

Stream Status

Overall Strategy: Routine Watershed Management

Water Quality Rating: A-

Stream Class: Groundwater Large Watershed Nonurban (GWL)

Stream Type: Slightly entrenched, sand dominated, meandering channel, incised in gentle terrain.

Subwatershed Land Cover: 13% developed, 40% forests and woodlands, 9% grassland/shrubland/sparse vegetation, 36% planted or cultivated, 3% wetlands.



Macroinvertebrate Data (2002-2003)*

Metric	Score	Mean of Spring Creeks
Chironomidae Species Richness	21	21
Invertebrate Taxa Richness	26	31.75
HBI	4.5	4.4
% EPT	24.7	36.9
% Dominance	31.6	35.5
Most Common Families	Scuds, Black Flies and Small Minnow Mayfly	

Water Chemistry (2000-2002)*

Parameter	Site Mean	Site σ	MPCA NCHF Benchmark MIS/St. Croix River		Mean of Spring Creeks
TP [$\mu\text{g/L}$]	78.15	63.01	90	55	42.47
NO ₂ +NO ₃ [mg/L]	4.51	0.32	0.1	0.203	2.15
TSS [mg/L]	34.76	11.94	8.8	7.50	15.96
Temperature [C]	9.80	4.55	13.0	10.30	9.95

*Refer to 2010 Watershed Management Plan Section V, Stream Management Plans for definitions of macroinvertebrate metrics and water chemistry parameters.

BASIC FACTS

Section	19
Township	31
Range	19
Stream Length	0.9 miles
Subwatershed Area	1408 acres
Baseflow	0.86 cfs
Bankfull Flow	2.25 cfs
Entrenchment Ratio	1.42
Width:Depth Ratio	9.30
Sinuosity	1.10
Slope	0.02
Rosgen Class	G4
DNR Trout Stream	Yes

Fish Species:
Brook Trout

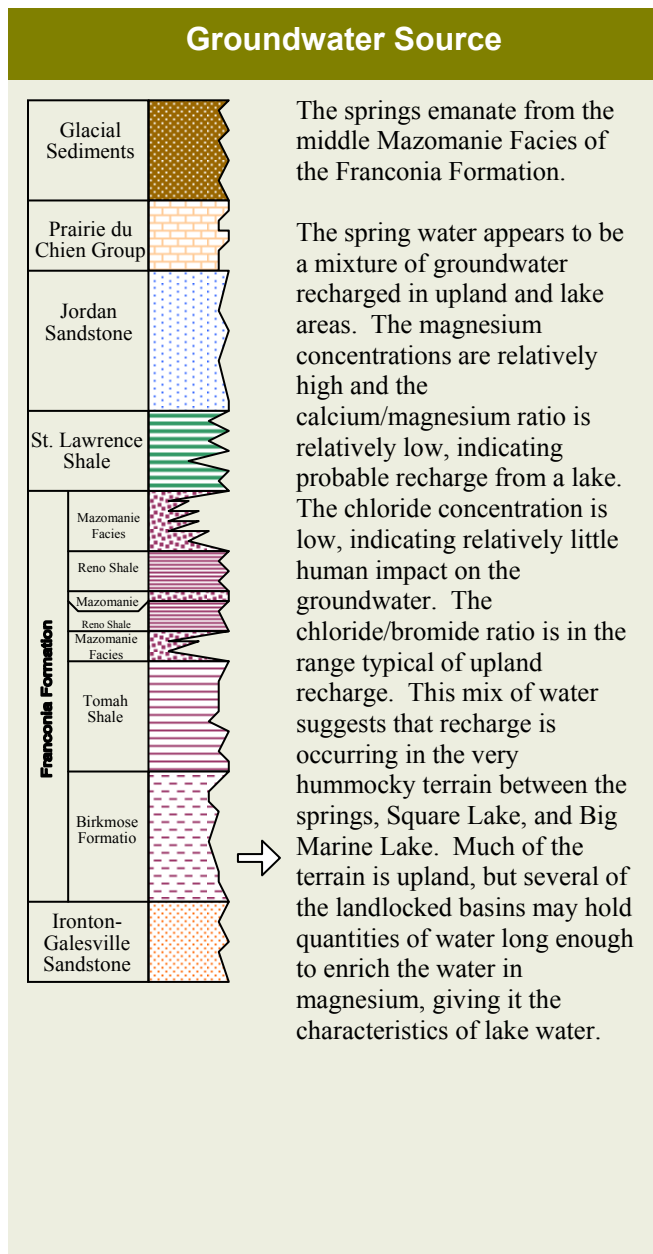
CMSCWD References:
Lower St. Croix River Spring Creek Stewardship Plan ('03)

Overall Assessment: Willow Brook

The 1150 acre watershed of Willow Brook is relatively undeveloped west of Highway 95, where it is dominated by forest, woodland, conifer plantation and old fields. The watershed east of Highway 95 is dominated by residential development, with Willow Brook flowing through the back yard of many residential homes. Willow Brook starts within a groundwater-dependent wetland complex west of Highway 95. East of Highway 95, Willow Brook flows through the Croixside Residential Development. Within this reach, Willow Brook is a moderate to high gradient stream. Just upstream of the St. Croix River, a series of small fish ponds has been formed behind concrete weirs.

The headwaters of Willow Brook encompass an excellent quality shrub fen/rich fen wetland complex. This wetland complex provides the majority of base flow to Willow Brook and is therefore important to the long term protection of this stream. Willow Brook contains populations of naturally reproducing brook trout (*Salvelinus fontinalis*). The Blanding's turtle (*Emydoidea blandingii*) is a state-listed threatened species that may be encountered throughout the watershed.

Based on macroinvertebrate data from the 2003 *Lower St. Croix River Spring Creek Stewardship Plan*, Willow Brook has a good water quality rating of 'A-.' Hilsenhoff's biotic index (HBI) is good and low dominance. However, data show a lower percent EPT (percent of pollutant intolerant mayflies, stoneflies and caddisflies in the sample) than other sites.



Key Management Recommendations

- Streamside buffers should be protected or, where lacking, established continuously from Highway 95 to the mouth of the St. Croix River. Streamside buffers should be planted with native trees, shrubs and groundcover species and should extend over Willow Brook to provide thermal protection.
- Stormwater runoff, especially from roads and rooftops, should be retained on-site through the use of infiltration practices. Due to the high permeability of soils in this area, pretreatment of runoff may be necessary to protect groundwater quality.
- Protect existing buffers and create new ones where lacking, around the margins of the headwaters wetland and associated seepage areas west of Highway 95.
- Control buckthorn within Rich Fen located west of Highway 95. Buckthorn should be hand cut and treated with a basal application of an approved herbicide.
- Fallen trees, log jams and other natural materials should not be cleaned out of the stream channel, but rather left in place to provide instream habitat for aquatic organisms.
- Re-establishment of the stream channel around the ponds (to maintain stream velocity and reduce sediment deposition) should be considered. It is possible that the ponds could still be retained if groundwater sources and or streamflow is adequate.
- Landowners adjacent to the headwaters wetland should limit ATV use around the margins of the wetland, where damage to vegetation and erosion may result.

* See *2010 Watershed Management Plan* Section V, *Stream Management Plans* for additional information on District stream management activities.

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