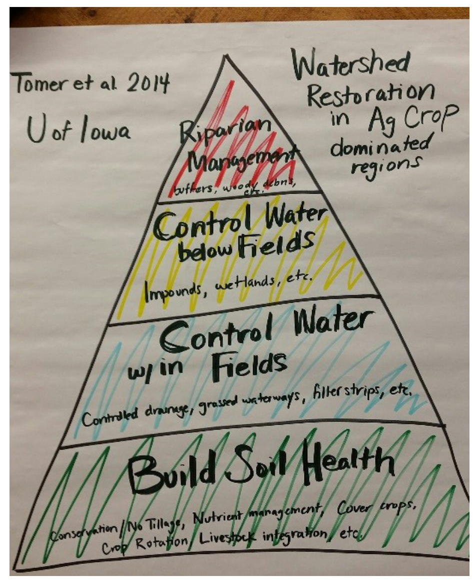
Hawk Creek

Watershed Restoration and Protection Strategies Report (WRAPS) Report Summary

How we can improve and protect it

The Hawk Creek Watershed Restoration adn Protection Strategy (WRAPS) identifies the watershed's impaired water bodies and those in need of protection, and identifies the actions needed to achieve and maintain good water quality. The strategy grew from the combined efforts of citizens, landowners, the Hawk Creek Watershed Project, and local and state water-quality scientists.



The Hawk Creek Watershed is part of the Minnesota River-Yellow Medicine River Major Watershed, one of 13 major watersheds in the Minnesota River basin. Named by the Native Americans for the kestrel, a small falcon, Hawk Creek flows 70 miles from its source at Eagle Lake north of Willmar, before entering the Minnesota River southeast of Granite Falls.

Prior to European settlement, Hawk Creek meandered through a sea of prairie grass dotted by wetland potholes. Since the 1950s, ditching has altered much of its natural channel and hydrology south of Willmar. Rapid water runoff from tributaries such as Hawk Creek contributes to degraded water quality in the Minnesota River. Improving water quality in Hawk Creek and the greater Minnesota River Basin requires managing our water and land resources for the dual goals of water quality and agricultural production.

Generally, most streams and lakes in the Hawk Creek Watershed do not meet acceptable, scientific standards for water quality. Streambank erosion and stormwater runoff deliver pollutants to streams and lakes in the watershed, which can have negative impacts on water quality. Runoff from agricultural activities carries excess phosphorus, nitrogen, sediment and bacteria into water bodies.

These pollutants degrade water quality and are harmful to fish and other aquatic life. Actions needed to achieve and maintain water quality include: Vegetated buffers along shoreland, stabilized stream banks, and stormwater-control projects. Agricultural practices include greater use of cover crops, minimum or no tillage, temporary storage of water, and greater crop diversity.

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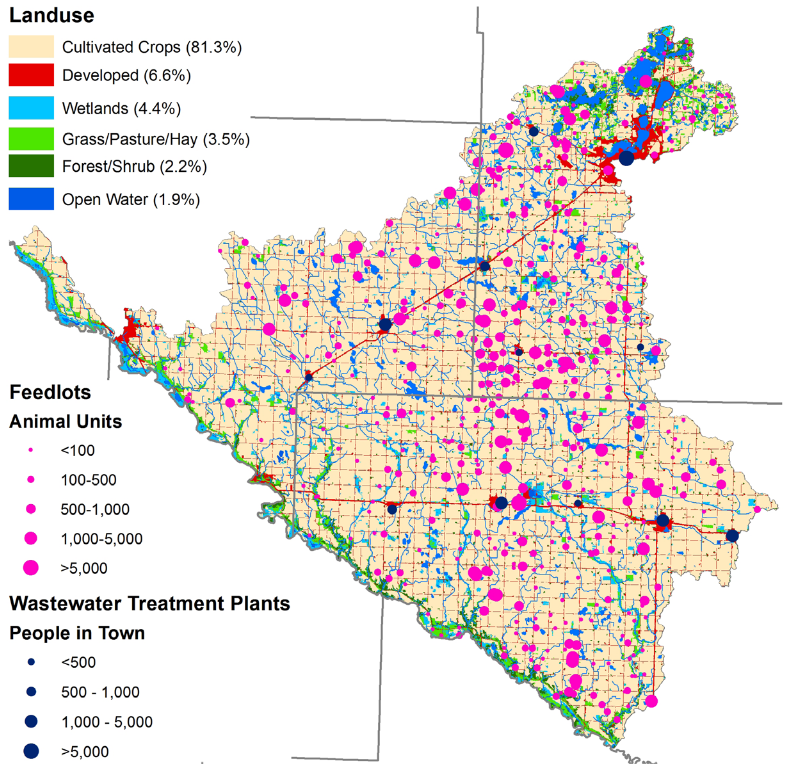
Actions needed to achieve and maintain water quality include: Plant buffers along shoreland, stabilized stream banks, and stormwater-control projects. Agricultural practices include greater use of cover crops, minimum or no tillage, temporary storage of water, and greater crop diversity.

Minnesota has adopted a "watershed approach" to address the state's 80 major watersheds. This approach looks at an entire watershed area as a whole instead of focusing on lakes and stream sections one at a time. The watershed approach incorporates the following into a 10-year cycle:

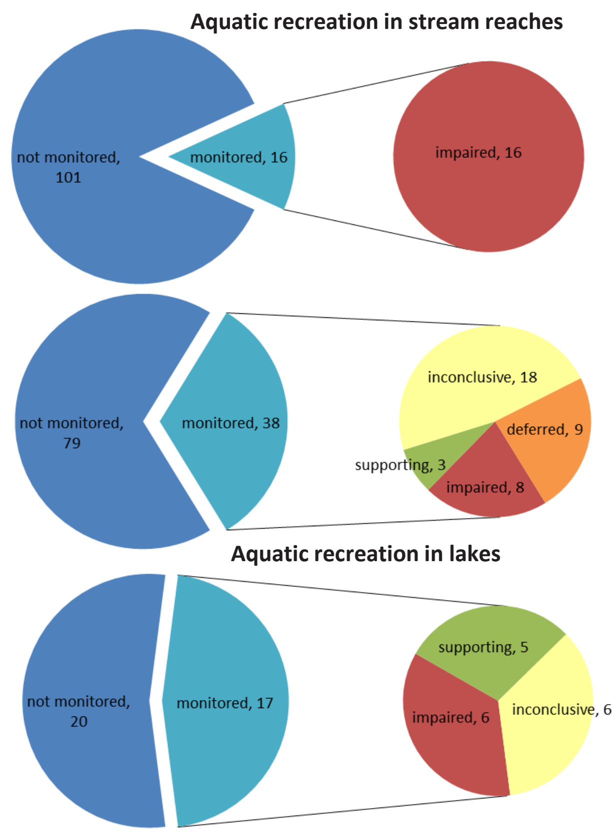
- Collect waterbody chemistry and biology data
- Assess the data to determine the conditions of waterbodies
- Develop strategies to restore and protect water bodies
- Plan and implement restoration and protection projects



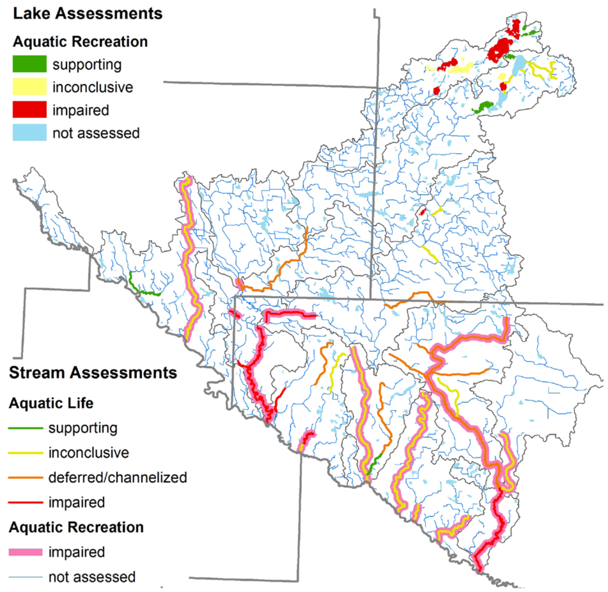
The Hawk Watershed area drains approximately 626,000 acres to the Minnesota River. Fifteen towns and cities are in or partially in the watershed: Bird Island, Blomkest, Clara City, Danube, Granite Falls, Maynard, Montevideo, Olivia, Pennock, Prinsburg, Raymond, Renville, Sacred Heart, Watson, Willmar and portions of three counties: Renville, Kandiyohi, and Chippewa. Land use in the watershed includes 81% agriculture, 6.6% developed, and 4.4% wetlands.

Waterbodies were monitored throughout the watershed to determine if they support aquatic life and aquatic recreation beneficial uses. See pie charts at right for the number of waterbodies monitored and assessment results by beneficial use.

For aquatic recreation assessment, streams were monitored for bacteria and lakes were monitored for clarity and algae-fueling phosphorus. For aquatic life assessment, streams were monitored for both aquatic life populations and pollutants that are harmful to these populations. When monitored parameters (bacteria, phosphorus, fish populations, etc.) do not meet the water quality standard, the water body is impaired.



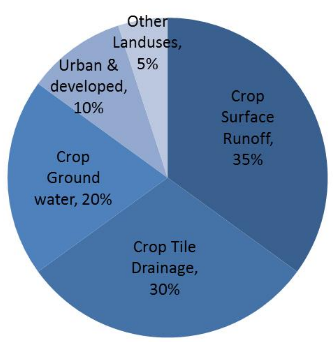
Monitoring and assessments of the waterbodies revealed poor conditions throughout much of the watershed. The map to the right shows the impairments for streams and lakes in the Hawk Watershed. Of the waterbodies monitored, only one stream reach and six lakes were found healthy enough to safely support aquatic recreation and one stream reach was healthy enough to support an appropriate fish and macroinvertebrate community (green). Impairments (red and pink) and channelized streams (orange) are common. Several lakes and streams need more data to make a conclusive finding (yellow). A large number of streams and lakes have not been assessed (blue).



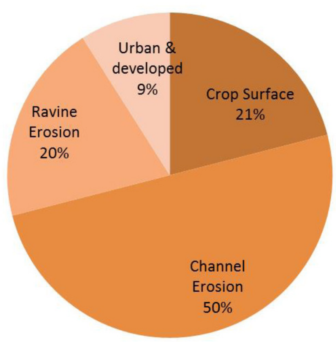
The identified pollutants and stressors causing impairments include:

- Altered hydrology: Artificial drainage is driving many of the problems in the watershed.
- Bacteria: Fecal bacteria indicate sewage or manure in water, which make the water unsafe for swimming.
- Dissolved oxygen: Aquatic life require adequate oxygen to live.
- Sediment and Turbidity: Soil and other particles impact aquatic life by reducing habitat.
- Nitrogen: Excess nitrogen is toxic to aquatic life and contributes to the Hypoxic zone in the Gulf of Mexico.
- Phosphorus: Excess phosphorus can cause algae blooms that degrade habitat and recreation.

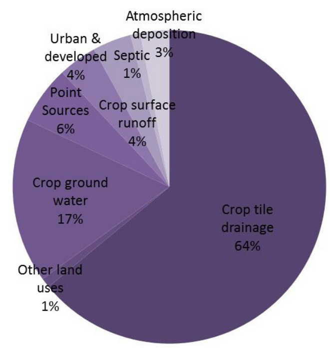
Sources of the pollutants and stressors were estimated by the WRAPS workshop participants, after examining multiple lines of evidence and applying their local knowledge and professional judgment. Source assessments for hydrology, sediment, nitrogen and phosphorus are represented in the pie charts below:



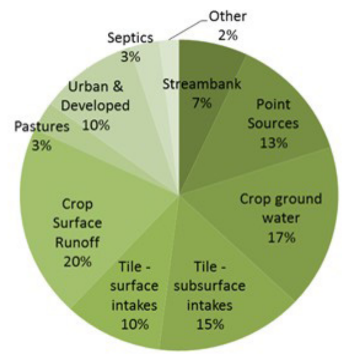
Hydrology



Sediment



Nitrogen



Phosphorus

The water quality goals presented for the Hawk watershed synthesize multiple layers of water quality goals into one watershed-wide goal (see table at right). Individual stream reach and lake goals were developed using the Hawk Creek Watershed Total Maximum Daily Load (TMDL) (PCA, 2016b) and the Long and Ringo Lake TMDL (PCA, 2011c). To set the watershed-wide goal, multiple water quality goals were considered: restoration of water quality to meet TMDLs within the watershed, protection of water quality to prevent degradation, and restoration and protection of downstream waters including the Minnesota River Sediment Reduction Strategy (PCA, 2015h), the Lake Pepin Phosphorus Reduction Project (PCA, 2016a), and state-level and national-level goals such as the Minnesota State Nutrient Reduction Strategy (PCA, 2015j).

Pollutant/Stressor	Goal
Altered Hydrology	25% reduction and increase base flow
Sediment	50% reduction
Phosphorus	60% reduction in river 50% reduction in lake
Nitrogen	45% reduction
Bacteria	80% reduction
Habitat	45% increase

Based on the impairments and source assessment information, a strategies table (see Table 14 in the report) was developed to restore and protect waterbodies in the Hawk watershed. Strategies Table 14B shows the types of practices and associated adoption rates estimated to meet the water quality goals and 10-year targets. A snapshot of this table is shown at the right. The parties responsible for making, facilitating, and overseeing the changes associated with the 10-year targets were identified by the WRAPS workshop participants. In other words, the strategies provide high-level information on "what" to do and "who" should do it. These strategies need to be refined in local planning processes to determine "how" the strategies will get done and "where" the practices will be targeted.

Land use/ Source Type	Watershed Restoration and Protection Strategies estimated to meet 10-year target at specified adoption rates	Adoption Rate		Practice Effectiveness					
		% watershed to newly treat	Acres to newly treat	Flow	TSS	Phosphorus	Nitrogen	Bacteria	Habitat ‡
Cultivated Crops	Nutrient management (for P & N)	7%	43,800			o	x		
	Cover crops	5%	31,300	x	x	o	x	X	-
	Reduced tillage	5%	31,300	o	x	o	x	o	-
	Crop rotation (including small grain)	4%	25,000	o	-	-	o		-
	Buffers, border filter strips*	3%	18,800	-	o	-	-	o	-
	Alternative tile intakes*	2%	12,500		x	x		o	
	Treatment wetland (for tile drainage system)*	2%	12,500	-		o	x		-
	Improved manure application	1%	6,300	o		o	x	X	-
	Conservation cover	1%	6,300	X	x	x	X	x	-
	Grassed waterway*	1%	6,300	-	o	-	-		-
	WASCOBS, terraces, flow-through basins*	1%	6,300	-	o	-	-	-	-
	Controlled drainage, drainage design*	1%	6,300	-		-	x		-
	Saturated buffers*	1%	6,300	-		-	x		-
	Wood chip bioreactor*	1%	6,300			-	x		
	Livestock integration	1%	6,300	x	x	x	X	X	-
	Wetland Restoration	1%	6,300	X	x	x	X	x	-
	Wind Breaks*	1%	6,300		-	-			
	In/near ditch retention/treatment*	1%	6,300		o	-			
	Retention Ponds	0.1%	600	X	x	x	X	x	-
	Contour strip cropping (50% crop in grass)	0.1%	600	x	x	x	x	x	-
	Mitigate new ag drainage projects†	All new projects		n/a (protection)					
	Maintain existing BMPs, CRP, RIM, etc. †	All current BMPs		n/a (protection)					

Practice Effectiveness Key
calculated % of goal addressed if 1% new watershed adoption
X = >2%
x = >1%
o = >0.5%
- = >0%
<blank> = ~0%

Full report

To view the full report visit https://www.pca.state.mn.us/water/watersheds/minnesota-river-yellow-medicine-river-hawk-creek.

Contact person

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MINNESOTA POLLUTION CONTROL AGENCY

CLEAN WATER LAND & LEGACY AMENDMENT