Monitoring Gazette

Study results of HRWC's Adopt-A-Stream Program

Fall 2003

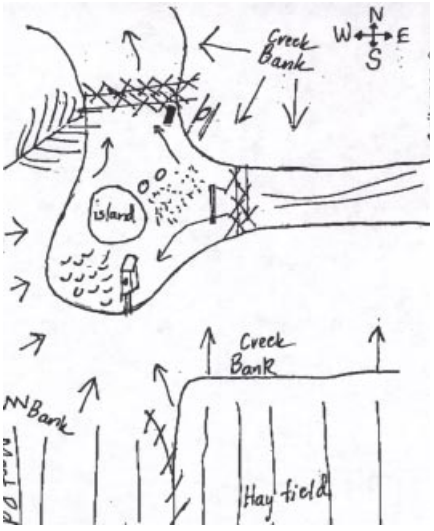
Stream Patrol

In the summer of 2003 the Adopt-A-Stream Program tested a new project to help parents and children learn about their natural surroundings and its response to rain. The participants were enthusiastic about Stream Patrol, a two-month project for pairs of adults and children during July and August.

In June, eight teams were trained to handle equipment and record their data and observations. They used a graduated cylinder to measure suspended sediment in the stream and recorded the daily amount of rain with a rain gauge in their yards. The first of their weekly tasks was to create a map that included their house and the nearby creek. Subsequently they visited their stream site to explore, make a few measurements, and record their observations. Participants experienced many changes in a single location, enabling them to see the dynamics of flowing water and the plants and animals associated with it.

> "My favorite part of stream patrol was noticing changes in velocity and turbidity of water after storms and how greatly a storm can affect just a little stream and its depth." -James Chamness, Stream Patrol Particpant, 10 years old

If you would like to participate in the Stream Patrol this summer, please let Joan (jmartin@hrwc.org) know. Your interest will influence our decision about whether to continue the project.



Julie and Alex Frost created a map of Arms Creek.

Patrolling the River at the Broadway Bridge

Stream Patrol provides useful monitoring when changes are happening on the land. Because of a concern about the potential impacts of construction on the river, we asked John Lillie to test the Patrol activities near a construction site.

by John Lillie

In late June I joined the Adopt-A-Stream Program's new Stream Patrol as an individual participant. In response to public concern about the impact that the construction of the new Broadway Bridge in Ann Arbor might have on the Huron River, I chose a site immediately downstream from the construction site and the old power plant.

There is a pond located downstream from the power plant through which water once

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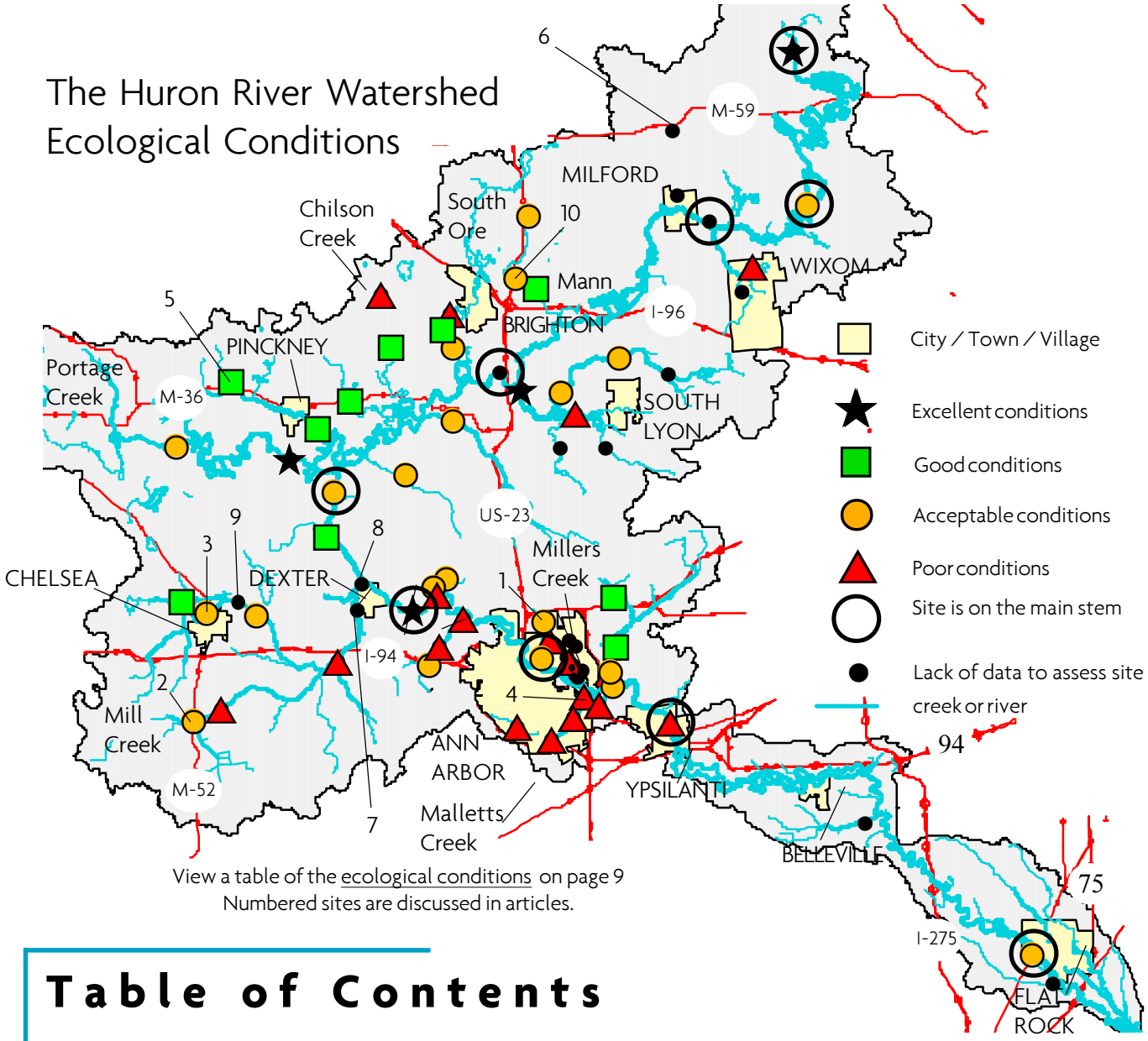
Far Right: Equipment for the Broadway bridge construction. Right: Filters in the outlet pipes to the Huron River.



View a table of the ecological conditions on page 9
Numbered sites are discussed in articles.

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CORRECTION--There was an error in the temperature results reported in the Winter-Spring 2003 Gazette. We reported that the majority of our study sites experience extreme temperature fluctuations of more then 18°F. Actually, the majority experience only moderate fluctuations (between 9 and 18°F). The only site that is warm (>71.6°F) with extreme fluctuations is Norton Creek at Loon Lake Outlet. Extreme fluctuations at warm sites has been found to decrease fish diversity.

The Best and Worst Sites

Like canaries in the mine aquatic insects are useful indicators of stream conditions because they respond to deteriorating environmental conditions before we do.

The results from fall 2003 were combined with 10 previous years of monitoring data to assess the quality of sites throughout the watershed (see glossary, p.10 for definitions of underlined terms).

The map on the previous page shows the location and condition of our study sites. The ranking of poor, acceptable, good and excellent is determined using a model created by Prof. Michael Wiley at the University of Michigan. In general much of the watershed is in acceptable or good condition, while four areas are in excellent condition. Sites in poor condition tend to be located downstream and in urban areas.

See table on pages 8 & 9 for a list of ecological conditions by site.

Excellent sites:

- support a rich diversity of aquatic insects

Poor sites:

- only a few kinds of insects are found here
- habitat quality is poor
- water quality (as measured by conductivity) is poor

Fred Hanert and Roy Cramer collect macroinvertebrates during the Fall RoundUp. Photo: John Cramer

Patrolling the River at the Broadway Bridge

continued from cover

discharged from the plant's turbines returned to the river. One of the abutments for the new bridge was to be located immediately adjacent to this pond. Through this old discharge path, silt from the excavation, fill and grading for the abutment could gain access to the river. On the south bank of the river mountains of fill dirt were awaiting the contouring of the south abutment and access road. To my mind the stage was set for major silt damage to the river!

I was impressed by the precautions that were in place that prevented silt runoff. In addition to silt fences and floating silt dams, two culverts that originally connected the pond to the river had been blocked with plastic sheeting and sandbags. I soon learned that an additional challenge to the site was provided by the periodic surges of water that were released daily from Argo Dam, raising the water level 14 to 15 inches in two hours.

So what was the river like at the site? Armed with a graduated cylinder, I verified that while the water in the pond was quite turbid, the river itself was clear. There were no pockets of silt in the riverbed even along the scalloped shoreline where the water flowed less rapidly. Aquatic plants had not accumulated silt and huge clams were alive in the slow moving regions. Ducks, geese and an occasional blue heron swam and fished in the river. Damselflies, dragonflies and water striders darted across the water surface.

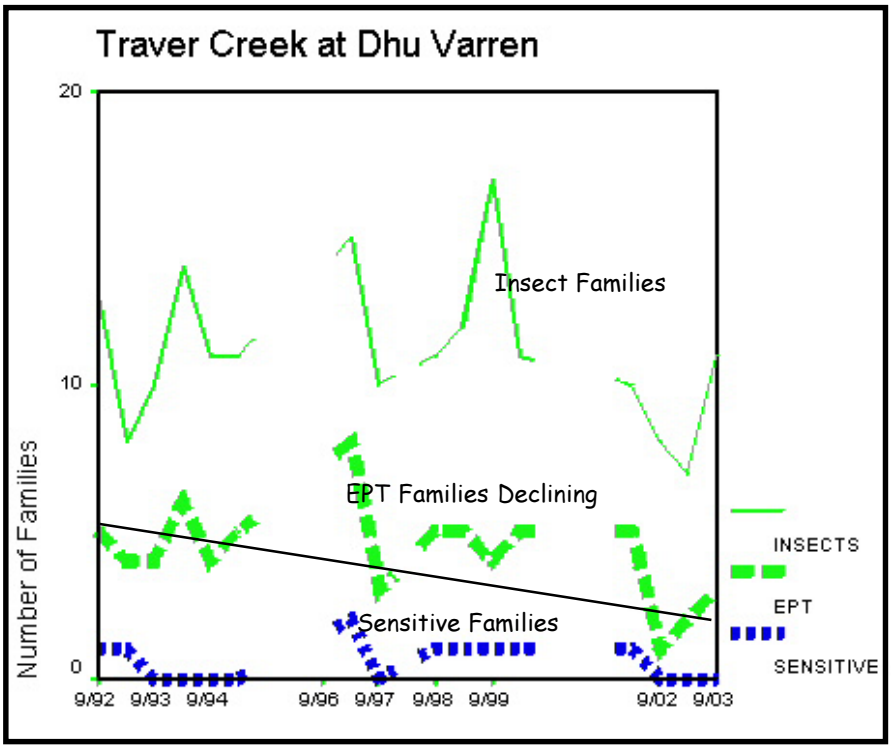
Yes, there were Styrofoam chunks and cups, plastic bottles and bags and other bits of human-made debris, but considering how much construction activity went on this past summer, I was impressed by how little our river had been damaged. There is still much bridgework to be completed, but as of this fall things looked good! I look forward to another season with the Stream Patrol.

Aquatic Population Changes Observed in Fall

We identify a change (increase or decline) only when there is a statistically significant trend over the entire time of monitoring. See page 8 for a table of the 2003 results and a complete listing of the population changes.

Many teams commented on the low water levels during the fall collection. One team was surprised to find a dry stream bed where Tobin Creek once flowed!

Although populations remained stable at most of our sites, declines were measured in several streams.



We find fewer EPT families in Traver Ceek than we used to.
Note: a break in the line indicates a period of no measurement

Creeks with less diversity than usual this Fall

Boyden
Davis
Honey in Livingston County
Honey in Washtenaw County
Mill
Portage
South Ore
Traver
Woodruff

Traver Creek at Dhu Varren Declines

Traver Creek is a small wetland stream as it winds under Dhu Varren Road (#1 on map p.2). The surrounding area is quickly developing. Plans for the future of this area are detailed in the Northeast Area Plan (for information about the plan visit http://www.ci.ann-arbor.mi.us/Planning/NE-Area/neap.html).

From 1992 until the spring of 2002 the creek was in good condition and we found on average almost five EPT families during each collection. Since then, we find only two EPT families indicating that conditions are declining in quality. (See glossary, p.10 for definitions of underlined terms.)

Just upstream of the road, the city has been constructing a park. During the summer, heavy rains disturbed soil that had been exposed during grading. Although this might explain why the EPT families looked lower this fall, the two collections prior to construction looked low as well. Nevertheless, we are hopeful that the creek will recover now that the site is stabilized.

The park includes innovative designs to protect the creek. Porous pavement was used in the parking lot to allow water to infiltrate into the land. Areas were planted with water loving plants to accept stormwater. A component of constructing the park included bank stabilization in Traver Creek.

Population in Mill Creek at Manchester lower then ever before

This fall, the aquatic insect population plummeted in the south branch of Mill Creek (#2 on map p.2). For the first time during our 5 years of monitoring, we were unable to find a single sensitive insect. Rusty Brach reported that there was only 3-4" of water at this site during the collection. Although we do not have detailed information about water levels, our habitat assessments in the fall of 1993 and 1999 show an average depth of 6-12".

Low water levels might explain the poor population diversity this fall. Low flows can result in challenges for aquatic organisms. When water levels drop, streams

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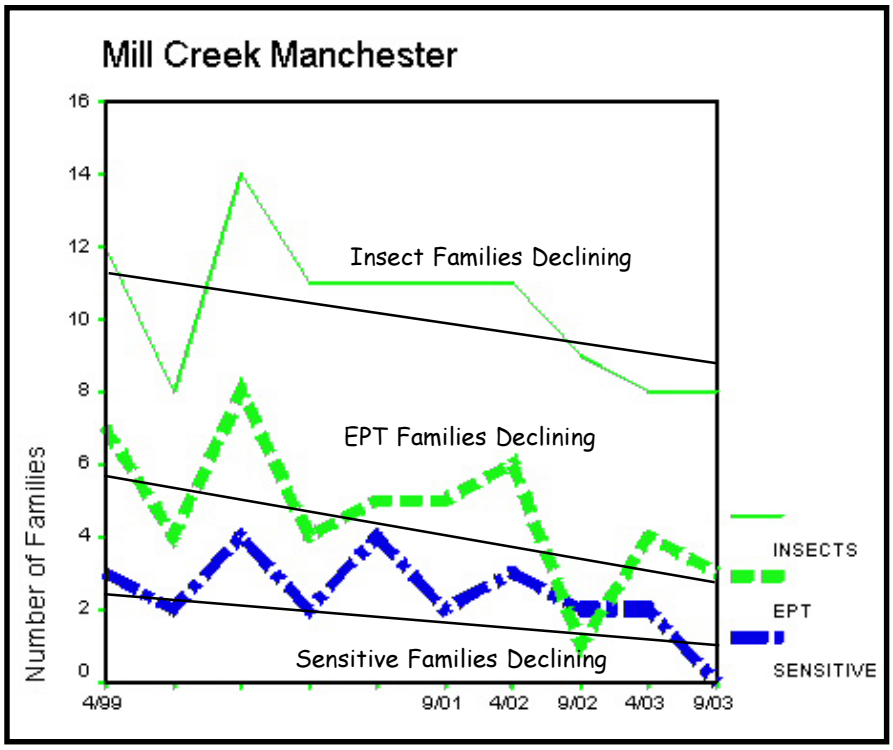
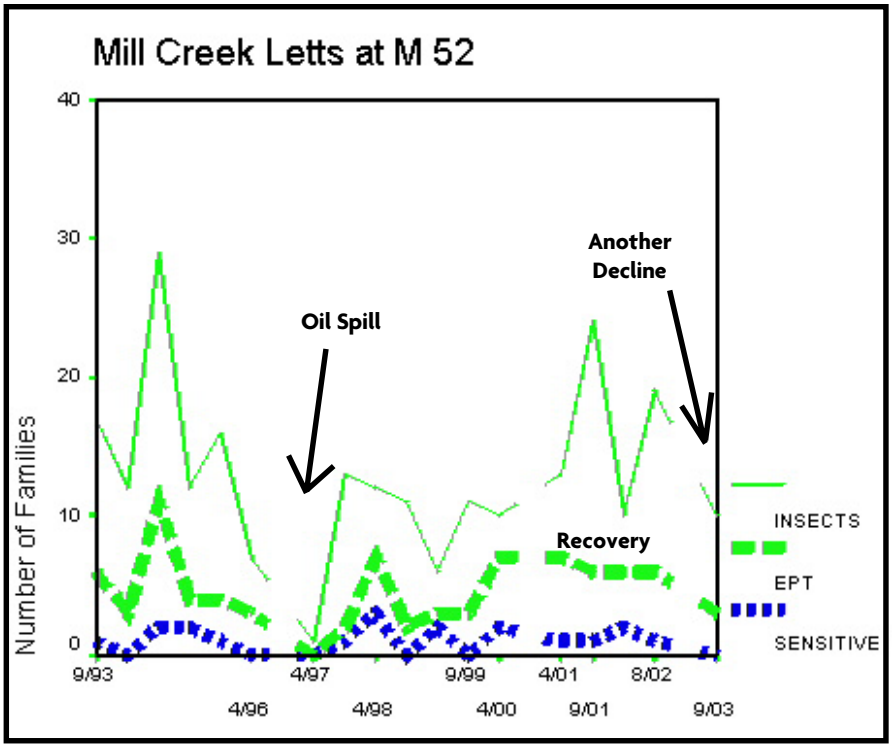
Aquatic Population Changes Observed in Fall



Low water levels might explain why the population at Mill Creek at Manchester plummeted this fall.



The north fork of Mill Creek (called Letts) in Chelsea has suffered multiple insults and the population diversity is low again.

continued from previous page

are likely to pool and have sluggish flows. Pollutants become more concentrated, oxygen levels drop and water temperatures are more variable.

As development increases, lower flows become more of a concern. With development comes impervious surfaces (such as roads and roofs) that cause more water to run rapidly overland rather than slowly through the soil. During dry times, less water is entering the stream because there is less water stored in the land. So, low flows get lower.

ACTION ITEM

You can help increase the amount of water available to streams (and wells) during dry times. Next time it rains, look around your yard for gullies or puddles and consider landscaping to either help the water infiltrate or support a bed of water-loving plants. We are available to talk to you about simple and interesting ways to do this.

Letts Creek

Letts Creek (#3 on map p.2) used to be in good condition. In 1997 we measured a population crash which followed an oil spill. After five years, the creek had bounced back only to be assaulted with sediment in the fall of 2002. Luckily, the population appeared only temporarily affected by the sediment, as we found good diversity when we collected again only weeks later. This fall the count was low again, maybe due to low water, or something else?

Surprising Finds!

Sensitive Insect Found in Malletts Creek!

Andrew & Jim Smith's team found a hellgrammite (Family Corydalidae) in Malletts Creek at Chalmers Road (#4 on map p.2). This is the first time we have found a sensitive insect in Malletts Creek.

Hellgrammites are among the largest insects we find in the Huron, measuring up to three and a half inches in length. Larvae live in the stream for two to three years before emerging as adults. The larva found in Malletts Creek was large, probably indicating that it was in its second or third year of life.

Uncommon Caddisfly Identified at Bug ID Day

Catherine Riseng identified an uncommon genus of the net-tube caddisfly (Family Psychomyiidae, Genus Lype) that her team collected from Hummocky Lick (#5 on map p.2). This insect prefers cold, clean streams, indicating the good conditions in this tributary to Honey Creek in Livingston County.

The Carroll and Mueller families collect macroinvertebrates during the Fall RoundUp. Photo: Edie Mueller

New Site Results

Sensitive Insect Results at New Sites

John Lillie's team found a sensitive clubtail dragonfly (Family Gomphidae) at our new site in the headwaters of Pettibone Creek (#6 on map p.2). Downstream, at our site in Milford, we were unable to find sensitive insects.

The team led by Dave Brooks found three sensitive families at our new site on Mill Creek at Shield Road (#7 on map p.2). The sensitive insects were the net-tube caddisfly (Psychomyiidae), clubtail dragonfly (Gomphidae) and a hellgrammite (Corydalidae).

Karen Pierce's team found the sensitive brush-legged mayfly (Isonychiidae) at the new site on Mill Creek at Warrior Park (#8 on map p.2).

No sensitive insects were found at our new site at Dexter-Chelsea Road on Mill Creek (#9 on map p.2), or in Woodruff Creek at Buno Road (#10 on map p.2).

None of our new sites on Millers Creek had sensitive insects this September.

John Cramer snapped a picture of a white egret and turtles during the River RoundUp.

Thank you

to all the environmental stewards who monitored in September, 2003

Currently, over 450 volunteers monitor more than 70 sites in the Huron River System.

Gretchen Alexander C
Alex Bajcz
Noemi Barabas C
Karl Leif Bates L
Rolf Bates
Marcy Bauman C
Dave Baxter
Jon Baxter
Michael Benham L
Laurel Beyer C
Rusty Brach C
Rochelle Breitenbach C
Dave Brooks C
Sharon Brooks L
Lee Burton
Eric Burton
Bruce Campbell
Cathy Campbell
Mike Carroll
Danielle Carroll
Barb Chamness
James Chamness
Wayne Cheyne L
John Cramer
Roy Cramer
Leo Cramer
Jennifer Croze
Ray Davio L
Kirk Davis
Carole Dubritsky L
Jim Fackert C
Ron Gamble C
Sam Giraud
Ann Gladwin
Tom Glaser
Noah Glaser
Kathie Gourlay L
Sarah Grammel
Alan Green
Austin Green
Lindsay Green
Emily Greenman
Kevin Gustavson C
Fred Hanert C

Hellgrammites are among the largest insects we find in the Huron measuring up to three and a half inches in length. Illustration from *Aquatic Entomology* by McCafferty & Provonsha

Helen Harris
Rob Henderson
Julia Henshaw L
Mark Higbee
Marley Higbee
Jonas Higbee
Gary Hochgraf L
Jessica Hornbeck
David Howell
Kiersten Isgrigg
Jag Jagadish
Sidd Jagadish
Tom Jameson C
Janet Kahan L
Matt Kevnick
Jonathon Kevnick
Nicolas Kevnick
Theresa Kevnick
Rosemary Kevnick
Hideyuki Kobayashi
Naomi Kobayashi
Deborah L. Kuehn
Kate Levin
John Lillie L
Sue Lillie C
Khaled Mabrouk
Cindy Mahalak
Dean Maiberger
Richard Manczak C
Charlie Markel
Dianne Martin C
Erin Mayernik L
Lynn Meadows
Karla Metzger
Jean Milligan L
Colin Mindel C
Laura Mindel L
John Minderhout C
Tui Minderhout L
Dan Minock
Dallas Moore L
Jeanne Moseley
Nate Moseley
Edie Mueller L
Hannah Murray
Nan Nelson C
Lisa Perschke
Dan Peters L
Ted Peters C
Karen Pierce C
Louise Piranian
Ellen Rambo
Bonnie Reardan
Reef, Don L
Lee Ren L
Simon Ren C
Ariana Rickard
Don Rottiers C
Rob Rougeau C
Esther Rubin L
Bill Seib C
Candace Shelly L
Lizzy Shelly L
Andrew Smith C
Andrea Smith
Jim Smith C
Hal Smith L
Mary Spence L
John Stahly C
Brian Swisher C
Chad Theismann C
Lewis Tripp C
Ben Upton C
Marie Valentine
Stacey Valentine
Fred Wark C
Mark Weiss
Eric Weiss
Jay Williams C
Chris Wilson
Matt Wilson
Lev Wood C
Jackie Xu
Anita Zot L

Please let us know if we missed your name.

C Collectors L Leaders

(These people take training and responsibility to ensure that the study event is reliable and educational.)

Fall 2003 Results and Population Changes

LOCATION of sites sampled in 9/03	Insect Families	EPT Families	Sensitive Families	Population Diversity	Ecological Conditions*
Arms Creek: Walsh Road	10	4	0	stable	3
Boyden Creek: Delhi	12	3	0	stable	3
Boyden Creek: Golf Course	12	**3**	0	**DEC**	3
Chilson Creek: Brighton Road	11	7	0	stable	4
Chilson Creek: Chilson Road	9	3	1	stable	2
Davis Creek: Doane Road	10	3	**0**	**DEC**	3
Davis Creek at 11 Mile	12	2	0	NEW	NA
Davis Creek: Pontiac Trail	20	7	**1**	**DEC**	3
Fleming Creek: Geddes Rd.	**13**	4	1	**INC**	3
Fleming Creek: Radrick Farms	12	4	1	stable	3
Fleming Creek: Warren	14	4	1	stable	2
Hay Creek	15	6	2	stable	2
Honey Creek (N): Darwin Rd.	**21**	6	3	**INC**	2
Honey Creek: Wagner	10	**2**	1	**DEC**	4
Horseshoe Creek:	13	5	0	stable	3
Hummocky Lick at M-36	18	**4**	2	**DEC**	2
Huron Creek: near the mouth	14	5	**3**	**INC**	2
Huron River at Bell Road	10	4	1	stable	3
Huron River: Commerce Rd	13	4	0	stable	3
Huron River: Cross Street	12	6	0	stable	4
Huron River: Flat Rock	12	5	1	stable	3
Huron River at Proud Lake Rec. Area	12	5	1	stable	NA-need temperature data
Huron River: US-23 (Liv. Co.)	12	4	3	stable	
Huron River:White Lake Rd	25	10	6	stable	1
Huron River at Island Park	17	5	1	stable	3
Huron River: Zeeb Road	**16**	6	1	**INC**	1
Malletts Creek: Chalmers	9	2	1	stable	4
Malletts Creek: I-94	9	2	0	stable	4
Malletts Creek: Scheffler	5	2	0	stable	4
Mann: VanAmburg Road	13	5	1	stable	2
Mill Creek: Ivey Road	19	9	3	stable	2
Mill Creek: Jackson Road	10	**3**	0	**INC**	4

*Ecological Conditions: 1=Excellent, 2=Good, 3=Acceptable, 4=Poor, NA=not enough data to assess conditions
Bold numbers indicate a population change (**INC**=increasing, **DEC**=declining) that is statistically significant at the 10% level or less. See explanation on p.4

Fall 2003 Results and Population Changes

LOCATION of sites sampled in 9/03	Insect Families	EPT Families	Sensitive Families	Population Diversity	Ecological Conditions*
Mill Creek: Manchester Rd	**8**	**3**	**0**	**DEC**	3
Mill Creek: Letts at M-52	10	3	0	stable	3
Mill Creek at Shield	13	3	3	NEW	NA
Mill Creek at Warrior Park	15	6	1	NEW	NA
Millers E. Branch at Baxter Road	8	0	0	NEW	NA
Millers trib at Green Road	3	0	0	NEW	NA
Miller's Creek: Glazier	5	0	0	stable	4
Millers at Huron Parkway	8	2	0	NEW	NA
Millers W. Branch at Plymouth Road	4	1	0	NEW	NA
Norton Creek: Loon Lake Outlet	10	1	0	stable	NA
Port Creek at Armstrong Rd.	7	1	0	stable	NA
Pettibone Creek at Livingston Road	14	3	1	NEW	NA
Pettibone Creek at Commerce Road	15	3	0	NEW	NA
Portage: Dexter-TownHall Rd	17	7	**3**	**DEC**	1
S. Branch of Huron River: Silver Lake	25	9	2	stable	1
South Ore Creek: Bauer Rd	**10**	5	0	**DEC**	2
South Ore Creek: Hamburg R	14	4	1	stable	3
Tobin Creek at 8 Mile	4	0	0	NEW	NA
Traver Creek: Broadway	11	2	0	stable	4
Traver Creek: Dhu Varren	11	**3**	0	**DEC**	3
Walker Creek at 8 Mile	22	6	0	NEW	NA
Woodruff Creek: Buno Rd.	15	6	0	stable	3
Woodruff: Maxfield Rd.	10	3	**0**	**DEC**	3

Check out a click-able map of our results at the Environmental Monitor website: http://empact.co.washtenaw.mi.us/summaps/mapaasshed.asp

*Ecological Conditions: 1=Excellent, 2=Good, 3=Acceptable, 4=Poor, NA=not enough data to assess conditions
Bold numbers indicate a population change (**INC**=increasing, **DEC**=declining) that is statistically significant at the 10% level or less. See explanation on p.4

Glossary of Terms

Ecological Conditions --"acceptable" indicates that the quality of the site is just below what we expect for a healthy site of its characteristics (such as drainage area and stream temperature). "Good" sites are at or slightly above expectations, while poor sites are well below what is expected. A few sites qualify as excellent due to a great diversity of insects and good physical quality.

Ecological Condition is determined by the biological and physical conditions of the site. The biological conditions include the diversity of insect families, EPT families and sensitive families. The physical conditions are determined by conductivity results and "measuring and mapping" assessments of habitat. These assessments involve examining characteristics such as the stream banks, stream widths and depths, and the types of material (such as sand and gravel) on the stream bottom. When interpreting the biological and physical conditions, we expect more diversity at a larger site or one with cooler summer stream temperatures.

Conductivity is an indication of the amount of dissolved ions (for example salt, metals) present in the water. It is determined using a meter that measures how easily an electrical current can flow through the water sample. If the average conductivity measured at a site is 800 microSiemens (uS) or less, it is considered natural for stream water. Conductivity over 800 uS is considered excessive and may indicate the presence of toxic substances. (However, many toxins, although harmful, are not measured by conductivity.) One source of elevated conductivity is development. At some of our sites with high levels of development and impervious surfaces (roads, driveways, roofs), rainwater washes chemicals, such as road salt, fertilizers and pet wastes, from the developed landscape into the creek.

EPT Families: Insects in the orders Ephemeroptera (the mayflies), Plecoptera (the stoneflies), and Trichoptera (the caddisflies) generally evolved in streams with high levels of oxygen and/or faster flowing waters. As a result, many of these insects are particularly sensitive to factors that reduce oxygen, reduce flow, increase temperature, or otherwise stress the insect.

Families: A taxonomic grouping of similar organisms, in this case insects. Taxonomy is a system for characterizing all living things. A "family" is a taxonomic level that includes similar genera which are groups of species. For example, mink, otters, and skunks belong to the family Mustelidae.

Insect Families: This indicator gives us our best overall picture of the insect community's health. Because there are about 87 insect families in the Huron, this indicator can provide a valid measure of ecological condition.

Winter Stoneflies: The winter stoneflies, which require high levels of oxygen, are active in January when the solubility of oxygen is high. At that time of year an absence of stoneflies suggests that toxic pollutants may be present in the river. The winter stoneflies allow us to see the effects of the chemicals entering the river, which is much harder to gauge in the summer. The ability to use stoneflies as an indicator of pollutants makes the winter Stonefly Search a good tool for investigating the conditions of our creeks.

Sensitive Insect Families: The number of families that have been identified in scientific studies as particularly vulnerable to organic pollution (such as fertilizers, human or animal waste) in studies by William Hilsenhoff at the University of Wisconsin. Twenty highly sensitive insect families live in the Huron River System.

A Watershed is the area of land that drains into the same waterway. Parts of seven counties in southeast Michigan drain into the Huron River and make up its watershed. The Huron, in turn, drains into Lake Erie and is part of the Great Lakes Watershed.

Please let us know how we can best work with you to protect the Huron River. We certainly want to hear about your interests and efforts. What would you like to do to help the river? What are you already doing?

Also, help us improve these reports by telling us if any parts are not clear and what you would find interesting, or other comments.

Sincerely,

Theresa Dakin & Joan Martin
tdakin@hrwc.org jmartin@hrwc.org
(734) 769 - 5971

Calendar of Events

Huron River Watershed Council
Protecting the river since 1965
1100 N. Main Street Suite 210
Ann Arbor, MI 48104
(734) 769-5123
www.hrwc.org

You must pre-register, call (734) 769-5971 or email jmartin@hrwc.org. Check on the location too.

Date	Activity	When	Where
Apr. 4	**LEADERSHIP TRAINING** Learn to lead the team in the River RoundUp as either the collector or the educator. You need to have experienced a RoundUp.	12-1 PM Educators, 12-5 PM Collectors	NEW Center & Nearby Creeks
Apr. 17	**RIVER ROUNDUP** Join a team and search in creeks or the River for creatures (macroinvertebrates) to learn about the River conditions. (View results at www.hrwc.org)	9 AM-3:30 PM or 10:30 AM-5 PM	Entire Watershed
May 2	**ID DAY** Learn about creatures collected at the RoundUp as you help to identify and count them.	Noon-3 PM or 2 -5 PM	NEW Center
May 16	**FLOW TRAINING** Learn to measure stream flow. Following the training, teams will visit Allens Creek and measure flow during dry times and during storms.	2-5 PM	NEW Center


Photo: Ron Gamble

Left: Volunteers train to be a collectors at the Leadership Training

Right: River RoundUp


Photo: Marc Akemann Photography

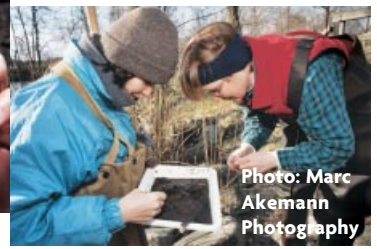


Photo: Marc Akemann Photography