

Stream Status

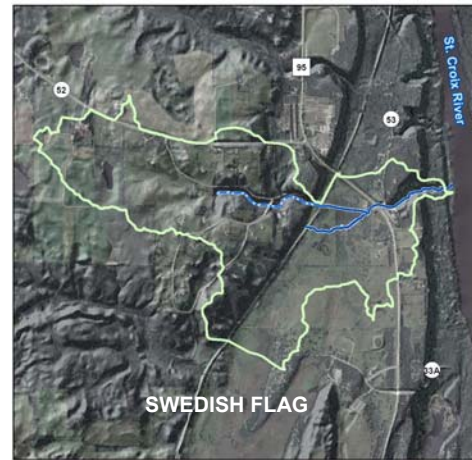
Overall Strategy: Routine Watershed Management

Water Quality Rating: A-

Stream Class: Groundwater Small Watershed Nonurban (GWS)

Stream Type: Unstable, incised, highly erodible channel primarily comprised of an unconsolidated, heterogeneous mixture of gravel, some small cobble, and sand.

Subwatershed Land Cover: 17% developed, 25% forests and woodlands, 15% grassland/shrubland/sparse vegetation, 1% lakes and open water wetlands, 19% planted or cultivated, 23% wetlands.



Macroinvertebrate Data (2002-2003)*

Metric	Score	Mean of Spring Creeks
Chironomidae Species Richness	20	21
Invertebrate Taxa Richness	32	31.75
HBI	4.26	4.4
% EPT	46.4	36.9
% Dominance	26.17	35.5
Most Common Families	Scuds, Nemourid Broadbacks 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 [$\mu\text{g/L}$]	32.94	8.38	90	55	42.47
NO ₂ +NO ₃ [mg/L]	1.24	0.67	0.1	0.203	2.15
TSS [mg/L]	8.43	10.71	8.8	7.50	15.96
Temperature [C]	9.56	4.37	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	30
Township	32
Range	19
Stream Length	0.74 miles
Subwatershed Area	514 acres
Baseflow	0.48 cfs
Bankfull Flow	4.18 cfs
Entrenchment Ratio	1.70
Width:Depth Ratio	5.60
Sinuosity	1.10
Slope	0.04
Rosgen Class	A4
DNR Trout Stream	No

Fish Species: N/A

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

Overall Assessment: Swedish Flag Creek

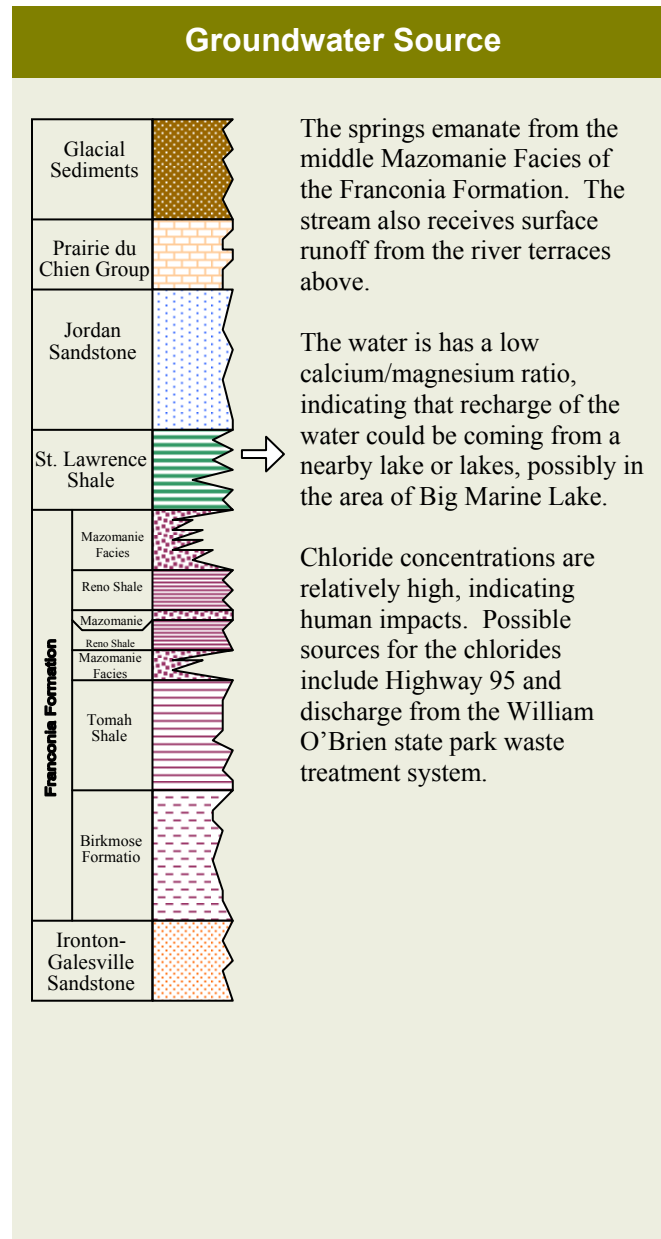
Swedish Flag drains a watershed area of 362 acres. The watershed extends approximately 1.5 miles west from the St. Croix River and encompasses the unincorporated town of Copus. Drainage from the west roughly parallels 199th Street. Swedish Flag is an ephemeral stream west of the Wisconsin Central Rail. Although some erosion is evident within this channel, it is not as pronounced as some of the other nearby streams draining from Scandia.

Two tributaries emerge from seeps along the east side of the Wisconsin Central Rail, and converge just upstream of the junction of 199th Street and Highway 95. Swedish Flag crosses under Highway 95 via a large box culvert, which abruptly terminates at the top of a 60 foot waterfall that plummets to the bottom of a deep gorge. Swedish Flag continues for approximately 0.25 mile where it outlets to the St. Croix River. Land use within the Swedish Flag watershed is dominated by agricultural fields (many of which are now fallow) in the upper watershed, and a mixture of forest and grassland in the lower watershed.

Swedish Flag receives significant groundwater inputs from one of the larger groundwater dependent wetland complexes in the study area. Extending from the north boundary of William O'Brien State Park to just north of the junction of CR 53 and the Wisconsin-Central Rail, this wetland complex includes rich fen, black ash seepage swamp and mixed hardwood seepage swamp.

Swedish Flag drains the southern-most portion of this complex along the north boundary of William O'Brien State Park. In the lower reaches, below Highway 95, riparian plant communities include a mixture of white pine-hardwood forest, maple-basswood forest and mixed hardwood seepage swamp. The plant communities in the lower reach of this stream are more fragmented and generally of lower quality than those of other nearby streams. Rare features associated with the Swedish Flag watershed include blanding's turtle (*Emydoidea blandingii*), documented near the Wisconsin-Central Rail crossing, and cerulean warbler (*Dendroica cerulean*), documented in the lower gorge section of the stream.

Swedish Flag is noteworthy in that data from the 2003 *Lower St. Croix River Spring Creek Stewardship Plan* indicate it contains the highest number of macroinvertebrate taxa collected for streams in the study area and ranked second in number of macroinvertebrate specimens collected. Hilsenhoff's biotic index (HBI) is good, and the data show an excellent percent EPT (percent of pollutant intolerant mayflies, stoneflies and caddisflies in the sample). Swedish Flag has a good water quality rating of 'A-.'



However, Swedish Flag downstream of Highway 95 is listed on the draft 2010 list of impaired waters for aquatic recreation (*E. coli*). If it remains on the final list, it will undergo Impaired Watershed Management.

Key Management Recommendations

- Work with riparian landowners to maintain and improve streamside buffers. In most cases, establishment of new buffers is not required, but rather the protection of existing buffers is desired. Buffers should encompass a zone that includes the stream floodplain, adjacent wetlands and adjacent steep slopes.
- Riparian landowners should retain woody debris and other naturally occurring material in the stream channel. This material provides protective pool habitat for fish and serves as substrate for periphyton, an important food source for macroinvertebrates.
- Portions of Swedish Flag west of Highway 95 are bordered by 199th Street North, resulting in runoff from the roadway into the stream. The Watershed should work with the County Highway Department and the City of Scandia to evaluate strategies to check erosion and control stormwater runoff rate and volume discharging from 199th Street.

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

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