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Rouge River Benthic Macroinvertebrate Monitoring Program Fall 2010 Results

This report contains benthic macroinvertebrate sampling results from 47 Rouge tributary and river sites. Twenty-two sites were sampled by 69 volunteers during Friends of the Rouge's (FOTR's) ninth Annual Fall Bug Hunt. Additionally, this report includes data from an on-campus site sampled by Schoolcraft students, additional FOTR sampling, and 21 sites sampled by Wayne County Department of Public Services.

Overall Scores

Of the 47 sites sampled this fall, the majority were in the FAIR range for the Stream Quality Index (SQI). One site had an EXCELLENT SQI (John8-Johnson Creek); 11 sites were GOOD; 29 sites were FAIR and six sites were POOR. Thirty-one sites have three years or more of past data (p. 3). Of these, one site was above a standard deviation of the mean (Fowl1) and three were below a standard deviation (LR-3, Nott, Bell1); the remaining 27 were close to the average, meaning they did not decline or improve.

Mayflies, stoneflies and caddisflies were found at all but six sites. The Johnson Creek (John8) and the Middle Branch at I-275 (MR-17) had the highest number of these families (5), followed by two sites on the Main Rouge – Sprague Creek (Sprag) and Douglas Evans Nature Preserve (Main5). Douglas Evans had two types of mayflies and two types of caddisflies despite being fairly far downstream.

Benthic Scores

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 SQI. A greater number of different organisms also results in a high SQI. The SQI has four different levels: >48=EXCELLENT, 34-48=GOOD, 19-33=FAIR, <19=POOR.

Number of taxa represents the number of different families of organisms. Like SQI, a higher number of taxa indicate a healthier site.

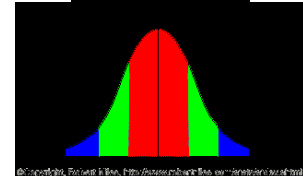
EPT refers to the number of mayfly, caddisfly and stonefly families found; these three orders contain some of the most sensitive organisms.

Number of sensitive families refers to the number of families of insects that rate very sensitive on the Hilsenhoff Biotic Index.

Seven sites had sensitive families. Clubtail dragonflies (Gomphidae) were found for the first time at Heritage Park in Farmington Hills (Up1), raising the number of sites in the watershed with this family to three (Shiawassee Park-Up2 and Sprague Creek-Sprag in Troy). Dobsonflies (Corydalidae) were found at two sites where they have only been found once before – Fellows Creek (Fel1) and the Main Rouge at Telegraph and Civic Center (Main6). Stoneflies (Perlodidae)

were found at one tributary to the Johnson Creek (John8) and prongill mayflies (Leptophlebiidae) were found at two sites on a tributary to the Johnson Creek (John8 & MR-22).

Standard Deviation



Some sites have consistent scores where others vary greatly year to year. Standard deviation is a measure of how spread out your data is. 68% of your data will fall within one standard deviation of the mean (red areas shown above). On Charts 1-4 (p. 3), one standard deviation is represented by the vertical lines for each site. Standard deviation helps us to determine whether the current score is within normal for the site.

Long Term Trends

We have finally collected enough benthic data for the Rouge to be able to begin to look at long term trends. To do this, we did some comparisons using a rolling three year average. This involves averaging the scores for all of the sites for a three year period, then moving ahead to the next three year period and so on. This method helps take some of the variation out of the data (due to weather, precipitation, etc.) and make the comparisons more robust. The figures 5-8 are on p. 4. The most robust correlation is an upward trend in scores for the Middle Branch ($R^2 = 0.8758$, the closer this value is to 1, the stronger the correlation), followed by a downward trend for the Main Branch sites ($R^2 = 0.7442$). Trend lines for the Upper and Lower Branches were flat (showing neither improving nor declining scores) and R^2 values low (0.4455; 0.3593).

Lower Branch

Nine sites were sampled on the Lower Branch of the Rouge (see Table 1). Three tributaries were sampled: three on Fellows Creek, two on Fowler Creek and an additional four sites on the main branch of the Lower. SQIs were: one GOOD, seven FAIR and one POOR. The site with the POOR SQI was a new site at Ford Field in Dearborn (LR-11) and this far downstream it would be expected to be lower than upstream.

Five of the sites had enough past data to compare scores (Figure 1). Three of them showed no change, one above a standard deviation of the mean (Fowl1) and one below a standard deviation (LR-3). Last fall, Fowl1 (Cherry Hill & Prospect) was below a standard deviation so this is good news that the site has improved. LR-3 at Goudy Park in Wayne usually scores in the Good range so the SQI of 22 is below average.

Main Branch

Thirteen sites on the Main Branch were sampled. Five were on tributaries: Franklin, Pebble, Murphy, Nottingham and Sprague Creek. SQIs were four GOOD, eight FAIR, and one POOR. Three new sites were added downstream: one in Southfield (Main7), one in Parkland Park in Dearborn Heights and one on Fordson Island in Dearborn near Fort Street. Despite the downstream locations, all had FAIR SQI.

Ten main branch sites had enough data to make comparisons and nine were within a standard deviation of average for the site. Nott (Nottingham Creek at Detroit Country Day Middle School) was below a standard deviation of average (Figure 2). This branch shows a slight downward trend in scores since 2001 (Figure 7).

Middle Branch

Thirteen sites were sampled on the Middle branch including Ingersoll, Johnson, Tonquish, and Walled Lake Creeks. SQI scores were: one EXCELLENT, five GOOD, and seven FAIR. No sites scored POOR. The Middle Branch had the only EXCELLENT score in the watershed - on a tributary to the Johnson Creek near Maybury State Park.

Ten sites had past data and all were within a standard deviation of the average (Figure 3). This branch also is also exhibiting an upward trend in scores since 2001 (Figure 6).

Upper Branch

Twelve Upper branch sites were sampled this fall, including the Bell Branch, Minnow Pond, Seeley Creek and Tarabusi Creek. SQIs were: one GOOD, seven FAIR, and four POOR. Three of the Bell Creek sites were POOR but the site at Schoolcraft College (Bell2) had the only GOOD score. The other POOR score was on Minnow Pond Creek at Dunckel Middle School. Six sites had past data and five were within a standard deviation of average. Bell1 at Bicentennial Park in Livonia was below a standard deviation of the mean (Figure 4).

THANK YOU!!!!

Thank you to all the **volunteers** and **Team Leaders**, **Schoolcraft College**, the **Schoolcraft Ambassadors** and professor **Diane O'Connell** for hosting the event and sampling one site with her class, **Wayne County**, especially **Sue Thompson** for sampling and providing data for 21 sites, **Krispy Kreme** for giving us half price donuts, biologist **Bruce McCulloch** for identifying our bugs to family and creating all of the graphs, **University of Michigan-Dearborn** for providing a lab for identification night and the **Alliance of Rouge Communities** for funding the program.

**Join us for the
Winter Stonefly Search
Saturday January 22, 2011
9 am – 3 pm at UM-D
Register today at www.therouge.org**

Figure 1-Lower Branch Mean SQIs

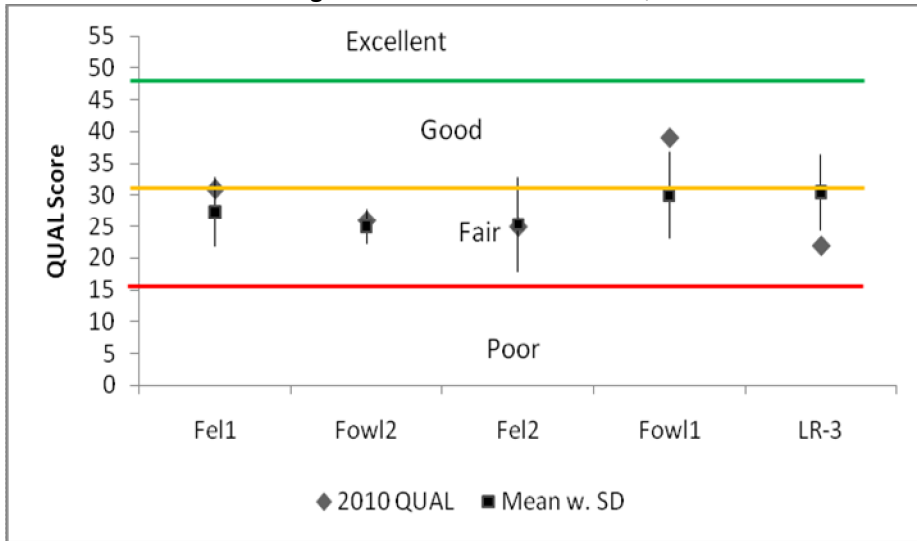


Figure 2-Middle Branch Mean SQIs

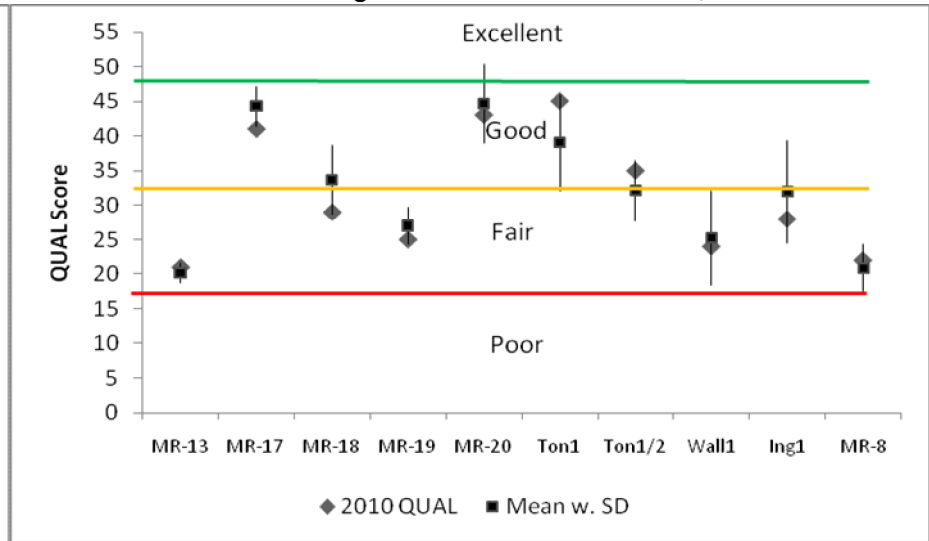


Figure 3-Main Branch Mean SQIs

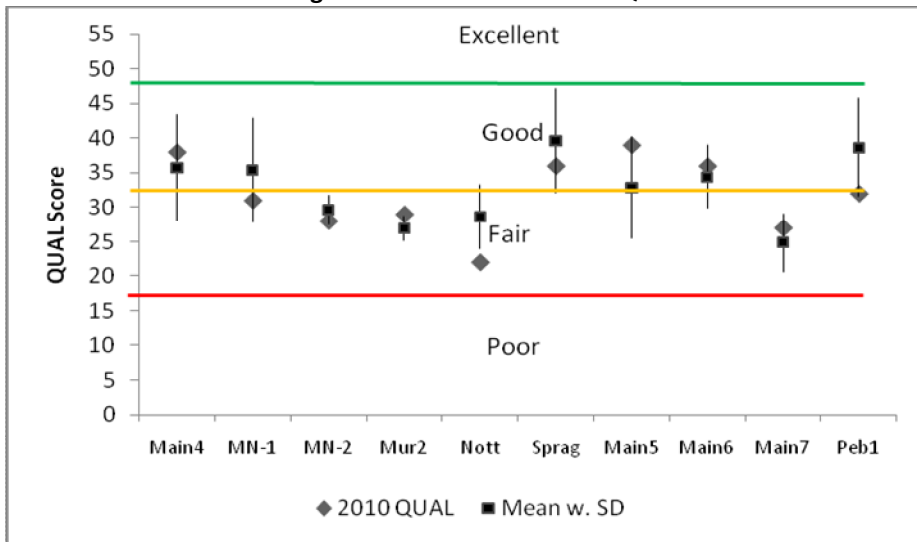


Figure 4-Upper Branch Mean SQIs

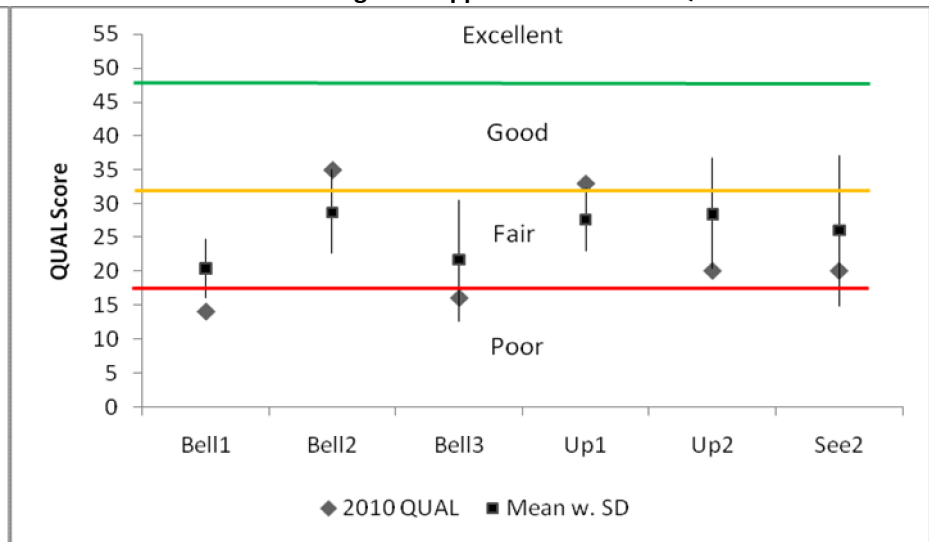


Figure 5 – Lower Branch Means 2001-2010

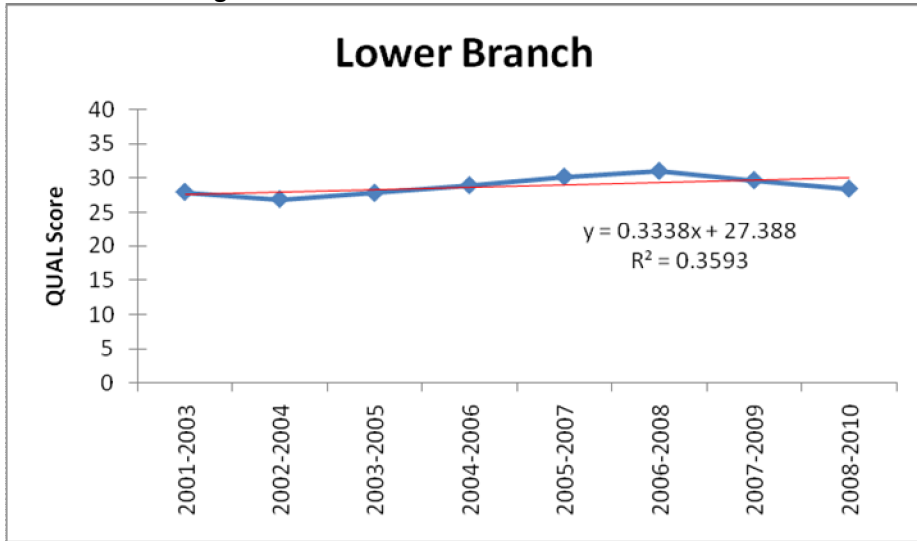


Figure 6 – Middle Branch Means 2001-2010

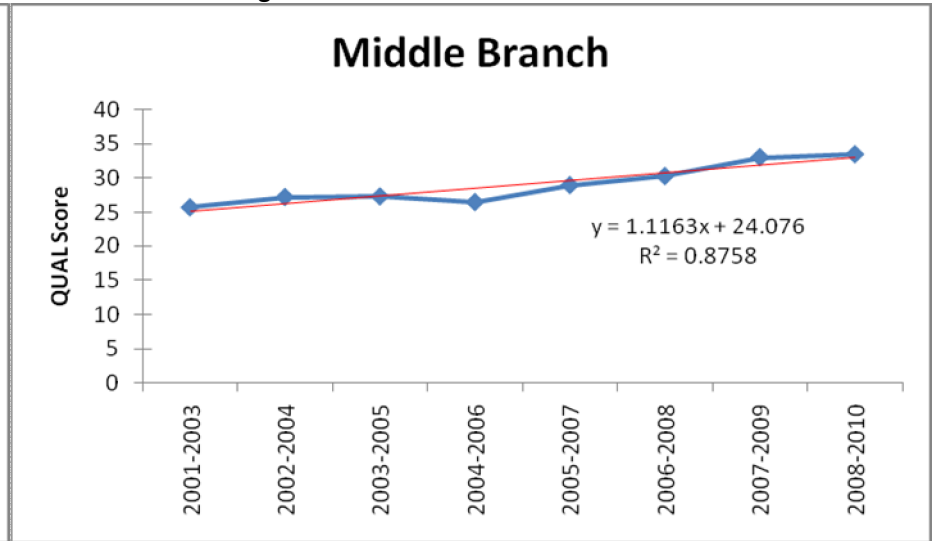


Figure 7 – Main Branch Means 2001-2010

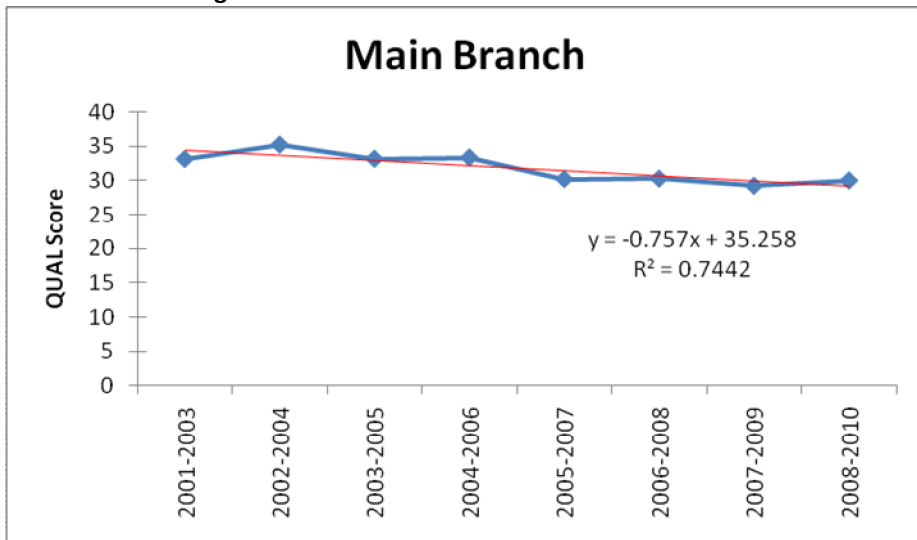


Figure 8 – Upper Branch Means 2002-2010

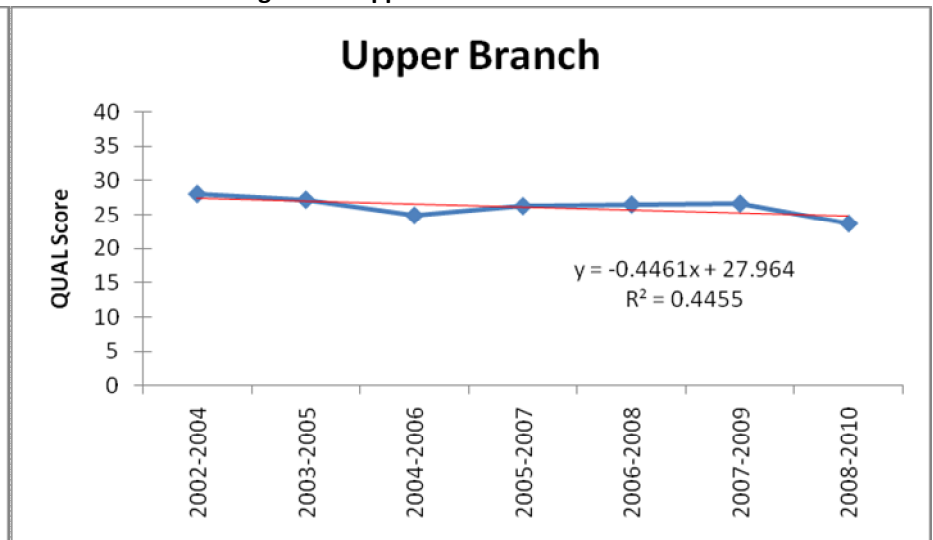


Table 1: Sampling Sites and Scores

Branch	FIELDID	Stream Name	Site Location	SQI	SQI rating	F10 TAXA	F10 EPT	F10 SENS	F10 SENS Family
Lower	Fel1	Fellows Creek	Fellows Plymouth	31	FAIR	12	2	1	Corydalidae
Lower	Fel2	Fellows Creek	South Fellows	25	FAIR	11	0	0	
Lower	LR-9	Fellows Creek	Beck Warren/Tonda Elementary	31	FAIR	13	0	0	
Lower	Fowl1	Fowler Creek	Fowler Prospect	39	GOOD	14	2	0	
Lower	Fowl2	Fowler Creek	Fowler Beck	26	FAIR	12	3	0	
Lower	LR-10	Lower Rouge	John Daly	31	FAIR	13	2	0	
Lower	LR-11	Lower Rouge	Ford Field	18	POOR	7	2	0	
Lower	LR-3	Lower Rouge	Goudy Park	22	FAIR	8	3	0	
Lower	LR-8	Lower Rouge	Lower Proctor	23	FAIR	15	1	0	
Main	Frank2	Franklin Creek	Inkster pumping station	15	POOR	7	0	0	
Main	Main4	Main Rouge	B'ham	38	GOOD	13	3	0	
Main	Main5	Main Rouge	Douglas Evans	39	GOOD	19	4	0	
Main	Main6	Main Rouge	Sfld	36	GOOD	13	2	1	Corydalidae
Main	Main7	Main Rouge	Sfld 10 Mile	27	FAIR	11	2	0	
Main	Main8	Main Rouge	Fordson Island	26	FAIR	14	0	0	
Main	MN-1	Main Rouge	Eight Mile	31	FAIR	13	2	0	
Main	MN-2	Main Rouge	Eliza Howell	28	FAIR	11	2	0	
Main	MN-4	Main Rouge	Parkland Park	28	FAIR	12	2	0	
Main	Mur2	Murphy Creek	Roeper School	29	FAIR	9	1	0	
Main	Nott	Nottingham Creek	Country Day MS	22	FAIR	10	1	0	
Main	Peb1	Pebble Creek	Pebble Creek-Danvers	32	FAIR	14	1	0	
Main	Sprag	Sprague Creek	Lloyd Stage	36	GOOD	12	4	2	Corydalidae, Gomphidae
Middle	Ing1	Ingersoll Creek	Brookfarm Park	28	FAIR	11	2	0	
Middle	John8	Johnson Creek	Maybury north	53	EXC	22	5	2	Leptophlebiidae, Perlodidae
Middle	MR-22	Johnson Creek	Maybury south	21	FAIR	10	1	1	Leptophlebiidae
Middle	MR-23	Johnson Creek	Maybury north	34	GOOD	15	3	0	
Middle	MR-13	Middle Rouge	Warrendale	21	FAIR	9	3	0	
Middle	MR-17	Middle Rouge	I-275 clam bar	41	GOOD	16	5	0	
Middle	MR-18	Middle Rouge	Springbrook Rec Area	29	FAIR	14	3	0	
Middle	MR-20	Middle Rouge	Waterford Bend	43	GOOD	21	3	0	
Middle	MR-8	Middle Rouge	Inkster Road	22	FAIR	12	3	0	
Middle	MR-19	Tonquish Creek	Tonquish - Joy Rd	25	FAIR	11	1	0	
Middle	Ton1	Tonquish Creek	Plymouth Twp Pk	45	GOOD	17	2	0	
Middle	Ton1/2	Tonquish Creek	Canton Ctr	35	GOOD	13	2	0	
Middle	Wall1	Walled Lk Drainage	Rotary Park	24	FAIR	10	2	0	
Upper	Bell1	Bell Branch	Bicentennial Park	14	POOR	7	0	0	
Upper	Bell2	Bell Branch	Schoolcraft College	35	GOOD	16	1	0	
Upper	Bell3	Bell Branch	Livonia 6 Mile	16	POOR	6	1	0	
Upper	UR-2	Bell Branch	Bell Creek Park	9	POOR	5	0	0	
Upper	Min2	Minnow Pond	OCC	20	FAIR	10	1	0	
Upper	Min3	Minnow Pond	Dunckel MS	15	POOR	7	1	0	
Upper	See2	Seeley Creek	Sleepy Hollow	20	FAIR	8	1	0	
Upper	See3	Seeley Creek	Seeley Creek Trail	23	FAIR	7	1	0	
Upper	UR-3	Tarabusi Creek	Tara 7 Mile	24	FAIR	9	2	0	
Upper	Up1	Upper Rouge	Heritage Pk	33	FAIR	13	1	1	Gomphidae
Upper	Up2	Upper Rouge	Shiawassee Pk	20	FAIR	8	1	1	Gomphidae
Upper	UR-4	Upper Rouge	Five Mile Rd	31	FAIR	16	2	0	

68 AQUATIC INSECT FAMILIES FOUND IN ROUGE RIVER WATERSHED

Updated Dec 2010

*Indicates sensitive family

EPHEMEROPTERA (Mayflies)-5

Baetidae (small minnow)
Caenidae (square gill)
Heptageniidae (flathead)
*Leptophlebiidae (prong gill)
Siphoneuridae (primitive minnow)

***PLECOPTERA (Stoneflies)-4**

*Perlodidae (perlodid)
*Capniidae (slender winter)
*Nemouridae (broadback) (Spr 06)
*Taeniopterygidae (broadback) (Winter 10)

TRICHOPTERA (Caddisflies)-15

*Brachycentridae (humpless - stone cases) (Spr 02)
*Glossosomatidae (saddle-case) (Spr 06)
Hydropsychidae (common net-spinner) (Spr 01)
Hydroptilidae (micor or purse) (Fall 02)
Lepidostomatidae (Spr 04)
Leptoceridae (long-horned) (Spr 04)
Limnephilidae (northern - stick cases) (Spr 01)
Molannidae (hoodcase maker) (Spr 07)
*Odontoceridae (strong casemakers) (Spr 04)
Philopotamidae (finger-net) (Spr 02)
Phryganeidae (giant) (Spr 03)
Polycentropodidae (spotted head) (Spr 07)
*Psychomyiidae (net-tube) (Spr 03)
Rhyacophilidae (free-living) (Spr 08)
Uenoidae (Fall 04)

MEGALOPTERA (Dobsonflies)-2

Sialidae (alderfly)
*Corydalidae (dobsonfly)

ANISOPTERA (Dragonflies)-4

Aeshnidae (darner)
Corduliidae (Spr 03)
Gomphidae (clubtail) (Oct 07)
Libellulidae (common skimmer)

ZYGOPTERA (Damselflies)-2

Calopterygidae (broad-winged)
Coenagrionidae (narrow-winged)

COLEOPTERA (Beetles)-11

Chrysomelidae (aquatic leaf) (Spr 06)
Dryopidae (long-toed) (Fall 01)
Dytiscidae (predaceous diving)
Elmidae (riffle)
Gyrinidae (whirligig) (Fall 06)
Haliplidae (crawling)
Hydrophilidae (water scavenger)
Noteridae (burrowing) (Fall 02)
Psephenidae (waterpenny) (Fall 04)
Scirtidae (marsh) (Spr 06)
Staphylinidae (rove)

DIPTERA (True Flies)-15

*Athericidae (watersnipe)
Ceratopogonidae (no-see-um)
Chironomidae (midge)
Culicidae (mosquito)
Ceratopogonidae (no-see-um)
Dixidae (Spr 06)
Dolichopodidae (aquatic long-legged) (Fall 02)
Empididae (aquatic dance)
Ephydriidae (shore) (Fall 03)
Ptychopteridae (phantom crane) (Fall 03)
Sciomyzidae (marsh) (Fall 03)
Simuliidae (black)
Stratiomyidae (soldier)
Tabanidae (horse)
Tipulidae (crane)

HEMIPTERA (True Bugs)-9

Belostomidae (giant water bug)
Corixidae (water boatman)
Gerridae (water strider)
Mesoveliidae (water treader) (Fall 01)
Naucoridae (creeping) (Spr 07)
Nepidae (water scorpion) (Fall 01)
Notonectidae (back-swimmer)
Pleidae (pigmy back-swimmer) (Spr 01)
Veliidae (short-legged strider)

LEPIDOPTERA (Aquatic moths & butterflies)-1

Pyralidae (aquatic moth)