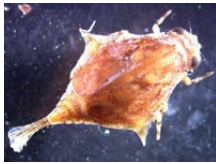


## Volunteers Stream through the Tip of the Mitt

Just three short years ago, the Tip of the Mitt Watershed Council Volunteer Stream Monitoring program began with but five volunteers on one small creek. Since that time, the program has burgeoned to over 100 volunteers that have sampled at a total of 25 sites on nine streams spread throughout the tip of the mitt! The invaluable work performed by volunteers has generated enough high-quality data to begin to truly assess stream water quality.

The majority of water quality data collected by volunteers is biological. Volunteers selflessly commit a few days every spring and fall to collect, sort, and identify aquatic macroinvertebrates. Aquatic macroinvertebrates, such as mayflies, caddisflies, crayfish, and snails, are useful biological indicators of water quality; both in terms of diversity and sensitivity. Overall low diversity, a lack of pollution-sensitive species or an abundance of pollution-tolerant larvae may be a sign of water quality impairment. For example, if volunteers consistently find no mayflies in what is typically a high quality trout stream, we would question why and dig deeper for causes. We do have to be careful when assessing stream water quality and look at data over the long-term to rule out any human error or natural variability. Ideally, we assess streams with at least three years of data at hand.



Nearly every site sampled by volunteers in our program has produced a healthy diversity of total macroinvertebrate families and often a high number of sensitive families. Among the most diverse sites were Kimberly Creek at Montgomery Road with 31 families, Eastport Creek at Farrell Road with 29 families, and the Jordan River at Webster Road with 28 families. Looking at groups susceptible to pollution, 13 EPT families (families belonging to the most sensitive insect orders: mayflies, stoneflies, and caddisflies), were collected from the Bear River at Springvale Road, the Boyne River at City Park and Mullett Creek at Crump Road. Further narrowing it down to the most sensitive aquatic macroinvertebrate families, Horton Creek at Boyne City Road scored the highest with nine families and was closely followed by the Jordan River at Webster Road with eight.



So how do these numbers compare with similar programs in the State? Our best reference source is the Huron River Watershed Council's Adopt-a-Stream Program in southern Michigan, which has been accumulating volunteer data since 1992. In the Huron River, volunteers found 39 families, 15 EPT families, and seven highly sensitive families at individual sites. Thus, our volunteers are approaching the total number of families and EPT families collected by Huron River volunteers and have already outdone them in terms of highly sensitive families; and all in just three years!

From the beginning, we have intended to coordinate the Volunteer Stream Monitoring program over the long-term in order to accurately assess stream water quality, protect the resource, and get people in touch with the resource. Considering our long-range plans, we can always use more help. If you want to join in the fun, contact the program coordinator, Kevin Cronk, at extension 109 or at [kevin@watershedcouncil.org](mailto:kevin@watershedcouncil.org).

## Stream Reports: What's happening in your stream?

With nearly three full years of data available, we are now in a position to perform some preliminary assessments. Full data sets are only available for streams initially included in the program, so at this time we will limit our summaries to those streams. As volunteer data continues to “flow in”, we will provide summary reports for other streams.

### *Spencer Creek*

Spencer Creek flows into the south end of Torch Lake at the village of Alden. Initially, we were quite concerned about the low diversity numbers from Spencer Creek, but two years and four data collection events later we are relieved that the diversity scores are up and typical of the high quality streams found in our area. There has been a recent decline in sensitive family diversity from downstream site at Coy Street; resurrecting those fears that something could be amiss. This decline might be the result of low volunteer turnout with the team consisting of only two volunteers during last two sampling events. Time and further sampling will tell if there is indeed a problem.



### *Eastport Creek*

Eastport Creek is similar to Spencer Creek in that it flows into Torch Lake, though at the north end. It also parallels the Spencer Creek experience in that it has been difficult to keep a full volunteer team together. Regardless, diversity scores from Eastport Creek have been high. In fact, some of the highest total diversity numbers in the program have come from the Farrell Road site. During recent sampling events at the downstream site near Eastport Market there was a drop in diversity. Whether this is indicative of water quality problems or simply natural variability will become clearer as volunteers continue collecting data in 2008.

### *Stover Creek*

Stover Creek gains distinction due to the fact that it was the first stream to be monitored in the program and the first to be monitored at more than two sites. Total biological diversity has been good at all sites on Stover Creek, albeit somewhat higher mid-stream at the City of Charlevoix Cemetery. However, sensitive family scores show marked differences between sites. Both EPT and sensitive family indices are much higher at the cemetery site and not one sensitive family has yet been encountered at the mouth, adjacent to Irish Boat Shop. Why? The lower section of Stover Creek flows through Charlevoix, an urban area where runoff from roads, roofs and parking lots picks up and carries in pollutants as well as a lot of water (i.e., in-stream flooding and scouring) during rainstorms.



### *Horton Creek*

Horton Creek is a great example of habitat variability within a stream system and how habitat influences the composition of the macroinvertebrate community. The upstream section at Church Road is low-gradient with sluggish flow through bountiful wetlands, which deposits great amounts of silt and muck on the bottom. Moving downstream toward Lake Charlevoix the gradient changes, flow velocity increases, depositional changes to erosional, gravel and cobble

are exposed, and habitat variety improves. All diversity scores are much higher at the downstream site on Boyne City Road, though the upstream site consistently produces a number of EPT families and even a few highly sensitive species. The lower diversity at the upstream site should not be alarming. Habitat in this slow-flowing system is noticeably different as is the biology where volunteers regularly find macroinvertebrates typical of such habitats, including scuds, sow bugs, leptocerid caddisflies and haliplid beetles. In this case, one should consider the lower diversity to be natural.

### ***Boyne River***

The Boyne River is locally and regionally famous river for its high quality waters that sustain healthy trout populations and provide tremendous wildlife viewing and recreational boating opportunities. At sites monitored on the Boyne, volunteers have found many aquatic insects typical of such a high quality trout stream including a number of stonefly and mayfly families. The downstream site at City Park is one of few sites monitored by volunteers where the mighty “Pteronarcys” is found, a prehistoric-looking stonefly that dwarfs all others.



Biological diversity started high at both sites sampled in 2005, but then changes started to occur. Diversity upstream at the Dobleski Road site jumped up and down from one sample period to the next whereas scores at the downstream site fell and remained low. Bouncing numbers at the upstream site can be attributed to natural variability, but what happened downstream at the Park Street site?

When the lower numbers were first observed, it was noted that construction had taken place on the river edge to repair a seawall with major alterations occurring within the stream channel. Thus, the likely culprit was neglectful riverside construction that was carried out without precautions to protect the river ecosystem. Recovery has been slow and potentially impeded by further riverside alterations at that site. In efforts to improve the river’s water quality over the long-term, the Friends of the Boyne River carried out a project last year to stabilize the river bank and reducing erosion, which may have had minor short-term impacts. Despite continuing low diversity scores, a fair number of sensitive families consistently appear in samples collected by volunteers; giving hope for full recovery in the future.

### ***Kimberly Creek***

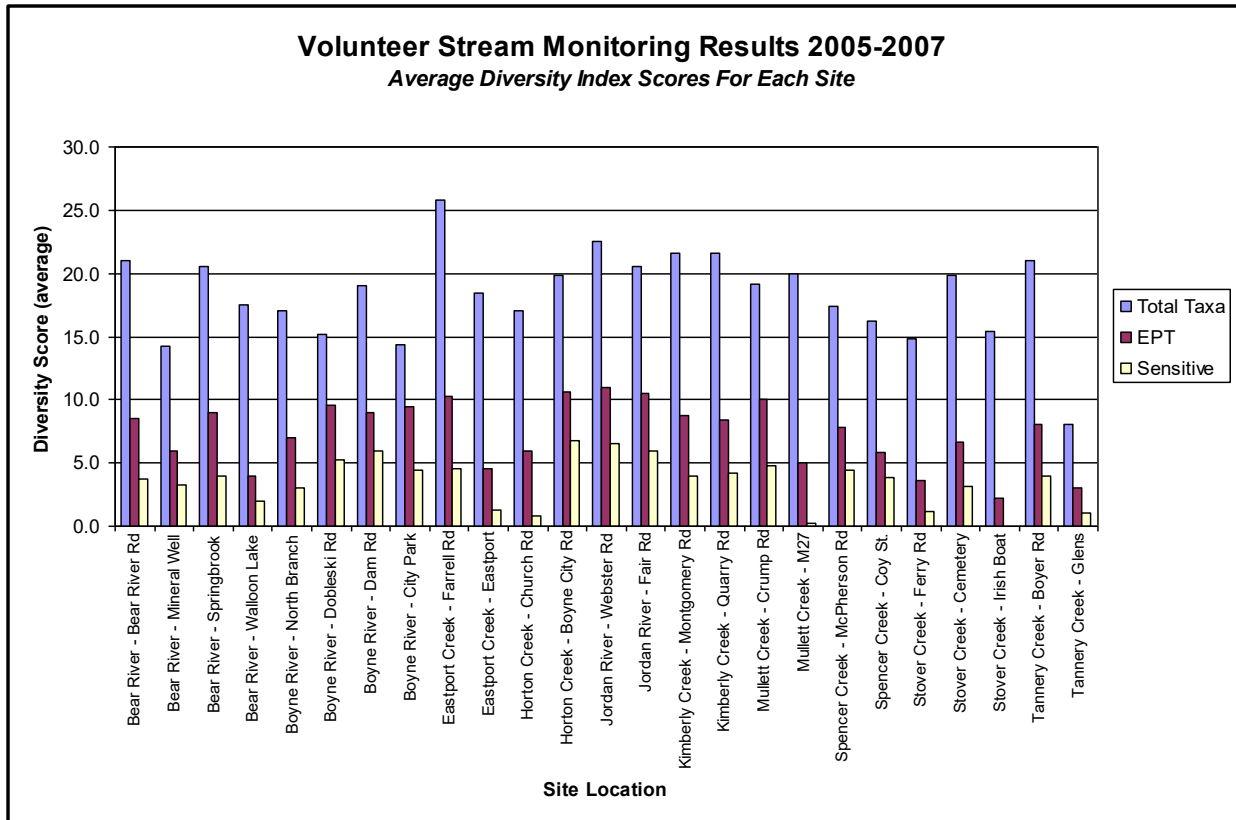
Little-known Kimberly Creek flows to the east of Afton, joining the Little Pigeon River and making its way to Mullett Lake to the north. Initially selected for monitoring due to concerns regarding agricultural and mining operations, results from biological sampling thus far do not show impacts from either. In fact, all scores at both upstream and downstream sites show very healthy biological diversity. The trick of course is to keep it that way!

### ***Mullett Creek***

Mullett Creek flows into the northwest side of Mullett Lake and its watershed lies between Mullett, Burt and Douglas Lakes. Similar to Horton Creek, the sites sampled by



volunteers on Mullett Creek differ with respect to habitat; only in reverse with the fast-flowing site upstream at Crump Road and slow-slowing site downstream at M27. Total diversity scores are similar between sites, though a little higher at Crump Road. However, both EPT and sensitive families are much more numerous at the Crump Road site. Lower diversity downstream is in part due to habitat, but there are other issues potentially contributing to the low numbers. There is a considerable amount of agricultural land use in the watershed, which tends to negatively impact the stream ecosystem by increasing the nutrient and sediment loads. In addition, beaver dams have been reported upstream of the M27 site, which affects water quality by slowing stream flow and raising water temperatures.



*Total Taxa = total number of aquatic macroinvertebrate families, EPT = number of families belonging to the Ephemeroptera, Plecoptera, and Trichoptera orders, Sensitive = the number of families belonging to the three most sensitive categories in the Hilsenhoff family-level sensitivity system.*

**Need to give credit to PHSCAF for funding!**

## **SIDEBAR**

### **How do “critters” help us monitor water quality?**

Volunteers collect aquatic insects and other macroinvertebrates to see how many different types are in the stream. Greater diversity generally means higher water quality. Some organisms are more sensitive to pollution than others, so this gives us another way to use the critters to determine water quality. In our program we use the following three diversity scores to rate stream water quality for sites that are sampled:

**Total Diversity:** the number of aquatic macroinvertebrate families found at a sample site.

**EPT Diversity:** the number of families belonging to the most sensitive insect orders: mayflies, stoneflies, and caddisflies.

**Sensitive Diversity:** the number of aquatic macroinvertebrate families belonging to the three most sensitive groups in a system developed by premier aquatic entomologist PhD. William Hilsenhoff.