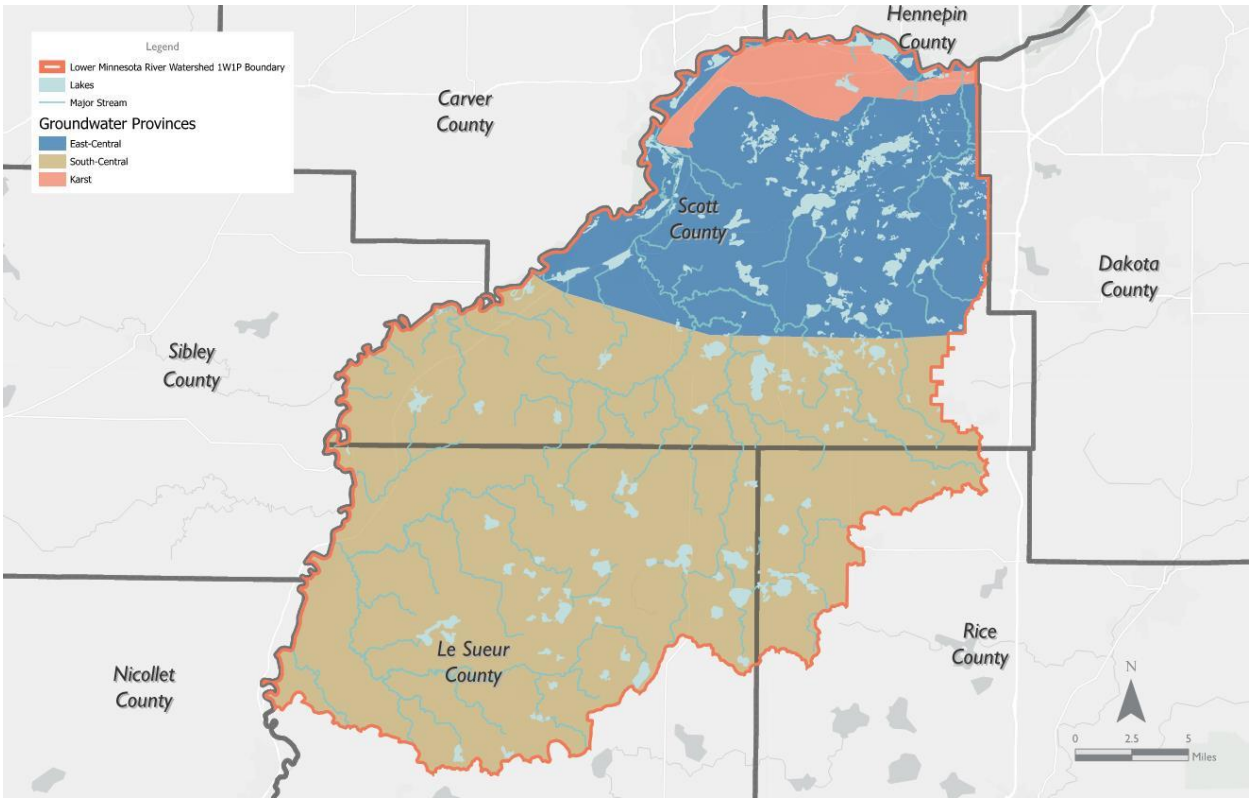


Figure 1-11. Minnesota Groundwater Provinces

The primary groundwater quality contaminates of concern within the planning area are nitrates and arsenic. Nitrate is a human influenced contaminant with feedlots, septic systems, and fertilizers as examples of systems that influence nitrate levels. Arsenic is a known carcinogen and is a naturally occurring element found in rocks and soil. There are limited protection or treatment measures for arsenic in drinking water supplies, therefore, testing and education are important. Contaminates of emerging concern for drinking water include pesticides, chlorides, and PFAS.

Rice and Scott counties have completed county geologic atlases while Le Sueur County does not. County geologic atlases help to identify soil compositions and layers of materials that historically collected and created the landscape that is present today. Details from the geologic atlas can help identify surface and groundwater connections (UMN, 2022).

Most of the planning area has medium aquifer vulnerability except for the area along the Minnesota River corridor and its tributaries which have high aquifer vulnerability (MDH, 2016). Vulnerability varies based on how easily surface water pollutants can move through the soil and into the groundwater with higher vulnerability coinciding with areas where it is easier for the pollutants to infiltrate into the aquifer. In areas where high aquifer vulnerability is present, restrictions to fall nitrogen fertilizer application are required except in locations where the conditions for exclusion are met. To help protect the groundwater from surface water pollutants, the MDA has established a Groundwater Protection Rule (GPR) to restrict the application of nitrogen fertilizer in the fall (after September 1) or on frozen soils in identified vulnerable groundwater areas (Figure 1-12**Error! Reference source not found.**) (MDA, 2022).

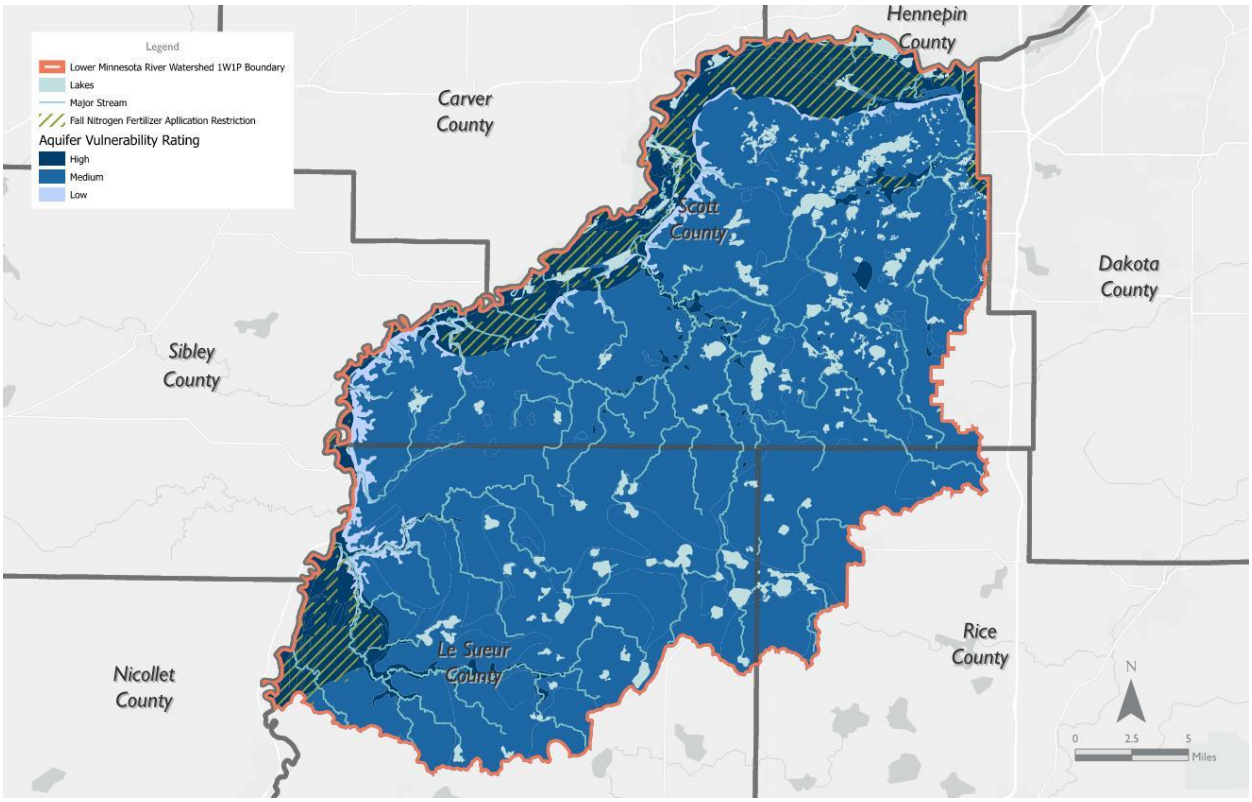


Figure 1-12. Aquifer Vulnerability and Fall Restriction Areas

1.4 Topography, Soils, and Geology

Approximately 10,000 years ago the Des Moines Lobe glacier covered the planning area. The retreat of the glacier left Lake Agassiz in its place, formed from ice melt in northwestern Minnesota, eastern North Dakota, and Canada. Eventually the Glacial River Warren was created at the outlet of Lake Agassiz carving the Minnesota River Valley. The glacial activity in the northern and eastern parts of the planning area provide its lake rich characteristics in these areas that support important recreational resources.

The topography of the planning area is characterized as rolling in nature, with a dramatic change in elevation as it shifts to the lower reaches of the Minnesota River bluffs (approximately 1200 ft to 682 ft according to LiDAR). With the significant elevation change, tributaries, ravines, and bluffs that outlet into the Minnesota River experience significant erosion. The shift in the lower reaches gives rise to cold water springs that feed the planning area's unique natural resources such as Eagle Creek, a trout stream, and Savage Fen, a calcareous fen wetland (MPCA, 2020b).

The planning area primarily consists of rich organic glacial prairie soils that are consistent with Central Iowa and Minnesota Till Prairie complex that are typically fine textured soils. The glacial deposit soils present characteristics that are prime for cultivation (MPCA, 2020b).

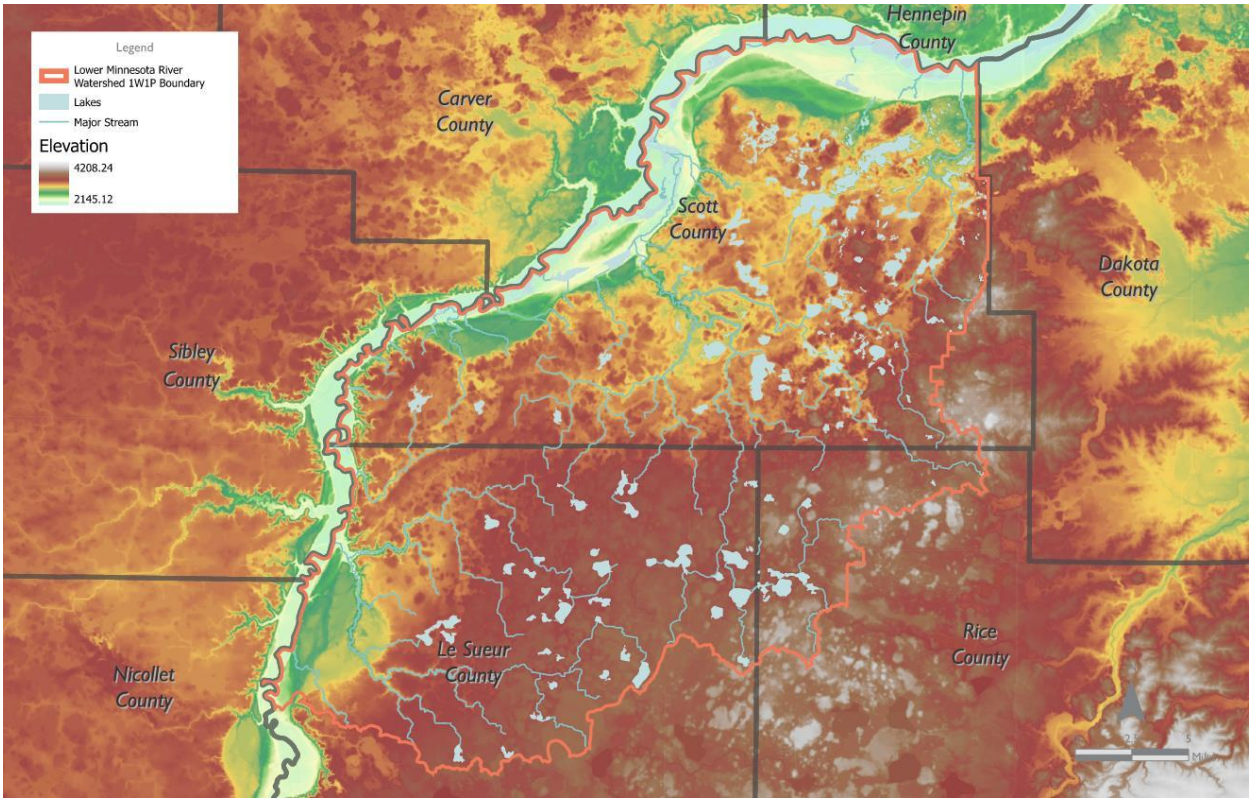


Figure 1-13. Surface Elevation

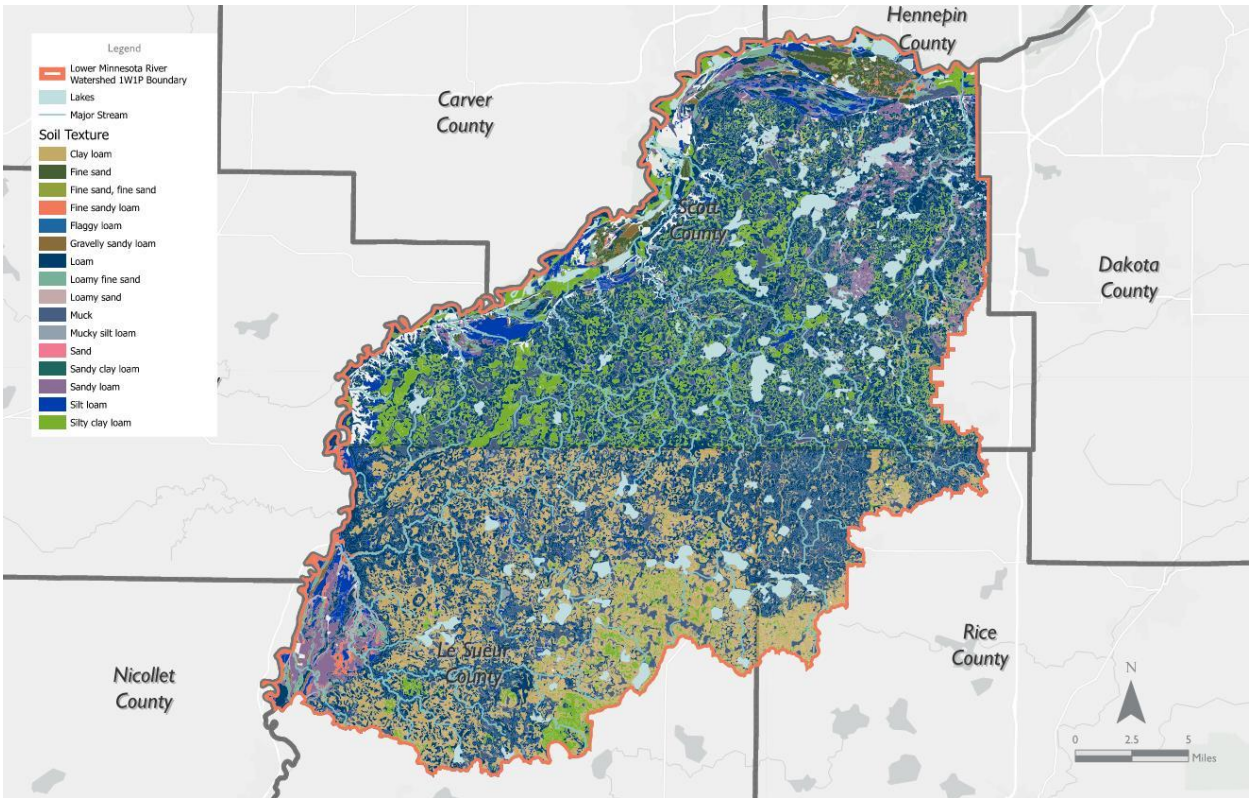
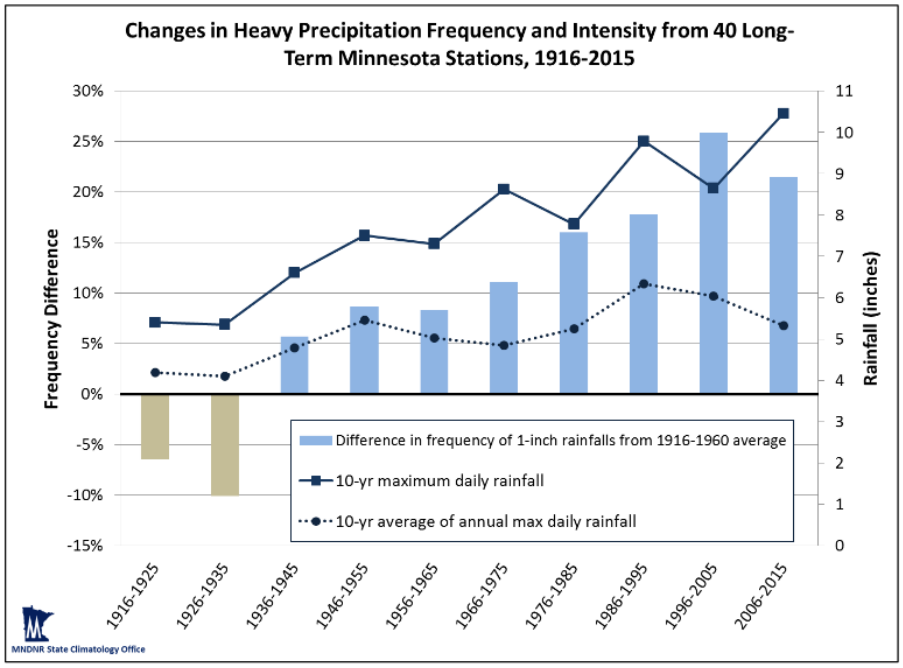


Figure 1-14. Soil Types

1.5 Climate

A climate summary was completed for the Lower Minnesota River Watershed by the DNR in 2019. The information below is not explicit to the planning area and includes areas east and west of the planning area consistent with the Lower Minnesota River HUC 8 watershed.

Long term precipitation records show an annual rainfall average of roughly 32 inches in the north portions of the Lower Minnesota River Watershed and up to 33.6 inches in the southeastern portion of the Lower Minnesota River Watershed. When comparing the recent observations (1989-2018) to the long-term precipitation records (1895-2018), the annual average rainfall shows an increase in roughly 2.5-3.5 inches. This changing precipitation trend is expected to continue, which will result in additional stresses to the water resources in the planning area. In addition to an increasing trend in annual precipitation, precipitation events have become more intense with larger rainfall events occurring more frequently (BWSR, 2019).



Changes in the frequency of one-inch rainfalls relative to the 1916-1960 average (vertical bars), from 40 long-term stations in Minnesota. Also shown are the 10-year average (lower dotted line, right axis) and 10-year maximum values (upper solid line, right axis) of the heaviest single rainfall amount recorded each year at any of the 40 stations. Note that the 10-year maximum value has doubled from just over five inches at the beginning of the record, to just over 10 inches at the end of the record. Courtesy of Minnesota State Climatology Office.

Figure 1-15: Changes in heavy Precipitation Frequency and Intensity in Minnesota (BWSR, 2019)

Temperature across the Lower Minnesota River Watershed is generally uniform, however, slight differences are present across due to variations in topography, vegetation, and soils. The average annual temperature from 1989 to 2018 for the area is 45.2° Fahrenheit (F) with winter temps (December through February) averaging 17.8°F and summer temps (June through August) averaging 69.9°F. Average annual temperatures have increased 0.3°F with average winter temps seeing the largest increase (1.6°F) and average summer temps slightly decreasing (-0.8°F) (DNR, 2019).

1.6 Socio-economics

Cities within the planning area include:

- Belle Plaine
- Heidelberg
- Jordan
- Le Center
- Le Sueur
- Montgomery
- New Prague
- Prior Lake
- Savage
- Shakopee
- Portions of Elko New Market
- Portions of Lonsdale

Population

Scott County is the second fastest growing county in Minnesota (US Census Bureau, 2020). Continued urban expansion south and southwest of the Twin Cities Metropolitan Area, in the northern part of the planning area, is expected as demands for housing and development increase due to the growing population. Additionally, Le Sueur and Rice counties have overall rising trends in population with 4.21% and 5.53% growth since 2010 census.

Growth projections are highest in the city of Shakopee while rural township areas are expected to have populations decline (Figure 1-16) (US Census Bureau, 2020).

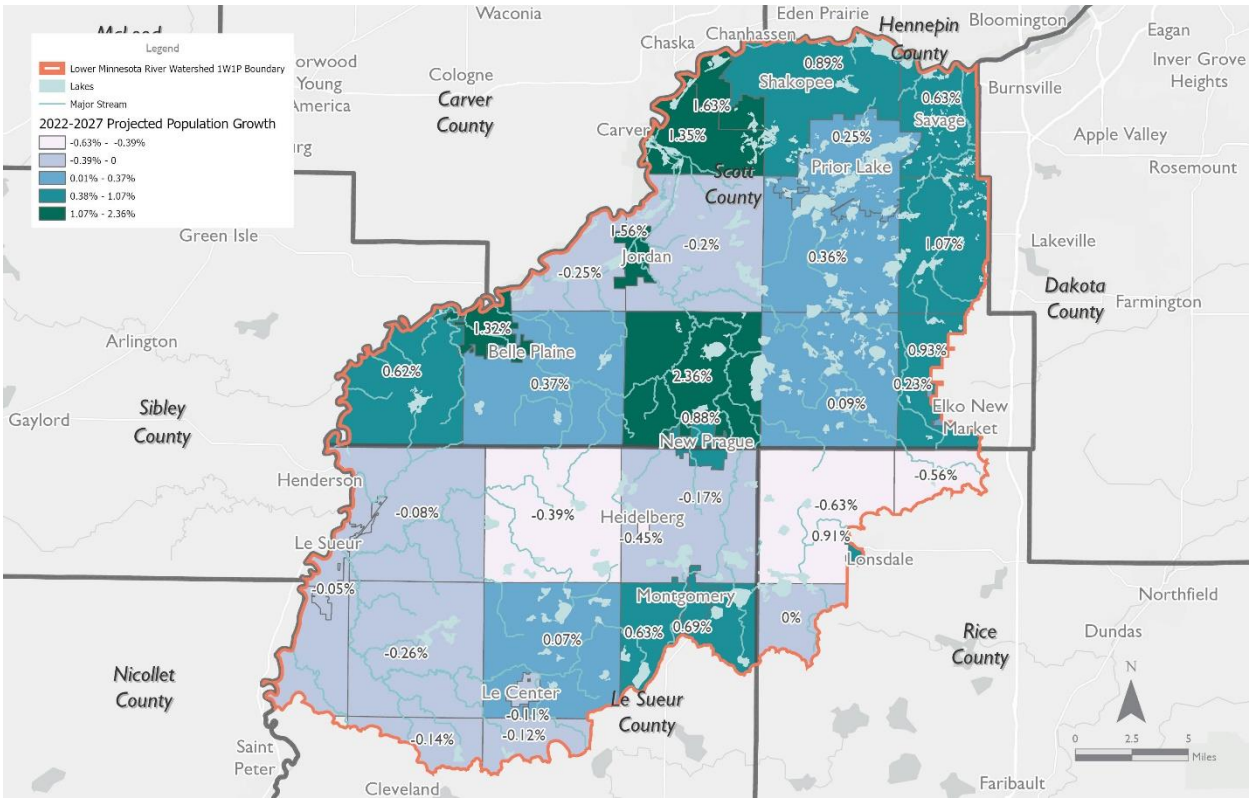


Figure 1-16. Projected Population Growth

Income

The median household income for counties within the planning boundary include (US Census Bureau, 2020):

- Le Sueur: $75,925
- Rice: $70,600
- Scott: $103,261

Approximately 5% of population in the planning area are below the poverty level

Race

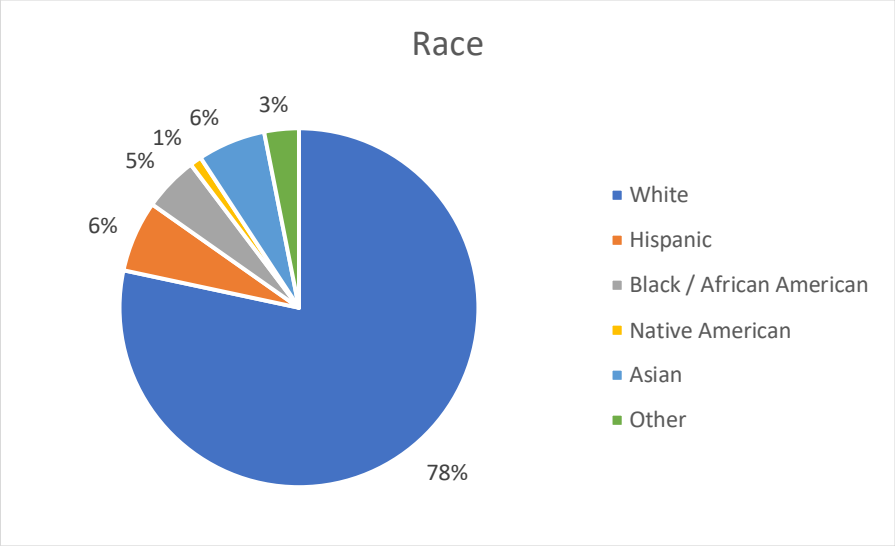


Figure 1-17: Race of Residents in Planning Area (US Census Bureau, 2020)

Age

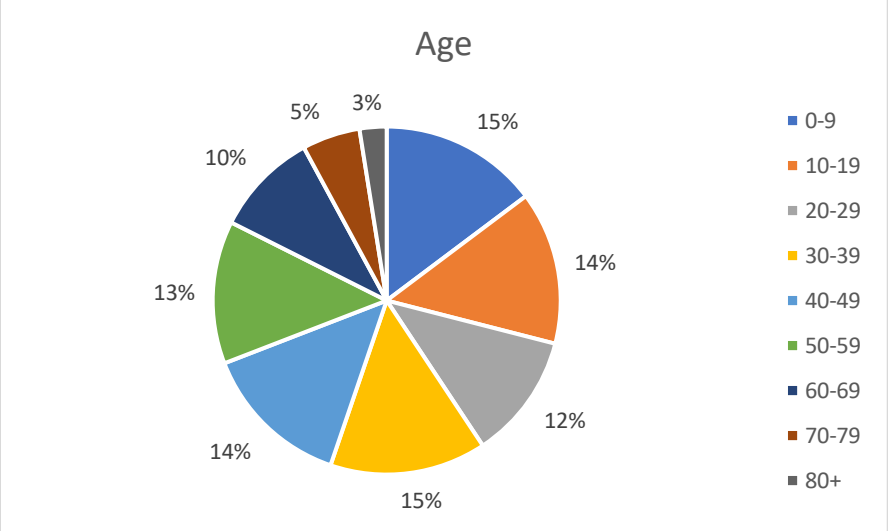


Figure 1-18: Age of Residents in Planning Area (US Census Bureau, 2020)

Environmental Justice

Environmental justice means fair treatment and meaningful involvement regardless of race, color, national origin, or income. Fair treatment and meaningful involvement to communities of color, indigenous communities, and low-income communities with respect to the development, adoption, implementation, and enforcement of environmental laws, regulation, and policies. The MPCA screened areas of increased concern census tracts with higher concentrations of low-income residents and people of color as well as tribal areas to ensure meaningful community engagement and evaluation for potential disproportionate adverse environmental impacts (MPCA, 2022a).

Check it out! MPCA's Understanding Environmental Justice in Minnesota

https://mpca.maps.arcgis.com/apps/MapSeries/index.html?appid=f5bf57c8dac24404b7f8ef1717f57d00

1.7 Habitat and Endangered Species

2021 Minnesota Statutes, Chapter 88. Division of Forestry (Minn. Stat. §§ 84.0895) governs protection of threatened and endangered species and defines species with special protection as follows: endangered species are those threatened with extinction throughout all or a significant portion of its range; threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of its range; and species of special concern are those that are not endangered or threatened, but are extremely uncommon in Minnesota or have unique or highly specific habitat requirements and deserve careful monitoring. The DNR is required to adopt rules designating species as endangered, threatened, or species of special concern. Species are also protected at the federal level and their protection status is determined by the US Fish and Wildlife Service (USFWS). Species with protection status at the state (as listed by DNR) and federal level (as listed by USFWS) present in Le Sueur, Rice, and Scott Counties are shown in Table 1-5.

Wild rice can be found in many of the floodplains lakes along the Minnesota River.

Table 1-5. Protected Species Within Le Sueur, Rice, and Scott Counties (USFWS, 2022)

Common Name	Scientific Name	Group	Federal Status	State Status
Mucket	Actinonaias ligamentina	Mussel		Threatened
Elktoe	Alasmidonta marginata	Mussel		Threatened
Henslow's Sparrow	Ammodramus henslowii	Bird		Endangered
Rock Pocketbook	Arcidens confragosus	Mussel		Endangered
Rusty patch bumble bee	Bombus affinis	Insect	Endangered	
Waterhyssop	Bacopa rotundifolia	Plant		Threatened
Kitten-tails	Besseya bullii	Plant		Threatened
Sterile Sedge	Carex sterilis	Plant		Threatened
Ghost Tiger Beetle	Cicindela lepida	Insect		Threatened
Purple Wartyback	Cyclonaias tuberculata	Mussel		Endangered
Big Tick Trefoil	Desmodium cuspidatum var. longifolium	Plant		Threatened
Beaked Spikerush	Eleocharis rostellata	Plant		Threatened
Wolf's Spikerush	Eleocharis wolfii	Plant		Endangered
Butterfly	Ellipsaria lineolata	Mussel		Threatened
Elephant-ear	Elliptio crassidens	Mussel		Endangered
Blanding's Turtle	Emydoidea blandingii	Reptile		Threatened
Minnesota dwarf trout lily	Erythronium propullans	Plant	Endangered	
Spike	Eurynia dilatata	Mussel		Threatened
Black Buffalo	Ictiobus niger	Fish		Threatened
Butternut	Juglans cinerea	Plant		Endangered
Higgins Eye	Lampsilis higginsii	Mussel		Endangered
Yellow Sandshell	Lampsilis teres	Mussel		Endangered
Loggerhead Shrike	Lanius ludovicianus	Bird		Endangered
Fluted-shell	Lasmigona costata	Mussel		Threatened

Common Name	Scientific Name	Group	Federal Status	State Status
Prairie bush-clover	Lespedeza leptostachya	Plant	Threatened	
Washboard	Megalonaias nervosa	Mussel		Endangered
Northern long-eared bat	Myotis septentrionalis	Mammal	Threatened	
Louisiana Broomrape	Orobanche ludoviciana var. ludoviciana	Plant		Threatened
Rough-seeded Fameflower	Phemeranthus rugospermus	Plant		Threatened
Sheepnose	Plethobasus cyphyus	Mussel		Endangered
Round Pigtoe	Pleurobema coccineum	Mussel		Threatened
James' Polanisia	Polanisia jamesii	Plant		Endangered
Winged Mapleleaf	Quadrula fragosa	Mussel		Endangered
Wartyback	Quadrula nodulata	Mussel		Threatened
Ebonyshell	Reginaia ebenus	Mussel		Endangered
Hair-like Beak Rush	Rhynchospora capillacea	Plant		Threatened
Short-beaked Arrowhead	Sagittaria brevirostra	Plant		Endangered
Hooded Arrowhead	Sagittaria calycina var. calycina	Plant		Threatened
Whorled Nutrush	Scleria verticillata	Plant		Threatened
Monkeyface	Theliderma metanevra	Mussel		Threatened
Pistolgrip	Tritogonia verrucosa	Mussel		Endangered
Edible Valerian	Valeriana edulis var. ciliata	Plant		Threatened

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