River Raisin Watershed Volunteer
Macroinvertebrate Monitoring Project

MiCorps Volunteer Stream Monitoring Grant #3003-VSM2007-03
Quarterly and Final Report
January – June 2009

Task 1: Program Administration

1. Submission of QAPP to MiCorps

TASK COMPLETE. QAPP has been submitted and approved.

2. Submit Quarterly Status Report

a. July – September quarterly report written and submitted
b. October – December report started

3 Submit Annual Report to MiCorps

a. Report is complete and has been submitted

4. Conduct Volunteer Training

.

a. Volunteer Training was conducted at Adrian College. 22 volunteers attended.

5. Conduct Volunteer Stream Sampling

a. Equipment from Stream Search Day was cleaned and inventoried.
b. Additional waders and nets were ordered, inventoried and labeled.
c. Volunteer snacks were purchased.
d. Coordination and prep
e. Stream Search scheduled for April 25, 2009 was postponed due to unsafe river conditions.
f. Stream Search was rescheduled for May 23, 2009.
g. Coordination and prep recommenced.
h. Stream Search took place on May 23, 2009 with # volunteers monitoring 20 sites.
i. Thirty –three volunteers participated in the sampling.
j. Due to weather conditions three sites were not monitored by volunteers. Dr. Martin, Dr. Hanley and Greg Wicking conducted the sampling at these sites the following week when conditions permitted.
k. Dr. Martin, Dr. Hanley and Greg Wicking also re-sampled at select sites where data was deemed questionable.

6. Conduct Macroinvertebrate Identification Day

a. Coordination and preparation for Bug ID Day
    - Volunteers were contacted via email and phone up until the day of the event. A press release was issued announcing the event. All equipment including identification manuals were taken to Adrian College. Bug I.D. Day took place on June 6, 2009 at Adrian College. Twenty volunteers participated.
b. Volunteers sorted and keyed macroinvertebrates while ID experts verified and assisted.
c. Volunteers were treated with lunch.

7. Create and Distribute Monitoring Results to Volunteers and Municipalities

a. An update was sent out to municipalities in March advising them the Adopt-A-Stream report was still being refined.

8. Submission of Release of Claims Statement

a. Task Complete
b. Grant was closed out after consultation with MiCorps.

Task 2: Data Management

1. Create and Update the RRWC Macroinvertebrate Monitoring Database

a. Continued creation and update of database. Dr. Martin has further refined his database and continues to work on it on an ongoing basis. He stated that once he completes the task for 2008, it will be easier to manage in the ensuing years.
b. MiCorps suggested that the database be copied so the RRWC has it in office.

2. Input Monitoring Data into Database and MiCorps Database

a. Dr. Martin input macro data to the MiCorps database.

3. Analyze Macroinvertebrate Data

a. Dr. Martin has completed the 2008 Adopt-A-Stream report. He will commence analyzing the data from spring 2009 and work on creating the report. Dr. Martin met with Dr. Paul Steen to review and discuss his 2008 Adopt-A-Stream report. The RRWC executive committee created a draft timeline for the Adopt-A-Stream program to guide the program and ensure timely completion of tasks.

4. Update the Volunteer Database

a. The database is being updated on an as needed basis. Efforts to find a simple format to track each of the three Adopt-A-Stream events in one spreadsheet are being commenced.

5. Update the River Raisin Macroinvertebrate Reference Collection

a. The macro collection will be updated as needed. It has over 50 animals identified to family as of now. This is a long term on-going project.

6. Assess River Raisin Subwatersheds based on Macroinvertebrate Analyses, Land Use and Stream Crossing Surveys

a. Dr. Martin states we may be in shape to comment on the macroinvertebrate analysis, land use and stream crossing surveys after the fall report.

Task 3: Training

1. Side by Side Sampling with MiCorps

TASK COMPLETE. Dr. Martin sampled with Paul Steen on August 12, 2008. The results of this sampling have been made available to Dr. Steen. Two conclusions can be made from this sampling. 1) Dr. Martin can adequately sample a stream, and 2) the pattern of recovered invertebrates (the first sampler finding 11 taxa the other did not, and the second sampler finding 7 taxa the first did not), suggest strongly that two samplers lessons total sample variability. This supports the preferred method of sampling at the River Raisin Adopt-A-Stream program.

2. Attend 8 hr. MiCorps Training

TASK COMPLETE. Dr. Martin and Courtney Shaffer attended the MiCorps training on June 21, 2008.

3. Participate in MiCorps Conference

TASK COMPLETE. Dr. Martin attended and presented at the MiCorps conference in October 2008.

4. Revise and Prepare Volunteer Training

TASK COMPLETE. Dr. Martin conducted a thorough review of methods and preparations for volunteer training. Small changes will be incorporated as needed.

5. Conduct Volunteer Training

a. Volunteer training was conducted at Adrian College on April 18, 2009.

Task 4: Public Relations

1. Volunteer Macroinvertebrate Monitoring Summary for RRWC newsletter

A summary of the Adopt-A-Stream program with our improvements appeared in the most recent edition of our newsletter and can be found on our website. (http://riverraisin.org/newsletter/2007newsletter) Work has commenced on the next newsletter. It will include a summary of the 2008 AAS program results as soon as Dr. Martin completes the report.

2. Post Monitoring Analyses on Website

The 2002-2007 Report completed by Dr. J. Martin is on the website and can be found at: http://riverraisin.org/programs/aas/aasreport

Upon approval from Dr. Martin and completion of the 2008 fall collection, the 2008 report will be posted. We will also post (or link to) Dr. Martin's paper that he presented at the Fourth Annual MiCorps conference. This paper is an updated version of the one he presented at the 2008 National Monitoring Conference.

3. Create and Submit News Release

News releases were created and released for the Stream Search Program. See Task 1.

4. Develop Audience Appropriate Pamphlet with River Raisin Assessment Results

The Adopt-A-Stream pamphlet has been completed and has been distributed via mail, at meetings, to schools and other events in the River Raisin watershed. We will be working on condensing future AAS results for a pamphlet as well.

5. River Raisin Assessment sent to Watershed Municipalities

The Adopt-A-Stream pamphlet was mailed to all trustees and commissioners in the River Raisin watershed. The 2008 Adopt-A-Stream report will be made available to all of the municipalities.

6. Public Outreach

Dr. Martin created a PowerPoint presentation for the program and has given talks throughout the watershed. Dr. Martin was the featured speaker at The Schultz-Holmes Memorial Library for The Phyllis Robertson Program Series on Thursday, October 2, 2008. Dr. Martin presented "A Biological History of the River Raisin Watershed". Dr. Martin also presented at Adrian Kiwanis in July, 2008, and to Adrian Rotary on September 18th, 2008, updating these community groups on the general stream health of the watershed, as indicated by our stream invertebrate findings.

Dr. Martin presented his studies to the United Methodist Women's group with approximately 85 in attendance on Good Friday. He also was a guest lecturer at Siena Heights University for a May term class studying the watershed.

Dr. Martin received the Michigan Campus Compact Award for his work with the River Raisin Watershed Council's Adopt-A-Stream by incorporating students into the program and promoting college students to be civilly engaged through creating and expanding academic, co-curricula and campus-wide opportunities for community service and service-learning.

Dr. Martin was a guest lecturer at Siena Heights University on May 30, 2009 for a May term course. Dr. Martin discussed the River Raisin Watershed and his work on the River Raisin and the resulting data.

Summary

All goals and objectives were met and exceeded for the River Raisin Watershed Council Volunteer Stream Macroinvertebrate Monitoring Project. We are very pleased with the increase in quality of collections due to better trained volunteers and an increased level of effort. It is our opinion that the validity of the data has increased due to the level of preparation of the volunteers and the expertise and dedication of Dr. Martin. The council is extremely proud of the comprehensive report that Dr. Martin produced and is very pleased with the level of detail included in it.

Dr. Martin has increased the visibility of the Adopt-A-Stream program through outreach activities and networking. He has also garnered a front page, top story article in The Daily Telegram and numerous other articles and mentions in various publications and websites. He was also awarded a prestigious statewide award for his work on the program and has been a speaker at a national monitoring conference.

Adrian College and the Lenawee Conservation District have been invaluable partners over the years. We look forward to continuing to work with them in the future.

There were a few issues that were addressed over the course of the grant. The most critical was the length of time it took to receive a written report evaluating the data. The report was received approximately eight months after the collection which resulted in a number of delayed tasks. The executive committee met with Dr. Martin to reach an agreement on a timeline for future reports. The meeting has resulted in improved communications and a better understanding of expectations.

As with the majority of non-profits, sustainability of programs is always a challenge. With the economic downturn, the RRWC is experiencing a significant reduction of memberships. However, the council is committed to the continuation of the Adopt-A-Stream program and is working with Dr. Martin and volunteers to ensure this.

Overall, the RRWC feels the program has consistently been improved every year and is very pleased with the level of professionalism and expertise the program has under the direction of Dr. Martin.

The next several pages outline some of the major findings of this project.

Summary of 2008 findings: RRWC Adopt-A-Stream Program

The River Raisin Watershed's Adopt-A-Stream program has been collecting aquatic invertebrates out of various locations throughout the Raisin Watershed since 2002. Insects have been identified to the family level, while other invertebrates are identified to class or order. These categories, or kinds of animals, are known as taxa. These invertebrate taxa can been divided into three basic categories with relation to their ability to survive in polluted situations and/or where oxygen availability is low: sensitive, semi-sensitive, and tolerant.

The following figures show maps of the watershed with each of our 20 sampling sites illustrated. Associated with each sampling site is a pie chart that characterizes the proportion of sensitive (in blue), semi-sensitive (in yellow) and tolerant (in red) taxa. The ratio associated with each pie chart is the number of sensitive taxa (the first number) to total taxa recovered for that search event. The results from spring 2008 (sampled April 26) are shown in figure 1. Figure 2 shows the result for the fall 2008 search (conducted September 27). In general slightly less sensitive animals are recovered in fall compared to spring, though overall captures are typically higher.

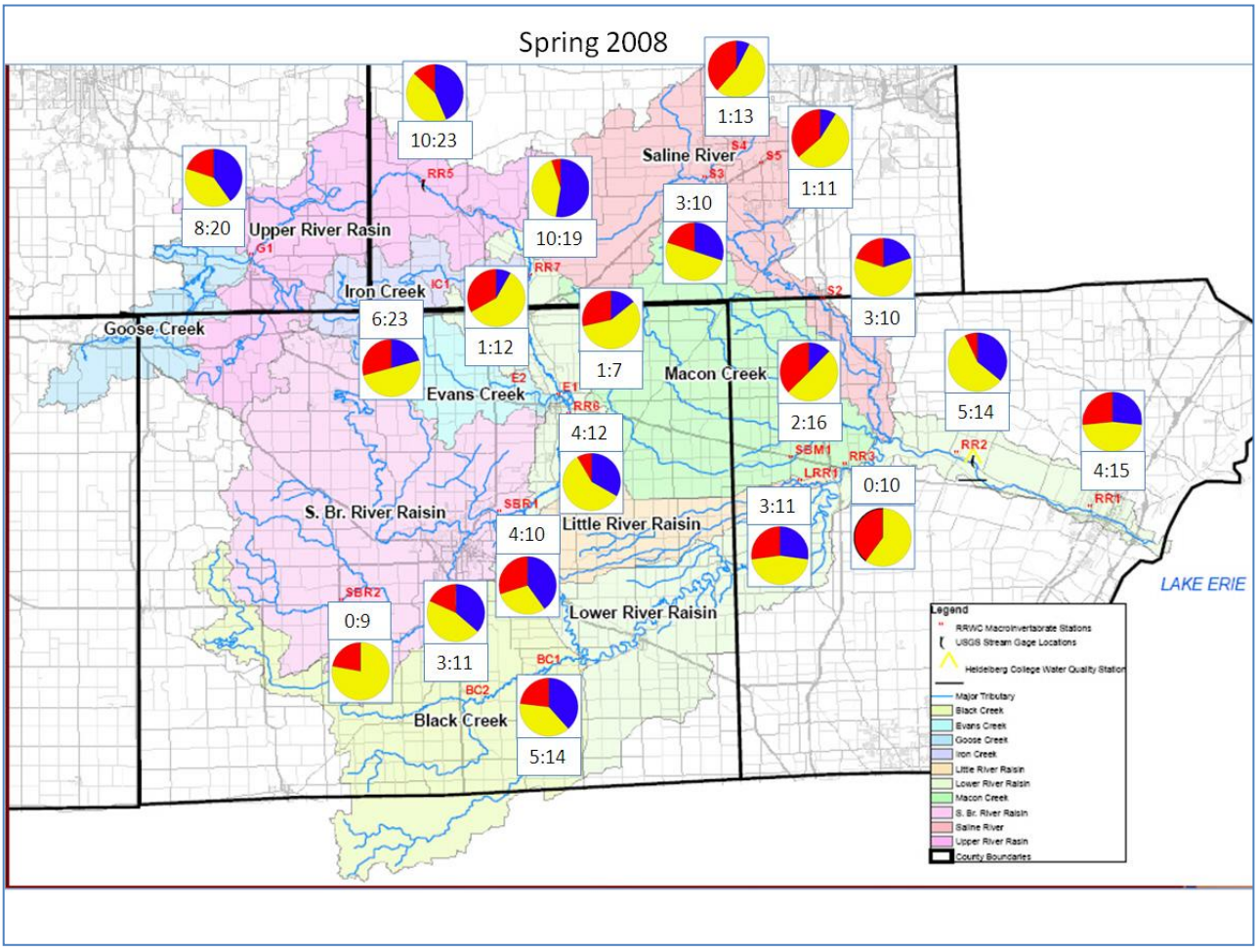

Figure 1. Spring 2008 Adopt-A-Stream collections. The pie charts show percentages of sensitive taxa (in blue), semi-sensitive taxa (in yellow) and tolerant taxa (in red). In general, the greater the blue portion of the pie chart, the healthier the stream stretch. The first number given for each chart is the number of taxa considered sensitive and the second number is the entire number of taxa captured.

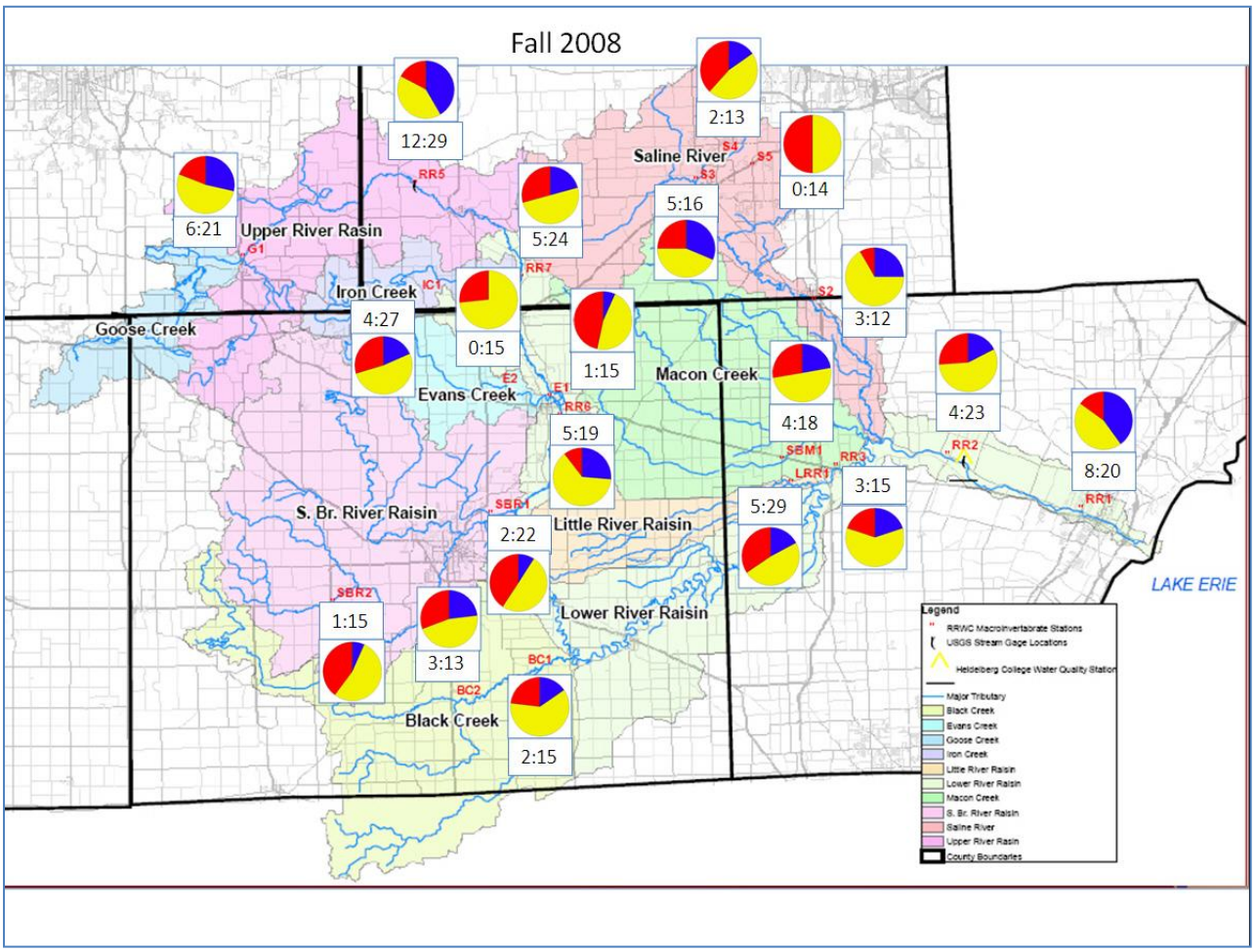

Figure 2. Fall 2008 Adopt-A-Stream collections. Legend same as Figure 1.

In general, sites that had good proportions of sensitive taxa in the spring also had a good number in the fall – though some sites did see some significant changes. For instance, SBR1 (South Branch River Raisin 1, sampled at Heritage Park just downriver from the city of Adrian) saw the proportion of sensitive taxa drop from 40% in the spring to just 9% in the fall, despite the fact that the absolute number of sensitive taxa only dropped by two (from four). This is because the overall capture numbers increased from 10 types of animals to 22, decreasing the proportion of sensitive taxa to a much more marginal percentage. Nevertheless, this might be an instructive change, as the city of Adrian had four accidental sewage outflows during the intervening summer that would certainly have been detrimental to any sensitive invertebrates (and other animals) that lived downstream.

Figure 3 is a compilation of all spring stream searches for each of the sites, up through April, 2007. There have been six years of data collected for many, though not all, sites prior to 2008. The pie charts again show sensitive, semi-sensitive, and tolerant taxa, but this time the data is cumulative for all spring collections prior to 2008. This graphic allows us to compare last spring with the long term findings.
The first number, again, is the number of sensitive taxa recovered and the second number is the total number of taxa (the same taxon may be counted multiple times if it was recovered at the same site over multiple years). Not all sites have been in the Adopt-A-Stream program from the beginning, so while proportions of sensitive taxa may be comparable, the absolute numbers are not (see full report for details).

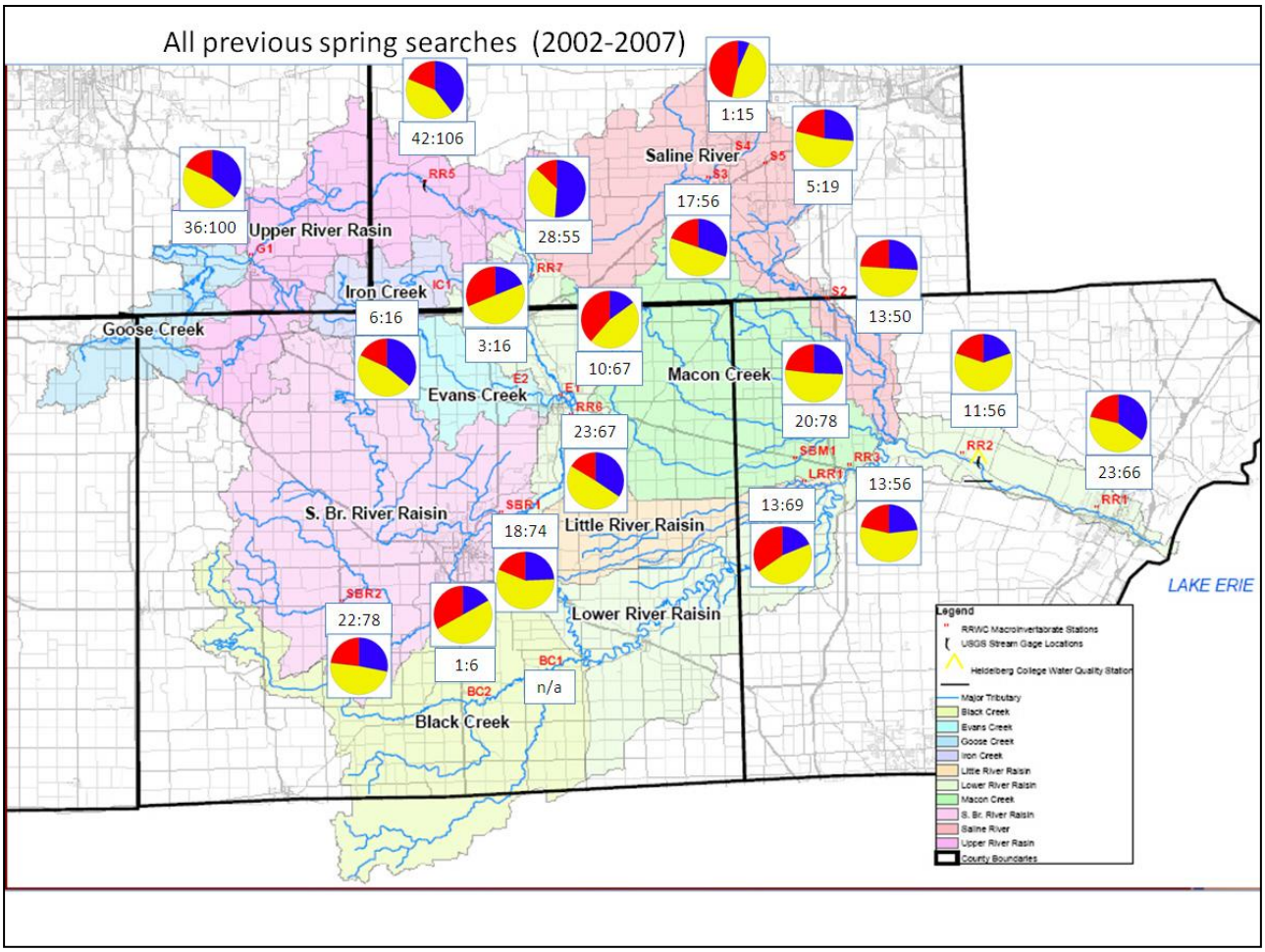

Figure 3. All previous spring (2002-2007) Adopt-A-Stream collections. Legend same as Figure 1.

Figure 4 does the same for the fall collections, of which there were only two prior to 2008.

There are a number of changes that are worth investigating further when comparing the 2008 data to the long term data set (see the trend column in the table below). Five sites have considerably lower percentages (a difference of 10 percentage points or greater) of sensitive taxa recovered over the past year as compared with the long term data (E1, E2, IC1, RR3, RR6, S5, and, in particular, SBR2).

Iron Creek (IC1) shows a drop from spring to fall of about 10 percentage points; this is due to slightly fewer sensitive taxa and slightly more other taxa being recovered during fall from spring. This is not particularly worrying, as this site has one of the greatest invertebrate diversities in the watershed. The site directly below the city of Tecumseh (RR6) had a particularly low number of sensitive invertebrates from the fall collection, driving its average (spring and fall) values down. An examination of the long term records show that sensitive taxa are usually rare there in the fall, suggesting that this could be a 'normal' response for this site due to seasonality and phenology effects, though perhaps this may be an annual response to the city of Tecumseh that sits above this site. A similar pattern exists for one of the Saline sites, S5, possibly for similar reasons.

The other sites are more difficult to assess as to why they have declined. Evans Creek (E1) in Tecumseh had many sensitive taxa recovered from the site in the early years of the sampling, but now few are found. Why this is, is unclear, though low sample size is evident in some of the searches mid-decade (though sample size was adequate in 2008, and still low numbers of sensitive taxa were recovered). The second Evans Creek site (E2) recovered no sensitive taxa in the fall search, despite good sample effort (as evidenced by the total sample size recovered) and a history of at least some sensitive groups recovered in the past.

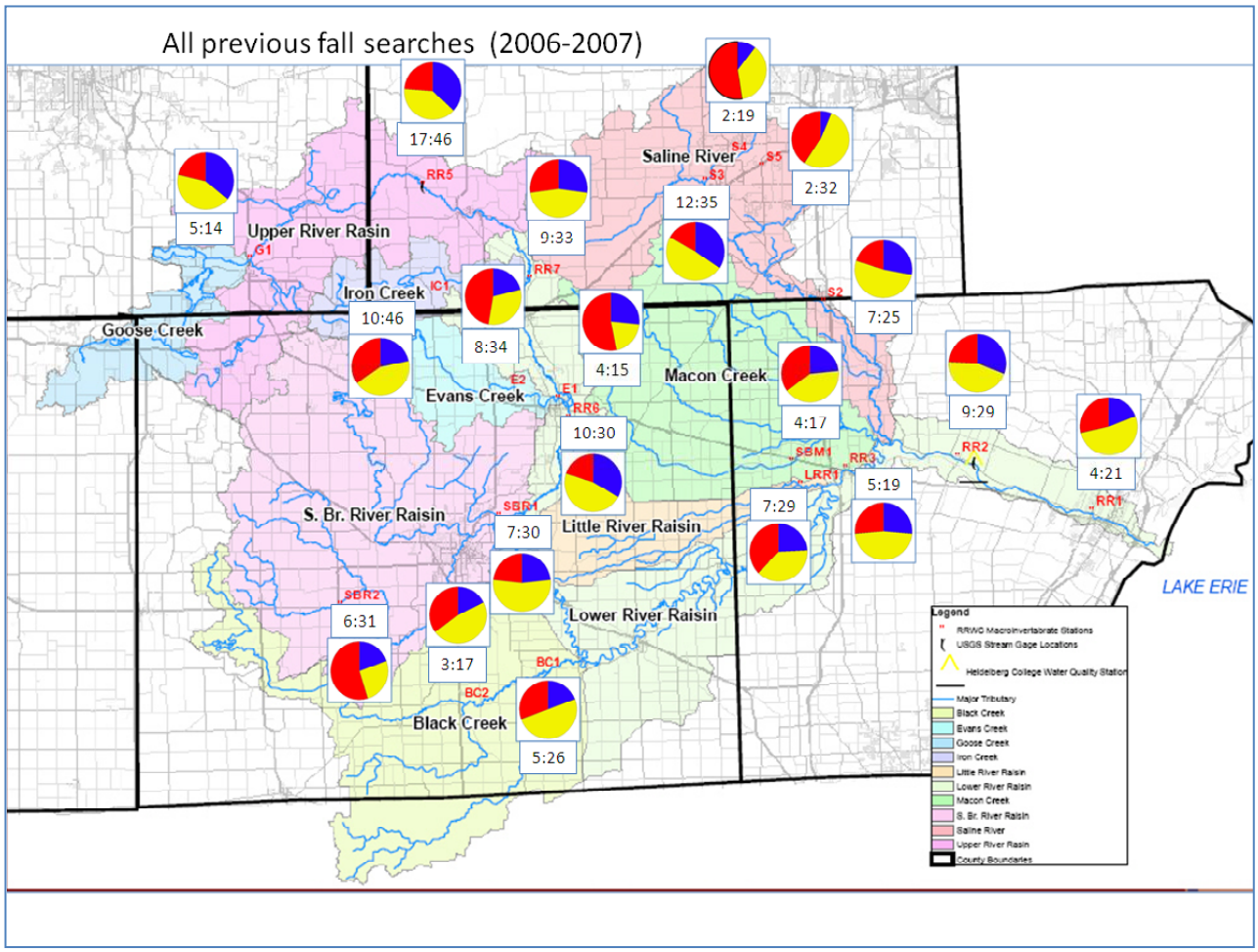

Figure 4. All previous fall (2006-2007) Adopt-A-Stream collections. Legend same as Figure 1.

The site downriver from the city of Dundee (RR3) had a very poor spring collection (no sensitive groups, and again, a reasonable sample effort), but by fall, for whatever reason, the percentage of sensitive taxa increased to the long term values for this site. The single worst site for 2008, with the lowest number of sensitive taxa recovered and the greatest drop from the long term findings is SBR2, west of the city of Adrian on the South Branch of the River Raisin. The decline in this stream has no obvious cause other than, perhaps, land use changes upstream to this site.

The following table summarizes the percent sensitive taxa for each of the sites for both spring and fall 2008 as well as all previous spring and falls. A trend is noted if the difference of sensitive taxa is greater or less than 10% the long term finding. The Locations (study sites) are arranged in order of the proportion of sensitive taxa, from least to greatest. The rankings are ordered by the individual sites long term findings; last year's findings may be either higher or lower.

For the most part, upriver sites above Clinton have the best invertebrate faunas. This region of the watershed has, generally, wide riparian corridors and greater forest cover. The corridors help filter the water before it flows into the river, picking up excess nutrients and sediments such that the river is a more amenable place for invertebrates (and fish species too). The forest cover shades the water, allowing animals that require cooler temperatures to survive.

Sites that are highly channelized, surrounded by impervious surfaces (parking lots, urban environments) and sites that are located in highly agriculturally oriented sub basins have the worst invertebrate faunas. Many, though not all, of these sites have poorer invertebrate faunas discovered over the last year, as compared with their long term findings.

Location	**% sensitive taxa spring 2008**	% sensitive taxa previous spring collections	**% sensitive taxa fall 2008**	% sensitive taxa previous fall collections	Trend
S4	**8**	7	**15**	11	~Consistent
BC2	**27**	16	**23**	17	Upward (slightly)
BC1	**25**	-	**13**	19	Downward (slightly)
S5	**9**	26	**0**	6	Downward
E1	**14**	15	**7**	26	Downward
E2	**8**	19	**0**	24	Downward
LRR1	**27**	19	**17**	24	~Consistent
SBR2	**0**	28	**7**	15	Downward
SBR1	**40**	24	**9**	23	Spring up, Fall down
RR3	**0**	23	**20**	26	Downward
SBM1	**12**	26	**22**	24	Downward
RR2	**36**	20	**17**	31	Spring up, Fall down
RR1	**27**	35	**40**	19	~Consistent
S2	**30**	26	**25**	28	~Consistent
IC1	**26**	38	**15**	22	~Consistent
RR6	**33**	34	**7**	33	Fall downward
S3	**30**	31	**31**	34	~Consistent
RR7	**53**	51	**21**	27	~Consistent
G1	**40**	36	**28**	36	Fall downward (slightly)
RR5	**43**	40	**41**	37	~Consistent