

Stream Status

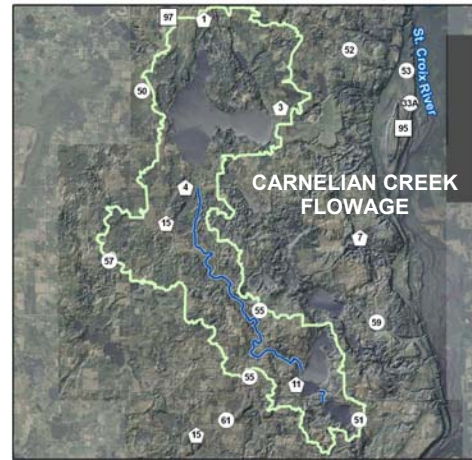
Overall Strategy: Routine Watershed Management

Water Quality Rating: B-

Stream Class: Surface Water (SW)

Stream Type: N/A

Subwatershed Land Cover: 12% developed, 23% forests and woodlands, 7% grassland/shrubland/sparse vegetation, 21% lakes and open water wetlands, 25% planted or cultivated, 12% wetlands.



Macro-invertebrate Data (2007)*

Metric	Score
Chironomidae Species Richness	9.7
Invertebrate Taxa Richness	28.7
HBI	NA
% EPT	10.5
% Dominance	35.4
Most Common Families	Mites, snails, amphipods (scuds), midges, and caddisflies
Note:	<i>All values highly variable over time and sampling site. Good potential health but just from biota there are some concerns. E.g. high #'s of non-insects, wild variation in dominant species.</i>

BASIC FACTS

Section	34
Township	31
Range	20
Stream Length	38,500 feet
Subwatershed Area	15,645 acres
Baseflow	3.5 cfs
Bankfull Flow	N/A
Entrenchment Ratio	N/A
Width:Depth Ratio	N/A
Sinuosity	N/A
Slope	N/A
Rosgen Class	N/A
DNR Trout Stream	No
Fish Species:	N/A

Water Chemistry (2008 Ozark Trail Sta.)*

Parameter	Site Mean	Site σ	MPCA NCHF Benchmark	
			MIS/St. Croix	River
TP [$\mu\text{g/L}$]	92	66.6	90	55
NO ₂ +NO ₃ [mg/L]	0.87	1.0	0.1	0.203
TSS [mg/L]	27	31.7	8.8	7.50
Temperature [C]	14.5	4.8	13.0	10.30

CMSCWD References:
WCD Water Monitoring Report ('08)

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

Overall Assessment

Carnelian Creek Flowage is an extensive waterway traversing almost 9 miles connecting numerous wetlands along its path from Big Marine Lake through Turtle, Bass and Big Carnelian Lakes and finally to Little Carnelian Lake. It is not suitable for trout or utilized as a significant recreational resource.

The former CMWD's *Natural Resource Inventory and Management Plan* identifies the resources found in the Carnelian Creek Flowage as ranking from moderate to high for ecological ranking, wildlife habitat rank and rare features potential. Including several groundwater dependent natural resources. In fact, the Blanding's turtle (*Emydoidea blandingii*) is a state-listed threatened species that may be encountered throughout the watershed. It is the intention of this District to manage this stream for the multi-purposes of flood prevention, water quality protection, and natural corridor preservation.

The natural watercourse of Carnelian Creek Flowage was modified by a major improvement project completed in July of 1985, referred to as the outlet project. The main purpose of the project was to alleviate flooding around Big Marine Lake, Big Carnelian Lake and along the entire watercourse. The outlet project consisted of a 15,000 ft gravity pipe from Little Carnelian Lake to the St. Croix River and downstream Lake St. Croix (an impaired water). In addition to the outlet pipe, the project included control structures and some channel improvements along the flow route. A control structure built at the outlet of Turtle Lake helps maintain water in the upstream wetlands during dry years while still providing an outlet from the area during wet years.

Routine maintenance of the outlet channel and associated structures continues to be a primary management function of the District. Routine maintenance includes clearing obstructed culverts and ditches, beaver control, outlet and shoreland inspections, and control structure management. Based on macroinvertebrate data from the 2007 monitoring season, Carnelian Creek Flowage has a water quality rating of 'B-.' That monitoring data had a high variation indicating some areas are highly impacted at times and some areas at times are good. In fact, Carnelian Creek Flowage from just above the intersection of County Hwy 7 and County Rd 55 to Big Carnelian Lake is listed on the draft 2010 list of impaired waters for aquatic recreation (*E. coli*) and aquatic life (turbidity). If it remains on the final list, it will undergo Impaired Watershed Management.

Implementation

Operational Priorities

Routine Watershed Management
 Outlet channel operation & maintenance
 Promote natural corridor and/or protective status for Carnelian Creek Flowage

Education

Routine Watershed Education (*esp. encouraging property owners to exclude livestock and establish buffers along stream*)

Projects

Current:

- Routine Watershed Monitoring
- Outlet Channel Maintenance
- Routine Watershed Best Management Practices (BMP) Program

Future/Potential:

- Maintenance of previously installed Best Management Practices (BMP)
- Installation of Clemson Levels through beaver dams to maintain flows
- Stream Assessment and Type determination
- St. Croix River TMDL related projects

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