

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
WATER RESOURCES DIVISION  
APRIL 2017

STAFF REPORT

A BIOLOGICAL SURVEY OF THE FLINT RIVER AND  
SELECTED TRIBUTARIES IN  
GENESEE, LAPEER, OAKLAND, SANILAC, SAGINAW, SHIAWASSEE, AND  
TUSCOLA COUNTIES  
JUNE-SEPTEMBER 2008 AND 2013

Qualitative biological sampling of the Flint River watershed was conducted by staff of the Michigan Department of Environmental Quality (MDEQ), Surface Water Assessment Section (SWAS), from June-September of both 2008 and 2013 as part of a five-year watershed monitoring cycle. The Flint River watershed is a vast watershed that falls within two ecoregions: the Southern Michigan Northern Indiana Till Plain and Huron and Lake Erie Till Plain ecoregions (Omernik and Gallant, 1988). Land use in the Flint River watershed is predominantly agriculture and forested with portions also being urban. The Flint River is a major tributary to the Saginaw River/Bay ecosystem.

**OBJECTIVES**

These biological surveys were conducted to:

- Assess the current status condition of individual waters to determine attainment of Michigan Water Quality Standards (WQS).
- Evaluate potential impacts from National Pollutant Discharge Elimination System (NPDES)-regulated sources to water quality in the watersheds.
- Identify potential nonpoint sources (NPS) of water quality impairment.
- Satisfy monitoring request submitted by internal and external customers.

The locations of the surveyed biological stations are illustrated in Figures 1a (2008) and 1b (2013) and Tables 1a (2008) and 1b (2013). For the 2008 data, detailed macroinvertebrate, fish, and habitat sampling results are provided in Tables 2a and 2b, 3a and 3b, and 4, respectively. Water (14 locations) and sediment (2 locations) chemistry samples were collected during the 2008 watershed assessment; locations and results can be found in Tables 5 and 6. Data from 2008 nonwadeable survey locations can be found in Tables 7a and 7b. For the 2013 data, detailed macroinvertebrate and habitat sampling results are provided in Tables 8a and 8b, and 9, respectively.

**WATERSHED DESCRIPTION**

The Flint River watershed drains approximately 1,350 square miles in Michigan's Thumb region and is a large tributary to the Saginaw River; Michigan's largest river basin. While much of the central and lower portion of the watershed is composed of lake plain deposits, characterized by flat topography; headwater portions of the north and south branches of the Flint River,

Kearsley Creek, and Thread Creek provide significant groundwater to the system. Because of the rich lake plain soils that encompass a large portion of the Flint River watershed, agriculture is the dominant land use within the watershed. To facilitate agricultural drainage, many tributaries have been straightened and channelized.

## **HISTORY**

Recent biological surveys conducted in the Flint River watershed concluded that siltation/sedimentation, unstable flows, and loss of habitat due to severe channel modification were the greatest impacts to the biological community throughout much of the middle and lower reaches of the watershed (Alexander, 1997; Walterhouse, 2001a and 2001b; Scott, 1993; and Cooper, 2003). The headwater portions of the Flint River and a number of headwater streams have shown acceptable to excellent biological communities in previous studies (Walterhouse, 2001b; Cooper, 2003).

## **METHODS**

Qualitative macroinvertebrate and habitat surveys were performed according to the SWAS Procedure 51 (MDEQ, 1990; Creal et al., 1996) for wadeable streams and SWAS Procedure 22 (MDEQ, 2013) for nonwadeable river sites. Site selection was made based on the need to gather information on a watershed-wide basis to inform decisions of attainment of WQS, identify NPS of water quality impairment, provide information for review of the NPDES permits, and to satisfy outside monitoring requests where possible.

In 2008, 46 randomly selected sampling locations, including three nonwadeable sites, were proposed to support watershed-wide status estimates and have enough to establish future temporal trend sites. In 2013, 14 sampling locations to support watershed-wide status were randomly selected from the pool of stream segments represented within the Flint River watershed. To develop long-term trend monitoring, 10 sites were sampled in 2013 from those sampled in 2008, thereby establishing fixed trend sites. During both sampling years additional sites were sampled to address targeted questions as well. In total, 58 sites (55 using Procedure 51 and 3 using Procedure 22) and 34 sites were sampled in 2008 and 2013, respectively, for macroinvertebrates and habitat. Additionally, water chemistry samples were collected at 14 locations; sediment chemistry samples were collected at two locations; and the fish community was assessed at one location in 2008.

## **Summary**

### **2008**

1. The locations of the biological sampling stations, habitat observations, and water and sediment samples are shown in Figure 1a. Table 1a contains a summary of station locations and qualitative ratings for habitat and biological community for each station. Macroinvertebrate community, fish community, physical habitat, and water and sediment chemistry data are presented in Tables 2a and 2b; 3a and 3b; 4; 5; and 6, respectively. Nonwadeable survey data can be found in Tables 7a and 7b.
2. The macroinvertebrate scores ranged from poor to excellent. Sites rating poor were primarily clustered around the city of Flint. This region is primarily composed of suburban and urban land use and therefore subject to severely altered hydrology resulting in flashy flows, increased sedimentation/siltation, and in-stream habitat loss.

Low scores for stream flashiness at a majority of sites further strengthens the argument that hydrological alterations are problems throughout the watershed (Table 4).

Tributaries to the West Branch Swartz Creek particularly stand out as a region that has poor biological communities. One site on Misteguay Creek also rated poor, this subwatershed has been heavily modified to support agriculture drainage. In-stream habitat loss, siltation, and channelization are the likely causes of poor macroinvertebrate communities in all the sites that rated poor.

Three additional nonwadeable stations on the Flint River (two on the main branch Flint River, one on the North Branch Flint River) were assessed using the SWAS Procedure 22 (Stations 1, 26, and 56; Table 1a and Figure 1a). Two nonwadeable stations (Stations 1 and 26) were in the vicinity of the upstream end of the city of Flint, while the third (Station 56) was upstream of Holloway Reservoir; all 3 macroinvertebrate community scores rated marginal (Tables 7a and 7b).

Sites that rated as having excellent and highly acceptable macroinvertebrate communities were typically found in the head water portions of the South Branch Flint River and other groundwater driven subwatersheds like Kearsley Creek. One site on Misteguay Creek (Burt Road) was rated excellent for macroinvertebrate community; the remaining sites within this subwatershed were rated as acceptable.

In 2008, 46 randomly selected sites within the Flint River watershed were sampled to support attainment status calculation. Based on the probabilistic monitoring aspect of this watershed survey, 92 +/- 8 percent of the randomly selected sites supported the Other Indigenous Aquatic Life and Wildlife (OIALW) designated use using biological monitoring procedures. Percent attainment was calculated by dividing the number of random sites that met WQS by the total number of random locations ((42 / 46)100 = 92 percent). This value is coupled with a 95 percent confidence interval to provide our estimation of certainty, meaning there is 95 percent certainty that the true proportion of attainment in the Flint River watershed is between 84 and 100 percent (MDEQ, 2015).

3. A single fish community assessment was conducted on Brent Run. Previous surveys conducted in 1997 and 1998 noted a poor fish community; however, the current survey rated as having an excellent fish community.
4. The overall habitat conditions of the 55 sites sampled using Procedure 51 generally ranged from marginal to good; however, one site on the South Branch Flint River rated as having excellent habitat. Habitat quality issues exist throughout the Flint River watershed; over two-thirds of the site surveyed had marginal habitat rating. Both agriculture and urban/suburban development can have similar effects on in-stream habitat by increasing precipitation-related runoff rates and altering stream hydrology, which often increase flashiness, sediment inputs, and erosion rates. The combination of these impacts often significantly limits the in-stream habitat available for colonization by macroinvertebrates.
5. Water chemistry was collected at 14 locations, results can be found in Table 5. Samples taken upstream and downstream of Holloway Reservoir (Stations 46 and 47, respectively) showed nutrient levels increasing from upstream to downstream (total phosphorus, nitrate + nitrite, total Kjeldahl nitrogen) but phosphorus readily available for biological uptake and growth (ortho-phosphorus) remaining unchanged.

6. Sediment chemistry. Surficial sediment samples were taken at 2 locations, Gilkey Creek at Center Road (Station 25) and Call Drain at Torrey Road (Station 20). Results can be seen in Table 6. Gilkey Creek sediments had Polycyclic Hydrocarbons (PAH) slightly above Probable Effect Concentrations (PEC) (MacDonald et al., 2000); it is expected these sediments are causing negative impacts to stream biota though to what extent is unclear. Macroinvertebrates scored at the very low end of the acceptable scale for the Procedure 51 survey at this site suggesting a biological response to possible water or habitat quality impacts, or a combination of both.

Call Drain sediments are a concern; PAHs numbers were very high, well above the PEC concentration guidelines. While on site a thick layer (approximately two feet) of black ooze was observed in the sediment while wading. The ooze appeared to be slimy and smelled of petroleum sludge. Zinc was also slightly above PEC values. Further investigation of contaminated sediments at this location is recommended.

2013

1. The locations of the biological sampling stations, habitat observations, and water samples are shown in Figure 1b. Table 1b contains a summary of station locations and qualitative ratings for habitat and biological community for each station. Macroinvertebrate community and physical habitat data are presented in Tables 8a and 8b, and 9, respectively
2. The macroinvertebrate ranged from poor to excellent, with a majority of sites rating acceptable.

Carman Creek at Atherton Road (Figure 2) was the only site that rated as having a poor macroinvertebrate community during the 2013 sampling. Carman Creek is a small warmwater tributary to the West Branch of Swartz Creek and suffers from in-stream habitat loss due to channelization, flashy flows, and scour (Table 4). Very few macroinvertebrates were collected during sampling and good colonization habitat was almost nonexistent in the stream channel. A blue discharge was observed coming from a pipe that fed directly into the stream, the pipe appeared to drain a nearby pond and it was determined that the discharge was likely a dye product used for coloring pond water, typically for aesthetics and the control of algae and plant growth by inhibiting light penetration. Lansing District staff were notified of the issue for further investigation.

Two sites were rated as having excellent macroinvertebrate communities, one on Swartz Creek (Fenton Road) and the other on Kearsley Creek (Atlas Road). Both Swartz and Kearsley Creeks are predominantly developed suburban subwatersheds; however, some reaches still support good to excellent biological communities likely due to stable in-stream habitats, which provide good colonization substrate (e.g., cobble and woody debris) and are not engulfed by fine sediments as seen in many parts of the Flint River watershed.

Nine locations (~30%) that rated acceptable fell on the low end (-3 and -4) of the -4 to +4 acceptable range. Channel straightening, canopy removal, siltation, flashy flows, and continual maintenance are evident throughout the watershed and likely are the contributing factors impacting macroinvertebrate communities. Much of the Flint River watershed suffers from anthropogenic alterations.

In 2013, 14 randomly selected sites within the Flint River watershed were sampled to support attainment status calculation. Based on the probabilistic monitoring aspect of this watershed survey, 93 +/- 15 percent of the randomly selected sites supported the OIALW designated use using biological monitoring procedures. Percent attainment was calculated by dividing the number of random sites that met WQS by the total number of random locations ((13 / 14)100 = 93 percent). This value is coupled with a 95 percent confidence interval to provide our estimation of certainty, meaning there is 95 percent certainty that the true proportion of attainment in the Flint River watershed is between 78 and 100 percent (MDEQ, 2015).

3. No water chemistry or fish community assessments were conducted during the 2013 survey.



Figure 2. Carman Creek at Atherton Road

#### TREND EVALUATION

Ten locations were visited in both 2008 and 2013 to monitor biological/physical trends at specific sites. Another monitoring cycle (2018) will be required before any trend inference can be made. In general, macroinvertebrate scores did not vary much between both years and scores were typically within one or two points of each other.

#### NPS POLLUTION AND TARGETED SURVEY SUMMARY

In 2008, a five-mile segment of Rush Creek was investigated because of varying results in macroinvertebrate community scores from past surveys in relationship to an adjacent landfill. Macroinvertebrates rated as being acceptable both above (Durand Road) and below (Middleton Road) the landfill area with scores being slightly better at the downstream location. Water chemistry from both locations show all parameters (except Nitrate + Nitrite) being lower downstream of the landfill area than above.

Big Seven Lake in Oakland County was also investigated in 2008 due to comments about excessive plant growth. Staff collected a single grab sample for water chemistry near the boat launch location. Results suggest reasonable levels of nutrients (Table 4) and no excess levels of aquatic plants were observed.

NPS issues related to altered stream hydrology resulting in habitat loss, erosion, and siltation/sedimentation are prevalent throughout the Flint River watershed with the exception of portions of the South Branch Flint River. Stressors such as increases in impervious surfaces, channel straitening, canopy removal, and maintained dredging continue to greatly impact the quality of these waterways.

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# FLINT RIVER WATERSHED SITE LOCATIONS

**2008**

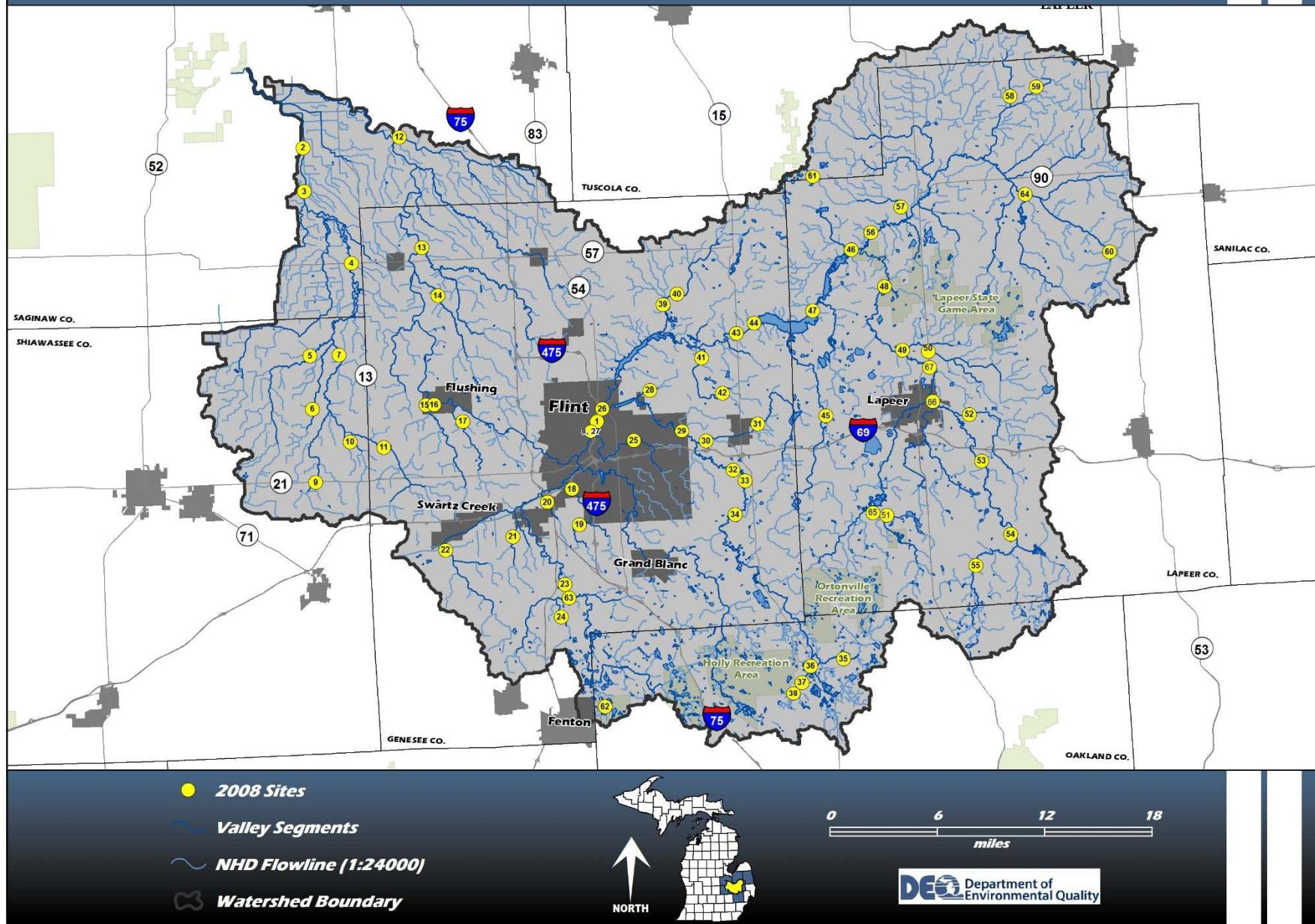


Figure 1a. Sampling locations for 2008 monitoring.

# **FLINT RIVER WATERSHED STATUS / TREND**

2013

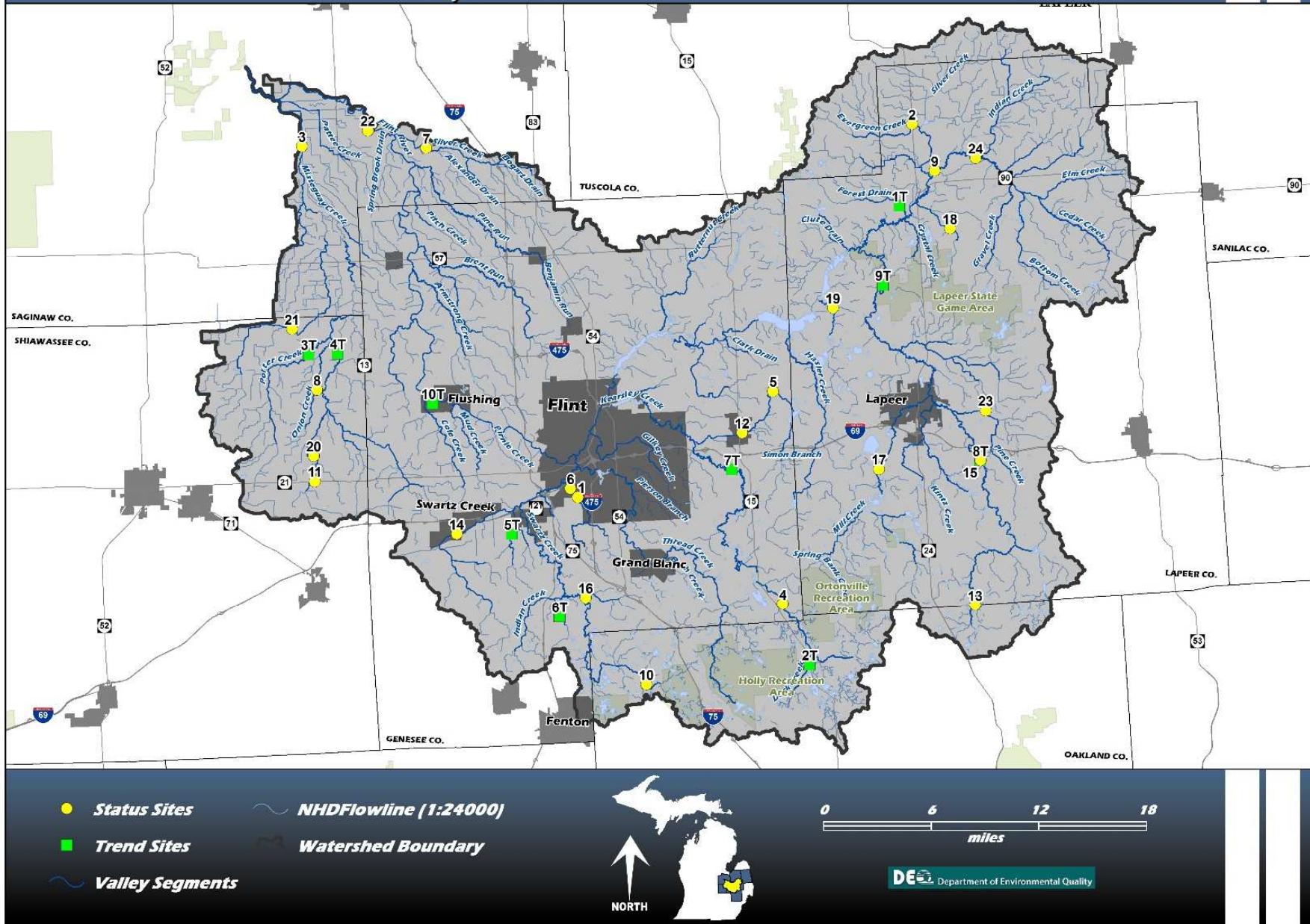


Figure 1b. Sampling locations for 2013 monitoring.

Table 1a. 2008 site sampling list and summary of findings.

Site #	Water Body Name	Location	Survey Method	Survey Type	Latitude	Longitude	Macroinvertebrate	Habitat
1	Flint River	Leith St	P22	Probabilistic	43.042849	-83.675452	Fair	
2	Misteguay Creek	Alicia Rd	P51	Combination	43.271000	-83.992000	Acceptable	Marginal
3	Misteguay Creek	Burt Rd	P51	Combination	43.235000	-83.992000	Excellent	Marginal
4	Misteguay Creek	Peet Rd	P51	Combination	43.176000	-83.942000	Acceptable	Good
5	Porter Creek	Allan Rd	P51	Probabilistic	43.102000	-83.990000	Acceptable	Good
6	Onion Creek	Juddville Rd	P51	Probabilistic	43.059000	-83.989000	Acceptable	Marginal
7	Misteguay Creek	Allan Rd	P51	Combination	43.102000	-83.958000	Poor	Good
8	Rush Creek	Middleton Rd.	Water Chem/P51	Targeted	43.034604	-83.682361	Acceptable	Marginal
9	Rush Creek	Durand Rd	Water Chem/P51	Combination	42.999000	-83.987000	Acceptable	Marginal
10	Crawford Creek	Byron Rd	P51	Probabilistic	43.031000	-83.948000	Acceptable	Marginal
11	Misteguay Creek	Duffield Rd	P51	Combination	43.026000	-83.911000	Acceptable	Marginal
12	Silver Creek	Canada Rd.	P51	Targeted	43.277693	-83.885380	Acceptable	Marginal
13	Brent Run	McKinley Rd	Water Chem/P51	Targeted	43.187210	-83.863540	Excellent	Good
14	Armstrong Creek	Dodge Rd	P51	Probabilistic	43.148000	-83.847000	Acceptable	Good
15	Cole Creek	Pierson Rd	P51	Targeted	43.059841	-83.863400	Acceptable	Good
16	Flint River	Riverview Park	P51	Probabilistic	43.059984	-83.854243	Acceptable	Good
17	Mud Creek	Potter Road	P51	Targeted	43.045900	-83.823300	Poor	Marginal
18	Carman Creek	Atherton Rd	P51	Probabilistic	42.988379	-83.705224	Poor	Marginal
19	Sherwood Drain	Maple Ave (west xing)	P51	Probabilistic	42.959511	-83.698176	Acceptable	Good
20	Call Drain	Torrey Rd	Sediment/Water Chem/P51	Probabilistic	42.978362	-83.732474	Poor	Marginal
21	Howland Drain	Linden Rd	P51	Combination	42.951335	-83.771466	Acceptable	Marginal
22	Alger Drain	Hill Rd.	P51	Targeted	42.941846	-83.846033	Acceptable	Good
23	Swartz Creek	Creekwood Dr.	P51	Targeted	42.911694	-83.715696	Acceptable	Good
24	Dawe Drain	Baldwin Rd	P51	Probabilistic	42.885440	-83.720574	Acceptable	Good
25	Gilkey Creek	Center Rd	Sediment/Water Chem/P51	Combination	43.026115	-83.635281	Acceptable	Marginal
26	Flint River	M-54	Water Chem/P22	Combination	43.053000	-83.669000	Fair	
27	Flint River	Davison Rd	Water Chem	Targeted	43.034604	-83.682361		
28	Chipmunk Creek	Genesee Rd	P51	Probabilistic	43.067000	-83.616000	Poor	Marginal
29	Kearsley Creek	Davison Rd	P51	Probabilistic	43.033000	-83.582000	Acceptable	Marginal
30	Black Creek	Irish Rd	P51	Combination	43.024000	-83.556000	Acceptable	Marginal
31	Black Creek	Oak	P51	Targeted	43.036999	-83.498123	Acceptable	Good
32	Kearsley Creek	Atlas Rd (North)	P51	Probabilistic	43.000000	-83.527000	Excellent	Good
33	Kearsley Creek	Atherton Rd	P51	Probabilistic	42.991000	-83.514000	Acceptable	Good
34	Kearsley Creek	Atlas Rd (South)	P51	Probabilistic	42.964000	-83.526000	Acceptable	Good

Table 1a. cont.

Site #	Water Body Name	Location	Survey Method	Survey Type	Latitude	Longitude	Macroinvertebrate	Habitat
35	Kearsley Creek	Hadley Rd	P51	Probabilistic	42.845000	-83.412000	Acceptable	Good
36	Duck Creek	M-15 (south xing)	P51	Probabilistic	42.840000	-83.448000	Acceptable	Good
37	Duck Creek	Glass Rd	P51	Probabilistic	42.827000	-83.458000	Acceptable	Good
38	Duck Creek	Duck Creek Ln	P51	Probabilistic	42.818000	-83.468000	Excellent	Good
39	Butternut Creek	Frances Rd	P51	Combination	43.136000	-83.599000	Acceptable	Good
40	Butternut Creek	Vassar Rd	P51	Combination	43.144000	-83.583000	Acceptable	Good
41	Powers Cullen Drain	Coldwater Rd	P51	Combination	43.092000	-83.558000	Acceptable	Marginal
42	Powers Cullen Drain	Richfield Rd	P51	Combination	43.063000	-83.536000	Acceptable	Good
43	Flint River	State Rd	P51	Probabilistic	43.111000	-83.519000	Acceptable	Good
44	Flint River	Oak (d/s Holloway)	Water Chem	Targeted	43.118730	-83.499119		
45	Hasler Creek	Davison Rd	P51	Combination	43.042000	-83.423000	Acceptable	Good
46	Flint River	Klam Rd (u/s Holloway)	Water Chem	Targeted	43.175600	-83.389300		
47	Flint River	Mt. Morris Rd.	Water Chem	Targeted	43.127212	-83.434056		
48	S B Flint River	Norway Lake Rd	P51	Probabilistic	43.145000	-83.354000	Acceptable	Good
49	Plum Creek Drain	Plum Creek Rd	P51	Combination	43.093000	-83.336000	Acceptable	Marginal
50	Plum Creek Drain	Lapeer Rd	P51	Targeted	43.091555	-83.307537	Acceptable	Marginal
51	Farmers Creek	Herd Rd	P51	Probabilistic	42.959806	-83.359315	Acceptable	Marginal
52	Pine Creek	Maple Grove Rd	P51	Combination	43.039443	-83.264577	Acceptable	Marginal
53	S B Flint River	Newark Rd	P51	Combination	43.001000	-83.253000	Excellent	Good
54	S B Flint River	Thornville	P51	Targeted	42.941007	-83.223446	Excellent	Good
55	S B Flint River	Gardner	P51	Targeted	42.916785	-83.263086	Acceptable	Excellent
56	N B Flint River	Barnes Lake Rd	P22	Combination	43.189000	-83.367000	Fair	
57	Forest Drain	Oliver Rd	P51	Probabilistic	43.209000	-83.333000	Acceptable	Marginal
58	Adams Drain	Murphy Lake Rd	P51	Probabilistic	43.296000	-83.208000	Acceptable	Marginal
59	Indian Creek	Lake Pleasant Rd	P51	Probabilistic	43.303000	-83.179000	Acceptable	Marginal
60	Cedar Creek	Willis Rd	P51	Probabilistic	43.167000	-83.104000	Acceptable	Good
61	North Lake		Visual Inspection	Targeted	43.236063	-83.429026		
62	Big Seven Lake		Water Chem	Targeted	42.811521	-83.675222		
63	Swartz Creek	Cook Rd	P51	Targeted	42.900551	-83.711302	Acceptable	Good
64	N B Flint River	Jefferson Rd	P51	Probabilistic	43.215810	-83.195220	Acceptable	Marginal
65	Farmers Creek	Wynns Mills Rd.	Water Chem	Targeted	42.962110	-83.374349		
66	S B Flint River	Genesee Rd	Water Chem	Targeted	43.050837	-83.304448		
67	S B Flint River	Saginaw Rd	Water Chem	Targeted	43.078615	-83.306948		

Table 1b. 2013 site sampling list and summary of findings.

SITE #	STORET	WATER BODY NAME	LOCATION	SURVEY TYPE	LATITUDE	LONGITUDE	2013 Ratings	
							Macroinvertebrates	Habitat
1	250536	Carman Creek	Hemphill Road	Status	42.98119	-83.69753	Acceptable	Good
2	440243	Evergreen Creek	M24	Status	43.27460	-83.31618	Acceptable	Good
3	730360	Misteguay Creek	off Alicia and Creswell Road	Status	43.27066	-83.99186	Acceptable	Marginal
4	250476	Kearsley Creek	Kipp Road	Status	42.89010	-83.47540	Acceptable	Good
5	250537	Black Creek	Henderson Road	Status	43.06212	-83.47902	Acceptable	Marginal
6	250528	Carman Creek	Atherton Road	Status	42.98838	-83.70522	Poor	Good
7	730361	Silver Creek	Marshall Road	Status	43.26675	-83.85442	Acceptable	Marginal
8	780254	Onion Creek	Riley Road	Status	43.07326	-83.98178	Acceptable	Marginal
9	440214	North Branch Flint River	Castle Road	Status	43.23650	-83.29290	Acceptable	Good
10	631229	Swartz Creek	Elliott Road	Status	42.82807	-83.62782	Acceptable	Good
11	780240	Rush Creek	Durand Road (south)	Status	42.99938	-83.98675	Acceptable	Marginal
12	250538	Black Creek	Rising Street	Status	43.02933	-83.51445	Acceptable	Good
13	631230	South Branch Flint River	Davison Lake Road	Status	42.88440	-83.26381	Acceptable	Good
14	250331	West Branch Swartz Creek	Morrish Road	Status	42.95422	-83.83181	Acceptable	Marginal
15	440232	South Branch Flint River	Newark Road	Status	43.00101	-83.25264	Acceptable	Good
16	250539	Swartz Creek	Fenton Road	Status	42.90004	-83.69178	Excellent	Good
17	440244	Farmers Creek	Sand Hill Farm Drive	Status	42.99664	-83.36485	Acceptable	Marginal
18	440245	Fitch Drain	Laur Road	Status	43.18934	-83.27802	Acceptable	Good
19	440185	Henry Drain	Mt. Morris Road	Status	43.12777	-83.41005	Acceptable	Good
20	780255	Rush Creek	Durand Road (north)	Status	43.01991	-83.98703	Acceptable	Marginal
21	780256	Northwood Creek	Reed Road	Status	43.12267	-84.00759	Acceptable	Good
22	730362	Flint River	off Seymour Road	Status	43.28198	-83.91842	Acceptable	Good
23	440246	Pine Creek	Wilder Road	Status	43.04117	-83.24515	Acceptable	Good
24	440247	North Branch Flint River	Silverwood Road	Status	43.24553	-83.24717	Acceptable	Good
1T	440227	Forest Drain	Oliver Rd	Trend	43.20900	-83.33300	Acceptable	Marginal
2T	631143	Duck Creek	M-15 (south xing)	Trend	42.84000	-83.44800	Acceptable	Marginal
3T	780220	Porter Creek	Allan Rd	Trend	43.10200	-83.99000	Acceptable	Good
4T	780234	Misteguay Creek	Allan Rd	Trend	43.10200	-83.95800	Acceptable	Good
5T	250514	Howland Drain	Linden Rd	Trend	42.95300	-83.77100	Acceptable	Marginal
6T	250515	Dawe Drain	Baldwin Rd	Trend	42.88500	-83.72100	Acceptable	Good
7T	250516	Kearsley Creek	Atlas Rd (north xing)	Trend	43.00000	-83.52700	Excellent	Marginal
8T	440232	S B Flint River	Newark Rd	Trend	43.00100	-83.25300	Acceptable	Good
9T	440068	S B Flint River	Norway Lake Rd	Trend	43.14500	-83.35400	Acceptable	Excellent
10T	250513	Flint River	Riverview Park (downtown Flushing)	Trend	43.06000	-83.85420	Acceptable	Good

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Misteguay Creek Alicia Road 8/6/2008	Misteguay River Burt Rd 8/6/2008	Misteguay River M-57 (Peet Raod) 8/6/2008	Porter Creek Allen Road 6/23/2008
	STATION 2	STATION 3	STATION 4	STATION 5
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria	6	1		
BRYOZOA (moss animals)				
ANNELIDA (segmented worms)				
Hirudinea (leeches)	1	14	2	
Oligochaeta (worms)				
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	13	3		10
Decapoda (crayfish)	1	1	5	52
Isopoda (sowbugs)		1		
Arachnoidea				
Hydracarina		1		
Insecta				
Ephemeroptera (mayflies)				
Baetidae		23	3	1
Caenidae	45	11	2	3
Ephemeridae	3	2		
Heptageniidae		13	8	1
Isonychiidae		1		
Tricorythidae	3	2		
Odonata				
Anisoptera (dragonflies)				
Aeshnidae		1	3	2
Gomphidae			1	
Libellulidae	2		1	1
Zygoptera (damselflies)				
Calopterygidae	2	5	4	10
Coenagrionidae	106	33		2
Lestidae	9			
Plecoptera (stoneflies)				
Perlidae		1	1	1
Hemiptera (true bugs)				
Belostomatidae		1	1	
Corixidae	29	7		3
Gerridae	3	7	2	5
Pleidae	1	1		
Veliidae	1	1	2	
Megaloptera				
Sialidae (alder flies)		1		1
Trichoptera (caddisflies)				
Helicopsychidae		1	1	
Hydropsychidae	1	13	1	21
Hydroptilidae	9	1		1
Leptoceridae	25	5	1	
Uenoidae		1	1	
Coleoptera (beetles)				
Dytiscidae (total)	1			
Gyrinidae (adults)	3			
Haliplidae (adults)	9	1	1	
Hydrophilidae (total)	2	5		
Dryopidae			1	
Elmidae	6	12	40	70
Gyrinidae (larvae)				1
Haliplidae (larvae)	2	3		
Psephenidae (larvae)			1	
Scirtidae (larvae)				1
Diptera (flies)				
Ceratopogonidae	1	1		
Chironomidae	42	35	8	39
Culicidae	3	1		1
Dixidae			1	

Simuliidae				1
Stratiomyidae	4			
Tabanidae	1	3		
Tipulidae	2		21	
MOLLUSCA				
Gastropoda (snails)				
Ancylidae (limpets)	1	1		1
Bithyniidae		1		
Lymnaeidae	1			
Physidae	12	26	3	15
Planorbidae	5	3		1
Pleuroceridae		4		
Viviparidae			1	
Pelecypoda (bivalves)				
Sphaeriidae (clams)	1	16	168	2
Unionidae (mussels)		1	1	
TOTAL INDIVIDUALS	347	269	269	267

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Misteguay Creek		Misteguay River		Misteguay River		Porter Creek	
	Alicia Road		Burt Rd		M-57 (Peet Raod)		Allen Road	
	8/6/2008		8/6/2008		8/6/2008		6/23/2008	
	STATION 2		STATION 3		STATION 4		STATION 5	
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	29	0	43	1	30	0	26	0
NUMBER OF MAYFLY TAXA	3	0	6	1	3	0	3	1
NUMBER OF CADDISFLY TAXA	3	0	5	1	4	1	2	0
NUMBER OF STONEFLY TAXA	0	-1	1	1	1	1	1	1
PERCENT MAYFLY COMP.	14.70	-1	19.33	0	4.83	-1	1.87	-1
PERCENT CADDISFLY COMP.	10.09	0	7.81	0	1.49	-1	8.24	0
PERCENT DOMINANT TAXON	30.55	-1	13.01	1	62.45	-1	26.22	-1
PERCENT ISOPOD, SNAIL, LEECH	5.19	1	13.38	0	2.23	1	6.37	0
PERCENT SURF. AIR BREATHERS	14.99	0	10.41	0	2.23	1	3.37	1
TOTAL SCORE	-2		5		1		1	
MACROINV. COMMUNITY RATING	ACCEPT.		EXCELLENT		ACCEPT.		ACCEPT.	

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Onion Creek Juddville Road 8/6/2008 STATION 6	Mistegay Creek Allen Road 6/23/2008 STATION 7	Rush Creek Middleton Road 9/23/2008 STATION 8	Rush Creek Durand Road 9/23/2008 STATION 9
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria			7	6
ANNELEIDA (segmented worms)				
Hirudinea (leeches)	2		4	1
Oligochaeta (worms)	37	5	15	41
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	3	6		1
Decapoda (crayfish)	5	9	2	1
Isopoda (sowbugs)	6	24	96	174
Arachnoidea				
Hydracarina	1	1	2	
Insecta				
Ephemeroptera (mayflies)				
Baetidae		1		
Caenidae	19	5	6	
Heptageniidae		1	1	
Leptophlebiidae				1
Odonata				
Anisoptera (dragonflies)				
Aeshnidae		1		3
Gomphidae			1	
Libellulidae	1			
Zygoptera (damselflies)				
Calopterygidae	3		12	
Coenagrionidae	2	6	16	11
Hemiptera (true bugs)				
Corixidae	15	44	25	2
Gerridae	1	1		1
Mesovelidae	1			
Notonectidae		1		1
Veliidae			2	
Megaloptera				
Sialidae (alder flies)	5	1		
Trichoptera (caddisflies)				
Helicopsychidae	2		13	
Hydropsychidae	1	1		
Hydroptilidae	3		1	
Leptoceridae	1	1		
Limnephilidae			1	
Phryganeidae				5
Polycentropodidae	1			
Coleoptera (beetles)				
Dytiscidae (total)			1	2
Gyrinidae (adults)				1
Haliplidae (adults)	3		5	25
Hydrophilidae (total)	1	2	1	
Dryopidae		1	1	
Elmidae	61	18	90	9
Haliplidae (larvae)		4		
Diptera (flies)				
Ceratopogonidae	1	1	1	2
Chironomidae	8	72	23	36
Culicidae	1			
Simuliidae		1	2	3
Tabanidae	1			
MOLLUSCA				
Gastropoda (snails)				
Ancylidae (limpets)		1		
Physidae	37	52	20	
Planorbidae	13			
Viviparidae			1	

Pelecypoda (bivalves)				
Sphaeriidae (clams)	51		17	4
Unionidae (mussels)		1		
TOTAL INDIVIDUALS	286	261	366	330

Table 2B. Macroinvertebrate metric evaluation of

METRIC	Onion Creek		Misteguay Creek		Rush Creek		Rush Creek	
	Juddville Road		Allen Road		Middleton Road		Durand Road	
	8/6/2008		6/23/2008		9/23/2008		9/23/2008	
	STATION 6		STATION 7		STATION 8		STATION 9	
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	29	1	26	0	27	1	21	1
NUMBER OF MAYFLY TAXA	1	1	3	0	2	1	1	1
NUMBER OF CADDISFLY TAXA	5	1	2	0	3	1	1	0
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	6.64	-1	2.68	-1	1.91	-1	0.30	-1
PERCENT CADDISFLY COMP.	2.80	-1	0.77	-1	4.10	0	1.52	-1
PERCENT DOMINANT TAXON	21.33	0	27.59	-1	26.23	-1	52.73	-1
PERCENT ISOPOD, SNAIL, LEECH	20.28	-1	29.50	-1	33.06	-1	53.03	-1
PERCENT SURF. AIR BREATHERS	7.69	1	18.39	0	9.29	1	9.70	0
TOTAL SCORE		0		-5		0		-3
MACROINV. COMMUNITY RATING		ACCEPT.		POOR		ACCEPT.		ACCEPT.

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Crawford Creek Byron Road 9/23/2008 STATION 10	Misteguay Creek Duffield Road 9/23/2008 STATION 11	Silver Creek Canada Road 8/6/2008 STATION 12	Brent Run McKinley Road 8/6/2008 STATION 13
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<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria	3	3		1
<b>BRYOZOA (moss animals)</b>				1
<b>ANNELIDA (segmented worms)</b>				
Hirudinea (leeches)	4	7	7	1
Oligochaeta (worms)	55	36	3	5
<b>ARTHROPODA</b>				
Crustacea				
Amphipoda (scuds)		71	100	6
Decapoda (crayfish)		1	2	3
Isopoda (sowbugs)	26	10	79	6
Arachnoidea				
Hydracarina	2			
Insecta				
Ephemeroptera (mayflies)				
Baetidae			7	27
Caenidae	4	1	1	8
Ephemerellidae	1			
Ephemeridae			2	
Heptageniidae			1	29
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	1	1	1	1
Libellulidae		2	1	
Zygoptera (damselflies)				
Calopterygidae	1		2	1
Coenagrionidae	3	1	9	
Plecoptera (stoneflies)				
Perlidae				1
Hemiptera (true bugs)				
Belostomatidae	1	1	2	
Corixidae	8	23	24	9
Gerridae	1		6	5
Nepidae	3	1		
Pleidae			1	
Veliidae				1
Megaloptera				
Corydalidae (dobson flies)				2
Sialidae (alder flies)		2	1	1
Trichoptera (caddisflies)				
Helicopsychidae				4
Hydropsychidae				82
Hydroptilidae				4
Leptoceridae			1	1
Limnephilidae			4	1
Philopotamidae				1
Phryganeidae	2	1		
Coleoptera (beetles)				
Dytiscidae (total)	1	1	3	
Gyrinidae (adults)			1	
Haliplidae (adults)	6	30	2	2
Hydrophilidae (total)	1	4	2	
Elmidae	101	37	6	76
Psephenidae (larvae)				10
Diptera (flies)				
Ceratopogonidae		1		
Chironomidae	3	5	14	23
Culicidae			9	
Simuliidae				1
Tabanidae		1	2	1
Tipulidae				13
<b>MOLLUSCA</b>				

Gastropoda (snails)				
Ancylidae (limpets)				4
Hydrobiidae	1			
Lymnaeidae		1		
Physidae	7	63	9	14
Planorbidae	14			
Pelecypoda (bivalves)				
Sphaeriidae (clams)	56	51	5	8
TOTAL INDIVIDUALS	304	355	308	353

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Crawford Creek		Misteguay Creek		Silver Creek		Brent Run	
	Byron Road		Duffield Road		Canada Road		McKinley Road	
	9/23/2008		9/23/2008		8/6/2008		8/6/2008	
	STATION 10		STATION 11		STATION 12		STATION 13	
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	23	1	25	1	31	1	34	1
NUMBER OF MAYFLY TAXA	2	1	1	-1	4	1	3	1
NUMBER OF CADDISFLY TAXA	1	0	1	1	2	0	6	1
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	1	1
PERCENT MAYFLY COMP.	1.64	-1	0.28	-1	3.57	-1	18.13	0
PERCENT CADDISFLY COMP.	0.66	-1	0.28	-1	1.62	-1	26.35	1
PERCENT DOMINANT TAXON	33.22	-1	20.00	0	32.47	-1	23.23	-1
PERCENT ISOPOD, SNAIL, LEECH	16.78	-1	22.82	-1	31.17	-1	7.08	0
PERCENT SURF. AIR BREATHERS	6.91	1	16.90	0	16.23	0	4.82	1
TOTAL SCORE		-2		-3		-3		5
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.		EXCELLEN

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Armstrong Creek	Cole Creek	Flint River
	Dodge Road 8/6/2008 STATION 14	Pierson Road 9/23/2008 STATION 15	Riverview Park 6/23/2008 STATION 16
<b>PLATYHELMINTHES (flatworms)</b>			
Turbellaria			1
BRYOZOA (moss animals)	1		
ANNELIDA (segmented worms)			
Hirudinea (leeches)			1
Oligochaeta (worms)	2	33	11
ARTHROPODA			
Crustacea			
Amphipoda (scuds)	1		41
Decapoda (crayfish)	3	1	3
Isopoda (sowbugs)		21	
Insecta			
Ephemeroptera (mayflies)			
Baetidae	1	2	7
Caenidae	8		
Heptageniidae	2	41	3
Tricorythidae			1
Odonata			
Anisoptera (dragonflies)			
Aeshnidae	6	1	
Zygoptera (damselflies)			
Calopterygidae	3	10	
Coenagrionidae		7	3
Plecoptera (stoneflies)			
Perlidae	1		1
Hemiptera (true bugs)			
Corixidae	1	3	
Gerridae	1		31
Veliidae		1	
Megaloptera			
Sialidae (alder flies)	1	3	
Trichoptera (caddisflies)			
Brachycentridae			1
Helicopsychidae	43		
Hydropsychidae	30		85
Hydroptilidae	5		13
Leptoceridae			5
Limnephilidae	4	4	
Molannidae	4		
Polycentropodidae			1
Psychomyiidae		1	
Uenoidae	8		4
Coleoptera (beetles)			
Dytiscidae (total)	1		
Haliplidae (adults)	1	6	
Hydrophilidae (total)	1		
Dryopidae	1		
Elmidae	97	47	8
Psephenidae (larvae)		3	
Diptera (flies)			
Chironomidae	28	18	49
Dixidae	2		
Simuliidae			30
Tabanidae	1		
Tipulidae	13	1	
MOLLUSCA			
Gastropoda (snails)			
Aculyidae (limpets)	2	7	2
Hydrobiidae	3		
Physidae	56	38	1
Viviparidae	1		
Pelecypoda (bivalves)			

Sphaeriidae (clams)	29	5	43
TOTAL INDIVIDUALS	361	253	345

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Armstrong Creek		Cole Creek		Flint River	
	Dodge Road	Piersom Road	Riverview Park			
	8/6/2008	9/23/2008	6/23/2008			
	STATION 14	STATION 15	STATION 16			
METRIC	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	33	1	21	0	23	0
NUMBER OF MAYFLY TAXA	3	1	2	0	3	0
NUMBER OF CADDISFLY TAXA	6	1	2	0	6	1
NUMBER OF STONEFLY TAXA	1	1	0	-1	1	1
PERCENT MAYFLY COMP.	3.05	-1	17.00	0	3.19	-1
PERCENT CADDISFLY COMP.	26.04	1	1.98	-1	31.59	1
PERCENT DOMINANT TAXON	26.87	-1	18.58	0	24.64	-1
PERCENT ISOPOD, SNAIL, LEECH	17.17	-1	26.09	-1	1.16	1
PERCENT SURF. AIR BREATHERS	1.39	1	3.95	1	8.99	1
TOTAL SCORE		3		-2		3
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Mud Creek Potter Rd 9/23/2008 STATION 17	Carman Creek Atherton Road 9/24/2008 STATION 18	Sherwood Drain Maple Ave (west xing) 8/8/2008 STATION 19	Call Drain Torrey Road 9/24/2008 STATION 20
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria			8	
NEMATOMORPHA (roundworms)			1	
ANNELIDA (segmented worms)				
Hirudinea (leeches)		2	9	
Oligochaeta (worms)	9	11	19	25
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	10	19		
Decapoda (crayfish)	1	1		
Isopoda (sowbugs)	69	2		
Arachnoidea				
Hydracarina		1		
Insecta				
Ephemeroptera (mayflies)				
Baetidae			7	1
Caenidae	5			
Heptageniidae			1	
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	2	1		
Libellulidae		1	7	
Zygoptera (damselflies)				
Calopterygidae	39	84		
Coenagrionidae	39	108	58	2
Hemiptera (true bugs)				
Belostomatidae	1			
Corixidae	29		6	12
Gerridae	2	1	2	
Mesovelidae	5			
Notonectidae			1	
Veliidae		3	1	
Trichoptera (caddisflies)				
Hydropsychidae	1	2	34	
Hydroptilidae			45	
Leptoceridae			2	
Limnephilidae			1	
Coleoptera (beetles)				
Haliplidae (adults)	1		4	
Hydrophilidae (total)			18	
Elmidae	5	2		
Diptera (flies)				
Ceratopogonidae		1		1
Chironomidae	10	8	56	44
Culicidae			2	
Tabanidae	1			
Tipulidae		1	1	
MOLLUSCA				
Gastropoda (snails)				
Aculyidae (limpets)		2		1
Lymnaeidae		1		
Physidae	11	20	13	3
Planorbidae			4	
Pelecypoda (bivalves)				
Sphaeriidae (clams)	29	3	160	
<b>TOTAL INDIVIDUALS</b>	<b>269</b>	<b>274</b>	<b>300</b>	<b>249</b>

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Mud Creek		Carman Creek		Sherwood Drain		Call Drain	
	Potter Rd	Atherton Road	9/24/2008	8/8/2008	Maple Ave (west xing)	9/24/2008	Torrey Road	
	STATION 17	STATION 18	STATION 19	STATION 20				
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	19	0	21	0	23	1	9	-1
NUMBER OF MAYFLY TAXA	1	-1	0	-1	2	1	1	-1
NUMBER OF CADDISFLY TAXA	1	-1	1	-1	4	1	0	-1
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	1.86	-1	0.00	-1	2.67	-1	0.40	-1
PERCENT CADDISFLY COMP.	0.37	-1	0.73	-1	27.33	0	0.00	-1
PERCENT DOMINANT TAXON	25.65	0	39.42	-1	19.33	1	64.26	-1
PERCENT ISOPOD, SNAIL, LEECH	29.74	-1	9.85	0	8.67	0	1.61	1
PERCENT SURF. AIR BREATHERS	14.13	0	1.46	1	11.33	0	4.82	1
TOTAL SCORE		-6		-5		2		-5
MACROINV. COMMUNITY RATING		POOR		POOR		ACCEPT.		POOR

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Howland Drain Linden Road 6/24/2008 STATION 21	Alger Drain Hill Road 9/24/2008 STATION 22	Swartz Creek Creekwood Road 9/29/2008 STATION 23	Swartz Creek Cook Road 9/29/2008 STATION 63
PORIFERA (sponges)	1			
PLATYHELMINTHES (flatworms)				
Turbellaria	4	11		
ANNELIDA (segmented worms)				
Hirudinea (leeches)	2	3		1
Oligochaeta (worms)	3	25	4	2
ARTHROPODA				
Crustacea				
Amphipoda (scuds)		1	6	6
Decapoda (crayfish)	1	2	1	3
Isopoda (sowbugs)			1	
Arachnoidea				
Hydracarina	1			
Insecta				
Ephemeroptera (mayflies)				
Baetidae	1	3	8	5
Caenidae		47	7	1
Heptageniidae		19	8	3
Leptophlebiidae		1		
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	1	5	3	1
Libellulidae	1			
Zygoptera (damselflies)				
Calopterygidae		7	10	5
Coenagrionidae	1	12	10	9
Plecoptera (stoneflies)				
Perlidae			1	1
Hemiptera (true bugs)				
Belostomatidae		1	1	1
Corixidae	11	3	97	117
Gerridae	3	1	1	
Nepidae				1
Pleidae			1	
Veliidae				1
Megaloptera				
Corydalidae (dobson flies)			1	
Sialidae (alder flies)				1
Trichoptera (caddisflies)				
Helicopsychidae			34	7
Hydropsychidae	13	7	65	15
Hydroptilidae	52	1		
Leptoceridae	2	4		
Limnephilidae			4	4
Phryganeidae		1	3	2
Uenoidae				1
Coleoptera (beetles)				
Dytiscidae (total)	1			
Gyrinidae (adults)				1
Haliplidae (adults)		4		1
Hydrophilidae (total)	1	4		1
Elmidae	9	59	51	38
Haliplidae (larvae)	4			
Psephenidae (larvae)			8	2
Diptera (flies)				
Ceratopogonidae	1			
Chironomidae	171	49	7	4
Culicidae				1
Simuliidae		1	5	1
Stratiomyidae		1		
Tabanidae			8	2
Tipulidae	1	1	3	4

<b>MOLLUSCA</b>				
Gastropoda (snails)				
Ancylidae (limpets)		16	2	1
Lymnaeidae	1	2		
Physidae	44	18	3	1
Planorbidae	2		3	1
Pleuroceridae				
Pelecypoda (bivalves)				
Sphaeriidae (clams)	2	105	22	52
<b>TOTAL INDIVIDUALS</b>	333	414	379	297

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Howland Drain		Alger Drain		Swartz Creek		Swartz Creek	
	Linden Road	Hill Road	Creekwood Road	Cook Road	6/24/2008	9/24/2008	9/29/2008	9/29/2008
	STATION 21		STATION 22		STATION 23		STATION 63	
	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	25	1	30	1	31	1	35	1
NUMBER OF MAYFLY TAXA	1	0	4	1	3	0	3	0
NUMBER OF CADDISFLY TAXA	3	0	4	0	4	0	5	1
NUMBER OF STONEFLY TAXA	0	-1	0	-1	1	1	1	1
PERCENT MAYFLY COMP.	0.30	-1	16.91	0	6.07	0	3.03	0
PERCENT CADDISFLY COMP.	20.12	0	3.14	-1	27.97	0	9.76	0
PERCENT DOMINANT TAXON	51.35	-1	25.36	0	25.59	0	39.39	-1
PERCENT ISOPOD, SNAIL, LEECH	14.71	-1	9.42	0	2.37	1	1.35	1
PERCENT SURF. AIR BREATHERS	4.80	1	3.38	1	26.39	-1	41.75	-1
TOTAL SCORE		-2		1		2		2
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.		ACCEPT.

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Dawe Drain Baldwin Road 6/24/2008 STATION 24	Gilkey Creek Center Rd 8/8/2008 STATION 25	Chipmunk Creek Genesee Road 8/7/2008 STATION 28	Kearsley Creek Davison Road 8/8/2008 STATION 29
<b>PORIFERA (sponges)</b>				1
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria	2	30	1	
<b>ANNELIDA (segmented worms)</b>				
Hirudinea (leeches)	1	6	1	
Oligochaeta (worms)	8	223		18
<b>ARTHROPODA</b>				
Crustacea				
Amphipoda (scuds)	1		7	1
Decapoda (crayfish)	2		2	1
Isopoda (sowbugs)			58	17
Insecta				
Ephemeroptera (mayflies)				
Baetidae	7			14
Caenidae			9	
Heptageniidae				33
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	1	1	1	1
Libellulidae	2	9		
Zygoptera (damselflies)				
Calopterygidae				3
Coenagrionidae		47	40	10
Hemiptera (true bugs)				
Belostomatidae			1	
Corixidae		1	27	29
Gerridae	5		5	2
Notonectidae			1	
Pleidae				1
Veliidae				5
Megaloptera				
Corydalidae (dobson flies)				1
Sialidae (alder flies)			10	1
Trichoptera (caddisflies)				
Glossosomatidae	1			
Hydropsychidae	5			6
Hydroptilidae	2			1
Leptoceridae				6
Limnephilidae				1
Polycentropodidae				6
Coleoptera (beetles)				
Dytiscidae (total)	9			
Haliplidae (adults)	2	1	1	
Hydrophilidae (total)		1	3	
Elmidae	6		5	
Haliplidae (larvae)	5			53
Diptera (flies)				
Ceratopogonidae		5		
Chironomidae	104	34	60	56
Culicidae			2	1
Ephydriidae		1		
Simuliidae	2			
Stratiomyidae	1			
Tabanidae				3
<b>MOLLUSCA</b>				
Gastropoda (snails)				
Aculyliidae (limpets)			3	
Lymnaeidae	5			
Physidae	36	2	3	
Planorbidae	4		4	
Pleuroceridae		2		
Viviparidae		1		

Pelecypoda (bivalves)				
Sphaeriidae (clams)	51	9	81	7
TOTAL INDIVIDUALS	262	373	325	283

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Dawe Drain		Gilkey Creek		Chipmunk Creek		Kearsley Creek	
	Baldwin Road	6/24/2008	Center Rd	8/8/2008	Genesee Road	8/7/2008	Davison Road	8/8/2008
	STATION 24		STATION 25		STATION 28		STATION 29	
	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	22	1	16	0	22	0	27	1
NUMBER OF MAYFLY TAXA	1	0	0	-1	1	-1	2	0
NUMBER OF CADDISFLY TAXA	3	0	0	-1	0	-1	5	1
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	2.67	-1	0.00	-1	2.77	-1	16.61	0
PERCENT CADDISFLY COMP.	3.05	-1	0.00	-1	0.00	-1	7.07	0
PERCENT DOMINANT TAXON	39.69	-1	59.79	-1	24.92	0	19.79	1
PERCENT ISOPOD, SNAIL, LEECH	17.56	-1	2.95	1	21.23	-1	7.77	0
PERCENT SURF. AIR BREATHERS	6.49	1	0.80	1	12.31	0	13.43	0
TOTAL SCORE		-3		-4		-6		2
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		POOR		ACCEPT.

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Black Creek Irish Road 8/8/2008 STATION 30	Black Creek Oak Rd 8/8/2008 STATION 31	Kearsley Creek Atlas Road (north crossing) 6/25/2008 STATION 32	Kearsley Creek Atherton Rd 6/25/2008 STATION 33
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria	13		1	
ANNELIIDA (segmented worms)				
Hirudinea (leeches)	4			
Oligochaeta (worms)	71	2	4	8
ARTHROPODA				
Crustacea				
Amphipoda (scuds)				1
Decapoda (crayfish)	3	14	5	1
Isopoda (sowbugs)	65	1		
Insecta				
Ephemeroptera (mayflies)				
Baetidae	12	13	10	20
Caenidae	1	25	1	
Ephemeridae			2	
Heptageniidae		27	6	5
Isonychiidae			1	
Odonata				
Anisoptera (dragonflies)				
Aeshnidae				1
Gomphidae			3	1
Libellulidae	2			
Zygoptera (damselflies)				
Calopterygidae	19	2	1	
Coenagrionidae	39	1	1	
Plecoptera (stoneflies)				
Perlidae			11	7
Hemiptera (true bugs)				
Belostomatidae	1			
Corixidae	29	4	55	31
Gerridae	1	1	1	1
Notonectidae	1			
Pleidae		1		
Veliidae	1	1		
Megaloptera				
Sialidae (alder flies)	3		1	
Trichoptera (caddisflies)				
Brachyceridae			90	22
Glossosomatidae				1
Helicopsychidae		3		1
Hydropsychidae		14	31	37
Hydroptilidae		10		11
Leptoceridae	2	7	21	4
Limnephilidae		1		
Molanidae			1	2
Philopotamidae				1
Polycentropodidae			1	2
Uenoidae		2		2
Coleoptera (beetles)				
Dytiscidae (total)	2	1		
Gyrinidae (adults)			1	1
Haliplidae (adults)	3	1		1
Hydrophilidae (total)	18	1	1	1
Psephenidae (adults)				1
Elmidae	1	44	15	16
Gyrinidae (larvae)			3	3
Diptera (flies)				
Ceratopogonidae				3
Chironomidae	47	27	23	36
Culicidae				1
Simuliidae	29	49		
Stratiomyidae				1

Tipulidae	1			
<b>MOLLUSCA</b>				
Gastropoda (snails)				
Ancylidae (limpets)	1	1	1	4
Hydrobiidae		1	2	3
Lymnaeidae			1	1
Physidae	3	7	6	22
Planorbidae	1	1		
Viviparidae	1			
Pelecypoda (bivalves)				
Sphaeriidae (clams)	26	8		6
Unionidae (mussels)				1
TOTAL INDIVIDUALS	400	271	299	260

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Black Creek		Black Creek		Kearsley Creek		Kearsley Creek	
	Irish Road 8/8/2008 STATION 30		Oak Rd 8/8/2008 STATION 31		Atlas Road (north crossing) 6/25/2008 STATION 32		Atherton Rd 6/25/2008 STATION 33	
	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	29	1	30	1	27	1	35	1
NUMBER OF MAYFLY TAXA	2	0	3	0	5	1	2	0
NUMBER OF CADDISFLY TAXA	1	-1	6	1	5	1	10	1
NUMBER OF STONEFLY TAXA	0	-1	0	-1	1	1	1	1
PERCENT MAYFLY COMP.	3.25	0	23.99	1	6.69	0	9.62	0
PERCENT CADDISFLY COMP.	0.50	-1	13.65	0	48.16	1	31.92	1
PERCENT DOMINANT TAXON	17.75	1	18.08	1	30.10	0	14.23	1
PERCENT ISOPOD, SNAIL, LEECH	18.75	-1	4.06	0	3.34	1	11.54	-1
PERCENT SURF. AIR BREATHERS	14.00	0	3.69	1	19.40	0	14.62	0
TOTAL SCORE		-2		4		6		4
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		EXCELLENT		ACCEPT.

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Kearsley Creek Atlas Road (south crossing) 6/25/2008 STATION 34	Kearsley Creek Hadley Road 8/7/2008 STATION 35	Duck Creek M-15 6/24/2008 STATION 36	Duck Creek Glass Road 6/24/2008 STATION 37
PORIFERA (sponges)		1		
PLATYHELMINTHES (flatworms)				
Turbellaria	1	2		
BRYOZOA (moss animals)	1			
ANNELIDA (segmented worms)		1		
Hirudinea (leeches)				
Oligochaeta (worms)	4		3	10
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	7	11		3
Decapoda (crayfish)	1	1	6	10
Isopoda (sowbugs)		6		
Arachnoidea				
Hydracarina		1	2	2
Insecta				
Ephemeroptera (mayflies)				
Baetidae	15	3	5	13
Caenidae	1	11	1	4
Heptageniidae	2	21	2	1
Leptophlebiidae			2	4
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	2	5	4	3
Cordulegastridae		1		
Corduliidae			1	
Gomphidae		1	1	
Libellulidae		1		
Zygoptera (damselflies)				
Calopterygidae		5	3	1
Coenagrionidae	1	2		2
Plecoptera (stoneflies)				
Perlidae	4			
Hemiptera (true bugs)				
Corixidae	30	1		22
Gerridae	3	2	4	4
Mesoveliidae			5	
Notonectidae				1
Veliidae	1	3		1
Megaloptera				
Corydalidae (dobson flies)		1	2	
Sialidae (alder flies)	1	7		1
Trichoptera (caddisflies)				
Brachycentridae	3		2	
Helicopsychidae		4	2	
Hydropsychidae	46	40	11	9
Hydroptilidae	6	1		
Leptoceridae	3	18	3	5
Limnephilidae	1	7	1	
Molanmidae		5		
Philopotamidae			47	
Polycentropodidae	3	3		
Uenoidae	12	2		
Coleoptera (beetles)				
Dytiscidae (total)		1		
Gyrinidae (adults)	1			1
Haliplidae (adults)				1
Hydrophilidae (total)		1		1
Psephenidae (adults)	1			
Scirtidae (adults)	1			
Elmidae	11	6	40	22
Gyrinidae (larvae)	1			1
Haliplidae (larvae)	1			

Diptera (flies)				
Ceratopogonidae		1		1
Chironomidae	37	52	67	37
Culicidae		1		4
Ptychopteridae		1		
Simuliidae		1	11	2
Stratiomyidae	1			1
Tipulidae	1	3		1
MOLLUSCA				
Gastropoda (snails)				
Ancylidae (limpets)	3		1	3
Lymnaeidae	20			4
Physidae	35	9	1	11
Planorbidae		2		2
Pelecypoda (bivalves)				
Sphaeriidae (clams)	2	36	9	63
TOTAL INDIVIDUALS	263	281	236	250

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Value	Kearsley Creek		Kearsley Creek		Duck Creek		Duck Creek	
		Atlas Road (south crossing)	Hadley Road	6/25/2008	8/7/2008	M-15	6/24/2008	Glass Road	6/24/2008
		STATION 34		STATION 35		STATION 36		STATION 37	
TOTAL NUMBER OF TAXA	34	1	41	1	26	1	33	1	
NUMBER OF MAYFLY TAXA	3	0	3	1	4	1	4	1	
NUMBER OF CADDISFLY TAXA	7	1	8	1	6	1	2	0	
NUMBER OF STONEFLY TAXA	1	1	0	-1	0	-1	0	-1	
PERCENT MAYFLY COMP.	6.84	0	12.46	0	4.24	0	8.80	0	
PERCENT CADDISFLY COMP.	28.14	0	28.47	0	27.97	0	5.60	0	
PERCENT DOMINANT TAXON	17.49	1	18.51	1	28.39	0	25.20	0	
PERCENT ISOPOD, SNAIL, LEECH	22.05	-1	6.41	0	0.85	1	8.00	0	
PERCENT SURF. AIR BREATHERS	14.45	0	3.56	1	3.81	1	14.00	0	
TOTAL SCORE		3		4		4		1	
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.		ACCEPT.	

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Duck Creek Duck Creek Lane 6/24/2008 STATION 38	Butternut Creek Frances Road 9/24/2008 STATION 39	Butternut Creek Vasser Rd 8/5/2008 STATION 40	Powers Cullen Drain Coldwater Road 8/7/2008 STATION 41
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria			5	1
BRYOZOA (moss animals)			1	
ANNELIDA (segmented worms)				
Hirudinea (leeches)				2
Oligochaeta (worms)	11	6	7	18
ARTHROPODA				
Crustacea				
Amphipoda (scuds)		38	9	10
Decapoda (crayfish)	1	1	1	3
Isopoda (sowbugs)			1	29
Arachnoidea				
Hydracarina	1			
Insecta				
Ephemeroptera (mayflies)				
Baetidae	3	9	5	3
Caenidae				36
Ephemeridae	4			
Heptageniidae	1	8	6	14
Leptophlebiidae	4	1		
Odonata				
Anisoptera (dragonflies)				
Aeshnidae		2	2	4
Cordulegastridae	1			
Gomphidae		1		
Zygoptera (damselflies)				
Calopterygidae	8	8	2	6
Coenagrionidae		1		24
Plecoptera (stoneflies)				
Nemouridae	2			
Perlidae	2			
Pteronarcyidae	1			
Hemiptera (true bugs)				
Belostomatidae		1		
Corixidae		60	57	1
Gerridae	8		3	1
Mesoveliidae		2	1	
Notonectidae			1	
Pleidae			1	
Veliidae	1			
Megaloptera				
Corydalidae (dobson flies)		1		
Sialidae (alder flies)	1		2	
Trichoptera (caddisflies)				
Brachycentridae	49	8	33	
Helicopsychidae				27
Hydropsychidae	16	45	21	5
Hydroptilidae				1
Leptoceridae	1		1	
Limnephilidae	1	1		
Philopotamidae				1
Phryganeidae		1		
Polycentropodidae		2		
Psychomyiidae				1
Uenoidae			3	10
Coleoptera (beetles)				
Dytiscidae (total)	2			
Gyrinidae (adults)	1			
Haliplidae (adults)				6
Hydrophilidae (total)		2	1	
Dryopidae			2	
Elmidae		7	15	21

Haliplidae (larvae)				1
Diptera (flies)				
Ceratopogonidae	3	4		1
Chironomidae	62	32	50	24
Culicidae	1			3
Dixidae	4			
Simuliidae	32	6		
Stratiomyidae			1	
Tabanidae	4	6	7	
Tipulidae	1	2	1	3
MOLLUSCA				
Gastropoda (snails)				
Ancylidae (limpets)			1	
Physidae	1	8	4	81
Planorbidae				2
Pelecypoda (bivalves)				
Sphaeriidae (clams)	14	5	32	13
TOTAL INDIVIDUALS	241	268	276	352

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Duck Creek		Butternut Creek		Butternut Creek		Powers Cullen Drain	
	Duck Creek Lane		Frances Road		Vasser Rd		Coldwater Road	
	6/24/2008		9/24/2008		8/5/2008		8/7/2008	
	STATION 38		STATION 39		STATION 40		STATION 41	
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	30	1	28	1	30	1	29	1
NUMBER OF MAYFLY TAXA	4	1	3	0	2	0	3	0
NUMBER OF CADDISFLY TAXA	4	1	5	1	4	0	6	1
NUMBER OF STONEFLY TAXA	3	1	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	4.98	0	6.72	0	3.99	0	15.06	0
PERCENT CADDISFLY COMP.	27.80	0	21.27	0	21.01	0	12.78	0
PERCENT DOMINANT TAXON	25.73	0	22.39	0	20.65	0	23.01	0
PERCENT ISOPOD, SNAIL, LEECH	0.41	1	2.99	1	2.17	1	32.39	-1
PERCENT SURF. AIR BREATHERS	5.39	1	24.25	-1	23.55	-1	3.13	1
TOTAL SCORE		6		1		0		1
MACROINV. COMMUNITY RATING			EXCELLENT		ACCEPT.		ACCEPT.	

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Powers Cullen Drain Richfield Road 8/7/2008 STATION 42	Flint River M-15 (State Rd) 8/5/2008 STATION 43	Hasler Creek Davison Road 8/7/2008 STATION 45	South Branch Flint River Norway Lake Road 6/26/2008 STATION 48
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria	2			
ANNELEIDA (segmented worms)				
Hirudinea (leeches)	2		3	
Oligochaeta (worms)	40	5	8	4
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	6	28	2	68
Decapoda (crayfish)	2		1	1
Isopoda (sowbugs)	34		1	
Arachnoidea				
Hydracarina		1		2
Insecta				
Ephemeroptera (mayflies)				
Baetidae			9	2
Caenidae		1	9	
Heptageniidae			5	20
Tricorythidae		7		
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	2		1	1
Gomphidae			1	1
Zygoptera (damselflies)				
Calopterygidae	8	1	13	1
Coenagrionidae	1	2	17	
Plecoptera (stoneflies)				
Perlidae				9
Hemiptera (true bugs)				
Corixidae	16	3	25	5
Gerridae	1	2	2	1
Mesovelidae		1		
Notonectidae	1			
Pleidae		7		
Veliidae		1		2
Megaloptera				
Sialidae (alder flies)		2	3	
Trichoptera (caddisflies)				
Helicopsychidae			1	
Hydropsychidae	9	95	28	52
Hydroptilidae			2	1
Leptoceridae		6	2	8
Limnephilidae			1	
Molannidae			2	
Phryganeidae	2		2	
Polycentropodidae		1		
Uenoidae			1	
Coleoptera (beetles)				
Dytiscidae (total)	1			
Haliplidae (adults)	1			
Psephenidae (adults)				1
Elmidae	14	15	23	18
Diptera (flies)				
Chironomidae	26	43	75	42
Culicidae		3		
Ephydriidae				1
Simuliidae	11	33	8	
Stratiomyidae	1			
Tabanidae	1	3	3	
Tipulidae	1			1
MOLLUSCA				
Gastropoda (snails)				
Ancylidae (limpets)	2	10	7	3

Lymnaeidae	1			
Physidae	113	2	26	1
Planorbidae	4			
Pelecypoda (bivalves)		8		
Dreissenidae				
Sphaeriidae (clams)	19		7	4
Unionidae (mussels)		1		
TOTAL INDIVIDUALS	321	281	288	249

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Powers Cullen Drain		Flint River		Hasler Creek		South Branch Flint River	
	Richfield Road		M-15 (State Rd)		Davison Road		Norway Lake Road	
	8/7/2008		8/5/2008		8/7/2008		6/26/2008	
	STATION 42		STATION 43		STATION 45		STATION 48	
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	27	1	25	1	30	1	24	0
NUMBER OF MAYFLY TAXA	0	-1	2	0	3	0	2	0
NUMBER OF CADDISFLY TAXA	2	0	3	0	8	1	3	0
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	1	1
PERCENT MAYFLY COMP.	0.00	-1	2.85	-1	7.99	0	8.84	0
PERCENT CADDISFLY COMP.	3.43	-1	36.30	1	13.54	0	24.50	0
PERCENT DOMINANT TAXON	35.20	0	33.81	0	26.04	0	27.31	0
PERCENT ISOPOD, SNAIL, LEECH	48.60	-1	4.27	0	12.85	-1	1.61	1
PERCENT SURF. AIR BREATHERS	6.54	1	6.05	1	9.38	0	3.61	1
TOTAL SCORE		-3		1		0		3
MACROINV. COMMUNITY RATING			ACCEPT.		ACCEPT.		ACCEPT.	

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Plum Creek Plum Creek Road 6/26/2008 STATION 49	Plum Creek Lapeer Road (M-24) 6/26/2008 STATION 50	Farmers Creek Herd Road 8/7/2008 STATION 51	Pine Creek Maple Grove Road 6/27/2008 STATION 52
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria				1
ANNELEIDA (segmented worms)				
Hirudinea (leeches)			1	1
Oligochaeta (worms)	10	9	229	14
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	24	63	5	3
Decapoda (crayfish)	3	2	1	5
Isopoda (sowbugs)			2	42
Arachnoidea				
Hydracarina				4
Insecta				
Ephemeroptera (mayflies)				
Baetidae	5			12
Caenidae		1	1	1
Heptageniidae	1		2	3
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	1	1	4	1
Gomphidae	1			
Libellulidae				1
Zygoptera (damselflies)				
Calopterygidae	1	1	7	1
Coenagrionidae				5
Plecoptera (stoneflies)				
Perlidae	1			
Hemiptera (true bugs)				
Corixidae	19	38		1
Gerridae	3	2	2	1
Mesoveliidae	2	1		
Veliidae	1	1		1
Megaloptera				
Sialidae (alder flies)			8	
Trichoptera (caddisflies)				
Brachycentridae	22	6		
Helicopsychidae			1	
Hydropsychidae	95	30	13	21
Hydroptilidae	5			34
Leptoceridae	1	23	1	
Limnephilidae	1		1	
Molannidae	1			
Uenoidae				1
Coleoptera (beetles)				
Dytiscidae (total)			1	
Haliplidae (adults)		1		
Hydrophilidae (total)				1
Elmidae	23	24	42	29
Diptera (flies)				
Ceratopogonidae		1		
Chironomidae	34	56	13	26
Dixidae		1		
Ephydriidae				1
Ptychopteridae				5
Simuliidae	11		1	13
Tipulidae			1	
MOLLUSCA				
Gastropoda (snails)				
Ancylidae (limpets)	1		1	5
Lymnaeidae		1		
Physidae	5	7	2	8
Planorbidae		1		1

Viviparidae			1	
Pelecypoda (bivalves)				
Sphaeriidae (clams)	2		13	5
TOTAL INDIVIDUALS	273	270	352	248

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Plum Creek		Plum Creek		Farmers Creek		Pine Creek	
	Plum Creek Road 6/26/2008 STATION 49		Lapeer Road (M-24) 6/26/2008 STATION 50		Herd Road 8/7/2008 STATION 51		Maple Grove Road 6/27/2008 STATION 52	
	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	25	1	21	0	23	0	31	1
NUMBER OF MAYFLY TAXA	2	0	1	-1	2	0	3	0
NUMBER OF CADDISFLY TAXA	6	1	3	0	4	0	3	0
NUMBER OF STONEFLY TAXA	1	1	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	2.20	-1	0.37	-1	0.85	-1	6.45	0
PERCENT CADDISFLY COMP.	45.79	1	21.85	0	4.55	0	22.58	0
PERCENT DOMINANT TAXON	34.80	0	23.33	0	65.06	-1	16.94	1
PERCENT ISOPOD, SNAIL, LEECH	2.20	1	3.33	1	1.70	1	23.39	-1
PERCENT SURF. AIR BREATHERS	9.16	0	15.93	0	0.85	1	3.63	1
TOTAL SCORE		4		-2		-1		1
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.		ACCEPT.

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	South Branch Flint River Newark Road 6/27/2008 STATION 53	South Branch Flint River Thornville Road 6/27/2008 STATION 54	South Branch Flint River Gardner Road 6/27/2008 STATION 55	Forest Drain Oliver Road 6/25/2008 STATION 57
<b>PORIFERA (sponges)</b>	1			
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria		1	1	
<b>BRYOZOA (moss animals)</b>	1			
<b>ANNELIDA (segmented worms)</b>				
Hirudinea (leeches)			5	
Oligochaeta (worms)	6		2	110
<b>ARTHROPODA</b>				
Crustacea				
Amphipoda (scuds)	6	4	23	
Decapoda (crayfish)	1	1	2	
Isopoda (sowbugs)				56
Arachnoidea				
Hydracarina	4	1		
Insecta				
Ephemeroptera (mayflies)				
Baetidae	29	5	6	2
Caenidae	3	5	6	
Ephemerellidae	1			
Ephemeridae	2	20	12	
Heptageniidae	10	27	6	1
Isonychiidae	1	4		
Tricorythidae	12	1	1	
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	1	3	2	1
Gomphidae	1	1	1	1
Libellulidae			1	
Zygoptera (damselflies)				
Calopterygidae	1	1	3	1
Coenagrionidae	1		3	
Plecoptera (stoneflies)				
Perlidae	5	18	1	
Hemiptera (true bugs)				
Corixidae		1	41	9
Gerridae	10	1	1	1
Mesoveliidae			1	
Veliidae	2	1		
Megaloptera				
Corydalidae (dobson flies)	1		1	
Sialidae (alder flies)				
Trichoptera (caddisflies)				
Brachycentridae	2			19
Helicopsychidae	7	2	1	
Hydropsychidae	35	45	18	17
Hydroptilidae	3	2		
Leptoceridae	6	28	2	
Limnephilidae	1	5	4	
Melanidae		1		
Polycentropodidae		3	1	
Uenoidae		1	1	
Coleoptera (beetles)				
Dytiscidae (total)				1
Hydrophilidae (total)		1		1
Psephenidae (adults)	2	1		
Scirtidae (adults)	1			
Dryopidae				2
Elmidae	23	23	10	12
Diptera (flies)				
Ceratopogonidae	1	1	5	1
Chironomidae	32	28	39	59

Dixidae				1
Simuliidae			2	
Tabanidae			2	1
Tipulidae				4
<b>MOLLUSCA</b>				
Gastropoda (snails)				
Ancylidae (limpets)	3		2	
Hydrobiidae	7	1	36	1
Lymnaeidae	4		2	2
Physidae	12	12	21	16
Planorbidae			3	
Pleuroceridae	5			
Viviparidae			2	
Pelecypoda (bivalves)				
Sphaeriidae (clams)	25	38	5	1
Unionidae (mussels)		1	1	
<b>TOTAL INDIVIDUALS</b>	<b>267</b>	<b>290</b>	<b>276</b>	<b>320</b>

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	South Branch Flint River		South Branch Flint River		South Branch Flint River		Forest Drain	
	Newark Road	6/27/2008	Thornville Road	6/27/2008	Gardner Road	6/27/2008	Oliver Road	6/25/2008
	STATION 53		STATION 54		STATION 55		STATION 57	
	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	37	1	36	1	39	1	24	1
NUMBER OF MAYFLY TAXA	7	1	6	1	5	1	2	1
NUMBER OF CADDISFLY TAXA	6	1	8	1	6	1	2	0
NUMBER OF STONEFLY TAXA	1	1	1	1	1	1	0	-1
PERCENT MAYFLY COMP.	21.72	1	21.38	1	11.23	0	0.94	-1
PERCENT CADDISFLY COMP.	20.22	0	30.00	1	9.78	0	11.25	0
PERCENT DOMINANT TAXON	13.11	1	15.52	1	14.86	1	34.38	0
PERCENT ISOPOD, SNAIL, LEECH	11.61	-1	4.48	0	25.72	-1	23.44	-1
PERCENT SURF. AIR BREATHERS	5.62	1	1.72	1	15.58	0	3.75	1
TOTAL SCORE		6		8		4		0
MACROINV. COMMUNITY RATING			EXCELLENT		EXCELLENT		ACCEPT.	ACCEPT.

Table 2A. Qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Adams Drain Murphy Lake Road 6/25/2008 STATION 58	Indian Creek Lake Pleasant Road 6/25/2008 STATION 59	North Branch Flint River Jefferson Rd 6/26/2008 STATION 64	Cedar Creek Willis Road 6/26/2008 STATION 60
PORIFERA (sponges)			1	
PLATYHELMINTHES (flatworms)				
Turbellaria			1	
BRYOZOA (moss animals)			1	
ANNELIDA (segmented worms)				
Hirudinea (leeches)	2	1		1
Oligochaeta (worms)	23	36	4	20
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	12	38	33	3
Decapoda (crayfish)	2	4		1
Isopoda (sowbugs)		1	3	1
Arachnoidea				
Hydracarina				3
Insecta				
Ephemeroptera (mayflies)				
Baetidae	1	1	2	6
Caenidae	1		23	
Ephemeridae	1		2	
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	1	1		3
Libellulidae	1	3		1
Zygoptera (damselflies)				
Coenagrionidae	1	2	7	
Plecoptera (stoneflies)				
Perlidae				1
Hemiptera (true bugs)				
Belostomatidae				1
Corixidae	12	37	52	3
Gerridae	1	1	1	1
Mesoveliidae				3
Pleidae				1
Megaloptera				
Sialidae (alder flies)		1		1
Trichoptera (caddisflies)				
Hydropsychidae			1	17
Hydroptilidae	3		23	14
Leptoceridae			3	
Limnephilidae		1		3
Molannidae				1
Uenoidae		1		
Coleoptera (beetles)				
Dytiscidae (total)	6	8	1	
Gyrinidae (adults)	1	6	2	
Haliplidae (adults)	1	1		3
Hydrophilidae (total)		1	2	1
Scirtidae (adults)	1		1	
Dryopidae			1	
Elmidae	17	3	69	2
Haliplidae (larvae)		4	1	43
Diptera (flies)				
Ceratopogonidae	18	6	2	
Chironomidae	23	50	35	99
Dixidae	2		1	
Simuliidae	65	2		11
Stratiomyidae				2
Tabanidae	1			4
Tipulidae				3
MOLLUSCA				
Gastropoda (snails)				
Ancylidae (limpets)				1

Hydrobiidae	1				
Limnaeidae	18	19			
Physidae	74	109	1	11	
Planorbidae	1	23		1	
Pelecypoda (bivalves)					
Sphaeriidae (clams)	8	16		6	
TOTAL INDIVIDUALS	298	377	273	272	

Table 2B. Macroinvertebrate metric evaluation of the Flint River watershed, 2008.

METRIC	Adams Drain		Indian Creek		North Branch Flint River		Cedar Creek	
	Murphy Lake Road		Lake Pleasant Road		Jefferson Rd		Willis Road	
	6/25/2008		6/25/2008		6/26/2008		6/26/2008	
	STATION 58		STATION 59		STATION 64		STATION 60	
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	28	1	27	1	26	1	32	1
NUMBER OF MAYFLY TAXA	3	1	1	-1	3	0	1	0
NUMBER OF CADDISFLY TAXA	1	-1	2	0	3	0	4	1
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	1	1
PERCENT MAYFLY COMP.	1.01	-1	0.27	-1	9.89	0	2.21	-1
PERCENT CADDISFLY COMP.	1.01	-1	0.53	-1	9.89	0	12.87	0
PERCENT DOMINANT TAXON	24.83	0	28.91	0	25.27	0	36.40	0
PERCENT ISOPOD, SNAIL, LEECH	32.21	-1	40.58	-1	1.47	1	5.51	0
PERCENT SURF. AIR BREATHERS	7.38	0	14.32	0	21.61	-1	5.51	1
TOTAL SCORE		-3		-4		0		3
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.		ACCEPT.

Table 3A. Qualitative fish sampling results for the Flint River watershed, 2008.

Brent Run  
 McKinley Road  
 8/6/2008  
**TAXA** STATION 13

Cyprinidae (minnows and carps)	
<i>Cyprinus carpio</i> (Carp)	4
<i>Nocomis biguttatus</i> (Horneyhead chub)	7
<i>Semotilus atromaculatus</i> (Creek chub)	8
<i>Notropis atherinoides</i> (Emerald shiner)	73
<i>Notropis volucellus</i> (Mimic shiner)	35
<i>Pimephales notatus</i> (Bluntnose minnow)	6
Catostomidae (suckers)	
<i>Catostomus commersoni</i> (White sucker)	3
Ictaluridae (Bullhead, Catfish)	
<i>Ameiurus natalis</i> (Yellow bullhead)	1
<i>Noturus flavus</i> (Stonecat)	1
Centrarchidae (sunfish)	
<i>Ambloplites rupestris</i> (Rock bass)	10
<i>Lepomis cyanellus</i> (Green sunfish)	6
<i>Lepomis macrochirus</i> (Bluegill sf)	11
<i>Micropterus salmoides</i> (Largemouth bass)	3
<i>Micropterus dolomieu</i> (Smallmouth bass)	2
Percidae (perch)	
<i>Etheostoma caeruleum</i> (Rainbow darter)	26
<i>Etheostoma nigrum</i> (Johnny darter)	1
<i>Percina caprodes</i> (Logperch)	3
<i>Perca flavescens</i> (Yellow perch)	1
<b>TOTAL INDIVIDUALS</b>	
	201
Number of hybrid sunfish	0
Number of anomalies	0
Percent anomalies	0.000
Percent salmonids	0.000
Reach sampled (ft)	80

Table 3B. Fish metric evaluation of the Flint River watershed, 2008.

Brent Run  
 McKinley Road  
 8/6/2008  
**STATION 13**

METRIC	Value	Score
TOTAL NUMBER OF TAXA	18	1
NO. OF DARTER, SCULPIN, MADTOM TAXA	4	1
NUMBER OF SUNFISH TAXA	3	0
NUMBER OF SUCKER TAXA	1	-1
NUMBER OF INTOLERANT TAXA	4	1
PERCENT TOLERANT	14.43	1
PERCENT OMNIVOROUS TAXA	10.95	1
PERCENT INSECTIVOROUS TAXA	81.09	1
PERCENT PISCIVOROUS TAXA	7.46	1
% SIMPLE LITHOPHILIC SPAWNER TAXA	15.92	0
TOTAL SCORE		6
FISH COMMUNITY RATING	EXCELLENT	

Table 4. Habitat evaluation for the Flint River watershed, 2008.

Table 4. Habitat evaluation for the Flint River watershed, 2008.					
	Misteguay Creek	Misteguay River	Misteguay River	Porter Creek	
Alicia Road	Burt Rd	M-57 (Peet Raod)	Allen Road		
GLIDE/POOL	GLIDE/POOL	RIFFLE/RUN	RIFFLE/RUN		
Station 2	Station 3	Station 4	Station 5		
<strong>HABITAT METRIC</strong>					
<strong>Substrate and Instream Cover</strong>					
Epifaunal Substrate/ Avail Cover (20)	5	12	11	12	
Embeddedness (20)*			16	15	
Velocity/Depth Regime (20)*			11	15	
Pool Substrate Characterization (20)**	8	11			
Pool Variability (20)**	2	5			
<strong>Channel Morphology</strong>					
Sediment Deposition (20)	11	15	16	13	
Flow Status - Maint. Flow Volume (10)	9	9	8	9	
Flow Status - Flashiness (10)	9	9	2	5	
Channel Alteration (20)	5	5	16	15	
Frequency of Riffles/Bends (20)*			15	16	
Channel Sinuosity (20)**	1	2			
<strong>Riparian and Bank Structure</strong>					
Bank Stability (L) (10)	8	6	3	8	
Bank Stability (R) (10)	8	6	5	2	
Vegetative Protection (L) (10)	3	3	2	8	
Vegetative Protection (R) (10)	3	3	2	5	
Riparian Veg. Zone Width (L) (10)	1	2	9	9	
Riparian Veg. Zone Width (R) (10)	1	2	9	4	
<strong>TOTAL SCORE (200):</strong>	74	90	125	136	
<strong>HABITAT RATING:</strong>	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).					
Date:	8/6/2008	8/6/2008	8/6/2008	6/23/2008	
Weather:	Sunny	Sunny	Partly Cloudy	Partly Cloudy	
Air Temperature:	82 Deg. F.	84 Deg. F.	80 Deg. F.	70 Deg. F.	
Water Temperature:	Deg. F.	Deg. F.	Deg. F.	65 Deg. F.	
Ave. Stream Width:	100 Feet	100 Feet	24 Feet	21 Feet	
Ave. Stream Depth:	1.5 Feet	1.5 Feet	1 Feet	0.5 Feet	
Surface Velocity:	0.1 Ft./Sec.	0.1 Ft./Sec.	0.1 Ft./Sec.	0.3 Ft./Sec.	
Estimated Flow:	15 CFS	15 CFS	2.4 CFS	3.15 CFS	
Stream Modifications:	Dredged	Dredged	None	None	
Nuisance Plants (Y/N):	N	N	N	N	
Report Number:					
STORET No.:	730005	730329	730328	780220	
Stream Name:	Misteguay Creek	Misteguay River	Misteguay River	Porter Creek	
Road Crossing/Location:	Alicia Road	Burt Rd	M-57 (Peet Raod)	Allen Road	
County Code:	73	73	73	78	
TRS:	10N04E16	10N04E33	09N04E24	08N04E16	
Latitude (dd):	43.263892	43.2345	43.1759	43.102	
Longitude (dd):	-83.992781	-83.9921	-83.9426	-83.99	
Ecoregion:	HELP	HELP	HELP	HELP	
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater	
USGS Basin Code:	4080204	4080204	4080204	4080204	
* Applies only to Riffle/Run stream Surveys					
** Applies only to Glide/Pool stream Surveys					
<strong>COMMENTS:</strong>					

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Onion Creek	Misteguay Creek	Rush Creek	Rush Creek			
	Juddville Road	Allen Road	Middleton Road	Durand Road			
	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL			
	Station 6	Station 7	Station 8	Station 9			
<b>HABITAT METRIC</b>							
<b>Substrate and Instream Cover</b>							
Epifaunal Substrate/ Avail Cover (20)	3	6	11	9			
Embeddedness (20)*							
Velocity/Depth Regime (20)*							
Pool Substrate Characterization (20)**	6	11	16	7			
Pool Variability (20)**	2	10	5	7			
<b>Channel Morphology</b>							
Sediment Deposition (20)	3	14	16	15			
Flow Status - Maint. Flow Volume (10)	4	10	9	9			
Flow Status - Flashiness (10)	9	3	6	7			
Channel Alteration (20)	8	15	6	6			
Frequency of Riffles/Bends (20)*							
Channel Sinuosity (20)**	6	8	6	8			
<b>Riparian and Bank Structure</b>							
Bank Stability (L) (10)	6	4	6	6			
Bank Stability (R) (10)	6	2	6	6			
Vegetative Protection (L) (10)	4	5	3	4			
Vegetative Protection (R) (10)	4	2	3	4			
Riparian Veg. Zone Width (L) (10)	1	10	2	2			
Riparian Veg. Zone Width (R) (10)	2	8	2	2			
<b>TOTAL SCORE (200):</b>	64	108	97	92			
<b>HABITAT RATING:</b>	MARGINAL (MODERATELY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)			
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).							
Date:	8/6/2008	6/23/2008	9/23/2008	9/23/2008			
Weather:	Sunny	Sunny	Sunny	Cloudy			
Air Temperature:	80 Deg. F.	72 Deg. F.	70 Deg. F.	65 Deg. F.			
Water Temperature:	70 Deg. F.	70 Deg. F.	65 Deg. F.	65 Deg. F.			
Ave. Stream Width:	4 Feet	35 Feet	8 Feet	2 Feet			
Ave. Stream Depth:	0.5 Feet	1.25 Feet	1.25 Feet	1 Feet			
Surface Velocity:	0.1 Ft./Sec.	0.25 Ft./Sec.	0.75 Ft./Sec.	0.25 Ft./Sec.			
Estimated Flow:	0.2 CFS	10.9375 CFS	7.5 CFS	0.5 CFS			
Stream Modifications:	Dredged	None	Dredged	Dredged			
Nuisance Plants (Y/N):	N	N	N	N			
Report Number:							
STORET No.:	780235	780234	780237	780238			
Stream Name:	Onion Creek	Misteguay Creek	Rush Creek	Rush Creek			
Road Crossing/Location:	Juddville Road	Allen Road	Middleton Road	Durand Road			
County Code:	78	78	78	78			
TRS:	08N04E33	08N04E14	07N04E09	07N04E27			
Latitude (dd):	43.058555	43.102	43.020862	42.978067			
Longitude (dd):	-83.989297	-83.958	-83.994191	-83.9866			
Ecoregion:	HELP	HELP	HELP	SMNITP			
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater			
USGS Basin Code:	4080204	4080204	4080204	4080204			
* Applies only to Riffle/Run stream Surveys							
** Applies only to Glide/Pool stream Surveys							
COMMENTS:							

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Crawford Creek	Misteguay Creek	Silver Creek	Brent Run			
Byron Road		Duffield Road	Canada Road	McKinley Road			
GLIDE/POOL		GLIDE/POOL	GLIDE/POOL	RIFFLE/RUN			
Station 10		Station 11	Station 12	Station 13			
<b>HABITAT METRIC</b>							
<b>Substrate and Instream Cover</b>							
Epifaunal Substrate/ Avail Cover (20)	6	7	5	11			
Embeddedness (20)*				17			
Velocity/Depth Regime (20)*				15			
Pool Substrate Characterization (20)**	11	8	8				
Pool Variability (20)**	5	5	5				
<b>Channel Morphology</b>							
Sediment Deposition (20)	12	11	14	11			
Flow Status - Maint. Flow Volume (10)	9	9	9	9			
Flow Status - Flashiness (10)	5	5	9	2			
Channel Alteration (20)	6	10	6	18			
Frequency of Riffles/Bends (20)*				13			
Channel Sinuosity (20)**	7	6	5				
<b>Riparian and Bank Structure</b>							
Bank Stability (L) (10)	4	5	9	3			
Bank Stability (R) (10)	4	5	9	3			
Vegetative Protection (L) (10)	3	3	3	9			
Vegetative Protection (R) (10)	3	3	3	9			
Riparian Veg. Zone Width (L) (10)	2	2	2	9			
Riparian Veg. Zone Width (R) (10)	2	2	2	9			
<b>TOTAL SCORE (200):</b>	79	81	89	138			
<b>HABITAT RATING:</b>	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)			
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).							
Date:	9/23/2008	9/23/2008	8/6/2008	8/6/2008			
Weather:	Sunny	Sunny	Sunny	Sunny			
Air Temperature:	70 Deg. F.	75 Deg. F.	80 Deg. F.	78 Deg. F.			
Water Temperature:	62 Deg. F.	70 Deg. F.	Deg. F.	70 Deg. F.			
Ave. Stream Width:	7 Feet	17 Feet	8 Feet	20 Feet			
Ave. Stream Depth:	0.5 Feet	1.5 Feet	1 Feet	0.75 Feet			
Surface Velocity:	0.4 Ft./Sec.	0.1 Ft./Sec.	0.1 Ft./Sec.	0.5 Ft./Sec.			
Estimated Flow:	1.4 CFS	2.55 CFS	0.8 CFS	7.5 CFS			
Stream Modifications:	Dredged	Dredged	Dredged	None			
Nuisance Plants (Y/N):	N	N	N	N			
Report Number:							
STORET No.:	780236	250530	730184	250167			
Stream Name:	Crawford Creek	Misteguay Creek	Silver Creek	Brent Run			
Road Crossing/Location:	Byron Road	Duffield Road	Canada Road	McKinley Road			
County Code:	78	25	73	25			
TRS:	08N04E01	07N05E08	10N05E16	09N05E15			
Latitude (dd):	43.031374	43.02539	43.277693	43.186948			
Longitude (dd):	-83.947974	-83.910601	-83.88538	-83.86417			
Ecoregion:	HELP	HELP	HELP	HELP			
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater			
USGS Basin Code:	4080204	4080204	4080204	4080204			
* Applies only to Riffle/Run stream Surveys							
** Applies only to Glide/Pool stream Surveys							
COMMENTS:							

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Armstrong Creek	Cole Creek	Flint River						
Dodge Road		Pierson Road	Riverview Park						
RIFFLE/RUN		GLIDE/POOL	RIFFLE/RUN						
Station 14		Station 15	Station 16						
<b>HABITAT METRIC</b>									
<b>Substrate and Instream Cover</b>									
Epifaunal Substrate/ Avail Cover (20)	11		13		15				
Embeddedness (20)*	16				10				
Velocity/Depth Regime (20)*	15				15				
Pool Substrate Characterization (20)**			15						
Pool Variability (20)**			10						
<b>Channel Morphology</b>									
Sediment Deposition (20)	14		16		8				
Flow Status - Maint. Flow Volume (10)	6		10		10				
Flow Status - Flashiness (10)	5		4		6				
Channel Alteration (20)	15		16		18				
Frequency of Riffles/Bends (20)*	15				17				
Channel Sinuosity (20)**			10						
<b>Riparian and Bank Structure</b>									
Bank Stability (L) (10)	6		6		8				
Bank Stability (R) (10)	6		6		9				
Vegetative Protection (L) (10)	7		9		3				
Vegetative Protection (R) (10)	7		9		8				
Riparian Veg. Zone Width (L) (10)	8		6		3				
Riparian Veg. Zone Width (R) (10)	10		6		7				
<b>TOTAL SCORE (200):</b>	141		136		137				
<b>HABITAT RATING:</b>	<b>GOOD</b> <small>(SLIGHTLY IMPAIRED)</small>	<b>GOOD</b> <small>(SLIGHTLY IMPAIRED)</small>	<b>GOOD</b> <small>(SLIGHTLY IMPAIRED)</small>						
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).									
Date:	8/6/2008		9/23/2008		6/23/2008				
Weather:	Sunny		Sunny		Sunny				
Air Temperature:	75	Deg. F.	75	Deg. F.	70	Deg. F.			
Water Temperature:	70	Deg. F.	70	Deg. F.	78	Deg. F.			
Ave. Stream Width:	12	Feet	16	Feet	140	Feet			
Ave. Stream Depth:	1	Feet	0.5	Feet	1.5	Feet			
Surface Velocity:	0.2	Ft./Sec.	0.25	Ft./Sec.	0.75	Ft./Sec.			
Estimated Flow:	2.4	CFS	2	CFS	157.5	CFS			
Stream Modifications:			None		None				
Nuisance Plants (Y/N):	N		N		N				
Report Number:									
STORET No.:	250520		250529		250513				
Stream Name:	Armstrong Creek		Cole Creek		Flint River				
Road Crossing/Location:	Dodge Road		Pierson Road		Riverview Park				
County Code:	25		25		25				
TRS:	09N05E35		08N05E34		08N05E27				
Latitude (dd):	43.148		43.059618		43.059987				
Longitude (dd):	-83.847		-83.863285		-83.854243				
Ecoregion:	HELP		HELP		HELP				
Stream Type:	Warmwater		Warmwater		Warmwater				
USGS Basin Code:	4080204		4080204		4080204				
* Applies only to Riffle/Run stream Surveys									
** Applies only to Glide/Pool stream Surveys									
COMMENTS:									

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Mud Creek	Carman Creek	Sherwood Drain	Call Drain			
Potter Rd		Atherton Road	Maple Ave (west crossing)		Torrey Road		
GLIDE/POOL		GLIDE/POOL	RIFFLE/RUN		GLIDE/POOL		
Station 17		Station 18	Station 19		Station 20		
<b>HABITAT METRIC</b>							
<b>Substrate and Instream Cover</b>							
Epifaunal Substrate/ Avail Cover (20)	10		10	15	0		
Embeddedness (20)*				16			
Velocity/Depth Regime (20)*				10			
Pool Substrate Characterization (20)**	15		10		0		
Pool Variability (20)**	5		5		5		
<b>Channel Morphology</b>							
Sediment Deposition (20)	10		7	16	0		
Flow Status - Maint. Flow Volume (10)	9		9	8	9		
Flow Status - Flashiness (10)	4		3	7	3		
Channel Alteration (20)	12		13	8	14		
Frequency of Riffles/Bends (20)*				7			
Channel Sinuosity (20)**	6		6		6		
<b>Riparian and Bank Structure</b>							
Bank Stability (L) (10)	4		8	6	7		
Bank Stability (R) (10)	4		8	6	7		
Vegetative Protection (L) (10)	4		5	5	5		
Vegetative Protection (R) (10)	4		5	5	5		
Riparian Veg. Zone Width (L) (10)	1		4	2	3		
Riparian Veg. Zone Width (R) (10)	3		4	2	3		
<b>TOTAL SCORE (200):</b>	91		97	113	67		
<b>HABITAT RATING:</b>	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)			
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).							
Date:	9/23/2008	9/24/2008	8/8/2008		9/24/2008		
Weather:	Sunny	Sunny	Sunny		Sunny		
Air Temperature:	75	Deg. F.	65	Deg. F.	80	Deg. F.	70
Water Temperature:		Deg. F.	68	Deg. F.	72	Deg. F.	68
Ave. Stream Width:	12	Feet	20	Feet	5	Feet	14
Ave. Stream Depth:	1	Feet	0.75	Feet	0.3	Feet	1.25
Surface Velocity:	0.1	Ft./Sec.	0.1	Ft./Sec.	0.3	Ft./Sec.	0.01
Estimated Flow:	1.2	CFS	1.5	CFS	0.45	CFS	0.175
Stream Modifications:	Dredged		Dredged		Dredged		None
Nuisance Plants (Y/N):	N		N		N		N
Report Number:							
STORET No.:	250470		250528		250523		250527
Stream Name:	Mud Creek		Carman Creek		Sherwood Drain		Call Drain
Road Crossing/Location:	Potter Rd		Atherton Road		Maple Avenue (west crossing)		Torrey Road
County Code:	25		25		25		25
TRS:	07N05E01		07N06E25		06N06E01		07N06E26
Latitude (dd):	43.0459		42.988379		42.959511		42.978362
Longitude (dd):	-83.8233		-83.705224		-83.698176		-83.732474
Ecoregion:	SMNITP		SMNITP		SMNITP		SMNITP
Stream Type:	Warmwater		Warmwater		Warmwater		Warmwater
USGS Basin Code:	4080204		4080204		4080204		4080204
* Applies only to Riffle/Run stream Surveys							
** Applies only to Glide/Pool stream Surveys							
COMMENTS:							

Table 4. Habitat evaluation for the Fint River watershed, 2008.

Habitat Evaluation Results for Fint River Watershed, 2008					
	Howland Drain	Alger Drain	Swartz Creek	Swartz Creek	
Linden Road	Hill Road	Creekwood Road	Cook Road		
RIFFLE/RUN	RIFFLE/RUN	RIFFLE/RUN	RIFFLE/RUN		
Station 21	Station 22	Station 23	Station 63		
<strong>HABITAT METRIC</strong>					
<strong>Substrate and Instream Cover</strong>					
Epifaunal Substrate/ Avail Cover (20)	5	14	11	11	
Embeddedness (20)*	15	13	16	16	
Velocity/Depth Regime (20)*	10	12	16	15	
Pool Substrate Characterization (20)**					
Pool Variability (20)**					
<strong>Channel Morphology</strong>					
Sediment Deposition (20)	10	10	11	14	
Flow Status - Main Flow Volume (10)	8	10	10	10	
Flow Status - Flashiness (10)	6	8	6	8	
Channel Alteration (20)	7	8	16	15	
Frequency of Riffles/Bends (20)*	10	15	15	11	
Channel Sinuosity (20)**					
<strong>Riparian and Bank Structure</strong>					
Bank Stability (L) (10)	2	6	5	5	
Bank Stability (R) (10)	3	6	5	8	
Vegetative Protection (L) (10)	3	5	5	6	
Vegetative Protection (R) (10)	4	5	5	6	
Riparian Veg. Zone Width (L) (10)	2	2	8	5	
Riparian Veg. Zone Width (R) (10)	2	2	5	8	
<strong>TOTAL SCORE (200):</strong>	87	116	134	138	
<strong>HABITAT RATING:</strong>	MARGINAL (MODERATELY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).					
Date:	6/24/2008	9/24/2008	9/29/2008	9/29/2008	
Weather:	Sunny	Sunny	Sunny	Partly Cloudy	
Air Temperature:	65 Deg. F.	75 Deg. F.	70 Deg. F.	68 Deg. F.	
Water Temperature:	64 Deg. F.	70 Deg. F.	68 Deg. F.	65 Deg. F.	
Ave. Stream Width:	5 Feet	15 Feet	21 Feet	22 Feet	
Ave. Stream Depth:	0.33 Feet	0.75 Feet	1.5 Feet	1.75 Feet	
Surface Velocity:	0.1 Ft./Sec.	0.75 Ft./Sec.	1.5 Ft./Sec.	1 Ft./Sec.	
Estimated Flow:	0.165 CFS	8.4375 CFS	47.25 CFS	38.5 CFS	
Stream Modifications:	Dredged	Dredged	None	None	
Nuisance Plants (Y/N):	N	N	N	N	
Report Number:					
STORET No.:	250514	250330	250526	250525	
Stream Name:	Howland Drain	Alger Drain	Swartz Creek	Swartz Creek	
Road Crossing/Location:	Linden Road	Hill Road	Creekwood Road	Cook Road	
County Code:	25	25	25	25	
TRS:	06N06E05	06N05E02	06N06E23	06N06E23	
Latitude (dd):	42.951335	42.941949	42.911694	42.900551	
Longitude (dd):	-83.771466	-83.846392	-83.715696	-83.711302	
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP	
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater	
USGS Basin Code:	4080204	4080204	4080204	4080204	
* Applies only to Riffle/Run stream Surveys					
** Applies only to Glide/Pool stream Surveys					
COMMENTS:					

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Dawe Drain	Gilkey Creek	Chipmunk Creek	Kearsley Creek		
	Baldwin Road	Center Rd	Genesee Road	Davison Road		
	RIFFLE/RUN	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL		
	Station 24	Station 25	Station 28	Station 29		
HABITAT METRIC						
<b>Substrate and Instream Cover</b>						
Epifaunal Substrate/ Avail Cover (20)	12	2	5	9		
Embeddedness (20)*	16					
Velocity/Depth Regime (20)*	8					
Pool Substrate Characterization (20)**		6	9	10		
Pool Variability (20)**		1	5	10		
<b>Channel Morphology</b>						
Sediment Deposition (20)	16	2	10	9		
Flow Status - Maint. Flow Volume (10)	8	9	9	9		
Flow Status - Flashiness (10)	8	4	4	2		
Channel Alteration (20)	16	5	13	14		
Frequency of Riffles/Bends (20)*	17					
Channel Sinuosity (20)**		5	6	7		
<b>Riparian and Bank Structure</b>						
Bank Stability (L) (10)	8	6	6	4		
Bank Stability (R) (10)	9	6	6	4		
Vegetative Protection (L) (10)	9	3	7	5		
Vegetative Protection (R) (10)	9	3	7	5		
Riparian Veg. Zone Width (L) (10)	5	3	5	7		
Riparian Veg. Zone Width (R) (10)	7	3	4	3		
TOTAL SCORE (200):	148	58	96	98		
HABITAT RATING:	GOOD (SLIGHTLY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)		
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).						
Date:	6/24/2008	8/8/2008	8/7/2008	8/8/2008		
Weather:	Sunny	Sunny	Cloudy	Sunny		
Air Temperature:	68 Deg. F.	60 Deg. F.	75 Deg. F.	Deg. F.		
Water Temperature:	61 Deg. F.	Deg. F.	70 Deg. F.	Deg. F.		
Ave. Stream Width:	5 Feet	18 Feet	18 Feet	36 Feet		
Ave. Stream Depth:	0.25 Feet	1.25 Feet	1.5 Feet	2.5 Feet		
Surface Velocity:	0.4 Ft./Sec.	0.3 Ft./Sec.	0.1 Ft./Sec.	0.2 Ft./Sec.		
Estimated Flow:	0.5 CFS	6.75 CFS	2.7 CFS	18 CFS		
Stream Modifications:	None	Dredged	None	None		
Nuisance Plants (Y/N):	N	N	N	N		
Report Number:						
STORET No.:	250515	250323	250524	250170		
Stream Name:	Dawe Drain	Gilkey Creek	Chipmunk Creek	Kearsley Creek		
Road Crossing/Location:	Baldwin Road	Center Rd	Genesee Road	Davison Road		
County Code:	25	25	25	25		
TRS:	06N06E35	07N07E18	08N07E26	07N07E01		
Latitude (dd):	42.88544	43.0256	43.067398	43.033892		
Longitude (dd):	-83.720574	-83.6351	-83.616381	-83.58167		
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP		
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater		
USGS Basin Code:	4080204	4080204	4080204	4080204		
* Applies only to Riffle/Run stream Surveys						
** Applies only to Glide/Pool stream Surveys						
COMMENTS:						

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Black Creek	Black Creek	Kearsley Creek	Kearsley Creek				
	Irish Road	Oak Rd	Atlas Road (north crossing)	Atherton Rd				
	GLIDE/POOL	RIFFLE/RUN	GLIDE/POOL	GLIDE/POOL				
	Station 30	Station 31	Station 32	Station 33				
<b>HABITAT METRIC</b>								
<b>Substrate and Instream Cover</b>								
Epifaunal Substrate/ Avail Cover (20)	5	15	12	14				
Embeddedness (20)*		16						
Velocity/Depth Regime (20)*		14						
Pool Substrate Characterization (20)**	6		16	16				
Pool Variability (20)**	4		9	5				
<b>Channel Morphology</b>								
Sediment Deposition (20)	5	16	11	15				
Flow Status - Maint. Flow Volume (10)	9	9	9	10				
Flow Status - Flashiness (10)	3	8	6	5				
Channel Alteration (20)	10	11	16	11				
Frequency of Riffles/Bends (20)*		13						
Channel Sinuosity (20)**	6		8	7				
<b>Riparian and Bank Structure</b>								
Bank Stability (L) (10)	6	8	6	8				
Bank Stability (R) (10)	4	8	5	8				
Vegetative Protection (L) (10)	3	3	5	7				
Vegetative Protection (R) (10)	3	3	3	9				
Riparian Veg. Zone Width (L) (10)	2	1	3	8				
Riparian Veg. Zone Width (R) (10)	2	1	1	8				
TOTAL SCORE (200):	68	126	110	131				
<b>HABITAT RATING:</b>	MARGINAL	GOOD	GOOD	GOOD				
(MODERATELY	(SLIGHTLY	(SLIGHTLY	(SLIGHTLY	(SLIGHTLY				
IMPAIRED)	IMPAIRED)	IMPAIRED)	IMPAIRED)	IMPAIRED)				
	Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).							
Date:	8/8/2008	8/8/2008	6/25/2008	6/25/2008				
Weather:	Sunny	Sunny	Sunny	Partly Cloudy				
Air Temperature:	70	Deg. F.	70	Deg. F.	65	Deg. F.	70	Deg. F.
Water Temperature:		Deg. F.		Deg. F.	70	Deg. F.	68	Deg. F.
Ave. Stream Width:	18	Feet	14	Feet	14	Feet	30	Feet
Ave. Stream Depth:	1.25	Feet	1.25	Feet	1	Feet	1.5	Feet
Surface Velocity:	0.7	Ft./Sec.	0.5	Ft./Sec.	0.75	Ft./Sec.	0.5	Ft./Sec.
Estimated Flow:	15.75	CFS	8.75	CFS	10.5	CFS	22.5	CFS
Stream Modifications:	Dredged		None		None		None	
Nuisance Plants (Y/N):	N		N		N		N	
Report Number:								
STORET No.:	250030	250487	250516	250475				
Stream Name:	Black Creek	Black Creek	Kearsley Creek	Kearsley Creek				
Road Crossing/Location:	Irish Road	Oak Rd	Atlas Road (north crossing)	Atherton Rd				
County Code:	25		25		25		25	
TRS:	07N08E07		07N08E02		07N08E21		07N08E27	
Latitude (dd):	43.023893		43.0369		43.00049		42.9913	
Longitude (dd):	-83.556671		-83.4983		-83.526579		-83.5145	
Ecoregion:	SMNITP		SMNITP		SMNITP		SMNITP	
Stream Type:	Warmwater		Warmwater		Warmwater		Warmwater	
USGS Basin Code:	4080204		4080204		4080204		4080204	
* Applies only to Riffle/Run stream Surveys								
** Applies only to Glide/Pool stream Surveys								
COMMENTS:								

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Kearsley Creek	Kearsley Creek	Duck Creek	Duck Creek			
	Atlas Road (south crossing)	Hadley Road	M-15	Glass Road			
	GLIDE/POOL	RIFFLE/RUN	RIFFLE/RUN	GLIDE/POOL			
	Station 34	Station 35	Station 36	Station 37			
<b>HABITAT METRIC</b>							
<b>Substrate and Instream Cover</b>							
Epifaunal Substrate/ Avail Cover (20)	16	15	11	10			
Embeddedness (20)*		13	11				
Velocity/Depth Regime (20)*		8	10				
Pool Substrate Characterization (20)**	16			10			
Pool Variability (20)**	8			7			
<b>Channel Morphology</b>							
Sediment Deposition (20)	15	16	9	6			
Flow Status - Maint. Flow Volume (10)	10	4	10	10			
Flow Status - Flashiness (10)	8	9	9	9			
Channel Alteration (20)	19	17	11	18			
Frequency of Riffles/Bends (20)*		15	6				
Channel Sinuosity (20)**	10			8			
<b>Riparian and Bank Structure</b>							
Bank Stability (L) (10)	9	9	8	8			
Bank Stability (R) (10)	9	9	8	10			
Vegetative Protection (L) (10)	8	9	6	4			
Vegetative Protection (R) (10)	8	9	6	9			
Riparian Veg. Zone Width (L) (10)	9	9	3	4			
Riparian Veg. Zone Width (R) (10)	9	8	3	7			
<b>TOTAL SCORE (200):</b>	154	150	111	120			
<b>HABITAT RATING:</b>	<b>GOOD</b>	<b>GOOD</b>	<b>GOOD</b>	<b>GOOD</b>			
	(SLIGHTLY IMPAIRED)	(SLIGHTLY IMPAIRED)	(SLIGHTLY IMPAIRED)	(SLIGHTLY IMPAIRED)			
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).							
Date:	6/25/2008	8/7/2008	6/24/2008	6/24/2008			
Weather:	Cloudy	Cloudy	Sunny	Sunny			
Air Temperature:	70 Deg. F.	75 Deg. F.	75 Deg. F.	80 Deg. F.			
Water Temperature:	68 Deg. F.	68 Deg. F.	72 Deg. F.	75 Deg. F.			
Ave. Stream Width:	25 Feet	6 Feet	7 Feet	6 Feet			
Ave. Stream Depth:	2 Feet	0.25 Feet	1 Feet	1 Feet			
Surface Velocity:	0.4 Ft./Sec.	0.1 Ft./Sec.	0.75 Ft./Sec.	0.25 Ft./Sec.			
Estimated Flow:	20 CFS	0.15 CFS	5.25 CFS	1.5 CFS			
Stream Modifications:	None	None	Dredged	None			
Nuisance Plants (Y/N):	N	N	N	N			
Report Number:							
STORET No.:	250517	631184	631143	631142			
Stream Name:	Kearsley Creek	Kearsley Creek	Duck Creek	Duck Creek			
Road Crossing/Location:	Atlas Road (south crossing)	Hadley Road	M-15	Glass Road			
County Code:	25	63	63	63			
TRS:	07N08E33	05N09E16	05N09E18	05N08E24			
Latitude (dd):	42.964163	42.84508	42.840487	42.82677			
Longitude (dd):	-83.526036	-83.411843	-83.447662	-83.458184			
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP			
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater			
USGS Basin Code:	4080204	4080204	4080204	4080204			
* Applies only to Riffle/Run stream Surveys							
** Applies only to Glide/Pool stream Surveys							
COMMENTS:							

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Duck Creek	Butternut Creek	Butternut Creek	Powers Cullen Drain	
	Duck Creek Lane	Frances Road	Vasser Rd	Coldwater Road	
	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	RIFFLE/RUN	
	Station 38	Station 39	Station 40	Station 41	
<b>HABITAT METRIC</b>					
<b>Substrate and Instream Cover</b>					
Epifaunal Substrate/ Avail Cover (20)	16	11	7	7	
Embeddedness (20)*				11	
Velocity/Depth Regime (20)*				11	
Pool Substrate Characterization (20)**	10	8	10		
Pool Variability (20)**	5	16	10		
<b>Channel Morphology</b>					
Sediment Deposition (20)	16	6	10	6	
Flow Status - Maint. Flow Volume (10)	10	8	9	9	
Flow Status - Flashiness (10)	10	6	7	8	
Channel Alteration (20)	19	18	17	9	
Frequency of Riffles/Bends (20)*				10	
Channel Sinuosity (20)**	10	13	10		
<b>Riparian and Bank Structure</b>					
Bank Stability (L) (10)	10	2	5	7	
Bank Stability (R) (10)	10	2	5	7	
Vegetative Protection (L) (10)	9	5	9	5	
Vegetative Protection (R) (10)	9	5	9	5	
Riparian Veg. Zone Width (L) (10)	8	8	8	1	
Riparian Veg. Zone Width (R) (10)	8	8	9	1	
<b>TOTAL SCORE (200):</b>	150	116	125	97	
<b>HABITAT RATING:</b>	<b>GOOD</b> (SLIGHTLY IMPAIRED)	<b>GOOD</b> (SLIGHTLY IMPAIRED)	<b>GOOD</b> (SLIGHTLY IMPAIRED)	<b>MARGINAL</b> (MODERATELY IMPAIRED)	
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).					
Date:	6/24/2008	9/24/2008	8/5/2008	8/7/2008	
Weather:	Sunny	Sunny	Sunny	Cloudy	
Air Temperature:	70 Deg. F.	78 Deg. F.	82 Deg. F.	75 Deg. F.	
Water Temperature:	63 Deg. F.	Deg. F.	Deg. F.	70 Deg. F.	
Ave. Stream Width:	6 Feet	18 Feet	22 Feet	15 Feet	
Ave. Stream Depth:	0.5 Feet	1.5 Feet	2 Feet	1 Feet	
Surface Velocity:	0.5 Ft./Sec.	0.75 Ft./Sec.	0.3 Ft./Sec.	0.4 Ft./Sec.	
Estimated Flow:	1.5 CFS	20.25 CFS	13.2 CFS	6 CFS	
Stream Modifications:	None	None	None	Dredged	
Nuisance Plants (Y/N):	N	N	N	N	
Report Number:					
STORET No.:	631144	250488	250456	250522	
Stream Name:	Duck Creek	Butternut Creek	Butternut Creek	Powers Cullen Drain	
Road Crossing/Location:	Duck Creek Lane	Frances Road	Vasser Rd	Coldwater Road	
County Code:	63	25	25	25	
TRS:	05N08E24	08N07E35	09N07E36	08N08E19	
Latitude (dd):	42.817817	43.1263	43.14444	43.091946	
Longitude (dd):	-83.467942	-83.599	-83.58355	-83.558211	
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP	
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater	
USGS Basin Code:	4080204	4080204	4080204	4080204	
* Applies only to Riffle/Run stream Surveys					
** Applies only to Glide/Pool stream Surveys					
COMMENTS:					

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Powers Cullen Drain	Flint River	Hasler Creek	South Branch Flint River	
	Richfield Road	M-15 (State Rd)	Davison Road	Norway Lake Road	
	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	RIFFLE/RUN	
	Station 42	Station 43	Station 45	Station 48	
<b>HABITAT METRIC</b>					
<b>Substrate and Instream Cover</b>					
Epifaunal Substrate/ Avail Cover (20)	7	11	8	13	
Embeddedness (20)*				16	
Velocity/Depth Regime (20)*				17	
Pool Substrate Characterization (20)**	8	10	7		
Pool Variability (20)**	10	10	5		
<b>Channel Morphology</b>					
Sediment Deposition (20)	11	15	6	3	
Flow Status - Maint. Flow Volume (10)	9	10	9	9	
Flow Status - Flashiness (10)	9	4	9	5	
Channel Alteration (20)	11	15	11	16	
Frequency of Riffles/Bends (20)*				10	
Channel Sinuosity (20)**	6	6	6		
<b>Riparian and Bank Structure</b>					
Bank Stability (L) (10)	9	5	9	3	
Bank Stability (R) (10)	9	5	9	3	
Vegetative Protection (L) (10)	8	9	8	9	
Vegetative Protection (R) (10)	8	9	8	9	
Riparian Veg. Zone Width (L) (10)	1	9	9	10	
Riparian Veg. Zone Width (R) (10)	2	9	5	10	
TOTAL SCORE (200):	108	127	109	133	
<b>HABITAT RATING:</b>	GOOD (SLIGHTLY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).					
Date:	8/7/2008	8/5/2008	8/7/2008	6/26/2008	
Weather:	Partly Cloudy	Sunny	Sunny	Sunny	
Air Temperature:	78 Deg. F.	82 Deg. F.	80 Deg. F.	72 Deg. F.	
Water Temperature:	70 Deg. F.	Deg. F.	70 Deg. F.	Deg. F.	
Ave. Stream Width:	4 Feet	80 Feet	20 Feet	40 Feet	
Ave. Stream Depth:	1 Feet	3 Feet	1.5 Feet	2 Feet	
Surface Velocity:	0.5 Ft./Sec.	0.75 Ft./Sec.	0.4 Ft./Sec.	0.8 Ft./Sec.	
Estimated Flow:	2 CFS	180 CFS	12 CFS	64 CFS	
Stream Modifications:	Dredged	None	Dredged	None	
Nuisance Plants (Y/N):	N	N	N	N	
Report Number:					
STORET No.:	250521	250466	440238	440068	
Stream Name:	Powers Cullen Drain	Flint River	Hasler Creek	South Branch Flint River	
Road Crossing/Location:	Richfield Road	M-15 (State Rd)	Davison Road	Norway Lake Road	
County Code:	25	25	44	44	
TRS:	08N08E31	08N08E10	07N09E05	08N09E01	
Latitude (dd):	43.06279	43.113	43.042125	43.145281	
Longitude (dd):	-83.563122	-83.5184	-83.42304	-83.353338	
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP	
Stream Type:	Warmwater	Warmwater	Warmwater	Coldwater	
USGS Basin Code:	4080204	4080204	4080204	4080204	
* Applies only to Riffle/Run stream Surveys					
** Applies only to Glide/Pool stream Surveys					
COMMENTS:					

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Plum Creek	Plum Creek	Farmers Creek	Pine Creek			
	Plum Creek Road	Lapeer Road (M-24)	Herd Road	Maple Grove Road			
	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL			
	Station 49	Station 50	Station 51	Station 52			
<b>HABITAT METRIC</b>							
<b>Substrate and Instream Cover</b>							
Epifaunal Substrate/ Avail Cover (20)	6	8	6	11			
Embeddedness (20)*							
Velocity/Depth Regime (20)*							
Pool Substrate Characterization (20)**	9	16	6	10			
Pool Variability (20)**	5	6	1	7			
<b>Channel Morphology</b>							
Sediment Deposition (20)	5	9	5	11			
Flow Status - Maint. Flow Volume (10)	8	9	9	10			
Flow Status - Flashiness (10)	6	3	8	8			
Channel Alteration (20)	12	11	10	6			
Frequency of Riffles/Bends (20)*							
Channel Sinuosity (20)**	6	6	5	6			
<b>Riparian and Bank Structure</b>							
Bank Stability (L) (10)	8	7	8	5			
Bank Stability (R) (10)	8	6	8	3			
Vegetative Protection (L) (10)	8	6	5	5			
Vegetative Protection (R) (10)	8	6	5	5			
Riparian Veg. Zone Width (L) (10)	6	3	3	5			
Riparian Veg. Zone Width (R) (10)	7	3	8	5			
<b>TOTAL SCORE (200):</b>	102	99	87	97			
<b>HABITAT RATING:</b>	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)			
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).							
Date:	6/26/2008	6/26/2008	8/7/2008	6/27/2008			
Weather:	Sunny	Sunny	Sunny	Cloudy			
Air Temperature:	70 Deg. F.	65 Deg. F.	75 Deg. F.	72 Deg. F.			
Water Temperature:	65 Deg. F.	64 Deg. F.	68 Deg. F.	67 Deg. F.			
Ave. Stream Width:	25 Feet	18 Feet	8 Feet	15 Feet			
Ave. Stream Depth:	1 Feet	1 Feet	0.75 Feet	1 Feet			
Surface Velocity:	0.5 Ft./Sec.	0.3 Ft./Sec.	0.6 Ft./Sec.	0.7 Ft./Sec.			
Estimated Flow:	12.5 CFS	5.4 CFS	3.6 CFS	10.5 CFS			
Stream Modifications:	Dredged	Dredged	Dredged	Dredged			
Nuisance Plants (Y/N):	N	N	N	N			
Report Number:							
STORET No.:	440071	440228	440237	440229			
Stream Name:	Plum Creek	Plum Creek	Farmers Creek	Pine Creek			
Road Crossing/Location:	Plum Creek Road	Lapeer Road (M-24)	Herd Road	Maple Grove Road			
County Code:	44	44	44	44			
TRS:	08N10E19	08N10E21	06N09E01	07N10E11			
Latitude (dd):	43.093	43.091694	42.959806	43.039443			
Longitude (dd):	-83.336	-83.307363	-83.359315	-83.264577			
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP			
Stream Type:	Coldwater	Coldwater	Warmwater	Coldwater			
USGS Basin Code:	4080204	4080204	4080204	4080204			
* Applies only to Riffle/Run stream Surveys							
** Applies only to Glide/Pool stream Surveys							
COMMENTS:							

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	South Branch Flint River		South Branch Flint River		South Branch Flint River		Forest Drain				
Newark Road		Thornville Road		Gardner Road		Oliver Road					
RIFFLE/RUN		GLIDE/POOL		GLIDE/POOL		GLIDE/POOL					
Station 53		Station 54		Station 55		Station 57					
<b>HABITAT METRIC</b>											
<b>Substrate and Instream Cover</b>											
Epifaunal Substrate/ Avail Cover (20)	15		15		15		10				
Embeddedness (20)*	12										
Velocity/Depth Regime (20)*	13										
Pool Substrate Characterization (20)**			16		16		8				
Pool Variability (20)**			10		14		7				
<b>Channel Morphology</b>											
Sediment Deposition (20)	11		2		10		8				
Flow Status - Maint. Flow Volume (10)	10		10		10		9				
Flow Status - Flashiness (10)	9		9		9		6				
Channel Alteration (20)	18		18		19		14				
Frequency of Riffles/Bends (20)*	15										
Channel Sinuosity (20)**			12		11		10				
<b>Riparian and Bank Structure</b>											
Bank Stability (L) (10)	3		6		9		5				
Bank Stability (R) (10)	9		6		9		6				
Vegetative Protection (L) (10)	2		9		9		6				
Vegetative Protection (R) (10)	8		9		9		6				
Riparian Veg. Zone Width (L) (10)	2		9		8		3				
Riparian Veg. Zone Width (R) (10)	9		8		9		3				
TOTAL SCORE (200):	136		139		157		101				
<b>HABITAT RATING:</b>											
	GOOD (SLIGHTLY IMPAIRED)		GOOD (SLIGHTLY IMPAIRED)		EXCELLENT (NON- IMPAIRED)		MARGINAL (MODERATELY IMPAIRED)				
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).											
Date:	6/27/2008		6/27/2008		6/27/2008		6/25/2008				
Weather:	Partly Cloudy		Partly Cloudy		Partly Cloudy		Cloudy				
Air Temperature:	80	Deg. F.	72	Deg. F.	72	Deg. F.	73	Deg. F.			
Water Temperature:	74	Deg. F.	74	Deg. F.	74	Deg. F.	64	Deg. F.			
Ave. Stream Width:	21	Feet	20	Feet	15	Feet	6	Feet			
Ave. Stream Depth:	1	Feet	2	Feet	1.5	Feet	1	Feet			
Surface Velocity:	1	Ft./Sec.	0.5	Ft./Sec.	0.5	Ft./Sec.	0.75	Ft./Sec.			
Estimated Flow:	21	CFS	20	CFS	11.25	CFS	4.5	CFS			
Stream Modifications:	None		None		None		None				
Nuisance Plants (Y/N):	N		N		N		N				
Report Number:											
STORET No.:	440232		440231		440230		440227				
Stream Name:	ranch Flint River	South Branch Flint River	South Branch Flint River				Forest Drain				
Road Crossing/Location:	Newark Road		Thornville Road		Gardner Road		Oliver Road				
County Code:	44		44		44		44				
TRS:	07N10E26		06N10E12		06N10E22		09N10E07				
Latitude (dd):	43.001005		42.944253		42.916842		43.209019				
Longitude (dd):	-83.252637		-83.224054		-83.263246		-83.333116				
Ecoregion:	SMNITP		SMNITP		SMNITP		SMNITP				
Stream Type:	Coldwater		Coldwater		Coldwater		Warmwater				
USGS Basin Code:	4080204		4080204		4080204		4080204				
* Applies only to Riffle/Run stream Surveys											
** Applies only to Glide/Pool stream Surveys											
COMMENTS:											

Table 4. Habitat evaluation for the Flint River watershed, 2008.

	Adams Drain	Indian Creek	Cedar Creek	North Branch Flint River		
Murphy Lake Road	Murphy Lake Road	Lake Pleasant Road	Willis Road	Jefferson Rd		
GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL		
Station 58	Station 59	Station 60	Station 64			
<b>HABITAT METRIC</b>						
<b>Substrate and Instream Cover</b>						
Epifaunal Substrate/ Avail Cover (20)	3	7	9	5		
Embeddedness (20)*						
Velocity/Depth Regime (20)*						
Pool Substrate Characterization (20)**	11	10	13	5		
Pool Variability (20)**	2	2	5	2		
<b>Channel Morphology</b>						
Sediment Deposition (20)	6	11	5	6		
Flow Status - Maint. Flow Volume (10)	9	9	9	9		
Flow Status - Flashiness (10)	8	8	6	8		
Channel Alteration (20)	6	6	18	6		
Frequency of Riffles/Bends (20)*						
Channel Sinuosity (20)**	1	2	12	5		
<b>Riparian and Bank Structure</b>						
Bank Stability (L) (10)	8	3	6	4		
Bank Stability (R) (10)	8	3	6	4		
Vegetative Protection (L) (10)	3	3	9	3		
Vegetative Protection (R) (10)	3	3	9	3		
Riparian Veg. Zone Width (L) (10)	2	2	10	2		
Riparian Veg. Zone Width (R) (10)	2	2	10	3		
<b>TOTAL SCORE (200):</b>	72	71	127	65		
<b>HABITAT RATING:</b>	<b>MARGINAL</b>	<b>MARGINAL</b>	<b>GOOD</b>	<b>MARGINAL</b>		
(MODERATELY IMPAIRED)	(MODERATELY IMPAIRED)	(SLIGHTLY IMPAIRED)	(MODERATELY IMPAIRED)	(MODERATELY IMPAIRED)		
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).						
Date:	6/25/2008	6/25/2008	6/26/2008	6/26/2008		
Weather:	Cloudy	Cloudy	Partly Cloudy	Sunny		
Air Temperature:	70 Deg. F.	72 Deg. F.	80 Deg. F.	80 Deg. F.		
Water Temperature:	69 Deg. F.	66 Deg. F.	77 Deg. F.	80 Deg. F.		
Ave. Stream Width:	6 Feet	12 Feet	6 Feet	24 Feet		
Ave. Stream Depth:	0.75 Feet	0.75 Feet	0.75 Feet	1.25 Feet		
Surface Velocity:	0.5 Ft./Sec.	0.5 Ft./Sec.	0.4 Ft./Sec.	0.2 Ft./Sec.		
Estimated Flow:	2.25 CFS	4.5 CFS	1.8 CFS	6 CFS		
Stream Modifications:	Dredged	Dredged	None	Dredged		
Nuisance Plants (Y/N):	N	N	N	N		
Report Number:						
STORET No.:	440225	440226	440202	440179		
Stream Name:	Adams Drain	Indian Creek	Cedar Creek	North Branch Flint River		
Road Crossing/Location:	Murphy Lake Road	Lake Pleasant Road	Willis Road	Jefferson Rd		
County Code:	44	44	44	44		
TRS:	10N11E08	10N11E10	09N12E31	09N11E08		
Latitude (dd):	43.296319	43.3028	43.1665	43.21581		
Longitude (dd):	-83.208511	-83.178797	-83.1035	-83.19522		
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP		
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater		
USGS Basin Code:	4080204	4080204	4080204	4080204		
* Applies only to Riffle/Run stream Surveys						
** Applies only to Glide/Pool stream Surveys						
<b>COMMENTS:</b>						

Table 5. Water Chemistry of select locations within the Flint River Watershed collected on October 23, 2008.

Waterbody	Farmers Creek	S.Br. Flint	S.Br. Flint	Flint River	Flint River	Flint River	Flint River	Gilkey Creek	Call Drain	Big 7 Lake	Brent Run	Rush Creek	Rush Creek	
Location	Wynns Mills Rd	Genesee Rd	Saginaw	Klam	Mt. Morris	Oak	M-54	Davison	Torrey Rd	Boat Launch	McKinley Rd	Middleton Rd d/s	Durand Rd u/s	
Station	65	66	67	46	47	44	26	27	25	20	62	13	8	9
Silver -Total	µg/L	ND	ND	ND	ND	ND	ND	ND						
Arsenic - Total	µg/L	4.5	2.5	3.5	3.9	3.4	3.3	2.9	3.3	3.3	1.4	1.3	1.4	1.3
Barium - Total	µg/L	46	54	47	61	62	52	58	59	75	77	61	94	120
Calcium - Total	mg/L	59.6	78.2	71.3	81.2	81.1	66.0	61.1	65.8	108	80.6	74.8	97.9	105
Cadmium - Total	µg/L	ND	ND	ND	ND	ND	ND	ND						
Conductance	umhos/cm												869	873
Chromium - Total	µg/L	ND	ND	ND	ND	ND	ND	ND						
Copper - Total	µg/L	ND	ND	ND	ND	ND	1.1	1.1	1.2	1.4	1.2	1.3	ND	ND
Iron - Total	µg/L									630				
Hardness - Calculated	mg/L	246	314	285	317	316	253	239	251	409	306	288	399	416
Mercury - Total	µg/L	ND	ND	ND	ND	ND	ND	ND						
Total Kjeldahl	mg/L	1.00	.48	.71	.65	.72	1.13	1.02	.93	.67	.79	.54	.36	.32
Nitrogen														
Magnesium - Total	mg/L	23.5	28.8	26.0	27.7	27.4	21.4	20.9	21.0	33.7	25.3	24.6	37.4	37.3
Manganese - Total	µg/L									81				
Nitrate + Nitrite	mg/L	.050	.23	.34	.37	.076	.161	.106	.112	.146	.25	.001	.004	.163
Ammonia	mg/L	.019	.018	.012	.007	.013	.099	.046	.059	.041	.165	.007	.005	.019
Nickel - Total	µg/L									4.3				
Nitrite	mg/L	.010	.007	.009	.007	.013	.018	.016	.016	.007	.015	.003	.003	.025
Ortho-phosphate	mg/L	.012	.004	.010	.011	.009	.009	.007	.010	.018	.011	.004	.007	.013
Lead - Total	µg/L	ND	ND	ND	ND	ND	ND	ND						
Selenium - Total	µg/L	ND	ND	ND	ND	ND	ND	ND						
Solids - Suspended	mg/L	12	4	7	5	11	13	14	11	5	8	ND	ND	6
Solids - Total	mg/L												510	540
Dissolved														
Total Phosphorus	mg/L	.088	.019	.054	.044	.033	.060	.050	.045	.040	.028	.013	.020	.023
Zinc - Total	µg/L	ND	ND	ND	ND	ND	ND	ND						
Aroclor 1016	ug/L									ND	ND			
Aroclor 1221	ug/L									ND	ND			
Aroclor 1232	ug/L									ND	ND			
Aroclor 1242	ug/L									ND	ND			
Aroclor 1248	ug/L									ND	ND			
Aroclor 1254	ug/L									ND	ND			
Aroclor 1260	ug/L									ND	ND			
Aroclor 1262	ug/L									ND	ND			
Aroclor 1268	ug/L									ND	ND			

Table 6. Sediment Chemistry of select locations within the Flint River Watershed on October 23, 2008.

Type	Analyte	Units	Gilky Creek @ Center Rd Station 25	Call Drain @ Torrey Rd Station 20
PAH's	Acenaphthene	ug/Kg dry	Not Detected	470
	Acenaphthylene	ug/Kg dry	Not Detected	Not Detected
	Anthracene	ug/Kg dry	280	1100
	Azobenzene	ug/Kg dry	Not Detected	Not Detected
	Benzo[a]anthracene	ug/Kg dry	1200	7000
	Benzo[a]pyrene	ug/Kg dry	1800	8800
	Benzo[b]fluoranthene	ug/Kg dry	2900	12000
	Benzo[g,h,i]perylene	ug/Kg dry	2400	9100
	Benzo[k]fluoranthene	ug/Kg dry	960	3900
	Benzyl Alcohol	ug/Kg dry	Not Detected	Not Detected
	Bis(2-chloroethoxy)methane	ug/Kg dry	Not Detected	Not Detected
	Bis(2-chloroethyl)ether	ug/Kg dry	Not Detected	Not Detected
	Bis(2-chloroisopropyl)ether	ug/Kg dry	Not Detected	Not Detected
	Bis(2-ethylhexyl)phthalate	ug/Kg dry	1500	3200
	Butyl benzyl phthalate	ug/Kg dry	Not Detected	Not Detected
	Carbazole	ug/Kg dry	Not Detected	1400
	Chrysene	ug/Kg dry	2600	11000
	Dibenz[a,h]anthracene	ug/Kg dry	Not Detected	2100
	Dibenzofuran	ug/Kg dry	Not Detected	Not Detected
	Diethylphthalate	ug/Kg dry	Not Detected	Not Detected
	Dimethyl phthalate	ug/Kg dry	Not Detected	Not Detected
	Di-n-butyl phthalate	ug/Kg dry	Not Detected	Not Detected
	Di-n-octyl phthalate	ug/Kg dry	Not Detected	Not Detected
	Fluoranthene	ug/Kg dry	4800	22000
	Fluorene	ug/Kg dry	Not Detected	680
	Hexachlorobenzene	ug/Kg dry	Not Detected	Not Detected
	Hexachlorobutadiene	ug/Kg dry	Not Detected	Not Detected
	Hexachlorocyclopentadiene	ug/Kg dry	Not Detected	Not Detected
	Hexachloroethane	ug/Kg dry	Not Detected	Not Detected
	Indeno(1,2,3-c,d)pyrene	ug/Kg dry	2300	9200
	Isophorone	ug/Kg dry	Not Detected	Not Detected
	Naphthalene	ug/Kg dry	Not Detected	Not Detected
	Nitrobenzene	ug/Kg dry	Not Detected	Not Detected
	N-Nitrosodimethylamine	ug/Kg dry	Not Detected	Not Detected
	N-Nitrosodi-n-propylamine	ug/Kg dry	Not Detected	Not Detected
	N-Nitrosodiphenylamine	ug/Kg dry	Not Detected	Not Detected
	Pentachlorophenol	ug/Kg dry	Not Detected	Not Detected
	Phenanthrene	ug/Kg dry	1900	8400
	Phenol	ug/Kg dry	Not Detected	Not Detected
	Pyrene	ug/Kg dry	3400	17000

Table 6. cont.

Type	Analyte	Units	Gilky Creek @ Center Rd Station 25	Call Drain @ Torrey Rd Station 20
PCBs	Aroclor 1016	ug/Kg dry	Not Detected	Not Detected
	Aroclor 1221	ug/Kg dry	Not Detected	Not Detected
	Aroclor 1232	ug/Kg dry	Not Detected	Not Detected
	Aroclor 1242	ug/Kg dry	Not Detected	Not Detected
	Aroclor 1248	ug/Kg dry	Not Detected	Not Detected
	Aroclor 1254	ug/Kg dry	140	Not Detected
	Aroclor 1260	ug/Kg dry	Not Detected	Not Detected
	Aroclor 1262	ug/Kg dry	Not Detected	Not Detected
	Aroclor 1268	ug/Kg dry	Not Detected	Not Detected
Metals	Silver - Sediment	mg/Kg dry	0.12	0.18
	Arsenic - Sediment	mg/Kg dry	13	7.4
	Barium - Sediment	mg/Kg dry	72	81
	Cadmium - Sediment	mg/Kg dry	0.67	1.8
	Chromium - Sediment	mg/Kg dry	24	39
	Copper - Sediment	mg/Kg dry	32	60
	Mercury - Sediment	mg/Kg dry	ND	ND
	Lead - Sediment	mg/Kg dry	38	87
	Selenium - Sediment	mg/Kg dry	0.41	0.66
	Zinc - Sediment	mg/Kg dry	240	470
% Total Solids		%	44.2	43.5

Table 7a. Nonwadeable qualitative macroinvertebrate sampling results for the Flint River watershed, 2008.

TAXA	Flint River at M-54	North Branch Flint River at Barnes Lake Rd.	Flint River at Leith St.
	6/30/08 Site 26	7/14/08 Site 56	6/30/08 Site 1
<b>PLATYHELMINTHES (flatworms)</b>			
Turbellaria	2		3
<b>ANNELIDA (segmented worms)</b>			
Oligochaeta (worms)	44	2	29
<b>ARTHROPODA</b>			
Crustacea			
Amphipoda (scuds)	165	100	52
Decapoda (crayfish)	1	2	5
Isopoda (sowbugs)	4	7	
Arachnoidea			
Hydracarina	210	16	220
Insecta			
Ephemeroptera (mayflies)			
Baetidae			7
Caenidae	75	2	14
Heptageniidae		2	
Polymitarcyidae		1	
Odonata			
Anisoptera (dragonflies)			
Aeshnidae		1	3
Corduliidae	3		
Gomphidae			1
Zygoptera (damselflies)			
Calopterygidae	45		13
Coenagrionidae	18	8	18
Hemiptera (true bugs)			
Corixidae		23	
Gerridae		1	
Nepidae	1		5
Notonectidae			
Veliidae	10	2	2
Trichoptera (caddisflies)			
Brachycentridae	1		
Hydropsychidae		1	
Leptoceridae		2	
Polycentropodidae		4	
Coleoptera (beetles)			
Gyrinidae (adults)		1	
Halipidae (adults)	2		3
Hydrophilidae (total)		2	
Elmidae	2	24	
Gyrinidae (larvae)		1	
Diptera (flies)			
Ceratopogonidae		1	
Chironomidae	152	95	85
Culicidae	65		29
Stratiomyidae		2	
Tabanidae	4		1
<b>MOLLUSCA</b>			
Gastropoda (snails)			
Lymnaeidae			2
Physidae	4		16
Planorbidae		1	2

METRIC	STATION 1		STATION 2		STATION 3	
	Value		Value		Value	
<b>TOTAL ABUNDANCE</b>	808		306		505	
<b>TOTAL RICHNESS</b>	19		25		19	
<b>NUMBER OF EPHEMEROPTERA FAMILIES</b>	1		3		2	
<b>NUMBER OF PLECOPTERA FAMILIES</b>	0		0		0	
<b>NUMBER OF TRICHOPTERA FAMILIES</b>	1		3		0	
<b>NUMBER OF DIPTERA TAXA</b>	3		3		3	
<b>TRICHOPTERA ABUNDANCE</b>	1		7		0	
<b>ABUNDANCE OF DOMINANT TAXON</b>	210		100		220	
<b>SHREDDER ABUNDANCE</b>	171		109		55	
<b>SCRAPER ABUNDANCE</b>	4		3		20	
<b>COLL-FILTERER ABUNDANCE</b>	66		1		29	
<b>COLL-GATH ABUNDANCE</b>	276		151		143	
<b>PREDATOR ABUNDANCE</b>	291		42		258	

Table 7b. Nonwadeable site rating from the Flint River watershed, 2008.

**DATE:** 6/30/08

**RIVER:** Flint River at Leith St.

**STATION NUMBER:** Site 1

Attribute	Data Sheet Box #	Value	Metric Calculations	Value	Metric Score
Total Abundance	1	505	FFG Diversity (25)	1.780034572	25
Total Richness	2	19	Habitat Stability FFG Surrogate (25)	0.247474747	8
Number of Ephemeroptera Families	3	2	% Trichoptera (20)	0	0
Number of Plecoptera Families	4	0	EPT Richness (8)	2	0
Number of Trichoptera Families	5	0	Total Richness (7)	19	5
Number of Diptera Taxa	6	3	Diptera Richness (5)	3	2
Trichoptera Abundance	7	0	Plecoptera Richness (5)	0	0
Abundance of Dominant Taxon	8	220	% Dominance (5)	43.56435644	4
Shredder Abundance	9	55			
Scraper Abundance	10	20			
Coll-Filterer Abundance	11	29			
Coll-Gath Abundance	12	143			
Predator Abundance	13	258			

**Graphical Representation of Individual Metric Scores**

Metric	Score
FFG Diversity (25)	25
Habitat Stability FFG Surrogate (25)	8
% Trichoptera (20)	0
EPT Richness (8)	2
Total Richness (7)	5
Diptera Richness (5)	2
Plecoptera Richness (5)	0

**TOTAL BIO SCORE (100 pts possible)**

Table 7b. Nonwadeable site rating from the Flint River watershed, 2008.

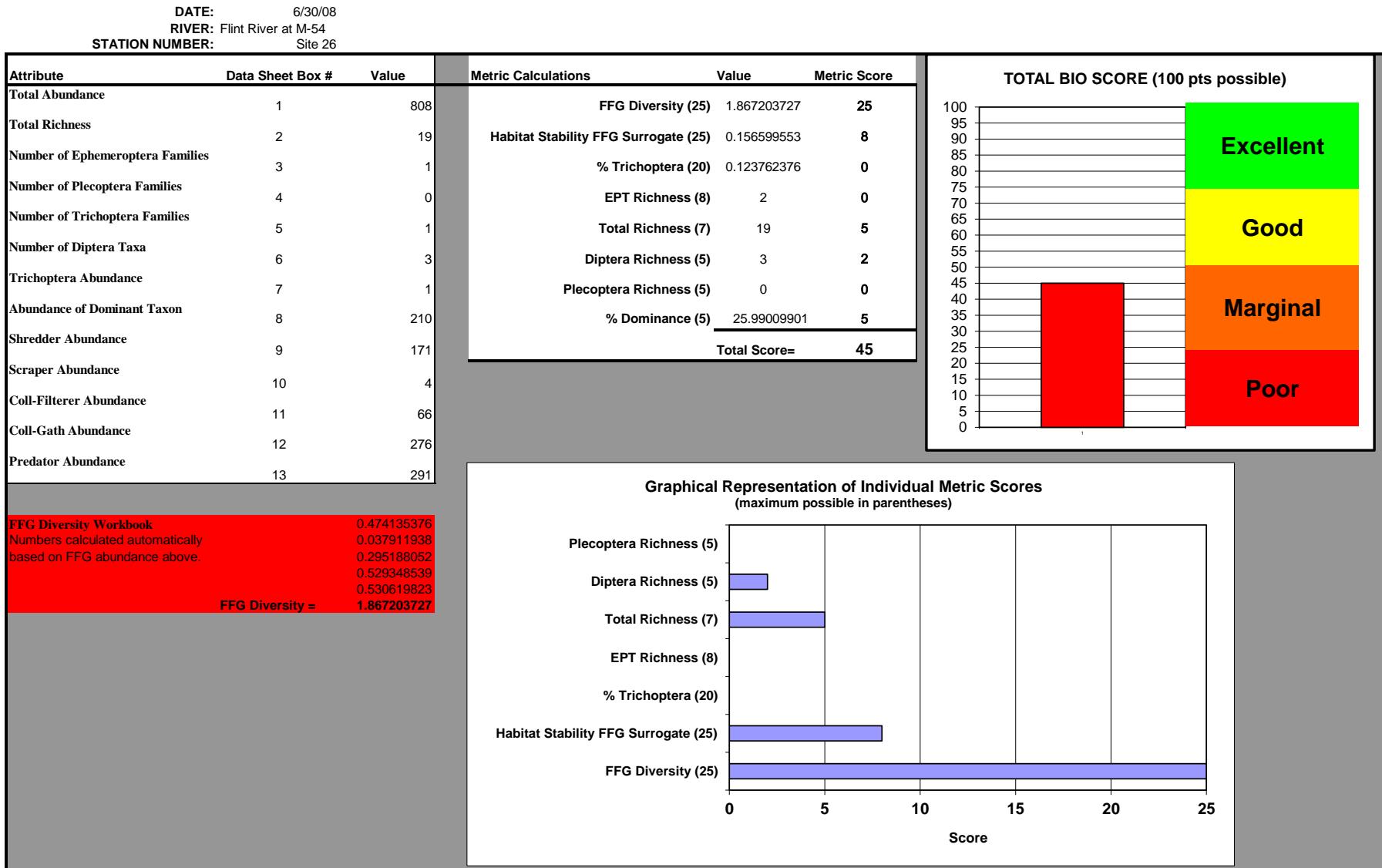


Table 7b. Nonwadeable site rating from the Flint River watershed, 2008.

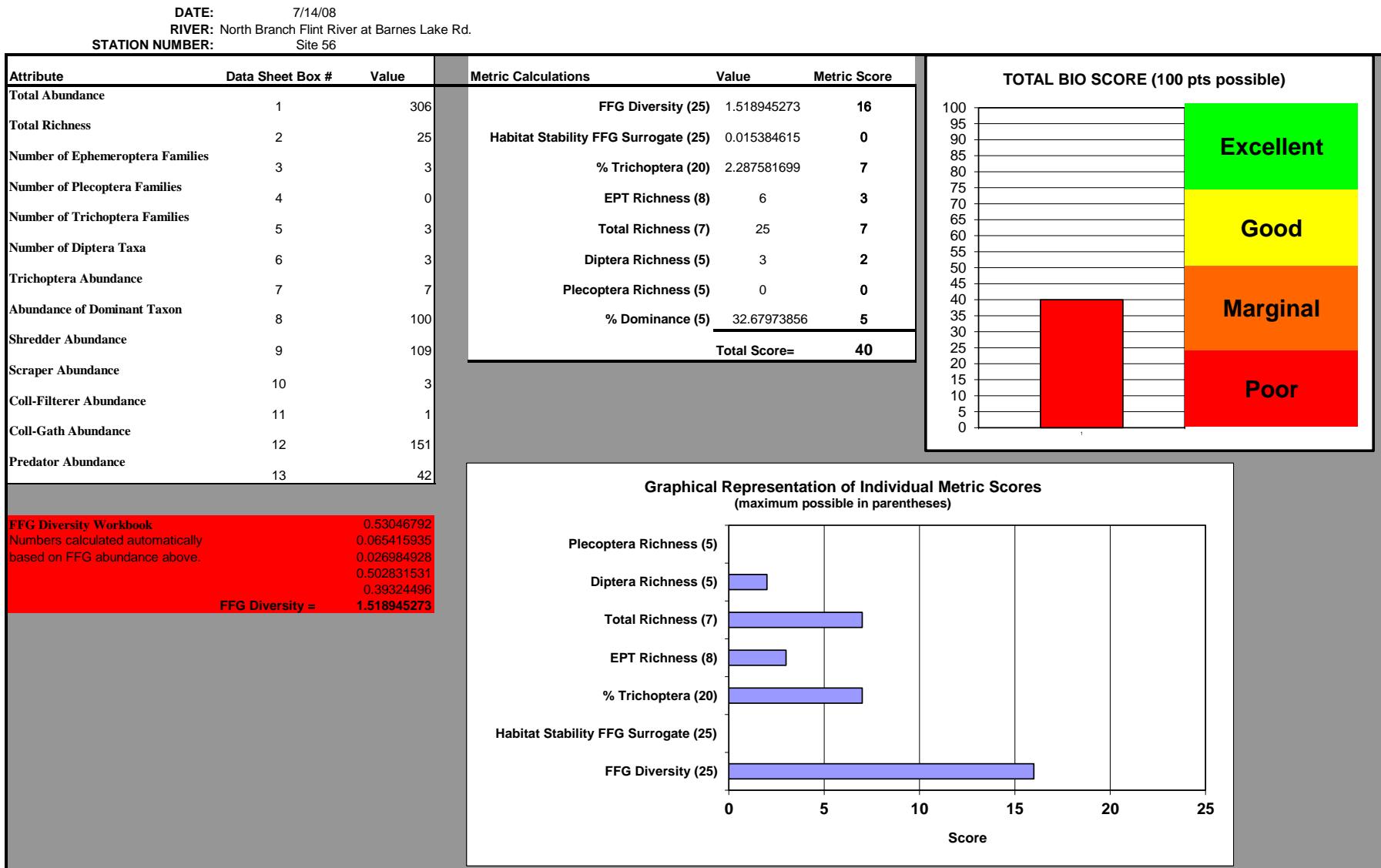


Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	Porter Creek Allen Road 6/25/2013 STATION 3T	Northwood Creek Reed Road 7/24/2013 STATION 21	Silver Creek Marshall Road 9/9/2013 STATION 7
<b>PLATYHELMINTHES (flatworms)</b>			
Turbellaria	4	4	
<b>ANNELIDA (segmented worms)</b>			
Hirudinea (leeches)	1	1	1
Oligochaeta (worms)	4	1	3
<b>ARTHROPODA</b>			
Crustacea			
Amphipoda (scuds)		146	1
Decapoda (crayfish)		7	1
Isopoda (sowbugs)		5	78
Arachnoidea			
Hydracarina	3	15	1
Insecta			
Ephemeroptera (mayflies)			
Baetidae		7	8
Caenidae	1	26	1
Heptageniidae		4	1
Odonata			
Anisoptera (dragonflies)			
Aeshnidae		1	3
Corduliidae		3	
Zygoptera (damselflies)			
Calopterygidae		21	1
Coenagrionidae	2	1	36
Lestidae		1	
Hemiptera (true bugs)			
Belostomatidae		1	
Corixidae	1	16	12
Notonectidae		1	
Trichoptera (caddisflies)			
Glossosomatidae	1		
Helicopsychidae	1		
Hydropsychidae	1		
Leptoceridae		73	
Coleoptera (beetles)			
Dytiscidae (total)		1	
Haliplidae (adults)		8	
Dryopidae	1		
Elmidae	16	95	20
Haliplidae (larvae)		1	
Diptera (flies)			
Chironomidae	139	12	107
Culicidae	1		
Simuliidae	63		
Tabanidae			7
Tipulidae	1		
<b>MOLLUSCA</b>			
Gastropoda (snails)			
Ancyliidae (limpets)	8		
Physidae	28	188	9
Planorbidae	9	31	
Pelecypoda (bivalves)			
Sphaeriidae (clams)	12		1
<b>TOTAL INDIVIDUALS</b>	297	670	291

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	Porter Creek		Northwood Creek		Silver Creek	
	Allen Road	Reed Road	Marshall Road			
	6/25/2013	7/24/2013	9/9/2013			
	STATION 3T	STATION 21	STATION 7			
METRIC	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	20	0	25	1	18	1
NUMBER OF MAYFLY TAXA	1	0	3	1	3	0
NUMBER OF CADDISFLY TAXA	3	1	1	1	0	0
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	0.34	-1	5.52	-1	3.44	-1
PERCENT CADDISFLY COMP.	1.01	-1	10.90	0	0.00	-1
PERCENT DOMINANT TAXON	46.80	-1	28.06	-1	36.77	-1
PERCENT ISOPOD, SNAIL, LEECH	15.49	-1	33.58	-1	30.24	-1
PERCENT SURF. AIR BREATHERS	0.67	1	4.03	1	4.12	1
TOTAL SCORE		-3		0		-3
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.

Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	Howland Drain Linden Road 6/25/2013 STATION 5T	Dawe Drain Baldwin Road 11/25/2013 STATION 6T
<b>PLATYHELMINTHES (flatworms)</b>		
Turbellaria	4	1
<b>ANNELIDA (segmented worms)</b>		
Hirudinea (leeches)	1	
Oligochaeta (worms)	7	5
<b>ARTHROPODA</b>		
Crustacea		
Decapoda (crayfish)		1
Isopoda (sowbugs)		40
Arachnoidea		
Hydracarina		3
Insecta		
Ephemeroptera (mayflies)		
Baetidae		1
Odonata		
Anisoptera (dragonflies)		
Aeshnidae	2	1
Corduliidae		1
Zygoptera (damselflies)		
Coenagrionidae		1
Hemiptera (true bugs)		
Corixidae	2	
Megaloptera		
Corydalidae (dobson flies)		1
Trichoptera (caddisflies)		
Hydropsychidae	4	3
Hydroptilidae	1	
Polycentropodidae	1	
Coleoptera (beetles)		
Haliplidae (adults)	1	
Hydrophilidae (total)	1	
Elmidae	1	
Haliplidae (larvae)	1	
Diptera (flies)		
Chironomidae	140	165
Simuliidae		14
Tipulidae		1
<b>MOLLUSCA</b>		
Gastropoda (snails)		
Physidae	57	17
Planorbidae	26	6
Pleuroceridae	1	
Viviparidae	34	
Pelecypoda (bivalves)		
Sphaeriidae (clams)	8	11
<b>TOTAL INDIVIDUALS</b>	<b>292</b>	<b>272</b>

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	Howland Drain		Dawe Drain	
	Linden Road	Baldwin Road		
	6/25/2013	11/25/2013		
	STATION 5T	STATION 6T		
TOTAL NUMBER OF TAXA	17	1	17	1
NUMBER OF MAYFLY TAXA	0	-1	1	0
NUMBER OF CADDISFLY TAXA	3	0	1	-1
NUMBER OF STONEFLY TAXA	0	-1	0	-1
PERCENT MAYFLY COMP.	0.00	-1	0.37	-1
PERCENT CADDISFLY COMP.	2.05	-1	1.10	-1
PERCENT DOMINANT TAXON	47.95	-1	60.66	-1
PERCENT ISOPOD, SNAIL, LEECH	40.75	-1	23.16	-1
PERCENT SURF. AIR BREATHERS	1.37	1	0.00	1
TOTAL SCORE		-4		-4
MACROINV. COMMUNITY RATING		ACCEPT.	ACCEPT.	ACCEPT.

Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	Carman Creek Atherton Road 9/27/2013 STATION 6	Carmen Creek Hemphill Road 9/27/2013 STATION 1	Evergreen Creek M24 7/30/2013 STATION 2	Onion Creek Riley Road 7/24/2013 STATION 8
PORIFERA (sponges)		1		
PLATYHELMINTHES (flatworms)				
Turbellaria		1		6
ANNELIDA (segmented worms)				
Hirudinea (leeches)	1	6		3
Oligochaeta (worms)	4	2	2	2
ARTHROPODA				
Crustacea				
Amphipoda (scuds)			32	
Decapoda (crayfish)		1	1	2
Isopoda (sowbugs)		1		
Arachnoidea				
Hydracarina	1		2	53
Insecta				
Ephemeroptera (mayflies)				
Baetidae		4	1	13
Caenidae			3	154
Heptageniidae			1	1
Odonata				
Anisoptera (dragonflies)				
Aeshnidae			2	1
Zygoptera (damselflies)				
Calopterygidae	10	50	4	
Coenagrionidae	27	2	3	11
Lestidae				1
Hemiptera (true bugs)				
Belostomatidae			1	
Corixidae	1		6	47
Gerridae	2	1	1	
Mesoveliidae	1	2	2	
Saldidae			2	
Trichoptera (caddisflies)				
Helicopsychidae			1	2
Hydropsychidae		72	27	
Leptoceridae			3	9
Limnephilidae		2	1	
Coleoptera (beetles)				
Haliplidae (adults)				14
Hydrophilidae (total)				2
Elmidae			93	33
Gyrinidae (larvae)			3	
Diptera (flies)				
Chironomidae	13	30	99	103
Culicidae			1	
Simuliidae			1	
Tabanidae			1	
Tipulidae			1	
MOLLUSCA				
Gastropoda (snails)				
Aculyidae (limpets)	4	7		
Physidae	1	7	1	15
Planorbidae				16
Pelecypoda (bivalves)				
Sphaeriidae (clams)		1		
TOTAL INDIVIDUALS	65	190	295	489

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	Carmen Creek		Carmen Creek		Evergreen Creek		Onion Creek	
	Atherton Road		Hemphill Road		M24		Riley Road	
	9/27/2013		9/27/2013		7/30/2013		7/24/2013	
	STATION 6		STATION 1		STATION 2		STATION 8	
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	11	-1	17	0	27	1	21	0
NUMBER OF MAYFLY TAXA	0	-1	1	-1	3	0	3	0
NUMBER OF CADDISFLY TAXA	0	-1	2	0	4	0	2	0
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	0.00	-1	2.11	-1	1.69	-1	34.36	1
PERCENT CADDISFLY COMP.	0.00	-1	38.95	1	10.85	0	2.25	-1
PERCENT DOMINANT TAXON	41.54	-1	37.89	-1	33.56	0	31.49	0
PERCENT ISOPOD, SNAIL, LEECH	9.23	0	11.05	-1	0.34	1	6.95	0
PERCENT SURF. AIR BREATHERS	6.15	1	1.58	1	4.41	1	12.88	0
TOTAL SCORE		-6		-3		1		-1
MACROINV. COMMUNITY RATING	POOR		ACCEPT.		ACCEPT.		ACCEPT.	

Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	Kearsley Creek Atlas Road (north crossing) 7/23/2013	Kearsley Creek Kipp Rd 7/23/2013	Black Creek Henderson Road 7/23/2013	Black Creek Rising Street 7/23/2013
	STATION 7T	STATION 4	STATION 5	STATION 12
<b>PORIFERA (sponges)</b>				1
PLATYHELMINTHES (flatworms)				
Turbellaria	1		1	1
ANNELIDA (segmented worms)				
Hirudinea (leeches)	1		6	7
Oligochaeta (worms)	5	5	13	6
ARTHROPODA				
Crustacea				
Amphipoda (scuds)		6	7	
Decapoda (crayfish)	1	2	1	2
Isopoda (sowbugs)		2	26	1
Arachnoidea				
Hydracarina	2	3	2	2
Insecta				
Ephemeroptera (mayflies)				
Baetidae	26	19		
Caenidae	12		8	10
Heptageniidae	30	7		5
Isonychiidae	1			
Leptophlebiidae			4	
Tricorythidae	7			
Odonata				
Anisoptera (dragonflies)				
Aeshnidae		1	1	1
Gomphidae		1		
Macromiidae			1	
Zygoptera (damselflies)				
Calopterygidae	2	1		
Coenagrionidae	1		37	20
Plecoptera (stoneflies)				
Perlodidae	2			
Hemiptera (true bugs)				
Belostomatidae	1			
Corixidae	5		1	
Gerridae	3		1	
Mesoveliidae			1	
Pleidae	1			
Veliidae	2			
Megaloptera				
Corydalidae (dobson flies)		1		
Sialidae (alder flies)	1		1	1
Trichoptera (caddisflies)				
Brachycentridae	1	2		
Helicopsychidae		2		
Hydropsychidae	46	104		
Hydroptilidae	2			
Leptoceridae	38	4	2	21
Limnephilidae	4			
Philopotamidae	1			
Phryganeidae	1			
Polycentropodidae	4	1		
Coleoptera (beetles)				
Dytiscidae (total)			1	
Gyrinidae (adults)	1			
Haliplidae (adults)			2	
Elmidae	25	57	20	92
Psephenidae (larvae)	1			
Scirtidae (larvae)	3		1	
Diptera (flies)				
Athericidae		1		
Ceratopogonidae		1		1
Chironomidae	23	26	133	141

Simuliidae	3	4		
Tabanidae		1	2	
Tipulidae		1		
<b>MOLLUSCA</b>				
Gastropoda (snails)				
Ancylidae (limpets)	6	1		2
Physidae			7	4
Planorbidae			2	
Viviparidae			1	
Pelecypoda (bivalves)				
Sphaeriidae (clams)	1	1	1	1
<b>TOTAL INDIVIDUALS</b>	<b>264</b>	<b>254</b>	<b>284</b>	<b>318</b>

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	Kearsley Creek		Kearsley Creek		Black Creek		Black Creek	
	Atlas Road (north crossing)		Kipp Rd		Henderson Road		Rising Street	
	7/23/2013	7/23/2013	7/23/2013	7/23/2013	7/23/2013	7/23/2013	7/23/2013	7/23/2013
	STATION 7T		STATION 4		STATION 5		STATION 12	
	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	35	1	25	1	28	1	18	0
NUMBER OF MAYFLY TAXA	5	1	2	0	2	0	2	0
NUMBER OF CADDISFLY TAXA	8	1	5	1	1	-1	1	-1
NUMBER OF STONEFLY TAXA	1	1	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	28.79	1	10.24	0	4.23	0	4.72	0
PERCENT CADDISFLY COMP.	36.74	1	44.49	1	0.70	-1	6.60	0
PERCENT DOMINANT TAXON	17.42	1	40.94	-1	46.83	-1	44.34	-1
PERCENT ISOPOD, SNAIL, LEECH	2.65	1	1.18	1	14.79	-1	4.40	0
PERCENT SURF. AIR BREATHERS	4.92	1	0.00	1	2.11	1	0.00	1
TOTAL SCORE		9		3		-3		-2
MACROINV. COMMUNITY RATING		EXCELLENT		ACCEPT.		ACCEPT.		ACCEPT.

Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	South Branch Flint River	South Branch Flint River	South Branch Flint River	Henry Drain
	Newark Road	Norway Lake Road	Davison Lake Road	Mt. Morris Rd
	6/27/2013	6/27/2013	8/1/2013	7/30/2013
	STATION 8T	STATION 9T	STATION 13	STATION 19
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria				2
ANNELEIDA (segmented worms)				
Hirudinea (leeches)		10	2	
Oligochaeta (worms)	2	7		8
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	80	11	122	14
Decapoda (crayfish)	2			1
Arachnoidea				
Hydracarina			4	2
Insecta				
Ephemeroptera (mayflies)				
Baetidae	10	10	39	5
Caenidae	8		6	4
Heptageniidae	2	11	2	7
Isonychiidae	1			
Tricorythidae			1	6
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	3	1	1	1
Gomphidae	1			2
Zygoptera (damselflies)				
Calopterygidae	1		2	16
Coenagrionidae	1			1
Lestidae	1			2
Plecoptera (stoneflies)				
Perlidae	2	25		
Hemiptera (true bugs)				
Gerridae				1
Mesoveliidae	3	1		1
Veliidae			2	
Megaloptera				
Corydalidae (dobson flies)	1			1
Sialidae (alder flies)			1	2
Trichoptera (caddisflies)				
Brachyceridae		4		
Helicopsychidae	3			2
Hydropsychidae	45	77	4	46
Hydroptilidae	1	7	6	2
Leptoceridae	1	26	1	4
Limnephilidae	2			1
Molannidae		1		
Philopotamidae		4		
Phryganeidae	1			
Polycentropodidae	2	3	7	
Uenoidae				12
Coleoptera (beetles)				
Dytiscidae (total)	1			
Haliplidae (adults)	1		1	
Elmidae	5	24	9	43
Psephenidae (larvae)	2			
Scirtidae (larvae)			1	1
Diptera (flies)				
Ceratopogonidae				3
Chironomidae	18	22	62	118
Culicidae			1	
Dixidae			2	
Simuliidae		5	1	6
Tabanidae				1
Tipulidae	2			
MOLLUSCA				

Gastropoda (snails)				
Ancylidae (limpets)				3
Lymnaeidae	2			
Physidae	20		1	1
Planorbidae	4			1
Viviparidae	1			
Pelecypoda (bivalves)				
Sphaeriidae (clams)	6		6	
Unionidae (mussels)	3		1	
TOTAL INDIVIDUALS	238	257	278	320

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	South Branch Flint River		South Branch Flint River		South Branch Flint River		Henry Drain	
	Newark Road 6/27/2013 STATION 8T		Norway Lake Road 6/27/2013 STATION 9T		Davison Lake Road 8/1/2013 STATION 13		Mt. Morris Rd 7/30/2013 STATION 19	
	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	34	1	21	0	23	0	33	1
NUMBER OF MAYFLY TAXA	4	1	2	0	4	1	4	1
NUMBER OF CADDISFLY TAXA	7	1	7	1	4	0	6	1
NUMBER OF STONEFLY TAXA	1	1	1	1	0	-1	0	-1
PERCENT MAYFLY COMP.	8.82	0	8.17	0	17.27	0	6.88	0
PERCENT CADDISFLY COMP.	23.11	0	47.47	1	6.47	0	20.94	0
PERCENT DOMINANT TAXON	33.61	0	29.96	0	43.88	-1	36.88	0
PERCENT ISOPOD, SNAIL, LEECH	11.34	-1	4.28	0	1.08	1	1.56	1
PERCENT SURF. AIR BREATHERS	2.10	1	0.39	1	1.44	1	0.63	1
TOTAL SCORE		4		4		1		4
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.		ACCEPT.

Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	Swartz Creek Elliot Road 8/1/2013	Swartz Creek Fenton Road 8/1/2013	West Branch Swartz Creek Morrish Road 7/24/2013	Pine Creek Wilder Rd 9/9/2013
	STATION 10	STATION 16	STATION 14	STATION 23
<b>PORIFERA (sponges)</b>	1			
<b>PLATYHELMINTHES (flatworms)</b>	2			
Turbellaria				
<b>ANNELIDA (segmented worms)</b>				
Hirudinea (leeches)	1	1	1	
Oligochaeta (worms)	1		6	
<b>ARTHROPODA</b>				
Crustacea				
Amphipoda (scuds)	1			8
Decapoda (crayfish)	1	2	1	1
Isopoda (sowbugs)	159	2		28
Arachnoidea				
Hydracarina			2	2
Insecta				
Ephemeroptera (mayflies)				
Baetidae	14	63	2	11
Caenidae		1	2	
Ephemeridae				1
Heptageniidae	22	20		
Tricorythidae			1	
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	1			3
Zygoptera (damselflies)				
Calopterygidae	10			1
Coenagrionidae		2	69	2
Plecoptera (stoneflies)				
Perlidae		1		
Hemiptera (true bugs)				
Corixidae			2	5
Gerridae		1		3
Mesoveliidae				3
Nepidae				1
Notonectidae				1
Veliidae	4	1		
Megaloptera				
Sialidae (alder flies)	3			
Trichoptera (caddisflies)				
Glossosomatidae	1	1		
Helicopsychidae	4	16		
Hydropsychidae	15	82	1	24
Hydroptilidae				1
Leptoceridae	4	3	5	
Limnephilidae	1			
Phryganeidae				1
Coleoptera (beetles)				
Gyrinidae (adults)				1
Haliplidae (adults)			1	2
Elmidae	17	39	3	25
Psephenidae (larvae)		18		
Scirtidae (larvae)		1		
Diptera (flies)				
Athericidae				3
Chironomidae	13	27	227	123
Culicidae			1	
Simuliidae	3	8		21
Tipulidae		1		1
<b>MOLLUSCA</b>				
Gastropoda (snails)				
Ancylidae (limpets)		1		1
Lymnaeidae		1		
Physidae	12		6	

Planorbidae	9			
Viviparidae	1	1		
Pelecypoda (bivalves)				
Sphaeriidae (clams)	5	9	1	
Unionidae (mussels)		1		
TOTAL INDIVIDUALS	303	303	331	275

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	Swartz Creek		Swartz Creek		Vest Branch Swartz Creek		Pine Creek	
	Elliot Road		Fenton Road		Morrish Road		Wilder Rd	
	8/1/2013		8/1/2013		7/24/2013		9/9/2013	
	STATION 10		STATION 16		STATION 14		STATION 23	
METRIC	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	24	0	25	1	17	0	26	1
NUMBER OF MAYFLY TAXA	2	0	3	0	3	0	2	0
NUMBER OF CADDISFLY TAXA	5	1	4	0	2	0	3	0
NUMBER OF STONEFLY TAXA	0	-1	1	1	0	-1	0	-1
PERCENT MAYFLY COMP.	11.88	0	27.72	1	1.51	-1	4.36	0
PERCENT CADDISFLY COMP.	8.25	0	33.66	1	1.81	-1	9.45	0
PERCENT DOMINANT TAXON	52.48	-1	27.06	0	68.58	-1	44.73	-1
PERCENT ISOPOD, SNAIL, LEECH	60.07	-1	1.98	1	2.11	1	10.55	-1
PERCENT SURF. AIR BREATHERS	1.32	1	0.66	1	1.21	1	5.82	1
TOTAL SCORE		-1		6		-2		-1
MACROINV. COMMUNITY RATING	ACCEPT.		EXCELLENT		ACCEPT.		ACCEPT.	

Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	Rush Creek Durand Road (south) 7/24/2013 STATION 11	Rush Creek Durand Road (north) 7/24/2013 STATION 20	Forest Drain Oliver Road 6/27/2013 STATION 1T	Duck Creek M-15 6/27/2013 STATION 2T
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria		12		
ANNELEIDA (segmented worms)				
Hirudinea (leeches)		2	1	1
Oligochaeta (worms)	8	4	10	2
ARTHROPODA				
Crustacea				
Amphipoda (scuds)			64	
Decapoda (crayfish)	6	10	2	9
Isopoda (sowbugs)	22		6	2
Arachnoidea				
Hydracarina	17	1		
Insecta				
Ephemeroptera (mayflies)				
Baetidae	2	1		14
Caenidae		4		
Odonata				
Anisoptera (dragonflies)				
Aeshnidae	3	2	3	2
Zygoptera (damselflies)				
Calopterygidae	1	6	1	3
Coenagrionidae	1	1		
Plecoptera (stoneflies)				
Perlidae				1
Hemiptera (true bugs)				
Corixidae		6		
Gerridae			1	
Mesoveliidae			2	
Trichoptera (caddisflies)				
Brachycentridae			9	4
Helicopsychidae		3		
Hydropsychidae			4	
Leptoceridae		2		13
Limnephilidae			1	2
Coleoptera (beetles)				
Haliplidae (adults)		3	1	
Elmidae	7	22	7	95
Haliplidae (larvae)		3		
Diptera (flies)				
Ceratopogonidae	1			8
Chironomidae	109	148	121	39
Culicidae	1			
Simuliidae			6	
MOLLUSCA				
Gastropoda (snails)				
Physidae		15	4	
Planorbidae			7	
Viviparidae		4		
Pelecypoda (bivalves)				
Sphaeriidae (clams)	1	1		
<b>TOTAL INDIVIDUALS</b>	<b>179</b>	<b>250</b>	<b>250</b>	<b>195</b>

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	Rush Creek		Rush Creek		Forest Drain		Duck Creek	
	Durand Road (south)		Durand Road (north)		Oliver Road		M-15	
	7/24/2013	7/24/2013	6/27/2013	6/27/2013	STATION 1T	STATION 2T	STATION 1T	STATION 2T
	STATION 11	STATION 20						
TOTAL NUMBER OF TAXA	13	1	19	1	18	0	14	0
NUMBER OF MAYFLY TAXA	1	1	2	1	0	-1	1	0
NUMBER OF CADDISFLY TAXA	0	-1	2	0	3	0	3	0
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	1	1
PERCENT MAYFLY COMP.	1.12	-1	2.00	-1	0.00	-1	7.18	0
PERCENT CADDISFLY COMP.	0.00	-1	2.00	-1	5.60	0	9.74	0
PERCENT DOMINANT TAXON	60.89	-1	59.20	-1	48.40	-1	48.72	-1
PERCENT ISOPOD, SNAIL, LEECH	12.29	-1	8.40	0	7.20	0	1.54	1
PERCENT SURF. AIR BREATHERS	0.56	1	3.60	1	1.60	1	0.00	1
TOTAL SCORE		-3		-1		-3		2
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.		ACCEPT.

Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	Farmers Creek Sand Hill Farm Drive 8/1/2013	Fitch Drain Laur Road 7/30/2013	North Branch Flint River Silverwood Road 9/9/2013	North Branch Flint River Castle Rd 7/30/2013
	STATION 17	STATION 18	STATION 24	STATION 9

**PLATYHELMINTHES (flatworms)**

Turbellaria 1

**ANNELIDA (segmented worms)**Hirudinea (leeches) 1  
Oligochaeta (worms) 9 13 3 4**ARTHROPODA**Crustacea  
Amphipoda (scuds) 52 1 28 24  
Decapoda (crayfish) 1 1 1 1  
Isopoda (sowbugs) 1 19

## Arachnoidea

Hydracarina 3 15 5

## Insecta

Ephemeroptera (mayflies)  
Baetidae 2 4 17 15  
Caenidae 2 1 1 16  
Heptageniidae 1 10 1 1

## Odonata

Anisoptera (dragonflies)  
Aeshnidae 1 1 1 3  
Zygoptera (damselflies)  
Calopterygidae 1 4 3  
Coenagrionidae 19 4 1  
Lestidae 1

## Hemiptera (true bugs)

Belostomatidae 1 1 1 1  
Corixidae 25 21 1  
Gerridae 1 1 2 2  
Mesoveliidae 3 1  
Nepidae 1  
Notonectidae 1 1  
Veliidae 2 1

## Megaloptera

Corydalidae (dobson flies) 6 1 3 1  
Sialidae (alder flies) 4 1 1 3

## Trichoptera (caddisflies)

Brachycentridae 1 3 1  
Glossosomatidae 1 1  
Helicopsychidae 1 1  
Hydropsychidae 2 60 61 58  
Hydroptilidae 1 2 5 1  
Leptoceridae 1 1  
Limnephilidae 1 1  
Molannidae 1 1  
Phryganeidae 1 1  
Polycentropodidae 4 1 1 7  
Uenoidae 1

## Lepidoptera (moths)

Pyralidae 1

## Coleoptera (beetles)

Gyrinidae (adults) 55 1  
Haliplidae (adults) 1  
Hydrophilidae (total) 2Elmidae 37 15 52 31  
Scirtidae (larvae) 5

## Diptera (flies)

Ceratopogonidae 1  
Chironomidae 38 95 68 59  
Dixidae 5 12 8 6  
Simuliidae 1  
Tabanidae 6  
Tipulidae

MOLLUSCA				
Gastropoda (snails)				
Physidae	2			
Planorbidae	2			
Pelecypoda (bivalves)				
Sphaeriidae (clams)	1			
TOTAL INDIVIDUALS	271	264	280	267

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	Farmers Creek		Fitch Drain		North Branch Flint River		North Branch Flint River	
	Sand Hill Farm Drive		Laur Road		Silverwood Road		Castle Rd	
	8/1/2013		7/30/2013		9/9/2013		7/30/2013	
	STATION 17		STATION 18		STATION 24		STATION 9	
TOTAL NUMBER OF TAXA	25	1	30	1	21	0	23	0
NUMBER OF MAYFLY TAXA	3	0	2	0	2	0	2	0
NUMBER OF CADDISFLY TAXA	4	0	7	1	3	0	5	1
NUMBER OF STONEFLY TAXA	0	-1	0	-1	0	-1	0	-1
PERCENT MAYFLY COMP.	1.85	-1	5.30	0	6.43	0	11.61	0
PERCENT CADDISFLY COMP.	2.95	-1	25.38	0	23.21	0	26.97	0
PERCENT DOMINANT TAXON	20.30	0	35.98	0	24.29	0	22.10	0
PERCENT ISOPOD, SNAIL, LEECH	0.74	1	1.89	1	0.36	1	7.49	0
PERCENT SURF. AIR BREATHERS	32.10	-1	1.89	1	9.29	0	1.12	1
TOTAL SCORE		-2		3		0		1
MACROINV. COMMUNITY RATING			ACCEPT.		ACCEPT.		ACCEPT.	

Table 8A. Qualitative macroinvertebrate sampling results for the Flint River Watershed, 2013

TAXA	Flint River off Seymour Road 9/9/2013 STATION 22	Flint River Riverview Park 11/26/2013 STATION 10T	Misteguay Creek Off Creswall Road 9/9/2013 STATION 3	Misteguay Creek Allen Road 6/25/2013 STATION 4T
<b>PLATYHELMINTHES (flatworms)</b>				
Turbellaria				2
ANNELIDA (segmented worms)				
Oligochaeta (worms)	2	18	5	2
ARTHROPODA				
Crustacea				
Amphipoda (scuds)	2	23	1	6
Decapoda (crayfish)		1		6
Isopoda (sowbugs)		4		24
Arachnoidea				
Hydracarina			1	1
Insecta				
Ephemeroptera (mayflies)				
Baetiscidae		103		
Baetidae	14		3	1
Caenidae	5		7	5
Ephemeridae			5	
Heptageniidae		2		2
Tricorythidae		1		
Odonata				
Anisoptera (dragonflies)				
Corduliidae			1	
Zygoptera (damselflies)				
Coenagrionidae	12	1	77	12
Plecoptera (stoneflies)				
Perlodidae		4		
Hemiptera (true bugs)				
Corixidae	1		4	4
Trichoptera (caddisflies)				
Glossosomatidae				1
Hydropsychidae	8	45		
Hydroptilidae		3		
Leptoceridae			2	
Coleoptera (beetles)				
Gyrinidae (adults)			1	
Haliplidae (adults)	1		8	2
Elmidae	20	8	3	23
Haliplidae (larvae)			4	
Psephenidae (larvae)				3
Diptera (flies)				
Ceratopogonidae		1	1	
Chironomidae	36	55	62	99
Simuliidae	1	58		
Tabanidae	1			
MOLLUSCA				
Gastropoda (snails)				
Ancylidae (limpets)		1		8
Physidae	2	2	1	52
Viviparidae		1		
Pelecypoda (bivalves)				
Dreissenidae		1		
Sphaeriidae (clams)		4	1	
Unionidae (mussels)	1			1
<b>TOTAL INDIVIDUALS</b>	<b>106</b>	<b>336</b>	<b>187</b>	<b>254</b>

Table 8B. Macroinvertebrate metric evaluation of the Flint River Watershed, 2013

METRIC	Flint River off Seymour Road 9/9/2013 STATION 22		Flint River Riverview Park 11/26/2013 STATION 10T		Misteguay Creek Off Creswall Road 9/9/2013 STATION 3		Misteguay Creek Allen Road 6/25/2013 STATION 4T	
	Value	Score	Value	Score	Value	Score	Value	Score
TOTAL NUMBER OF TAXA	14	0	20	0	17	0	19	0
NUMBER OF MAYFLY TAXA	2	0	3	0	3	0	3	0
NUMBER OF CADDISFLY TAXA	1	-1	2	0	1	-1	1	-1
NUMBER OF STONEFLY TAXA	0	-1	1	1	0	-1	0	-1
PERCENT MAYFLY COMP.	17.92	0	31.55	1	8.02	0	3.15	0
PERCENT CADDISFLY COMP.	7.55	0	14.29	0	1.07	-1	0.39	-1
PERCENT DOMINANT TAXON	33.96	0	30.65	0	41.18	-1	38.98	-1
PERCENT ISOPOD, SNAIL, LEECH	1.89	1	2.38	1	0.53	1	33.07	-1
PERCENT SURF. AIR BREATHERS	1.89	1	0.00	1	6.95	1	2.36	1
TOTAL SCORE		0		4		-2		-4
MACROINV. COMMUNITY RATING		ACCEPT.		ACCEPT.		ACCEPT.		ACCEPT.

Table 9. Habitat evaluation for the Flint River Watershed, 2013

	Carmen Creek	Carman Creek	Evergreen Creek	Kearsley Creek	Kearsley Creek
Hemphill Road	Atherton Road	M24	Atlas Road (north crossing)	Kipp Rd	
RIFFLE/RUN	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	
<b>HABITAT METRIC</b>					
<b>Substrate and Instream Cover</b>					
Epifaunal Substrate/ Avail Cover (20)	11	10	10	8	14
Embeddedness (20)*	11				
Velocity/Depth Regime (20)*	8				
Pool Substrate Characterization (20)**		8	10	10	14
Pool Variability (20)**		8	16	7	15
<b>Channel Morphology</b>					
Sediment Deposition (20)	16	7	12	10	15
Flow Status - Maint. Flow Volume (10)	9	9	9	9	9
Flow Status - Flashiness (10)	2	2	3	1	4
Channel Alteration (20)	10	13	11	11	14
Frequency of Riffles/Bends (20)*	15				
Channel Sinuosity (20)**		6	3	10	11
<b>Riparian and Bank Structure</b>					
Bank Stability (L) (10)	9	7	6	3	6
Bank Stability (R) (10)	9	7	6	3	6
Vegetative Protection (L) (10)	7	9	8	5	8
Vegetative Protection (R) (10)	7	9	8	4	8
Riparian Veg. Zone Width (L) (10)	4	5	5	5	9
Riparian Veg. Zone Width (R) (10)	4	5	5	3	9
TOTAL SCORE (200):	122	105	112	89	142
<b>HABITAT RATING:</b>					
GOOD	GOOD	GOOD	MARGINAL	GOOD	
(SLIGHTLY IMPAIRED)	(SLIGHTLY IMPAIRED)	(SLIGHTLY IMPAIRED)	(MODERATELY IMPAIRED)	(SLIGHTLY IMPAIRED)	
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).					
Date:	9/27/2013	9/27/2013	7/30/2013	7/23/2013	7/23/2013
Weather:	Sunny			Cloudy	Cloudy
Air Temperature:	Deg. F.	Deg. F.	65	Deg. F.	Deg. F.
Water Temperature:	Deg. F.	Deg. F.	58	Deg. F.	Deg. F.
Ave. Stream Width:	15 Feet	25 Feet	15 Feet	25 Feet	15 Feet
Ave. Stream Depth:	0.5 Feet	1 Feet	1 Feet	1 Feet	1 Feet
Surface Velocity:	0.3 Ft./Sec.	0.2 Ft./Sec.	0.7 Ft./Sec.	0.8 Ft./Sec.	1 Ft./Sec.
Estimated Flow:	2.25 CFS	5 CFS	10.5 CFS	20 CFS	15 CFS
Stream Modifications:	Dredged	Dredged	Canopy Removal/Dredged	Canopy Removal/Dredged	None
Nuisance Plants (Y/N):	N	N	N	N	N
Report Number:					
STORET No.:	250536	250528	440243	250516	250476
Stream Name:	Carmen Creek	Carman Creek	Evergreen Creek	Kearsley Creek	Kearsley Creek
Road Crossing/Location:	Hemphill Road	Atherton Road	M24	Atlas Road (north crossing)	Kipp Rd
County Code:	25	25	44	25	25
TRS:	07N06E25	07N06E25	10N10E20	07N08E21	06N08E35
Latitude (dd):	42.98119	42.988379	43.2746	43.00049	42.8901
Longitude (dd):	-83.69753	-83.705224	-83.31618	-83.526579	-83.4754
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP	SMNITP
Stream Type:	Warmwater	Warmwater	Coldwater	Warmwater	Warmwater
USGS Basin Code:	4080204	4080204	4080204	4080204	4080204
* Applies only to Riffle/Run stream Surveys					
** Applies only to Glide/Pool stream Surveys					
COMMENTS:					

Table 9. Habitat evaluation for the Flint River Watershed, 2013

	Black Creek	Black Creek	Onion Creek	Farmers Creek	Fitch Drain
	Henderson Road	Rising Street	Riley Road	Sand Hill Farm Drive	Laur Road
	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	GLIDE/POOL	RIFFLE/RUN
<b>HABITAT METRIC</b>					
<b>Substrate and Instream Cover</b>					
Epifaunal Substrate/ Avail Cover (20)	11	12	10	7	11
Embeddedness (20)*					11
Velocity/Depth Regime (20)*					10
Pool Substrate Characterization (20)**	13	10	15	8	
Pool Variability (20)**	8	10	13	11	
<b>Channel Morphology</b>					
Sediment Deposition (20)	15	15	11	5	15
Flow Status - Maint. Flow Volume (10)	8	8	8	8	6
Flow Status - Flashiness (10)	1	3	2	6	8
Channel Alteration (20)	11	9	6	10	14
Frequency of Riffles/Bends (20)*					18
Channel Sinuosity (20)**	2	7	1	7	
<b>Riparian and Bank Structure</b>					
Bank Stability (L) (10)	5	8	6	8	9
Bank Stability (R) (10)	2	8	6	8	9
Vegetative Protection (L) (10)	8	7	4	3	9
Vegetative Protection (R) (10)	4	7	4	9	9
Riparian Veg. Zone Width (L) (10)	9	7	2	3	7
Riparian Veg. Zone Width (R) (10)	3	3	2	9	7
TOTAL SCORE (200):	100	114	90	102	143
<b>HABITAT RATING:</b>					
MARGINAL	GOOD	MARGINAL	MARGINAL	GOOD	
(MODERATELY	(SLIGHTLY	(MODERATELY	(MODERATELY	(SLIGHTLY	
IMPAIRED)	IMPAIRED)	IMPAIRED)	IMPAIRED)	IMPAIRED)	
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).					
Date:	7/23/2013	7/23/2013	7/24/2013	8/1/2013	7/30/2013
Weather:	Cloudy	Cloudy		Cloudy	Partly Cloudy
Air Temperature:	72 Deg. F.	70 Deg. F.	Deg. F.	72 Deg. F.	75 Deg. F.
Water Temperature:	74 Deg. F.	71 Deg. F.	66 Deg. F.	75 Deg. F.	67 Deg. F.
Ave. Stream Width:	15 Feet	15 Feet	10 Feet	40 Feet	11 Feet
Ave. Stream Depth:	1 Feet	1 Feet	1 Feet	2 Feet	0.3 Feet
Surface Velocity:	0.5 Ft./Sec.	0.5 Ft./Sec.	0.2 Ft./Sec.	0.6 Ft./Sec.	1.1 Ft./Sec.
Estimated Flow:	7.5 CFS	7.5 CFS	2 CFS	48 CFS	3.63 CFS
Stream Modifications:	removal/Dredged	Dredged	Canopy Removal/Dredged	Canopy Removal	Dredged
Nuisance Plants (Y/N):	N	N	N	N	N
Report Number:					
STORET No.:	250537	250538	780254	440244	440245
Stream Name:	Black Creek	Black Creek	Onion Creek	Farmers Creek	Fitch Drain
Road Crossing/Location:	Henderson Road	Rising Street	Riley Road	Sand Hill Farm Drive	Laur Road
County Code:	25	25	78	44	44
TRS:	08N08E36	07N08E10	08N04E27	07N09E26	09N10E22
Latitude (dd):	43.06212	43.029233	43.07326	42.99664	43.18934
Longitude (dd):	-83.47902	-83.51445	-83.98178	-83.36485	-83.27802
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP	SMNITP
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater	Warmwater
USGS Basin Code:	4080204	4080204	4080204	4080204	4080204
* Applies only to Riffle/Run stream Surveys					
** Applies only to Glide/Pool stream Surveys					
COMMENTS:					

Table 9. Habitat evaluation for the Flint River Watershed, 2013

Table 9. Habitat evaluation for the Flint River Watershed, 2013						
	North Branch Flint River	North Branch Flint River	South Branch Flint River	South Branch Flint River	South Branch Flint River	South Branch Flint River
	Silverwood Road	Castle Rd	Newark Road	Norway Lake Road	Davison Lake Road	
	GLIDE/POOL	GLIDE/POOL	RIFFLE/RUN	GLIDE/POOL	GLIDE/POOL	
HABITAT METRIC						
Substrate and Instream Cover						
Epifaunal Substrate/ Avail Cover (20)	9	5	14	19		10
Embeddedness (20)*			16			
Velocity/Depth Regime (20)*			15			
Pool Substrate Characterization (20)**	10	8		17		15
Pool Variability (20)**	10	12		16		16
Channel Morphology						
Sediment Deposition (20)	5	3	16	12		4
Flow Status - Maint. Flow Volume (10)	9	8	9	9		9
Flow Status - Flashiness (10)	4	3	10	7		9
Channel Alteration (20)	18	18	18	18		16
Frequency of Riffles/Bends (20)*			18			
Channel Sinuosity (20)**	10	15		13		12
Riparian and Bank Structure						
Bank Stability (L) (10)	9	8	3	9		9
Bank Stability (R) (10)	9	8	9	9		9
Vegetative Protection (L) (10)	9	8	3	9		7
Vegetative Protection (R) (10)	9	8	9	9		7
Riparian Veg. Zone Width (L) (10)	10	9	1	9		8
Riparian Veg. Zone Width (R) (10)	10	9	10	9		9
TOTAL SCORE (200):	131	122	151	165		140
HABITAT RATING:	GOOD (SLIGHTLY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	EXCELLENT (NON- IMPAIRED)		GOOD (SLIGHTLY IMPAIRED)
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).						
Date:	9/9/2013	7/30/2013	6/27/2013	6/27/2013		8/1/2013
Weather:	Partly Cloudy		Partly Cloudy	Partly Cloudy		Cloudy
Air Temperature:	65 Deg. F.	72 Deg. F.	83 Deg. F.	80 Deg. F.		70 Deg. F.
Water Temperature:	64 Deg. F.	64 Deg. F.	80 Deg. F.	75 Deg. F.		68 Deg. F.
Ave. Stream Width:	500 Feet	35 Feet	20 Feet	50 Feet		25 Feet
Ave. Stream Depth:	1 Feet	1.5 Feet	1 Feet	1 Feet		2 Feet
Surface Velocity:	0.3 Ft./Sec.	1.2 Ft./Sec.	1.5 Ft./Sec.	1 Ft./Sec.		1 Ft./Sec.
Estimated Flow:	150 CFS	63 CFS	30 CFS	50 CFS		50 CFS
Stream Modifications:	None	None	Canopy Removal	Canopy Removal		Impounded
Nuisance Plants (Y/N):	N	N	N	N		N
Report Number:						
STORET No.:	440247	440214	440232	440068		631230
Stream Name:	ranch Flint River	North Branch Flint River	South Branch Flint River	South Branch Flint River	South Branch Flint River	
Road Crossing/Location:	Silverwood Road	Castle Rd	Newark Road	Norway Lake Road	Davison Lake Road	
County Code:	44	44	44	44		63
TRS:	10N10E36	10N10E34	07N10E26	08N09E01		05N10E03
Latitude (dd):	43.24553	43.2365	43.001005	43.145281		42.8844
Longitude (dd):	-83.24717	-83.2929	-83.252637	-83.353338		-83.26381
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP		SMNITP
Stream Type:	Warmwater	Warmwater	Coldwater	Coldwater		Warmwater
USGS Basin Code:	4080204	4080204	4080204	4080204		4080204
* Applies only to Riffle/Run stream Surveys						
** Applies only to Glide/Pool stream Surveys						
COMMENTS:						

Table 9. Habitat evaluation for the Flint River		Swartz Creek		Swartz Creek		West Branch Swartz Creek	Rush Creek		Rush Creek	
		Elliot Road		Fenton Road		Morrish Road	Durand Road (south)		Durand Road (north)	
		RIFFLE/RUN		RIFFLE/RUN		GLIDE/POOL	GLIDE/POOL		GLIDE/POOL	
<b>HABITAT METRIC</b>										
<b>Substrate and Instream Cover</b>										
Epifaunal Substrate/ Avail Cover (20)		11		16		10		8		8
Embeddedness (20)*		14		13						
Velocity/Depth Regime (20)*		11		16						
Pool Substrate Characterization (20)**						11		11		11
Pool Variability (20)**						11		6		8
<b>Channel Morphology</b>										
Sediment Deposition (20)		15		16		7		15		11
Flow Status - Maint. Flow Volume (10)		7		9		7		8		8
Flow Status - Flashiness (10)		9		6		2		6		5
Channel Alteration (20)		12		10		6		6		8
Frequency of Riffles/Bends (20)*		12		11						
Channel Sinuosity (20)**						1		6		3
<b>Riparian and Bank Structure</b>										
Bank Stability (L) (10)		6		8		7		9		6
Bank Stability (R) (10)		8		5		7		9		6
Vegetative Protection (L) (10)		4		5		6		6		6
Vegetative Protection (R) (10)		8		6		6		6		6
Riparian Veg. Zone Width (L) (10)		3		4		3		3		1
Riparian Veg. Zone Width (R) (10)		7		2		3		3		1
TOTAL SCORE (200):		127		127		87		102		88
<b>HABITAT RATING:</b>										
GOOD		GOOD		MARGINAL		MARGINAL		MARGINAL		MARGINAL
(SLIGHTLY IMPAIRED)		(SLIGHTLY IMPAIRED)		(MODERATELY IMPAIRED)		(MODERATELY IMPAIRED)		(MODERATELY IMPAIRED)		(MODERATELY IMPAIRED)
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).										
Date:		8/1/2013		8/1/2013		7/24/2013		7/24/2013		7/24/2013
Weather:		Rainy		Partly Cloudy		Partly Cloudy				
Air Temperature:		72	Deg. F.	72	Deg. F.	75	Deg. F.		Deg. F.	Deg. F.
Water Temperature:		75	Deg. F.	75	Deg. F.	72	Deg. F.	60	Deg. F.	61 Deg. F.
Ave. Stream Width:		12	Feet	15	Feet	12	Feet	3	Feet	5 Feet
Ave. Stream Depth:		0.5	Feet	1	Feet	1	Feet	1	Feet	1 Feet
Surface Velocity:		1.2	Ft./Sec.	1.5	Ft./Sec.	1	Ft./Sec.	0.1	Ft./Sec.	0.2 Ft./Sec.
Estimated Flow:		7.2	CFS	22.5	CFS	12	CFS	0.3	CFS	1 CFS
Stream Modifications:		Canopy Removal		Canopy Removal		Canopy Removal/Dredged		Relocated/Dredged		Canopy Removal/dredged
Nuisance Plants (Y/N):		N		N		N		N		N
Report Number:										
STORET No.:		631229		250539		250331		780240		780255
Stream Name:		Swartz Creek		Swartz Creek	West Branch Swartz Creek			Rush Creek		Rush Creek
Road Crossing/Location:		Elliot Road		Fenton Road		Morrish Road		Durand Road (south)		Durand Road (north)
County Code:		63		25		25		78		78
TRS:		05N07E22		06N06E25		06N05E02		07N04E22		07N04E10
Latitude (dd):		42.82807		42.90004		42.95422		42.99938		43.01991
Longitude (dd):		-83.62782		-83.69178		-83.83181		-83.98675		-83.98703
Ecoregion:		SMNITP		SMNITP		SMNITP		SMNITP		SMNITP
Stream Type:		Warmwater		Warmwater		Warmwater		Warmwater		Warmwater
USGS Basin Code:		4080204		4080204		4080204		408024		4080204
* Applies only to Riffle/Run stream Surveys										
** Applies only to Glide/Pool stream Surveys										
COMMENTS:										

Table 9. Habitat evaluation for the Flint River	Henry Drain	Pine Creek	Forest Drain	Duck Creek	Howland Drain
	Mt. Morris Rd	Wilder Rd	Oliver Road	M-15	Linden Road
	RIFFLE/RUN	RIFFLE/RUN	GLIDE/POOL	RIFFLE/RUN	GLIDE/POOL
<b>HABITAT METRIC</b>					
<b>Substrate and Instream Cover</b>					
Epifaunal Substrate/ Avail Cover (20)	15	10	10	11	8
Embeddedness (20)*	16	10		11	
Velocity/Depth Regime (20)*	18	15		8	
Pool Substrate Characterization (20)**			11		13
Pool Variability (20)**			13		8
<b>Channel Morphology</b>					
Sediment Deposition (20)	15	14	10	10	11
Flow Status - Maint. Flow Volume (10)	8	9	8	8	7
Flow Status - Flashiness (10)	6	8	1	5	2
Channel Alteration (20)	11	12	8	6	6
Frequency of Riffles/Bends (20)*	18	8		13	
Channel Sinuosity (20)**			6		1
<b>Riparian and Bank Structure</b>					
Bank Stability (L) (10)	8	8	5	9	6
Bank Stability (R) (10)	8	8	5	9	6
Vegetative Protection (L) (10)	5	6	6	4	6
Vegetative Protection (R) (10)	5	6	6	2	6
Riparian Veg. Zone Width (L) (10)	5	5	3	3	1
Riparian Veg. Zone Width (R) (10)	5	5	3	3	1
TOTAL SCORE (200):	143	124	95	102	82
<b>HABITAT RATING:</b>					
	GOOD	GOOD	MARGINAL	MARGINAL	MARGINAL
(SLIGHTLY			(MODERATELY	(MODERATELY	(MODERATELY
IMPAIRED)			IMPAIRED)	IMPAIRED)	IMPAIRED)
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).					
Date:	7/30/2013	9/9/2013	6/27/2013	6/27/2013	6/25/2013
Weather:	Sunny	Cloudy	Partly Cloudy	Cloudy	Partly Cloudy
Air Temperature:	70 Deg. F.	65 Deg. F.		80 Deg. F.	78 Deg. F.
Water Temperature:	Deg. F.	58 Deg. F.	72 Deg. F.	75 Deg. F.	74 Deg. F.
Ave. Stream Width:	12 Feet	16 Feet	10 Feet	6 Feet	5 Feet
Ave. Stream Depth:	0.5 Feet	0.8 Feet	1.5 Feet	1 Feet	1 Feet
Surface Velocity:	1.5 Ft./Sec.	1 Ft./Sec.	1 Ft./Sec.	1.5 Ft./Sec.	1.5 Ft./Sec.
Estimated Flow:	9 CFS	12.8 CFS	15 CFS	9 CFS	7.5 CFS
Stream Modifications:	removal/Dredged	Canopy Removal/Dredged	Dredged/Canopy Removal	Dredged/Canopy Removal	Canopy Removal/dredged
Nuisance Plants (Y/N):	N	N	N	N	N
Report Number:					
STORET No.:	440185	440246	440227	631143	250514
Stream Name:	Henry Drain	Pine Creek	Forest Drain	Duck Creek	Howland Drain
Road Crossing/Location:	Mt. Morris Rd	Wilder Rd	Oliver Road	M-15	Linden Road
County Code:	44	44	44	63	25
TRS:	08N09E09	07N10E12	09N10E07	05N09E18	06N06E05
Latitude (dd):	43.12777	43.04117	43.209019	42.840487	42.951335
Longitude (dd):	-83.41005	-83.24515	-83.33316	-83.447662	-83.771466
Ecoregion:	SMNITP	SMNITP	SMNITP	SMNITP	SMNITP
Stream Type:	Warmwater		Warmwater	Warmwater	Warmwater
USGS Basin Code:	4080204	4080204	4080204	4080204	4080204
* Applies only to Riffle/Run stream Surveys					
** Applies only to Glide/Pool stream Surveys					
COMMENTS:					

Table 9. Habitat evaluation for the Flint River	Flint River off Seymour Road	Porter Creek Allen Road	Misteguay Creek Off Creswall Road	Misteguay Creek Allen Road	Flint River Riverview Park
	GLIDE/POOL	RIFFLE/RUN	GLIDE/POOL	GLIDE/POOL	RIFFLE/RUN
HABITAT METRIC					
<b>Substrate and Instream Cover</b>					
Epifaunal Substrate/ Avail Cover (20)					
	8	12	6	11	18
Embeddedness (20)*					
		11			16
Velocity/Depth Regime (20)*					
		13			13
Pool Substrate Characterization (20)**					
	11		6	10	
Pool Variability (20)**					
	11		8	5	
<b>Channel Morphology</b>					
Sediment Deposition (20)					
	16	18	9	8	16
Flow Status - Maint. Flow Volume (10)					
	8	7	8	9	9
Flow Status - Flashiness (10)					
	1	2	4	1	4
Channel Alteration (20)					
	16	11	6	10	17
Frequency of Riffles/Bends (20)*					
		16			14
Channel Sinuosity (20)**					
	7		1	5	
<b>Riparian and Bank Structure</b>					
Bank Stability (L) (10)					
	8	7	8	9	9
Bank Stability (R) (10)					
	8	7	8	9	7
Vegetative Protection (L) (10)					
	7	9	4	10	9
Vegetative Protection (R) (10)					
	7	9	4	10	4
Riparian Veg. Zone Width (L) (10)					
	5	8	3	10	9
Riparian Veg. Zone Width (R) (10)					
	5	6	3	10	1
TOTAL SCORE (200):	118	136	78	117	146
<b>HABITAT RATING:</b>					
GOOD					
(SLIGHTLY IMPAIRED)					
GOOD					
(SLIGHTLY IMPAIRED)					
Note: Individual metrics may better describe conditions directly affecting the biological community while the Habitat Rating describes the general riverine environment at the site(s).					
Date:	9/9/2013	6/25/2013	9/9/2013	6/25/2013	11/26/2013
Weather:	Partly Cloudy	Rainy		Partly Cloudy	Rainy
Air Temperature:	75 Deg. F.	65 Deg. F.	Deg. F.	65 Deg. F.	75 Deg. F.
Water Temperature:	65 Deg. F.	74 Deg. F.	75 Deg. F.	74 Deg. F.	74 Deg. F.
Ave. Stream Width:	150 Feet	10 Feet	40 Feet	40 Feet	125 Feet
Ave. Stream Depth:	1 Feet	0.7 Feet	1.2 Feet	1.5 Feet	1.2 Feet
Surface Velocity:	1 Ft./Sec.	0.2 Ft./Sec.	0.1 Ft./Sec.	0.2 Ft./Sec.	1.5 Ft./Sec.
Estimated Flow:	150 CFS	1.4 CFS	4.8 CFS	12 CFS	225 CFS
Stream Modifications:	None	Canopy Removal/dredged	Canopy Removal/dredged	Dredged	Canopy Removal
Nuisance Plants (Y/N):	N	N	N	N	N
Report Number:					
STORET No.:	730362	780220	730360	780234	250513
Stream Name:	Flint River	Porter Creek	Misteguay Creek	Misteguay Creek	Flint River
Road Crossing/Location:	off Seymour Road	Allen Road	Off Creswall Road	Allen Road	Riverview Park
County Code:	73	78	73	78	25
TRS:	10N05E07	08N04E16	10N04E16	08N04E14	08N05E27
Latitude (dd):	43.28198	43.102	43.27066	43.102	43.059987
Longitude (dd):	-83.91842	-83.99	-83.99186	-83.958	-83.854243
Ecoregion:	HELP	HELP	HELP	HELP	HELP
Stream Type:	Warmwater	Warmwater	Warmwater	Warmwater	Warmwater
USGS Basin Code:	4080204	4080204	4080204	4080204	4080204
* Applies only to Riffle/Run stream Surveys					
** Applies only to Glide/Pool stream Surveys					
COMMENTS:					

Table 9. Habitat evaluation for the Flint River	Northwood Creek	Silver Creek	Dawe Drain					
	Reed Road	Marshall Road	Baldwin Road					
	GLIDE/POOL	GLIDE/POOL	RIFFLE/RUN					
<b>HABITAT METRIC</b>								
<b>Substrate and Instream Cover</b>								
Epifaunal Substrate/ Avail Cover (20)	16	10	16					
Embeddedness (20)*			13					
Velocity/Depth Regime (20)*			10					
Pool Substrate Characterization (20)**	16	11						
Pool Variability (20)**	10	13						
<b>Channel Morphology</b>								
Sediment Deposition (20)	16	8	16					
Flow Status - Maint. Flow Volume (10)	8	8	8					
Flow Status - Flashiness (10)	1	1	3					
Channel Alteration (20)	7	11	14					
Frequency of Riffles/Bends (20)*			17					
Channel Sinuosity (20)**	2	6						
<b>Riparian and Bank Structure</b>								
Bank Stability (L) (10)	8	5	9					
Bank Stability (R) (10)	8	5	9					
Vegetative Protection (L) (10)	6	7	9					
Vegetative Protection (R) (10)	6	4	9					
Riparian Veg. Zone Width (L) (10)	3	8	9					
Riparian Veg. Zone Width (R) (10)	3	5	9					
TOTAL SCORE (200):	110	102	151	0	0			
<b>HABITAT RATING:</b>								
	GOOD (SLIGHTLY IMPAIRED)	MARGINAL (MODERATELY IMPAIRED)	GOOD (SLIGHTLY IMPAIRED)	POOR (SEVERELY IMPAIRED)	POOR (SEVERELY IMPAIRED)			
Note: Individual metrics may better describe conditions at the site(s). Note: Individual metrics may better describe conditions directly affecting the biological community. Describes the general riverine environment at the site(s). Describes the general riverine environment at the site(s).								
Date:	7/24/2013	9/9/2013	11/25/2013					
Weather:	Cloudy	Partly Cloudy	Sunny					
Air Temperature:		Deg. F.	75	Deg. F.	77	Deg. F.		Deg. F.
Water Temperature:		Deg. F.	65	Deg. F.	74	Deg. F.		Deg. F.
Ave. Stream Width:	20	Feet	22	Feet	5	Feet		Feet
Ave. Stream Depth:	1	Feet	1	Feet	0.5	Feet		Feet
Surface Velocity:	0.1	Ft./Sec.	0.01	Ft./Sec.	1	Ft./Sec.		Ft./Sec.
Estimated Flow:	2	CFS	0.22	CFS	2.5	CFS		CFS
Stream Modifications:	Removal/dredged			Dredged				
Nuisance Plants (Y/N):	N		N		N			
Report Number:								
STORET No.:	780256		730361		250515			
Stream Name:	Northwood Creek		Silver Creek		Dawe Drain			
Road Crossing/Location:	Reed Road		Marshall Road		Baldwin Road			
County Code:	78		73		25			
TRS:	08N04E05		10N05E14		06N06E35			
Latitude (dd):	43.12267		43.26675		42.88544			
Longitude (dd):	-84.00759		-83.85442		-83.720574			
Ecoregion:	HELP		HELP		SMNITP			
Stream Type:	Warmwater			Warmwater				
USGS Basin Code:	4080204		4080204		4080204			
* Applies only to Riffle/Run stream Surveys								
** Applies only to Glide/Pool stream Surveys								
COMMENTS:								