

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: January 18th, 2023
Subject: Priority Resources and Targeting

The following memo provides a summary of the updates to priority lakes and streams based on the discussion of the December Advisory Committee (AC) meeting. The AC will review, provide comments for change, and approve priority lake and streams for the Lower Minnesota East Planning Area.

Additional discussions took place at the AC meeting that included resource-based targeting. A draft outline of possible targeting criteria is summarized for identified resource concerns. As time allows, the AC will review and provide comments to develop targeting criteria for next steps in the planning process.

PRIORITY RESOURCES

LAKE PRIORITIZATION

Nearly / Barely Status:

The primary consideration for the selection of priority lakes are nearly/barely lakes. Nearly barely lakes are the lakes that are closest to meeting the water quality standard set by the MPCA for the North-Central Hardwood Forest (NCHF) ecoregion. The standard for is 60 ug /L and 40 ug/L for shallow lakes and deep lakes, respectively. All lakes within one level of magnitude of the standard are included for priority lake consideration. There are 4 protection lakes and 7 restoration lakes that are classified as nearly-barely in the Planning Area. Table 1 below lists each of these lakes.

Recreational Value and Public Health:

Lakes classified as a deep lake (more commonly used for boating and swimming) with public access, public park adjacent to the lake, or public beach for swimming were also included for priority lake consideration. Algae blooms can be dangerous to swimmers and dogs and have an impact on the recreational value of the lake. Special consideration was given to these lakes:

- Spring
- Cedar
- Clear

Connectivity:

Lakes connected to nearly-barely lakes were given special consideration. Upon completion of priority streams, additional lakes may be considered for connectivity to priority streams.

- Spring (Lower and Upper Prior Lake)
- Cody and Phelps (LeMay)
- Schneider (Thole and O'Dowd)

Professional Judgement:

During the meeting, discussion will be necessary to finalize the list of priority lakes. Additional consideration for removing or adding as well as possible tiering criteria may be based on professional judgement. Professional judgment may include momentum towards goals, landowner support, political support, funding mechanisms, and capacity/distribution of work.

Memorandum

Lower Minnesota River East - Advisory Committee

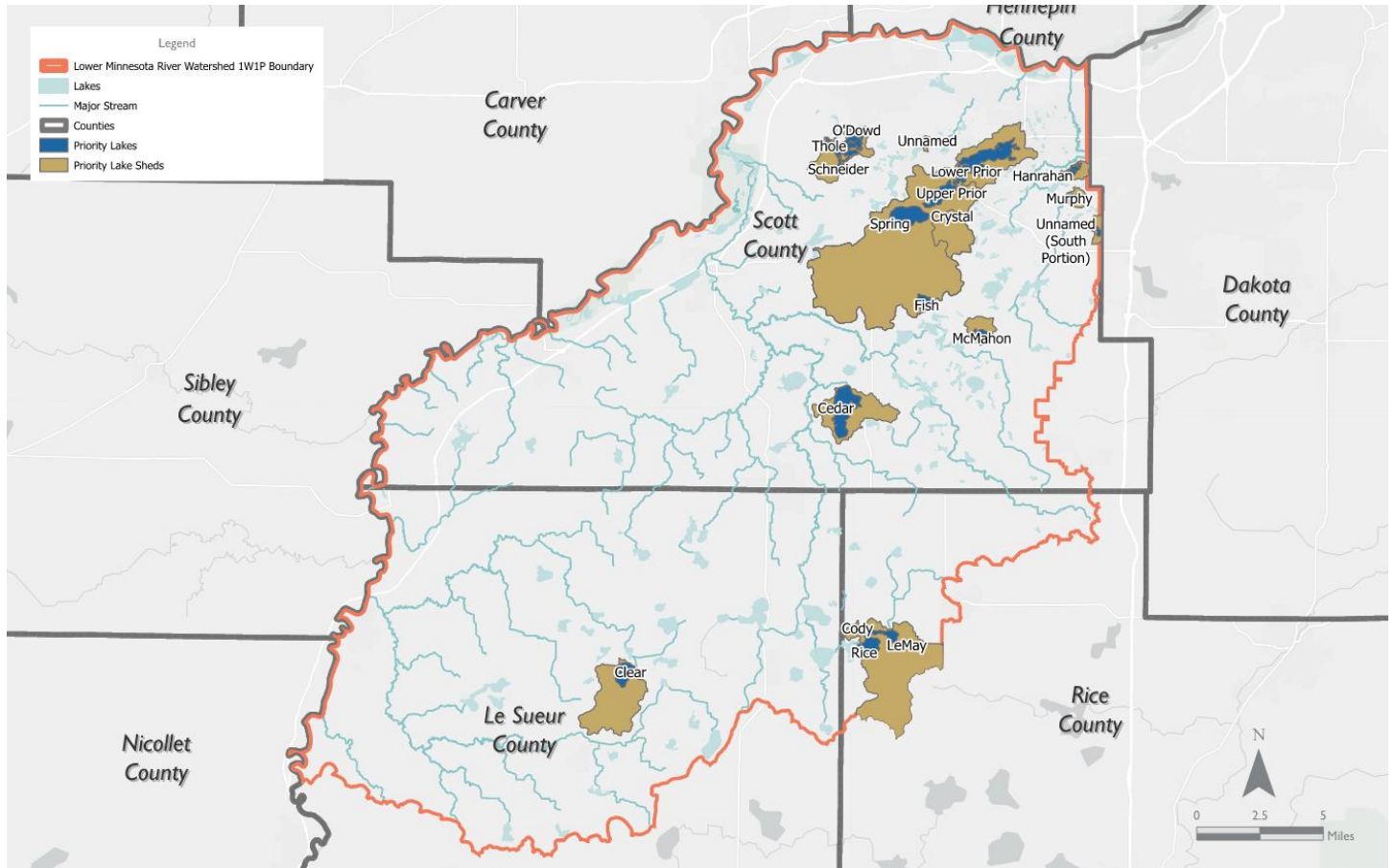


Figure 1: Priority Lakes and Subwatersheds

TABLE 1: CANDIDATE LAKES FOR PRIORITIZATION

Lake Name	County	Depth Class	Impairment Status	Ecoregion	Mean TP (ug/L)	TP Standard (ug/L)	% Mean P from P Standard	Lakeshed Area (ac)
Hanrahan	Scott	Shallow	N	North-Central Hardwood Forest (NCHF)	37	60	38%	351
Lower Prior	Scott	Deep	N	NCHF	25	40	37%	2866
Murphy	Scott	Deep	N	NCHF	28	40	30%	300
Unnamed (Hass)	Scott	Shallow	N	NCHF	44	60	27%	115

Memorandum

Lower Minnesota River East - Advisory Committee



Lake Name	County	Depth Class	Impairment Status	Ecoregion	Mean TP (ug/L)	TP Standard (ug/L)	% Mean P from P Standard	Lakeshed Area (ac)
Unnamed (South Portion)	Scott	Deep	N	NCHF	38	40	4%	284
O'Dowd	Scott	Deep	N	NCHF	46	40	-15%	774
McMahon	Scott	Shallow	N	NCHF	70	60	-17%	578
Fish	Scott	Deep	Y	NCHF	47	40	-17%	699
Crystal	Scott	Deep	N	NCHF	55	40	-37%	1249
Lemay	Rice	Deep	N	NCHF	61	40	-52%	6017
Thole	Scott	Shallow	Y	NCHF	104	60	-73%	1023
Upper Prior	Scott	Deep	Y	NCHF	72	40	-79%	2360
Spring	Scott	Deep	Y	NCHF	90	40	-125	12431
Cedar	Scott	Deep	Y	NCHF	185	60	-208%	2447
Clear	Le Sueur	Deep	Y	NCHF	334	40	-735%	3116
Cody	Rice	Shallow	Y	NCHF	344	60	-474%	See LeMay
Phelps	Rice	Shallow	Y	NCHF	390	60	-551%	See LeMay
Schneider	Scott	Shallow	NA	NCHF	NA	NA	NA	See Thole

STREAM PRIORITIZATION

Below summarizes the priority streams that were listed in the AC survey that was completed prior to December's AC meeting. In discussion during the December AC meeting, members prioritized and emphasized sediment as a priority concern. Below outlines framework for tiering priority streams based on the discussion of December AC meeting with prioritizing sediment concerns.

Memorandum

Lower Minnesota River East - Advisory Committee



Tier A: When considering priority resources, the AC primarily focused on pollutant loading and impacts to the Minnesota River. Additionally, The Minnesota River has great impacts to downstream waters including the Mississippi River, Lake Pepin, and eventually the Gulf of Mexico. Lastly, the Minnesota River has the greatest recreational value for streams within the Planning Area with multiple public accesses, refuges, and parks.

Tier B: Tier B includes streams with large sediment exports (near channel and overland) to the Minnesota River. Eagle Creek was also included as high value resource as a trout stream and has been identified as a high value protection stream for sediment.

Tier C: Tier C includes streams with other pollutant concerns such as E. Coli and chloride. Additional consideration was given to streams with IBI impairments or connectivity issues.

TABLE 2: CANIDATE STREAMS FOR PRIORITIZATION

Stream	Priority Class	HUC10 Watershed	Impairments	Prioritization Criteria	Available data
Minnesota River	Tier A	All	Nutrients Turbidity Fecal Coliform	Large sediment supply, state priority, impacts to downstream water such as Mississippi River and Lake Pepin, high recreational value	Available: approved E. Coli TMDL, approved turbidity TMDL approved in downstream reach
Sand Creek	Tier B	Sand Creek	IBI TSS Chloride E. Coli	Largest contributor of sediment in Planning area to MN River METC and DNR priority	Available: TSS model including near channel sources, PTMAApp analysis, approved chloride TMDL
Le Sueur Creek	Tier B	Le Sueur Creek	IBI E. Coli	High loading to MN River based on HSPF overland erosion Flooding concerns, underfunded in past, DNR priority for sediment, WRAPS priority stream	
Roberts Creek	Tier B	City of Belle Plaine – Minnesota River	IBI TSS	High loading to MN River based on HSPF overland erosion WRAPS priority stream	
Eagle Creek	Tier B	Minnesota River	E. Coli	Protection stream Trout stream, cultural significance to community, MPCA and DNR priority for	Available: Trout Steam Management Plan

Memorandum

Lower Minnesota River East - Advisory Committee



				protection, WRAPS priority stream	
Forest Prairie Creek	Tier C	Le Sueur Creek	IBI E. Coli	WRAPS priority stream	
Unnamed Creek (761 - near Henderson)	Tier C	City of Le Sueur - Minnesota River	E. Coli	Citizen and county concern with limited action or funding	
Porter Creek	Tier C	Sand Creek	IBI Turbidity E. Coli	Tributary of Sand Creek - largest contributor of sediment to MN River	
Raven Stream	Tier C	Sand Creek	IBI Chloride E. Coli	Tributary of Sand Creek - largest contributor of sediment to MN River	Available: approved chloride TMDL
Unnamed Creek - 604 (County Ditch 13)	Tier C	Minnesota River	IBI	Large contributor of P to Spring Lake, a priority lake	Available: Upper Watershed Blueprint
Unnamed Creek - 728 (Prior Lake Outlet Channel)	Tier C	Minnesota River	IBI	Outlet for Prior Lake and main drainageway for the City of Prior Lake	Available: Upper Watershed Blueprint, Stormwater Management Flood Mitigation Study
Credit River	Tier C	Minnesota River	Chloride	METC Priority Water, chloride impairment, increasing chloride trend, MPCA priority for restoration	Available: Protection Plan

RESOURCE BASED TARGETING - STREAMS

SEDIMENT - NEAR CHANNEL:

Background:

Near channel sources (gully, ravine, and bank erosion) are the largest contributor of sediment to stream reaches in the watershed and the Minnesota River. A study found Sand Creek was the 2nd largest contributor of sediment to the Minnesota River behind the Le Sueur River. Ravines along the Minnesota River are also a known source of near channel erosion. There are varying levels of data collection and monitoring available for the ravines and gullies along the Minnesota River in the Planning Area.

Targeting:

Targeting:

- Sand Creek
 - Source: Sand Creek Total Suspended Solid Model and Analysis of Potential Management Practices - <https://www.scottcountymn.gov/Archive/ViewFile/Item/359> (See pg 32)
 - Middle and Upper Sand Creek subwatershed have the highest TSS yield.
 - Management strategies found wetland restoration in the upper watershed and stabilization of middle sand channel to be most effective for pollution reductions.
- Gullies and Ravines adjacent to Minnesota River

Memorandum

Lower Minnesota River East - Advisory Committee



- Source: High priority areas identified in LMRWD 2021 Gully Inventory - https://lowermnriverwd.org/application/files/8416/6818/9034/2021_Gully_Inventory_Final_2022-07-15_r.pdf (See pg 78-101)
 - Main branch of Eagle Creek
 - Savage Bluff Line
 - Shakopee Bluffs
 - Kelly Court
- Source: Feasibility Report for Stabilization of Salisbury Hill and County Road 6 Ravines
 - Salisbury Hill
 - County Road 6
- Known ravines in Le Sueur County and portions of Scott County not already prioritized
 - Feasibility study needed to inventory and prioritize areas

Data Gaps:

- Data collection, monitoring, and feasibility studies for ravine areas in Le Sueur County and portions of Scott County
- Models that include near channel erosion

SEDIMENT - OVERLAND:

Background:

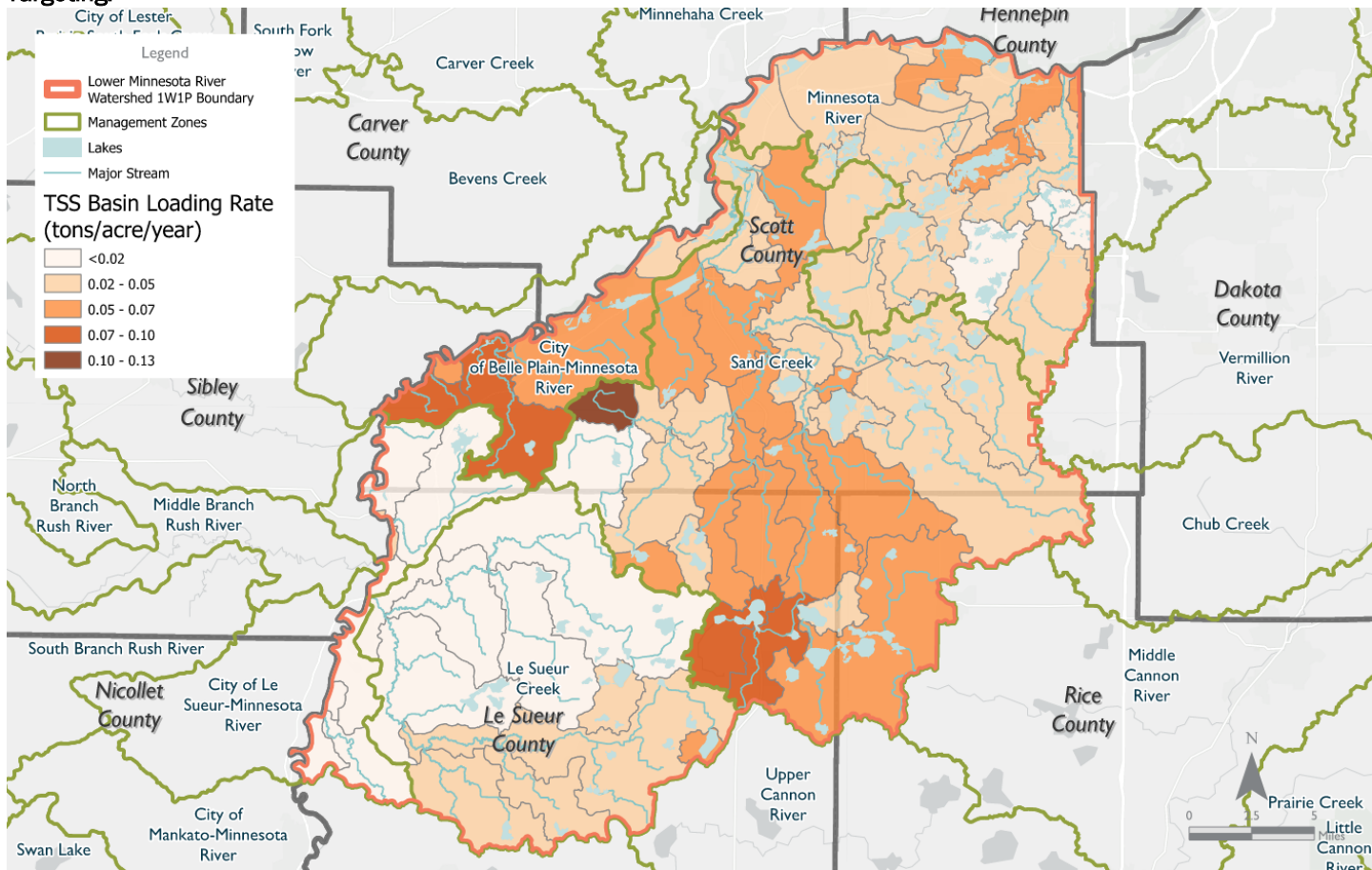
Cropland erosion is the second largest contributor of sediment to stream reaches in the watershed and the Minnesota River. HSPF model analyzes overland erosion. The heat map shown below indicates the subwatersheds with the highest sediment loading rate (not including near channel contributions). Streams with the highest annual load to the Minnesota River from overland sources are Le Sueur Creek (33,327 tons/year) and Sand Creek (13,027 tons/year).

Memorandum

Lower Minnesota River East - Advisory Committee

ISG

Targeting:



E. COLI:

Background:

E Coli impairments are widespread throughout the planning area. E Coli impairments can be very complex. In most cases, the first step is to identify the sources of E Coli in order to target efforts. E Coli monitoring can be very expensive and have results that are inconclusive. The outcome from the last AC meeting determined that the partners would focus on the areas with known concerns from landowners and impairments with cultural and habitat values.

Targeting:

Candidate streams based on impairments:

- Considerations per Dec. AC Meeting
 - Eagle Creek
 - Unnamed Creek near Henderson
- Priority Streams with E. Coli impairments
 - Credit River
 - Forest Prairie Creek
 - Le Sueur Creek

Memorandum

Lower Minnesota River East - Advisory Committee



- Porter Creek
- Raven Stream
- Rave Stream, East Branch
- Robert Creek
- Sand Creek
- Other streams based on impairments:
 - County Ditch 10
 - Unnamed Creek (headwaters to Unnamed Creek)
 - Unnamed Creek (Unnamed Creek to JD 2)
 - Unnamed Creek (Brewery Creek)

CHLORIDE:

Background:

The Met Council conducted a study that found nearly all monitored streams have experienced a rise in chloride levels in the Metro area. Chloride pollution in water is permanent, therefore reversing the increasing trend to protect and preserve natural and groundwater resources is critical. The main sources of chloride in waterbodies include de-icing salt, synthetic fertilizers, household water softening salt, and livestock waste. Chloride impacting surface water can infiltrate and impact groundwater resources. Chloride concentrations from MPCA ambient groundwater monitoring found increasing trends. Two ambient groundwater wells in the Planning Area exceeded the EPA drinking water standard of 250 mg/L.

Targeting:

Candidate streams based on impairments:

- Credit River
- Raven Stream
- Raven Stream, East Branch
- Sand Creek

CHANNEL ALTERATIONS - CONNECTIVITY

Background: Channel alterations and connectivity may adversely impact water quality and hydrology as well as limit fish migration. Channel alternations and connectivity have been identified as a stressor to aquatic habitat for many reaches in the watershed. Channel alterations and connectivity may be dams, perched culvert, dredging channels, and straightening channels among others.

Targeting:

- From DNR Concern Letter
 - Le Sueur Creek
 - Forest Prairie Creek
- Priority Streams with channel alteration/connectivity stressor
 - Sand Creek
 - Unnamed Creek (County Ditch No. 13)
 - Unnamed Creek (Prior Lake Outlet Channel)
- Other candidate streams based on stressors
 - County Ditch 42

Memorandum

Lower Minnesota River East - Advisory Committee

ISG

- Picha Creek
- Unnamed Creek (CD 56 to Le Sueur Creek)
- Unnamed Creek (Railroad bridge to East Branch Raven Stream)
- Unnamed Creek (Brewery Creek)

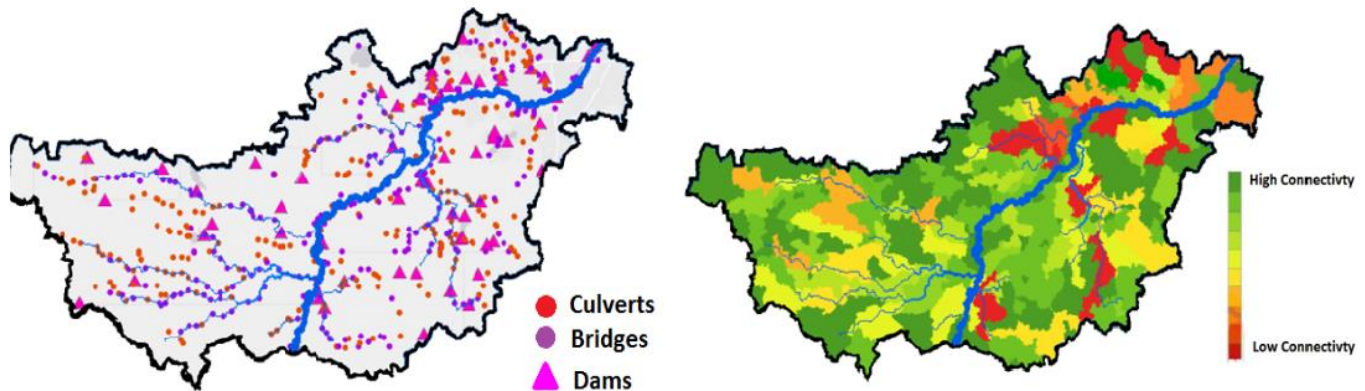


Figure 19 Culvert and dam locations on streams within the LMRW. DNR combined the locations of culverts and dams to develop a connectivity index for the LMRW. Maps developed utilizing DNR WHAF.

WATER STORAGE

Background: Hydrology has been significantly altered within the watershed due to land use changes which have altered flow rates, drainage, volumes, and storage causing flooding, erosion, and downstream impacts. Increases in precipitation and climate change have also contributed to increases in flow rates and volumes. Through various studies, water storage has been found to be the most cost effective strategy to compact the impacts of altered hydrology.

Targeting:

- Unnamed Creek (prior lake outlet channel) – storage in upper watershed identified in Prior Lake Stormwater Management Flood Mitigation Study
- Le Sueur Creek – Citizen concern from kickoff meeting
- Sand Creek – Identified as key strategy for sediment reduction
- Others?

DRAINAGE SYSTEMS

Background: Drainage systems have concerns related to altered hydrology, channel alterations, connectivity, lack of storage, sediment, and nutrients. Agricultural conservation practices are needed to improve water quality and water storage.

Targeting:

- Public Drainage Systems

Memorandum

Lower Minnesota River East - Advisory Committee

ISG



Figure 2: Public Drainage Systems

GROUNDWATER

Groundwater is a crucial resource as 100% of the drinking water for residents within the planning area is supplied from groundwater resources. Vulnerability ranking for groundwater can be classified as 1) DWSMA vulnerability ranking for public water supplies or 2) Aquifer vulnerability ranking areas with private water supplies. These areas can help identify where groundwater may be susceptible to contamination through surface water – groundwater connections and assist with targeting.

Memorandum

Lower Minnesota River East - Advisory Committee

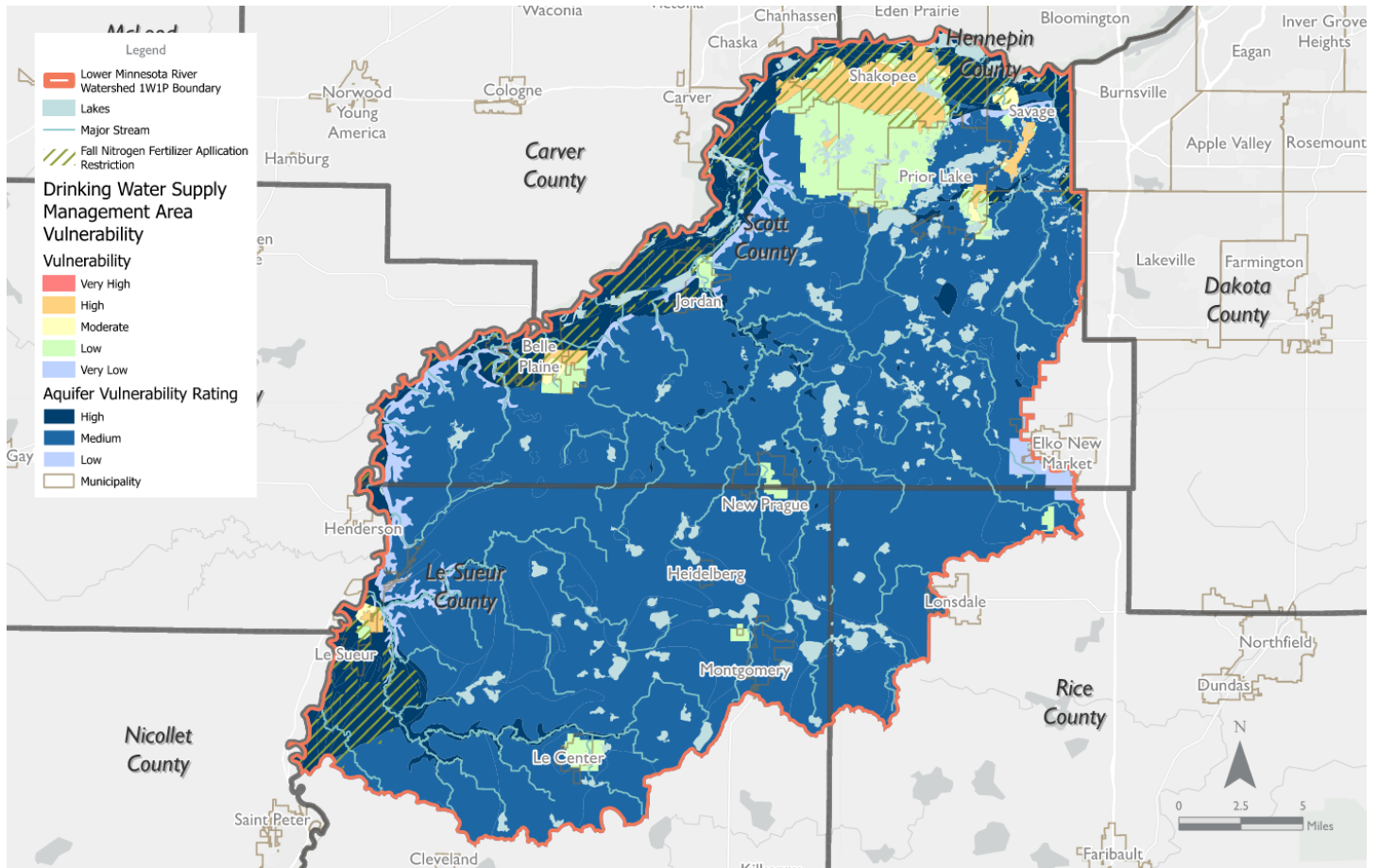


Figure 3: DWSMA Vulnerability and Aquifer Vulnerability Ratings

Memorandum

Lower Minnesota River East - Advisory Committee

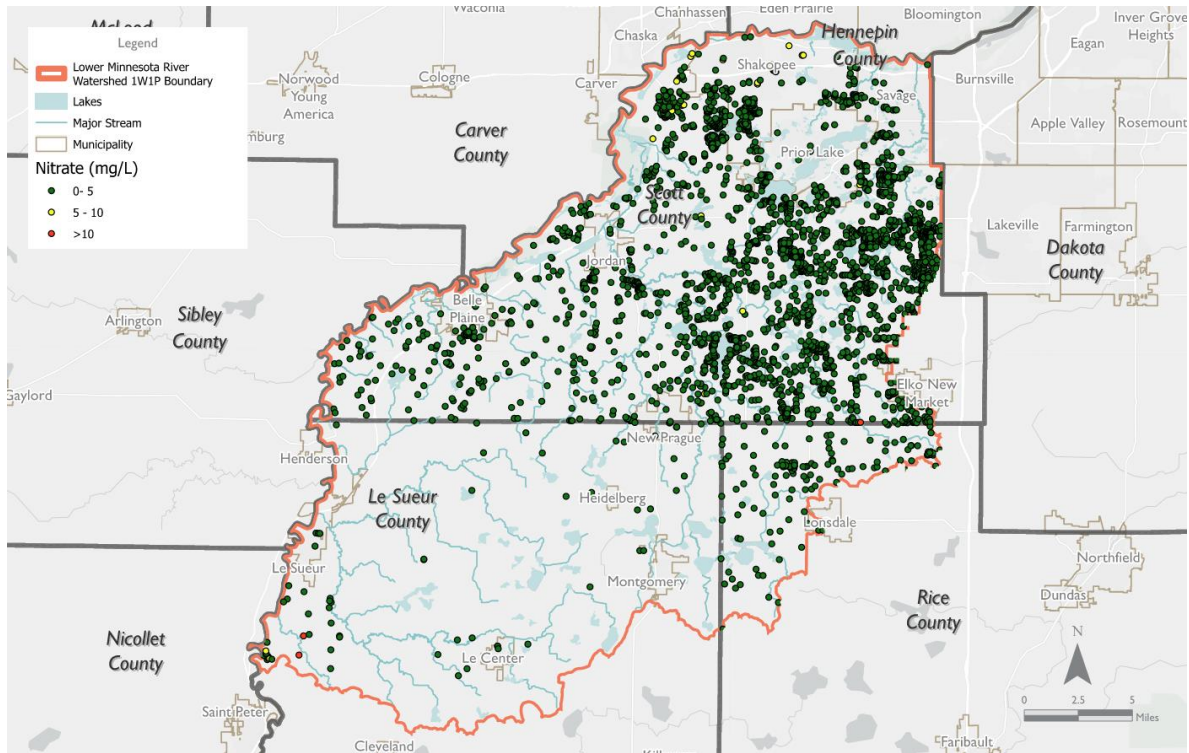


Figure 4: County Well Index Nitrate Testing Results

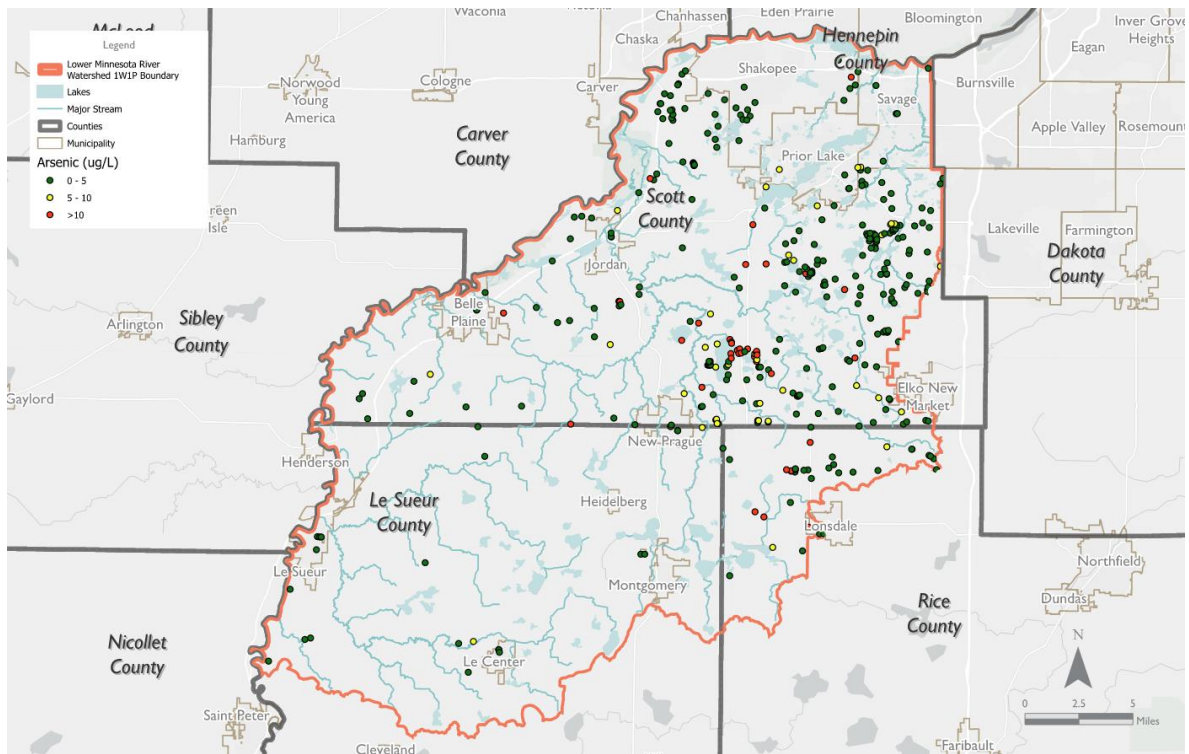


Figure 5: County Well Index Arsenic Testing Results

Memorandum

Lower Minnesota River East - Advisory Committee



HABITAT

Background: Per the Steering Team's direction, the habitat restoration efforts will focus on riparian areas and connectivity of habitat corridors. Connectivity of habitats corresponds to greater diversity and stronger ecosystems. Riparian areas can have multiple benefits to water quality through filtering pollutants and water quantity through connectivity to floodplain.

Targeting:

Criteria: existing vegetation, distance from public water, NWI status

NEXT STEPS: 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.