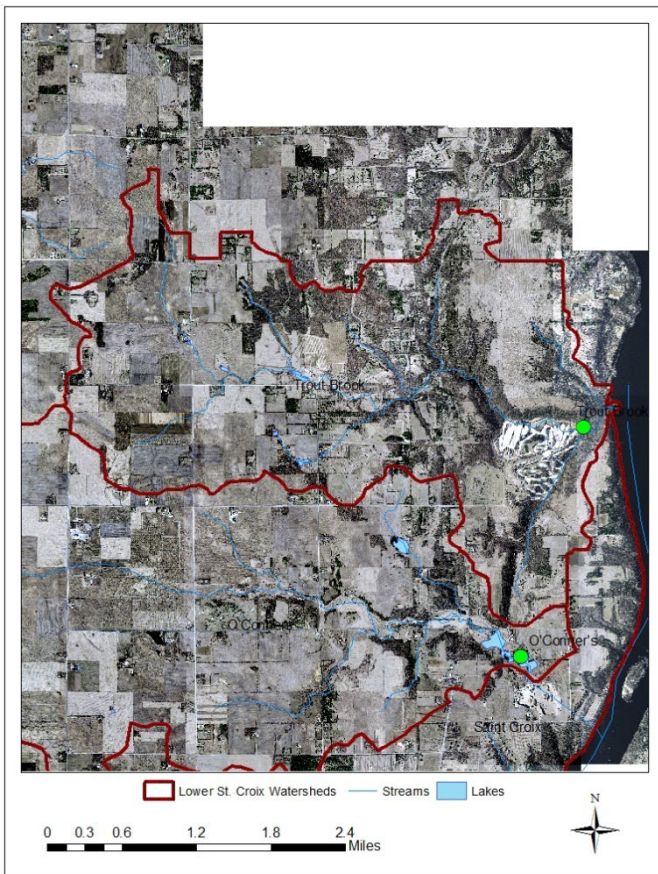




SOUTH WASHINGTON WATERSHED DISTRICT

Trout Brook

Municipality: Denmark Township, Afton Watershed Area: 5,537 Acres
TMDL Maximum Allowable Phosphorus Load: 0.22 lbs/ac/yr



Map 1: Trout Brook

The Trout Brook regional assessment monitoring station (Map 1) was established in 2011 and is used to assess the Trout Brook watershed and loading to Lake St. Croix. The Trout Brook watershed was historically forested. Much of the watershed is now agricultural lands with some areas transitioning to residential. Additionally, a significant portion of the Trout Brook riparian zone is now used for parking and recreation at the Afton Alps ski area.

The primary purpose of the Trout Brook site is to assess the water quality of water draining out of the Trout Brook watershed to Lake St. Croix and evaluate the effectiveness of stream restoration and other water quality improvement projects throughout Afton Alps and the larger Trout Brook watershed. SWWD currently uses its default Total Phosphorus loading standard for developments in the Trout Brook watershed—maintain existing loading rates. Little development occurs

or is expected to occur in the watershed and it is likely that a more restrictive standard would have little positive impact.

Trout Brook drains to Lake St Croix which is listed as impaired. The MPCA has led the development of a total maximum daily load (TMDL) report for the Lake. That TMDL plan predicts loading from the Trout Brook watershed under 1990s conditions to be approximately 1900 lbs/yr and proposes a reduction to approximately 1230 lbs/yr, or 0.22 lbs/ac/yr, in order to restore Lake St. Croix. Monitoring data shows that Trout Brook is near that TMDL target.

Trout Brook is monitored with the use of an automated monitoring station that collects flow data and periodic water samples which are used in assessing water quality throughout the April through October monitoring season. All data is available at www.swwdmn.org. SWWD’s annual loading data is summarized in Table 1. Though the data record is limited, the total phosphorus loading rate consistently met the TMDL condition for Lake St. Croix prior to 2017. Loading largely exceeded the 0.22 lbs/ac/yr limit since from 2017 to 2020, reflecting increased flow. Loading was decreased in 2021 with onset of drought conditions in the second half of the year. Flow increased dramatically from 2017-2020 along with increased groundwater levels throughout the area. SWWD will continue to monitor loading at Trout Brook to track compliance with the TMDL.

In addition to nutrients, SWWD analyzes water quality samples for various pollutants. Water samples collected during storm events at the Trout Brook site routinely exceed State standards for copper, lead, and suspended solids, likely reflecting the influence of parking areas at Afton Alps Ski Area through which Trout Brook flows. E. coli levels are also a concern at Trout Brook which was added to the State’s impaired waters list due to high levels of E. coli observed in 2007 and 2008 by the MN Pollution Control Agency. Elevated E. coli levels have occasionally been observed since.

Table 1: Loading Summary for Trout Brook

Year	April-Oct Precipitation (in)	Annual Precipitation (in)	April-Oct Flow (CF)	April-Oct TP (lbs)	Projected Annual TP (lbs)	Projected Annual TP Loading Rate (lbs/ac/yr)*	April-Oct TSS (lbs)	Projected Annual TSS (lbs)
2011	20.7	31.7	47,988,083	456	782	.18	275,550	472,187
2012	18.6	31.1	28,799,535	357	445	.10	175,405	300,577
2013	21.0	34.0	34,579,123	361	509	.12	160,508	275,049
2014	26.9	39.2	53,331,236	533	851	.20	212,355	363,895
2015	30.2	38.7	56,398,568	532	854	.20	258,517	442,999
2016	31.9	37.5	53,336,336	470	721	.17	220,758	378,295
2017	26	28.3	67,677,099	635	985	.23	311,119	533,138
2018	24.6	28.3	70,370,595	714	1308	.30	503,092	862,107
2019	30.4	35.4	80,998,472	712	1220	.28	384,743	659,301
2020	21.7	25.2	73,233,165	605	1036	.24	311,410	533,636
2021	14.7	19.6	50,793,998	465	798	.18	233,040	399,342
2022	19	24.6	35,885,183	314	538	.12	116,958	200,421
Not monitored in 2023 due to ongoing stream restoration work								

Note: Loads are reported for the April-October monitoring season and scaled up to project annual loading rates. *Calculated loading rates reflect the monitored portion of the watershed which is 4,343 acres.