

www.therouge.org
4901 Evergreen Rd.
220 ASC
Dearborn, MI
48128
(313) 792-9621

Rouge River Benthic Monitoring Program Spring 2011 Report

This report covers benthic macroinvertebrate monitoring at 47 sites on Rouge River tributaries and branches in the spring of 2011. Thirty sites were sampled by Friends of the Rouge (FOTR) volunteers and staff and seventeen sites were sampled by Wayne County Department of Public Service Water Quality Management Division. Most of Friends of the Rouge's sites were sampled on April 30 during the Spring Bug Hunt in which 93 volunteers participated.

The Spring Bug Hunt was very difficult this year because of the unusual amount of rain that fell in the spring (see below chart for discharge at

Southfield USGS gauge).

Water levels were above average for much of April and May and did not recede back to normal until early June. As a result, some deep water sites were impossible to sample. SQI were expected to be lower as the high water can wash organisms downstream and make it difficult for organisms to survive due to increased sediment, temperature and pollutants.

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 Erb Family Foundation and in cooperation with Wayne County Department of Public Services Water Quality Management Division.

Understanding SQI, Taxa, etc.

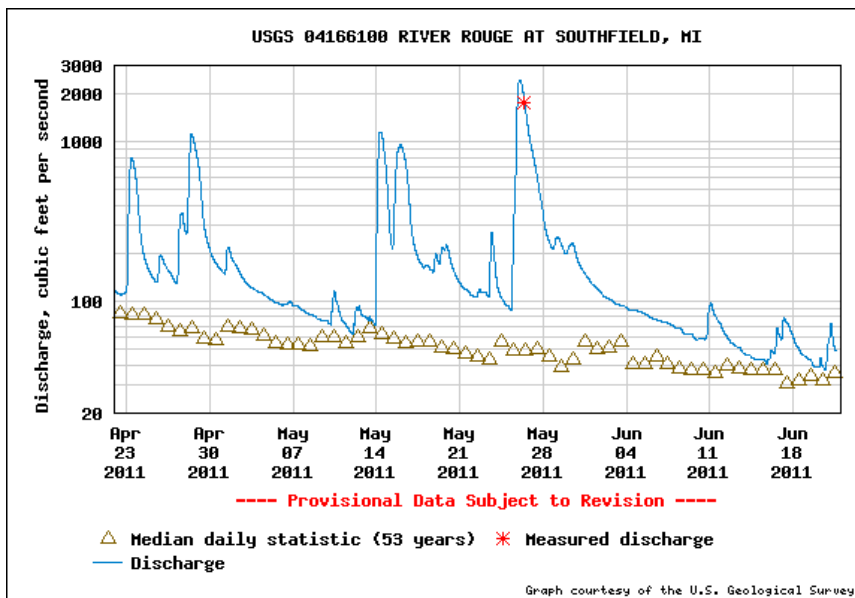
Each site is given a Stream Quality Index (SQI) which is determined by weighting each type and number of organisms found by their sensitivity ratings. A higher proportion of sensitive organisms such as mayflies and caddisflies results in a higher score. A number of different organisms also results in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



A Tale of Two Tolerances: The Caddisfly and the Damselfly By Bruce McCulloch, FOTR Aquatic Biologist



Lepidostomatid
caddisfly

While identifying the specimens collected during this year's Spring Bug Hunt, I was very excited to find two families of insects new to the Rouge River watershed. One was a Lepidostomatid caddisfly larvae found at John8. This family is considered very sensitive. The other was a Lestidae (spreadwinged damselfly) larvae found at Fel2. This family is considered very tolerant.

Lepidostomatid caddisflies can be found in a variety of aquatic habitats, but larvae are most common in the slow current of small, cool streams where dead leaves (remember allochthonous inputs!) have accumulated (Voshell 2002). As shredders/detritivores, these caddisflies feed on those leaves that have softened and started to decompose (Voshell 2002). While Lepidostomatid

caddisflies construct a variety of cases of different materials and shapes, they are best known for a four-sided case consisting

of quadrate panels of leaves and bark (Wiggins 2004). A distinguishing characteristic of these caddisflies is the location of short antennae immediately in front of the eye (Wiggins 2004).

When found in streams, Spreadwinged damselflies typically inhabit slow, weedy sections where larvae always live on vegetation (Voshell 2002). These damselflies are engulfer-predators and stalk their prey. The coloration and elongate body, which includes a very long, narrow lower lip which distinguishes it from other damselflies, provide excellent camouflage (Voshell 2002). If these damselflies are so tolerant, why have we not seen them before now? One reason could be that typical habitat is not encountered all that often. Also, Fel2 was sampled at a later date than most of the other sites, which might have affected species composition. Finally, some Odonates (dragonflies and damselflies) just seem to have a rather restricted distribution in the watershed. For example, Fellows and Fowler creeks, both in the lower Rouge, are the only two streams in which emerald dragonflies (Corduliidae, genus *Somatochlora*) have been found.

Literature Cited

Voshell, J. R. Jr. 2002. A Guide to Common Freshwater Invertebrates of North America. The McDonald & Woodward Publishing Company. Blacksburg, VA. 442 pp.

Wiggins, G.B. 2004. Caddisflies: The Underwater Architects. University of Toronto Press. Toronto, ON. 292 pp.

Overall Scores

The majority of sites (28/47 or 60%) had FAIR SQI. Two sites were EXCELLENT: John8, and MR-20, 11 were GOOD. Five sites were POOR: Fel4, LR-5, Bish2, Nton, and Will1.

In comparing sites with three or more years of past data, three sites (See2, Main5, and Main6) were above a standard deviation of the average while one site was below (LR-5).

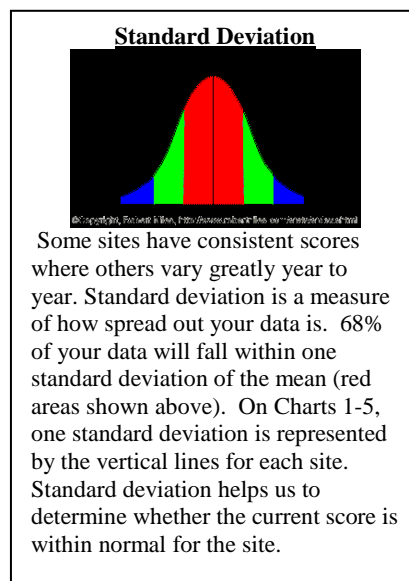
Data Trends

A trend analysis was performed by Wayne County on the data to determine if the Stream Quality Index (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. Two downstream subwatersheds (Main3-4 and Middle3) were left out because high water prevented data collection.

Table 1 contains the data trends by subwatershed (labeled Branch). While all of

Table 1			
Benthic Macroinvertebrate Trend by subwatershed			
Spring Bug Hunt Summary 2001-2011			
Branch	slope	p-value	True trend
Upper	0.39	0.23	no
Lower 1	0.51	0.22	no
Lower 2	1.19	0.68	no
Middle 1	1.60	0.00	yes, increase
Johnson Crk	0.85	0.11	no
Main 1-2	0.74	0.01	yes, increase

the slopes were positive, showing possible upward trends, only two subwatersheds, Middle 1 and Main 1-2, had significant trends (the p-value must be < 0.05 for the trend to be significant). Middle1, the upstream section of the Middle branch, had the steepest, positive slope at 1.60. Main 1-2 also seems to be trending upward though not as dramatically with a slope of 0.74. The data plots for Middle 1 and Main 1-2 are on p. 9 of this report.



Two new families of insects were found during the spring sampling (see article on p. 1 by Bruce McCulloch). One was a Lepidostomatid caddisfly larvae found at John8. This family is considered very sensitive. The other was a Lestidae damselfly larvae found at Fel2.

Six sensitive families were found at seven sites (see Table 2) including three stonefly families, one mayfly family, and two caddisfly families. Nemourid broadback stoneflies were found for the first time at Fowl1. Perlodid stoneflies were found at five sites (Fowl1, John2, John8, Fel2, LR-8) and Capnid stoneflies at one site (MR-22). Pronggill mayflies (Leptophlebiidae) were found at six sites (John2, John8, Fel2, John7, LR-8, MR-22). Rhyacophilid caddisflies were found at three sites (Fowl1, John2, and John7) and Lepidostomatidae at one site (John8).

Lower Branch

Twelve sites were sampled on the Lower Branch of the Rouge (see Table 1). Three tributaries were sampled: Delaney Creek (LR-7), Fellows Creek (Fel1, Fel2, Fel4, LR-5), Fowler Creek (Fowl1) and six sites on the main branch of the Lower (Low2, LR-3, LR-6, LR-8, LR-10, LR-11). Two sites scored GOOD (Fowl1 & LR-8), eight scored FAIR (Fel1, Fel2, Low2, LR-3, LR-6, LR-7, LR-10, LR-11), and two POOR scores (Fel4 & LR-5). For sites with past data, in comparison to past years, LR-5 was below a standard deviation of the mean score for the site. All of the rest of the sites were within the normal range

Delaney Creek

Delaney Creek (LR-7) near Hannan and Ecorse Roads in Romulus was FAIR rather than GOOD and the number of taxa was lower than average.

Fellows Creek

Four sites on Fellows Creek were sampled and all but one had lower SQI than average. Fel4 and LR-5 were POOR rather than FAIR and LR-5 was below the standard deviation of the mean for the site. The only site with a better SQI than average was Fel2. This site was resampled because the original SQI was POOR and it was felt that high water may have made it too difficult to sample there.



Fowler Creek team

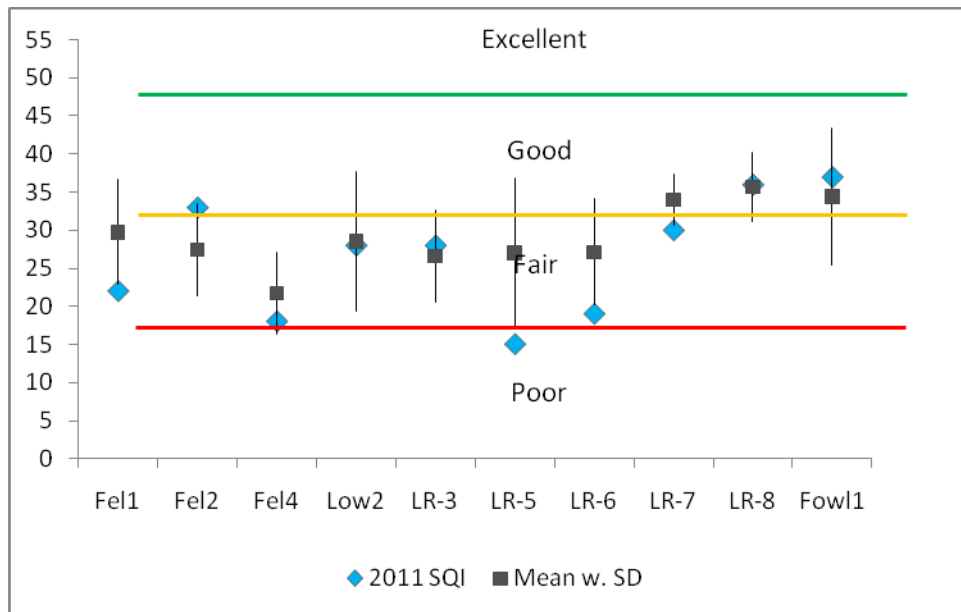
Fowler Creek

Fowler Creek was sampled at one location (Fowl1) rated GOOD as in past years. This site had Nemourid broad-backed stoneflies for the first time though they have been found downstream at Fowl2. It also had Perlodid stoneflies and Rhyacophilid caddisflies.

Lower

Five Lower branch sites (Low2, LR-3, LR-6, LR-8, LR-10, LR-11) were sampled and all but LR-8 had FAIR SQI. LR-8 at Proctor and Ridge was GOOD and had both Perlodid stoneflies and Pronggill mayflies.

Chart 1: Lower Branch SQI and Mean with Standard Deviation



Main Branch

Ten sites on the Main Branch were sampled. Four were on tributaries: Nottingham and Pebble Creek. Nine had FAIR SQI and one (Peb1) was GOOD. Two sites had SQI above a standard deviation of the mean: Main 5 and Main6.

Nottingham Creek

Nottingham Creek (Nott) in Beverly Hills was sampled near Country Day Middle School. THE SQI was FAIR which is average for the site.

Pebble Creek

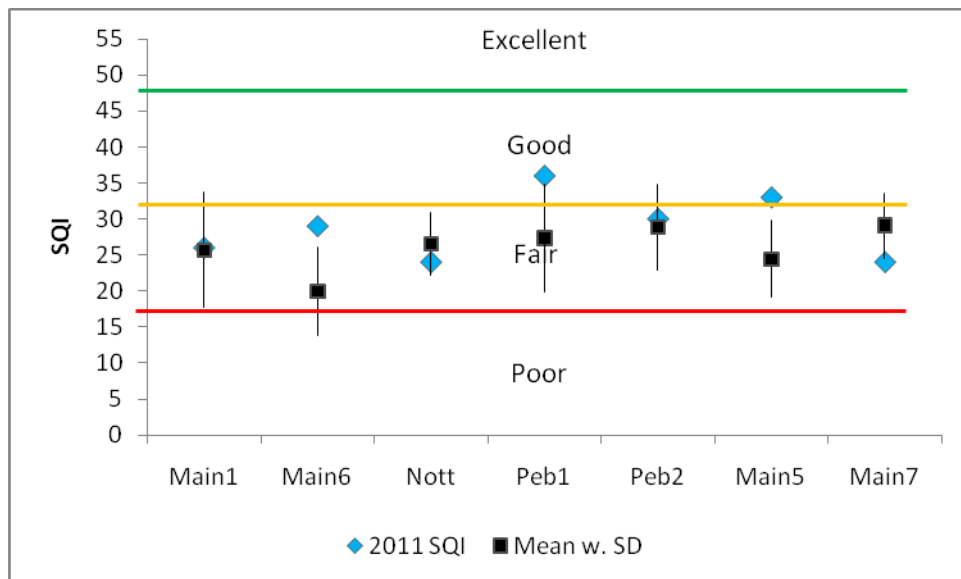
Pebble Creek was sampled at three sites including a new site this year in preparation for the removal of Danvers Pond next year. The site just upstream of the pond (Peb1) had a GOOD score while downstream (Peb3) and further upstream were FAIR.



Main

Six sites were sampled on the Main Branch and all had FAIR SQI, similar to past years. Firefighters Park had the small fish called stonecat (see photo at left). Due to the high water, downstream sites were very difficult to sample and Sally even managed to overtop her waders sampling the Main7 site at 10 Mile Road.

Chart 2: Main Branch SQI and Mean with Standard Deviation



Middle Branch

Sixteen sites were sampled on the Middle branch including six tributaries: Bishop, Ingersoll, Johnson, Tonquish, Walled Lake, and Willow Creeks. The Middle Branch had the only two EXCELLENT SQIs in the watershed; three POOR scores, seven GOOD and four FAIR. For sites with past data, most of the SQIs were within normal for the sites.

Bishop Creek

Bishop Creek (Bish2) had a POOR score and a lower number of taxa.

Ingersoll Creek

Ingersoll Creek had a FAIR SQI and similar number of taxa (11) as in past years.

Johnson Creek

Five Johnson Creek sites were sampled this spring (John2, John7, John8, MR-22, MR-23). John8 had an EXCELLENT SQI, the rest rated GOOD except MR-23 which had a high FAIR SQI. Four of the Johnson Creek sites had sensitive families (Table 2).

Walled Lake Drainage

In the Walled Lake Drainage system, two sites were sampled. Both (Wall2, Wall3) were in the FAIR range, similar to past years.

Tonquish Creek

The Tonquish Creek was sampled at three sites. The upstream site (Ton1) at Plymouth Township Park and the new Lion's Club Park site (MR-24) both had GOOD scores, and the North Tonquish Creek site (Nton) had a POOR SQI, similar to past years.

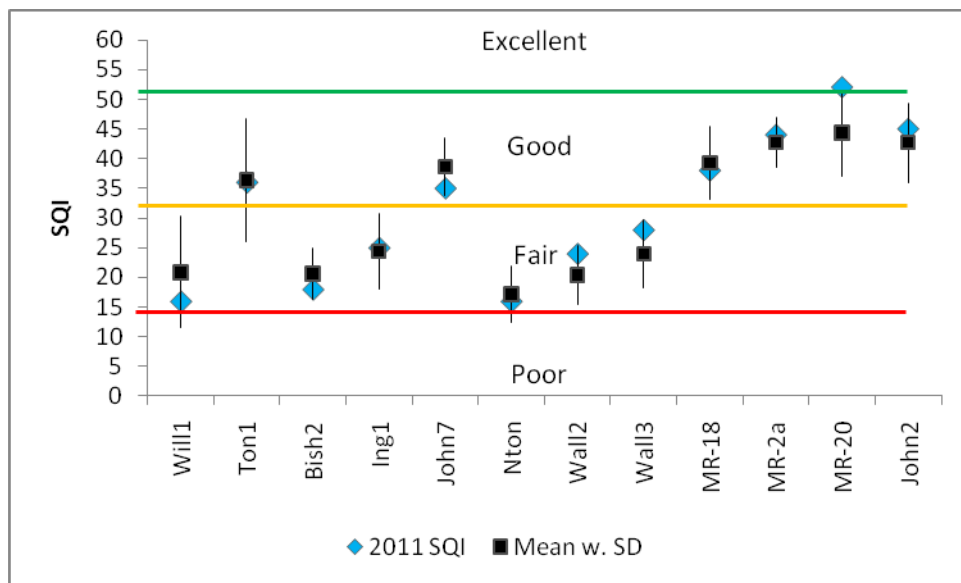
Willow Creek

Willow Creek at Barchester Park (Will1) had a POOR SQI and only 8 taxa. This is a bit down from past years when the SQI was FAIR.

Middle Branch

There were three sites on the Middle Branch. Two were GOOD (MR-2a and MR-18) and one was EXCELLENT (MR-20).

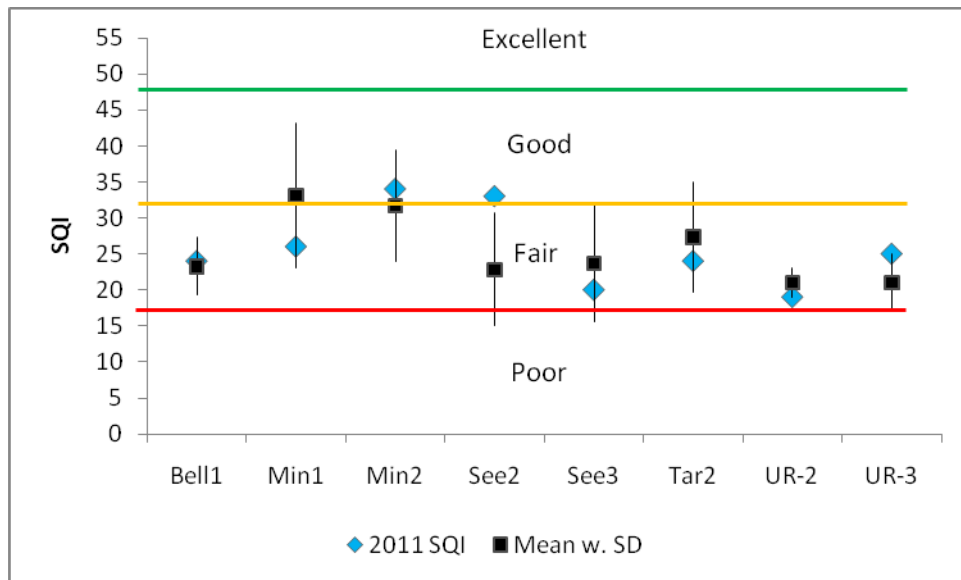
Chart 3: Middle Branch SQI and Mean with Standard Deviation



Upper Branch

Nine Upper branch sites were sampled this spring, including four tributaries: Bell, Minnow Pond, Seeley & Tarabusi Creeks. Seven sites scored FAIR and two sites scored GOOD (Min2, UR-4). For sites with past data, the See2 site was above a standard deviation of the mean for the site while the rest were within the normal range for the site.

Chart 4: Upper Branch SQI with Mean and Standard Deviation



Eden Tewkesbury shows off her gloves at Bell Creek

Bell Branch

Bell Creek at Bicentennial Park (Bell1) and at Bell Creek Park (UR-4) had a FAIR score.

Minnow Pond Creek

Minnow Pond both at 13 Mile Road (Min1) rated FAIR and GOOD at Oakland Community College (Min2).

Seeley Creek

Both Seeley Creek sites scored FAIR although the See3 site had a SQI that was above a standard deviation for the mean for the site.

Tarabusi Creek

Tarabusi Creek (UR-3 and Tar2) had FAIR SQI at both sites.

Upper Rouge

The Upper at Five Mile and Beech Daly (UR-4) had a GOOD SQI and 14 taxa.

THANK YOU!!!!

Thank you to all the **volunteers** and **Team Leaders**, **Wayne County**, (especially **Sue Thompson**) for sampling and providing data for 17 sites, **Krispy Kreme** for giving us half price donuts, **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 **Erb Family Foundation** for funding the program.

Join us for the Fall Bug Hunt Oct. 15, 2011

**Schoolcraft College VisTaTech Center
9am-4pm**

Sign up online today (deadline Oct. 1, 2011)

www.therouge.org

Friends of the Rouge Benthic Macroinvertebrate Monitoring Program

SPR11

- ★ excellent
- ▲ good
- fair
- poor

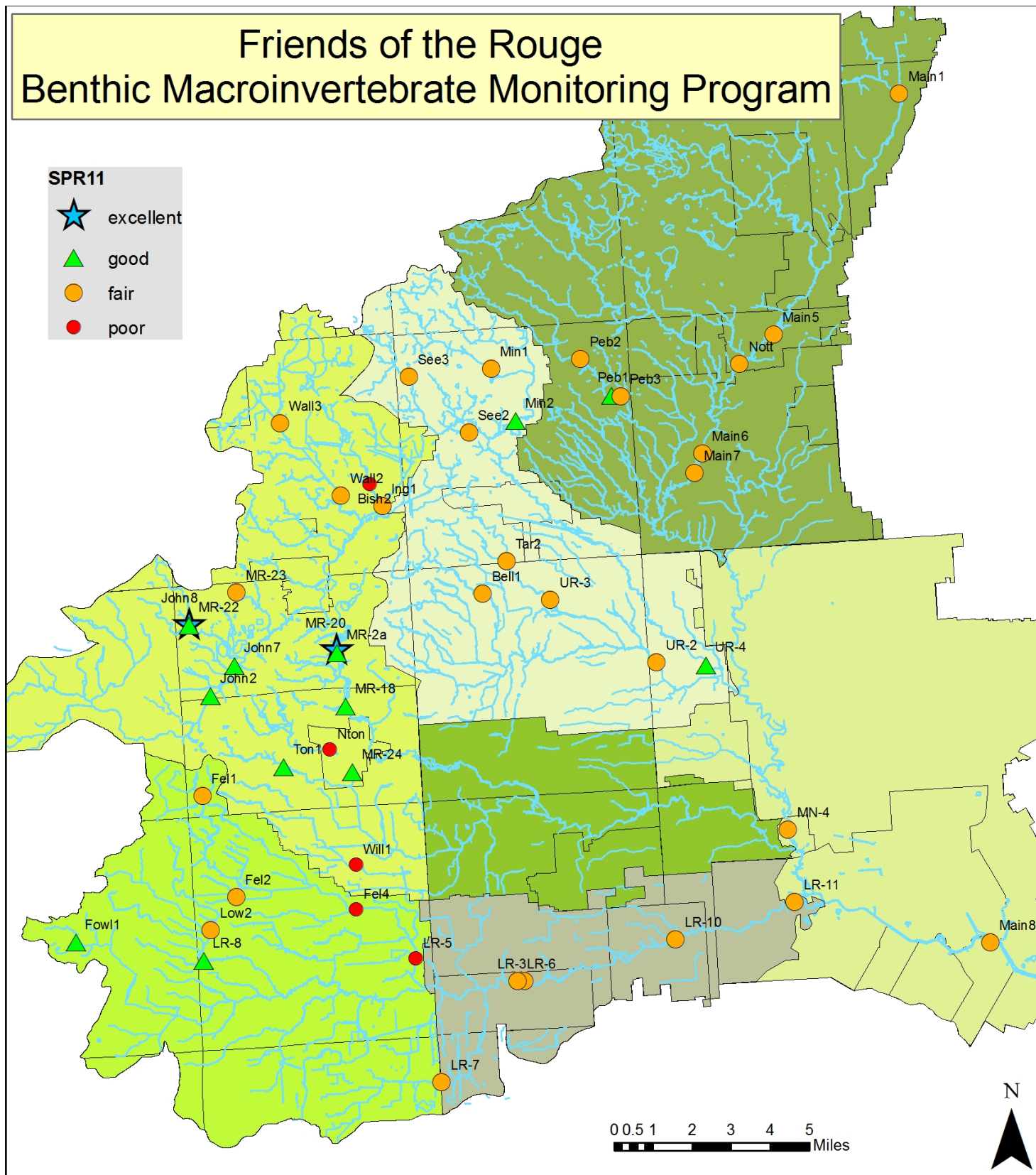
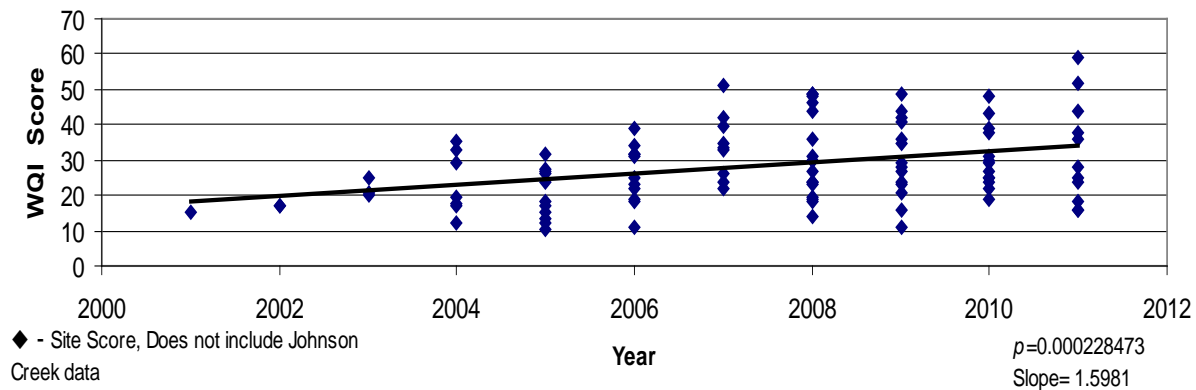


Table 1: Spring 2011 SQI Scores							
Branch	FieldID	Location	SQI	SQI Rating	Taxa	EPT	# Sen Fam
Lower	Fel1	Fellows Plymouth	22	fair	8	1	0
Lower	Fel2	South Fellows	33	fair	16	3	2
Lower	Fel4	Flodin Park	18	poor	8	0	0
Lower	Fowl1	Fowler Prospect	37	good	15	7	3
Lower	Low2	Lower Ridge	28	fair	10	2	0
Lower	LR-10	John Daly	24	fair	10	2	0
Lower	LR-11	Ford Field	25	fair	13	2	0
Lower	LR-3	Goudy Park	28	fair	8	2	0
Lower	LR-5	Meadows of Canton	15	poor	7	0	0
Lower	LR-6	Wayne WDM 201	19	fair	8	0	0
Lower	LR-7	Ecorse & Hannan	30	fair	12	1	0
Lower	LR-8	Lower Proctor	36	good	15	4	2
Main	Main1	Firefighters Pk	26	fair	14	1	0
Main	Main5	Douglas Evans	33	fair	13	1	0
Main	Main6	Sfld	29	fair	11	2	0
Main	Main7	Sfld 10 Mile	24	fair	11	1	0
Main	Main8	Fordson Island	21	fair	6	0	0
Main	MN-4	Parkland Park	32	fair	13	3	0
Main	Nott	Country Day MS	24	fair	11	1	0
Main	Peb1	Pebble Creek-Danvers	36	good	14	2	0
Main	Peb2	Pebble Creek 13 Mile	30	fair	13	1	0
Main	Peb3	d/s Danvers Pond	32	fair	14	1	0
Middle	Bish2	Bishop Cr Scarborough	18	poor	7	1	0
Middle	Ing1	Brookfarm Park	25	fair	11	1	0
Middle	John2	JC 5M NV	45	good	17	8	3
Middle	John7	JC Arcadia	35	good	16	6	2
Middle	John8	Maybury north	54	excellent	23	7	3
Middle	MR-18	Springbrook Rec Area	38	good	16	3	0
Middle	MR-20	Waterford Bend	52	excellent	20	4	0
Middle	MR-22	Maybury south	41	good	17	3	2
Middle	MR-23	Maybury north	32	fair	12	1	0
Middle	MR-24	Lion's Park	36	good	15	1	0
Middle	MR-2a	Reservoir Road W	44	good	15	3	0
Middle	Nton	North Tonquish	16	poor	6	1	0
Middle	Ton1	Plymouth Twp Pk-4-9	36	good	14	3	0
Middle	Wall2	WL 10 M	24	fair	10	1	0
Middle	Wall3	WL 12 M	28	fair	12	1	0
Middle	Will1	Barchester Pk	16	poor	8	0	0
Upper	Bell1	Bicentennial Park	24	fair	8	2	0
Upper	Min1	Minnow Pond	26	fair	10	1	0
Upper	Min2	OCC	34	good	13	1	0
Upper	See2	Sleepy Hollow	33	fair	11	2	0
Upper	See3	Seeley Creek Trail	20	fair	8	1	0
Upper	Tar2	Tara 8 M	24	fair	9	2	0
Upper	UR-2	Bell Creek Park	19	fair	8	1	0
Upper	UR-3	Tara 7 Mile	25	fair	10	1	0
Upper	UR-4	Five Mile Beech Daly	35	good	14	2	0

Table 2: Sensitive Families Found

Branch	Creek	FIELD ID	Family 1	Family 2	Family 3
Lower	Fellows	Fowl1	Perlodidae (Perlodid stonefly)	Nemouridae (Broadback stonefly)	Rhyacophilidae (free living caddisfly)
Middle	Johnson	John2	Perlodidae (Perlodid stonefly)	Leptophlebiidae (pronggill mayfly)	Rhyacophilidae (free living caddisfly)
Middle	Johnson	John8	Perlodidae (Perlodid stonefly)	Leptophlebiidae (pronggill mayfly)	Lepidostomatidae (caddisfly)
Lower	Fellows	Fel2	Perlodidae (Perlodid stonefly)	Leptophlebiidae (pronggill mayfly)	
Middle	Johnson	John7	Leptophlebiidae (pronggill mayfly)	Rhyacophilidae (free living caddisfly)	
Lower	Lower	LR-8	Perlodidae (Perlodid stonefly)	Leptophlebiidae (pronggill mayfly)	
Middle	Johnson	MR-22	Capniidae (slender winter stonefly)	Leptophlebiidae (pronggill mayfly)	

**Middle 1 Storm Water Management Area
Macroinvertebrate Data Trend
Spring 2001-2011 All Sites (Wayne County and Friends of the Rouge Data)**



**Main 1-2 Storm Water Management Area
Macroinvertebrate Data Trend
Spring 2001-2011 All Sites (Wayne County and Friends of the Rouge Data)**

