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Rouge River Benthic Monitoring Program Spring 2013 Report

This report covers benthic macroinvertebrate monitoring at 53 sites on Rouge River tributaries and branches in the spring of 2013 (Table 3). Thirty-six sites were sampled by Friends of the Rouge (FOTR) volunteers and staff, sixteen were sampled by Wayne County Department of Public Services Water Quality Management Division and one was sampled by Schoolcraft College. Most of Friends of the Rouge's sites were sampled on April 27 during the Spring Bug

**FRIENDS OF THE ROUGE
 BENTHIC MONITORING
 PROGRAM**

FOTR's benthic monitoring program was started in 2001 to involve a large number of volunteers in monitoring the health of the watershed by sampling the creeks of the Rouge River. The types and number of benthic macroinvertebrates found can be used to assess water quality. Each team of volunteers samples two sites under the direction of a trained team leader. Samples of each organism are collected and field identifications are verified in the lab. The program is funded by the Alliance of Rouge Communities and in cooperation with Wayne County Department of Public Services Water Quality Management Division.

Hunt in which 89 people participated. The Spring Bug Hunt was held a week later than planned due to extreme high water levels on April 20.

Stream Quality Index, Taxa, EPT and Sensitive Families

Each site is given a **Stream Quality Index (SQI)** which is determined by weighting each type and number of organisms found by their sensitivity ratings. A higher proportion of sensitive organisms such as mayflies and caddisflies results in a higher score. A number of different organisms also results in a high score. The SQI is then given a rating:

- >48 = EXCELLENT
- 34-48 = GOOD
- 19-33 = FAIR
- <19 = POOR

Number of **taxa** represents the number of different families of organisms. A higher number of taxa indicate a healthier site.

EPT refers to the number of mayfly, caddisfly and stonefly families found; these three orders contain some of the most sensitive organisms.

Sensitive Families refers to insects that are rated 1 on the Hilsenhoff Sensitivity Index.

Overall Scores

The majority of sites (30/53 or 57%) had FAIR Stream Quality Index (SQI) (average score 31). Five sites were EXCELLENT and 14 were GOOD.

Four sites had POOR SQI. The number of taxa at each site ranged from a low of six at LR-11 to 31 at John2. The number of EPT (see sidebar) ranged from zero at four sites to nine at John1. Five sensitive families were found at eleven sites (see Table 4) including two stonefly families, one mayfly family, one caddisfly family, and gomphid (clubtail) dragonfly nymphs.

Data Trends

Wayne County repeated a trend analysis to determine if the SQI scores are showing any significant trends over time. Since the seven subwatersheds that make up the Rouge have different characteristics, each was plotted separately. The Johnson Creek was also plotted separately because it is the only cold water stream tributary to the Rouge River. The trend is considered significant if the *p*-value is less than 0.05. A positive slope indicates an upward trend (scores increasing); a negative slope indicates a downward trend (scores decreasing).

Table 1 contains the data trends by subwatershed/creek. Three subwatersheds and the Johnson Creek are showing significant positive trends. No subwatershed had a significant negative trend.

In addition to the trend analysis by subwatershed, a site-by-site analysis of all the sites was done (Table 2). The majority of the sites had no trend and only sites with more than three years of data were considered. Sites with a statistically significant positive trend were: Main5, Main6, John2, John3, and Ton1. One sites had a statistically significant negative trend: MR-13.

Subwatershed/Creek	slope	<i>p</i> -value	True trend
Main 1-2	0.5911	0.002582	Yes, positive
Main3-4	0.0455	0.963170	No trend
Upper	0.0761	0.755656	No trend
Johnson Creek	1.0221	0.001702	Yes, positive
Middle 1	1.1575	0.000577	Yes, positive
Middle 3	1.2307	0.047028	Yes, positive
Lower 1	0.3508	0.273413	No trend
Lower 2	-0.0186	0.965533	No trend

<i>Site</i>	<i>p-value</i>	<i>Slope</i>	<i>True trend</i>
Main5	0.006701	1.3828	Yes, positive
Main6	0.042961	1.4161	Yes, positive
John2	0.015290	1.5011	Yes, positive
John3	0.043076	1.3355	Yes, positive
MR13	0.028695	-1.2323	Yes, negative
Ton1	0.021469	3.0657	Yes, positive



RHYACOPHILID CADDISFLIES CONTINUE TO EXPAND DISTRIBUTION IN ROUGE RIVER WATERSHED

By Bruce McCulloch

In the Spring 2008 Report, I wrote an article describing the first recorded specimen of a predacious caddisfly (Family Rhyacophilidae) in the Rouge River watershed. It was collected in the Lower Rouge at Cherry Hill and Ridge roads (Low2). Re-examination of a collection made at Low2 in spring 2003 revealed another smaller specimen. In spring 2010, a third specimen was collected at a different site and branch of the watershed (Johnson Creek at 5 Mile and Salem roads/Middle Branch; John1).

Collections made for this year's spring bug hunt showed that this caddisfly has expanded its distribution in the watershed. Not only was it found again at Low2 and John1, but also at two new sites in Johnson Creek: John3 (6 Mile and Beck) and John7 (south of 6 Mile, west of Beck). Also, the species was collected at Fowl1 (Prospect and Cherry Hill roads) in the Lower Rouge. It was also encouraging that several individuals were captured at most of the sites (Fowl1-20+, John1-9, John7 - 5).

DNA sequencing of specimens from Low2, Fowl1 and John7 is being conducted at the University of Michigan-Dearborn to confirm the visual identification of *Rhyacophila lobifera*, which has never been reported from Michigan outside of the FOTR collections. If so, I plan to collaborate with FOTR and UM-D staff to write a paper for submission to an appropriate scientific journal.

Go Rouge Go!!

Lower Branch

Eleven sites were sampled on the Lower Branch of the Rouge (see Table 3). Fellows Creek was sampled at two locations (Fel1, Fel2) and Fowler Creek at two (Fowl1 and Fowl2). On the main branch of the Lower, seven sites were sampled (Low2, LR-1, LR-3, LR-6, LR-10, LR-11, LR-12).

Most Lower sites scored FAIR (average 27). Three sites had GOOD scores (Fowl1, LR-1 and LR-12). One site (LR-11) scored POOR. The number of taxa ranged from 6-19 and EPT: 0-4. Two sensitive families were found at both Fowl1 and Low2 – Rhyacophilid caddisflies and Perlodid stoneflies (Table 4).

All but one site (LR-12) had past data for three years or more. Two sites were above a standard deviation of average: LR-1 and LR-10 (Chart1). One site was below a standard deviation of average for the site: LR-11.

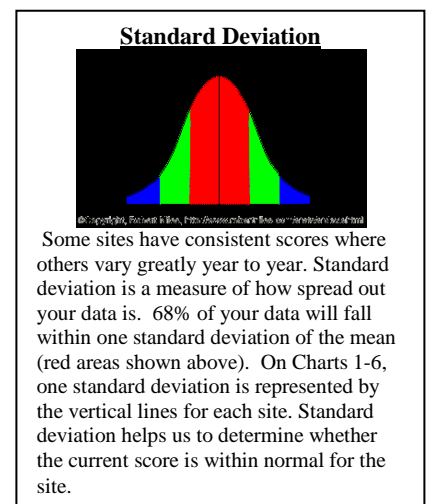
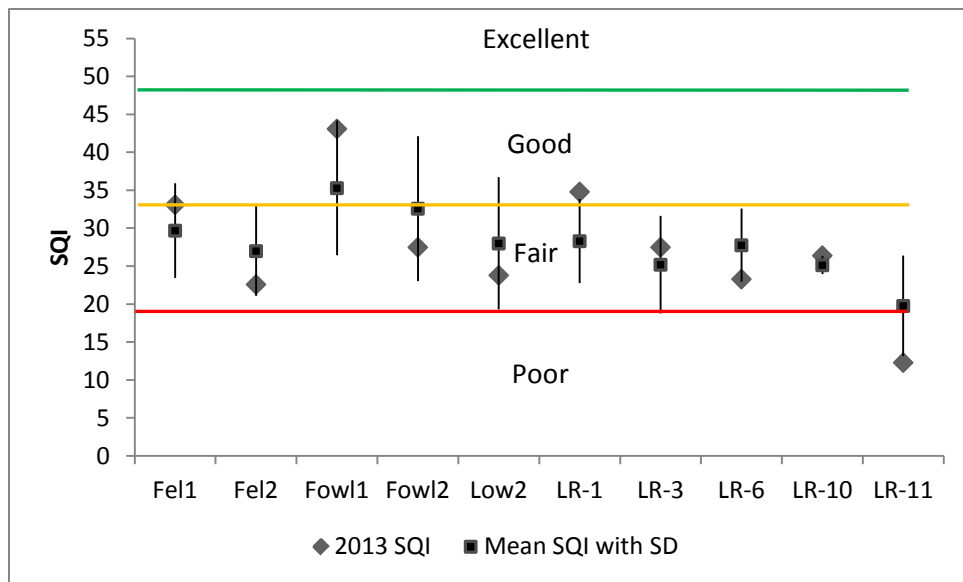


Chart 1: Lower Branch SQI and Mean with Standard Deviation



Main Branch

Fifteen sites on the Main Branch were sampled. Six were on tributaries: Murphy, Nottingham, Pebble, and Sprague Creeks.

The Main1/2 subwatershed had an overall improving trend (Table 1) while the Main3/4 subwatershed showed no significant trend. The majority (12) of the scores were FAIR (average 31). Three had GOOD SQI (Peb3, Sprag, Main7) and none were POOR. Number of taxa ranged from 7-17 and EPT 0-2. Only one site had Sensitive Families: Sprag (Troy Nature Center) had clubtail dragonflies (Gomphidae), a sensitive family.

For sites with three years or more of past data, SQI was within a standard deviation of the mean except Main7 which was above (Charts 2 & 3). Main 5 and Main6 both had positive trends (Table 2).

Chart 2: Main Branch & Tributary SQI and Mean with Standard Deviation

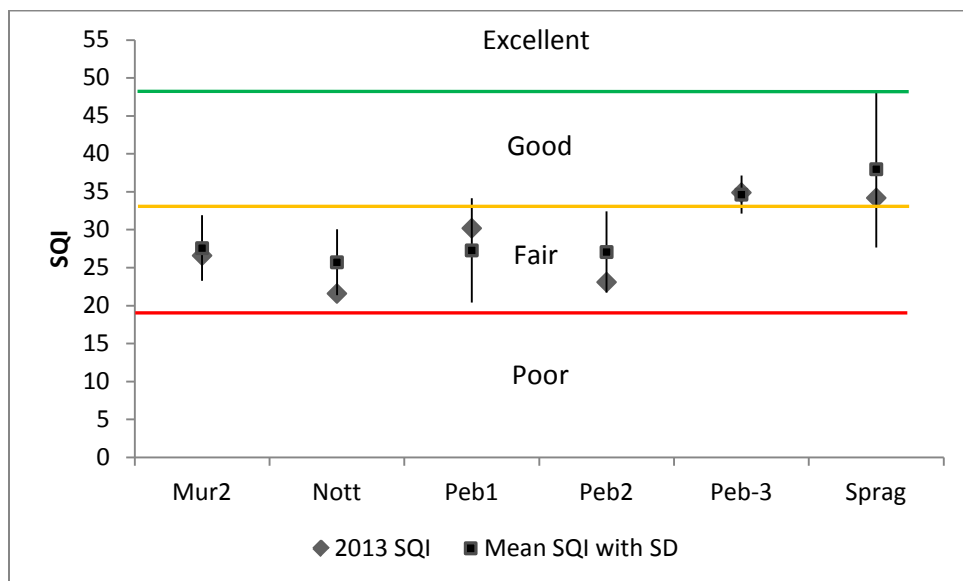
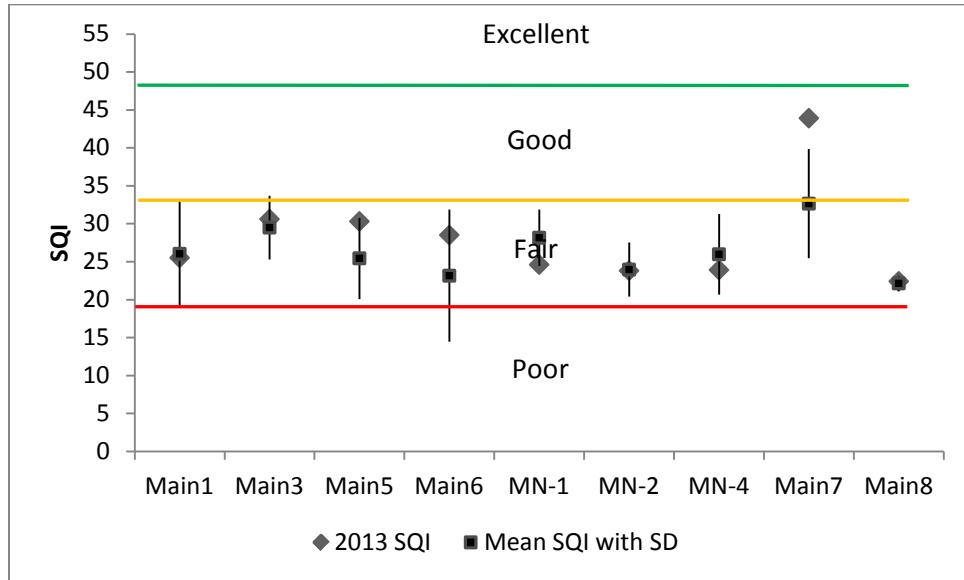


Chart 3: Main Branch SQI and Mean with Standard Deviation



Middle Branch

Nineteen sites were sampled on the Middle branch including six tributaries: Bishop, Ingersoll, Johnson, Tonquish, Walled Lake and Willow Creek.

Average scores for the Johnson Creek and all of the Middle Branch are showing a positive trend (Table1). The average score was FAIR (32) and the Middle Branch had five EXCELLENT SQI. There were two POOR scores, seven GOOD and five FAIR. Number of taxa ranged from 8-31 and EPT 0-9. Sensitive families were found at all eight Johnson Creek sites. Sensitive families included Perlodid and Nemourid stoneflies, pronggill mayflies (Leptophlebiidae), and Rhyacophilidae caddisflies (Table 4).

For sites with past data, four of the SQIs were above a standard deviation (John2, John3, MR-22 and MR-23) (Chart 4 & 5). Two of these sites have been trending up (John2 & John3) as has Ton1 (Table 2). MR-13 has been trending down (Table 2).

Chart 4: Middle Branch Tributary SQI and Mean with Standard Deviation

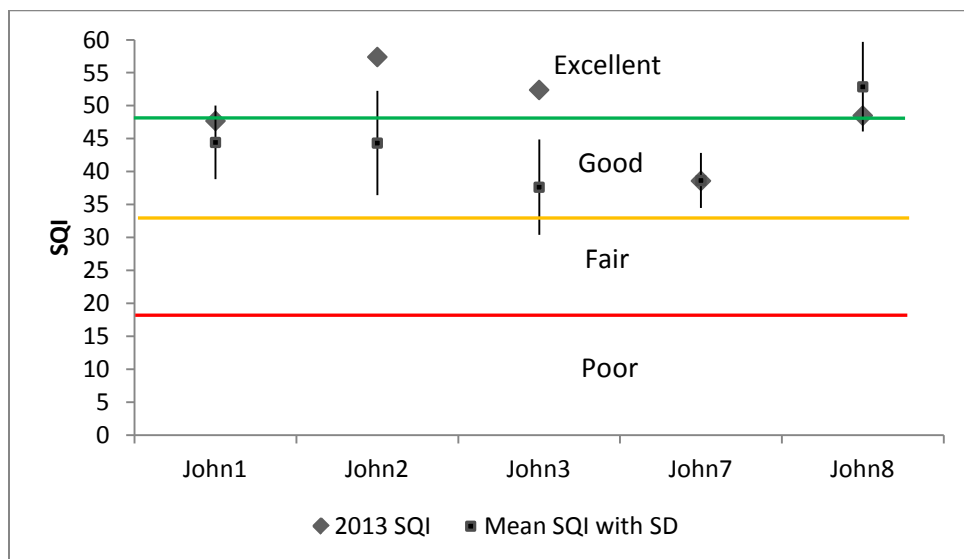
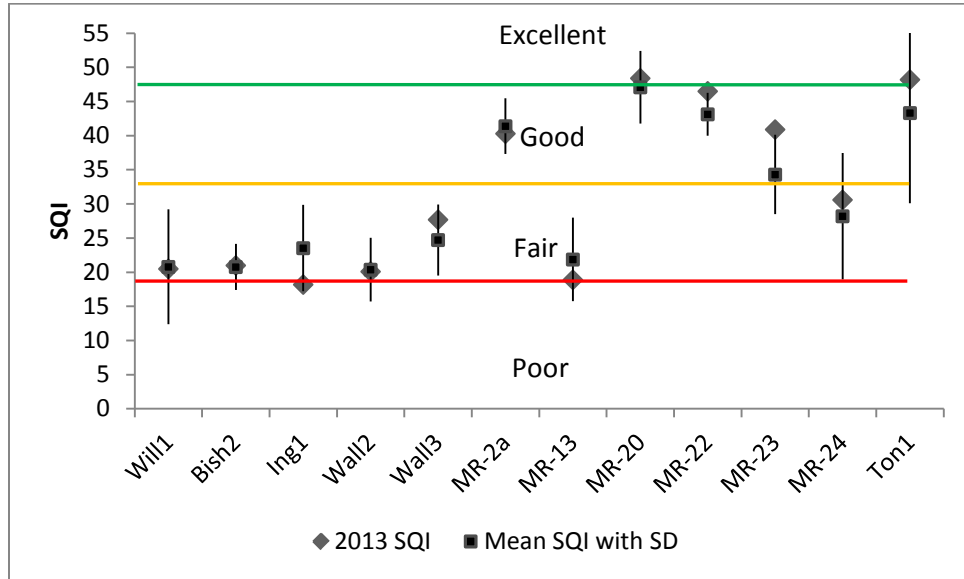


Chart 5: Middle Branch SQI and Mean with Standard Deviation



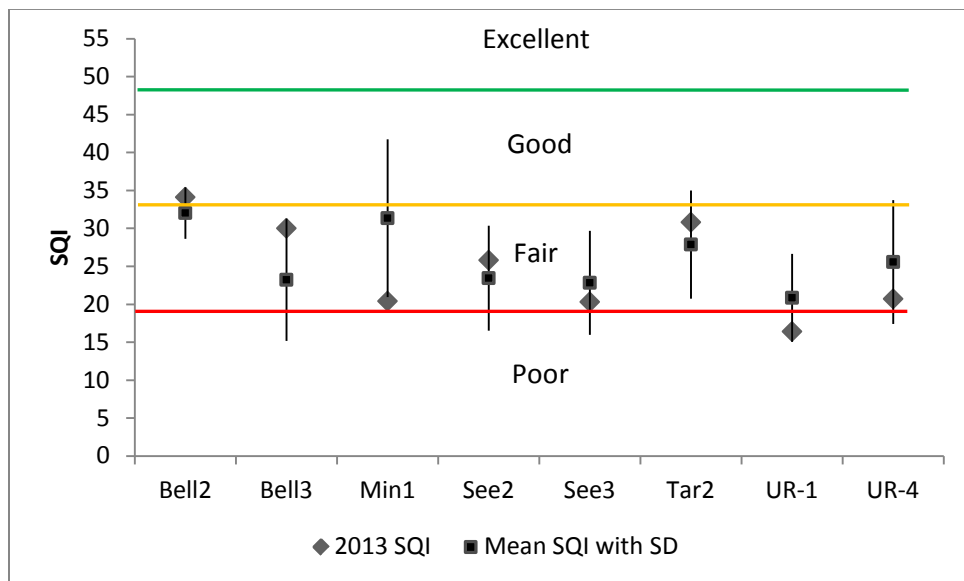
Upper Branch

Eight Upper branch sites were sampled this spring, including three tributaries: Bell, Minnow Pond, Tarabusi, and Seeley Creeks.

The average score was FAIR (31). One site scored GOOD (Bell2) and one site scored POOR (UR-1). Number of taxa ranged from 8-14 and EPT 0-8. No sensitive families were found at any Upper sites.

For sites with past data, all were within a standard deviation of the mean for the site except Min1 which was below (Chart 6).

Chart 6: Upper Branch SQI with Mean and Standard Deviation



THANK YOU!!!!

Thank you to all the **volunteers** and **Team Leaders, Wayne County**, (especially **Sue Thompson**) for sampling and providing data for 22 sites and doing the trend analysis, **Bruce McCulloch** for identifying our bugs, graphing data and advising us, **University of Michigan-Dearborn** for providing the meeting place for the Spring Bug Hunt and a lab for identification night, and the **Alliance of Rouge Communities** for funding the program.

Fall Bug Hunt - Oct. 19, 2013 9am-4pm

Schoolcraft College VisTaTech Center

Sign up online today (deadline Oct. 4, 2013) at www.therouge.org

Team Leader Training – Sat. Sept 7, 2013 9am-2pm (must have participated in a previous event)

2013 Spring Bug Hunt Results

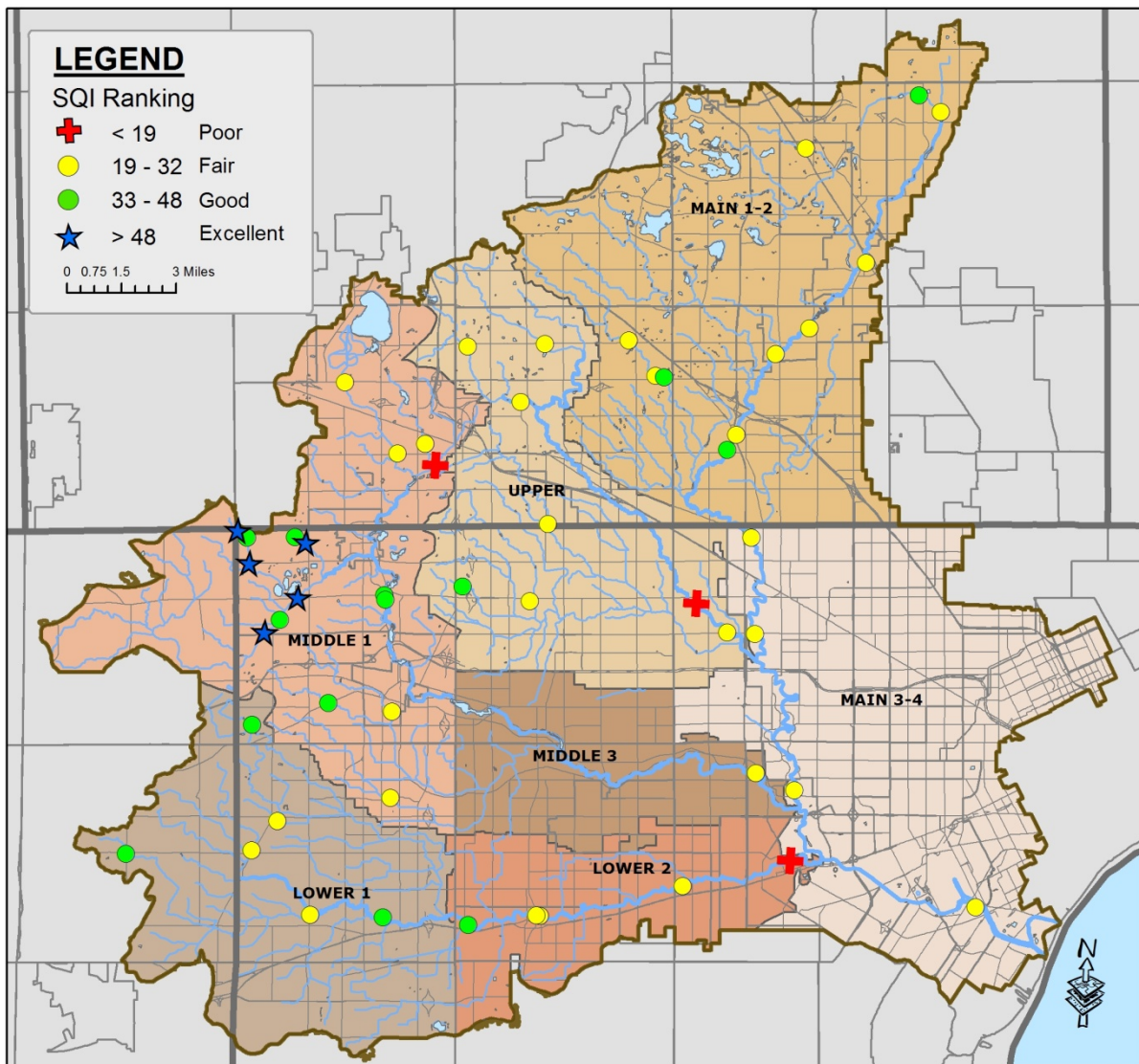


Table 3 : Stream Quality Index (SQI), score, taxa, EPT and Sensitive Families Found

FIELDID	Stream Name	Site Name	Location	SQI	score	Taxa	EPT	# Sens Fam Found
LOWER								
Fel1	Fellows Creek	Fellows Plymouth	Napier/Powell	33	FAIR	11	2	0
Fel2	Fellows Creek	South Fellows	Ford/Ridge	23	FAIR	11	0	0
Fowl1	Fowler Creek	Fowler Prospect	Prospect/Cherry Hill	43	GOOD	19	4	2
Fowl2	Fowler Creek	Fowler Beck	Beck, N of Geddes, E side of Rd	28	FAIR	12	2	0
Low2	Lower Rouge	Lower Ridge	Cherry Hill/Ridge	24	FAIR	9	2	2
LR-12	Lower Rouge	Morton Taylor	east of Morton Taylor, n of Michigan Ave	35	GOOD	16	2	0
LR-1	Lower Rouge	Commerce Court	Michigan Ave, WCDOE Office	35	GOOD	14	2	0
LR-6	Lower Rouge	Wayne WDM 201 Site	Wayne Rd W	23	FAIR	9	2	0
LR-3	Lower Rouge	Goudy Park	Wayne & Michigan Ave	28	FAIR	12	3	0
LR-10	Lower Rouge	John Daly	John Daly north of Michigan	26	FAIR	11	2	0
LR-11	Lower Rouge	Ford Field	Brady & Cherry Hill	12	POOR	6	1	0
MAIN								
Mur2	Murphy Creek	Roeper School	41190 Woodward	27	FAIR	11	1	0
Nott	Nottingham Creek	Country Day MS	Lahser/13 Mile	22	FAIR	9	1	0
Peb2	Pebble Creek	Pebble Creek 13 Mile	13 Mile/Middlebelt	23	FAIR	11	1	0
Peb1	Pebble Creek	Pebble Creek-Danvers	28314 Danvers Ct	30	FAIR	11	1	0
Peb3	Pebble Creek	d/s Danvers Pond	Danvers Drive	35	GOOD	15	1	0
Sprag	Sprague Creek	Lloyd Stage	6685 Coolidge	34	GOOD	16	2	1
Main1	Main Rouge	Firefighters Pk	Coolidge/I-75	26	FAIR	11	1	0
Main3	Main Rouge	Booth Park	Old Woodward/Euclid	31	FAIR	11	2	0
Main5	Main Rouge	Douglas Evans	Evergreen/13 Mile	30	FAIR	13	2	0
Main6	Main Rouge	Sfld Civic Ctr	Civic Center Dr/Telegraph	29	FAIR	13	1	0
Main7	Main Rouge	Sfld 10 Mile	10 Mile	44	GOOD	17	1	0
MN-1	Main Rouge	Eight Mile	Eight Mile East of Telegraph	25	FAIR	10	1	0
MN-2	Main Rouge	Eliza Howell	5 Mile/Telegraph	24	FAIR	9	2	0
MN-4	Main Rouge	Parkland Park	Ann Arbor Trail	24	FAIR	10	2	0
Main8	Main Rouge	Fordson Island	Fort Street	22	FAIR	12	0	0
MIDDLE								
Bish2	Bishop Creek	Bishop Cr Scarborough	10 Mile/Meadowbrook	21	FAIR	11	1	0
Ing1	Ingersoll Creek	Brookfarm Park	Willowbrook/10 Mile	18	POOR	8	1	0
Wall2	Walled Lk Drainage	WL 10 M	10 Mile/Novi	20	FAIR	8	2	0
Wall3	Walled Lk Drainage	WL 12 M	12 Mile/Taft	28	FAIR	9	2	0
John1	Johnson Creek	JC 5M Salem	5 Mile/Salem Rd	48	GOOD	22	9	3
John2	Johnson Creek	JC 5M NV	5 Mile/Ridge	57	EXC	31	8	1
John3	Johnson Creek	JC 6M NV	6 Mile/Beck	52	EXC	20	7	3
John7	Johnson Creek	JC Arcadia	S of 6 Mile, W of Beck	39	GOOD	19	6	2
John8	Johnson Creek	Maybury north	7 Mile & Napier	49	EXC	23	8	3
MR-22	Johnson Creek	Maybury south	7 Mile N & Napier	47	GOOD	16	3	2
MR-23	Johnson Creek	Maybury north	8 Mile	41	GOOD	18	2	0
MR-25	Johnson Creek	Maybury east	Beck/Main St	49	EXC	25	7	1
MR-26	Johnson Creek	Napier Rd		49	EXC	17	4	2
MR-24	Tonquish Creek	Lion's Park	Warren & Beck	31	FAIR	14	2	0
Ton1	Tonquish Creek	Plymouth Twp Pk	Beck/Ann Arbor Tr	48	GOOD	16	2	0
Will1	Willow Creek	Barchester Pk	Ford/Lilley	21	FAIR	10	0	0
MR-20	Middle Rouge	Waterford Bend	Waterford Bend	48	GOOD	21	5	0
MR-2a	Middle Rouge	Reservoir Road W	S of 6 Mile, E of Hines	40	GOOD	17	6	0
MR-13	Middle Rouge	Warrendale	Hines/Warren	19	FAIR	9	2	0

FIELDID	Stream Name	Site Name	Location	SQI	score	Taxa	EPT	# Sens Fam Found
UPPER								
Bell2	Bell Branch	Schoolcraft College	6 Mile/Haggerty	34	GOOD	14	8	0
Bell3	Bell Branch	Livonia 6 Mile	6 Mile/Farmington	30	FAIR	10	2	0
Min1	Minnow Pond	Minnow Pond	13 Mile/Farmington	20	FAIR	8	0	0
See3	Seeley Creek	Seeley Creek Trail	Kennedy Court	20	FAIR	8	1	0
See2	Seeley Creek	Sleepy Hollow	Drake/11 Mile	26	FAIR	10	1	0
Tar2	Tarabusi Creek	Tara 8 M	8 Mile/Gill	31	FAIR	13	2	0
UR-1	Upper Rouge	Lola Valley	Kinloch	16	POOR	9	1	0
UR-4	Upper Rouge	Five Mile Beech Daly	east of Inkster	21	FAIR	9	1	0

*SQI=Stream Quality Index, gives an overall assessment of how healthy a site is. Index is calculated by rating each Order of macroinvertebrate found, with more sensitive insects like stoneflies and caddisflies rated higher than less sensitive organisms like midge larvae. Abundance is roughly measured by distinguishing between rare (10 or less individuals) and common (11 or more), with common sensitive insects receiving the higher number (5.3) and common rare tolerant receiving 1.0.

**Score =the SQI category: >48=EXCELLENT, 34-48=GOOD, 19-33=FAIR, <19=POOR

***Taxa = Total number of Families of organisms found. A higher number of taxa indicates more diversity and therefore a better site.

****EPT= Number of families of Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). These three families are some of the most sensitive so a large number of these would indicate a good quality site.

*****Sensitive Families=Number of Families of insects that are considered very sensitive, based on a score of one in the Hilsenhoff Sensitivity Index.

Table 4: Sensitive Families							
FIELDID	Stream Name	Site Name					
Fowl1	Fowler Creek	Fowler Prospect	Rhyacophilidae	Perlodidae			
Low2	Lower Rouge	Lower Ridge	Rhyacophilidae	Perlodidae			
John1	Johnson Creek	JC 5M Salem	Rhyacophilidae	Perlodidae	Leptophlebiidae		
John2	Johnson Creek	JC 5M NV		Perlodidae			
John3	Johnson Creek	JC 6M NV	Rhyacophilidae	Perlodidae	Leptophlebiidae		
John7	Johnson Creek	JC Arcadia	Rhyacophilidae		Leptophlebiidae		
John8	Johnson Creek	Maybury north		Perlodidae	Leptophlebiidae	Nemouridae	
MR-22	Johnson Creek	Maybury south		Perlodidae	Leptophlebiidae		
MR-25	Johnson Creek	Maybury east		Perlodidae			
MR-26	Johnson Creek	Napier Rd		Perlodidae	Leptophlebiidae		
Sprag	Main Rouge	Lloyd Stage					Gomphidae