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## Butler County Stream Team August News - 2014



*Next Sampling Day - August 9th*

### Pontoon on Acton Lake September, Hueston Woods

In September we plan on holding a free, educational, pontoon boat ride on Acton Lake. Join us to find out about water quality research that is underway by Dr. Mike Vanni and Stream Team's Tera Ratliff. Sorry, I goofed and forgot to get the actual date from Tera before she went on vacation for a few days. I will send out a sign-up email on Tuesday.

The pontoon boat only fits 12 people, so including Mike and Tera, our tour guides, that only leaves 10 spots for volunteers. Being the great people they are, Mike and Tera agreed to hold 2 boat rides. One in the morning and one after lunch.

**Potluck Lunch**- Those of you that know me, know that I love food. So, in typical Stream Team fashion we want to make it a potluck with a picnic lunch between the am and pm boat rides.

Hopefully we will see some great wildlife like this eagle that Donna snapped a shot of on our canoe outing in June.



### Water Treatment Tour Oct 30, Fairfield

See right side bar for more info and to sign-up

### Four Mile Creek

Stream team has been contacted by a variety of individuals who have raised concerns over Four Mile Creek, downstream of Acton Lake. There have been questions raised about green slime and sediment. This may be due to work that is going on at the dam where they are strengthening the lake side of the dam. For the next several months we are planning on collecting a water sample along the road that loops around the lake, near the dam. [Here is an article](#) about the repairs being made to the dam.

### Watershed Spotlight: Elk Creek By Mary Cullum

This month's focus is on Elk Creek, contained in the Elk Creek watershed, shown on the above map. Dr. Donna thought it would be interesting to include a little local history on the streams we spotlight, so when she floated this idea, Amy Cameron was happy to compile some noteworthy historical facts:

### Mark Your Calendars!

**August Sampling Day** -  
Saturday, August 9th

**Pontoon Boat on Acton Lake** - It will either be Sept 6 or 20. I will send out an invite on Tuesday once its confirmed.

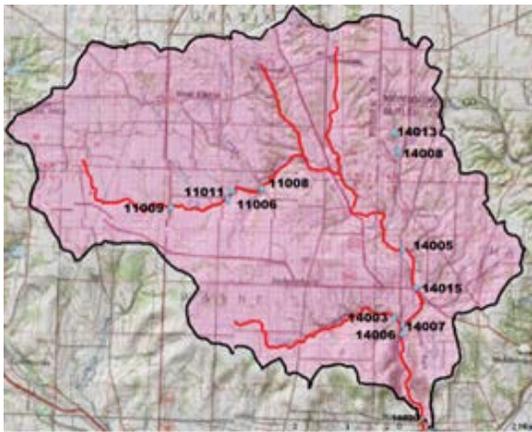
**Mill Creek Cleanup** - Saturday, October 4th. Contact [Annie Rahall](#) with the Mill Creek Watershed Council for details

**Great Miami River Cleanup** - Saturday, October 25th. Visit the web for more details [www.greatmiamirivercleanup.org](http://www.greatmiamirivercleanup.org)

**Butler County Children's Waterfest** - Friday, October 10 at Miami, Hamilton. Volunteers and presenters are needed. Just over 1,000 elementary students from around the county attend this fun educational event with their teachers. To run the event, we have about 100 volunteers and 40 presenters. Interested in finding our more, then [Email Lynn](#). Its a lot of fun, but if you are not convinced, volunteers and presenters receive a t-shirt, lunch, and great donuts : )

### Water Treatment Plant Tours

In Fairfield (both drinking and wastewater) Thursday, October 30. Tour starts at the Drinking Water Plant located on Groh Lane in Fairfield, next to Waterworks Park. The plan is to meet at 12:15 at Waterworks Park. 12:30 - 1:30 tour drinking



Elk Creek begins in Preble County, flowing southeast toward Wayne and Madison Townships. It continues to flow south through Madison Township, eventually emptying directly into the Great Miami River. Elk Creek gained its name from Robert McClellan, who, according to the Middletown Historical Society, hunted the last herd of elk in the area. Elk Creek is the largest creek in Madison Township. Its size and consistent flow made it a great place to build grist mills and saw mills. The first grist mill along Elk Creek was built in the early 1800s by Bambo Harris. Some of the flour produced in the mills along Elk Creek was transported by flat boat to the Great Miami, then to the Ohio River, eventually ending up in New Orleans. Today, Elk Creek is commonly used for recreational purposes, flowing adjacent to many parks such as Sebald MetroPark.

Elk Creek is 12.6 mile long and drains about 48 square miles of land into the Great Miami River. Elk Creek and its tributaries traverse through mostly agriculture land (89%). The remaining land use is in forested and recreational areas such as Sebald Park (4%), and in developed land (~7%) ([www.oki.org/pdf/wqm/Fulldocument.pdf](http://www.oki.org/pdf/wqm/Fulldocument.pdf)).

As shown in the map above, the Stream Team has sampled several sites in the headwaters (sites #11009, 11011, 11006, 11008), on an unnamed upstream tributary north of Streebe Road and West Alexandria Road intersection, (sites #14013, 14008), midway (sites #14005, 14015), by Sebald Park (sites #14003, 14006, 14007), and just north of Trenton (site #16020). The headwater sites (Wayne township) have good riparian buffer zones, but they are surrounded by significant agricultural land use. Sites #14013, 14008 also have good riparian cover in their wooded areas, as well as being surrounded by large agricultural areas. Midway, site #14005 is totally surrounded by agriculture, and site #14015 located on a tributary near where it flows into Elk Creek, is surrounded by a wooded buffer zone. Further downstream, site #14003, located at the mouth of Dry Run Creek is also surrounded by a good wooded buffer with a generous wooded area extending north, Sebald Park across the street, and agriculture occupying a large swath on the south side of the wooded riparian zone. Site #14007 is on north side of the bridge entrance to Sebald Park and #14006 is several yards south of the same bridge. Elk Creek borders Sebald Park, so both sites share a somewhat wooded riparian zone with the aforementioned agricultural field adjacent to them. The most downstream site, #16020, is located just north of Trenton. It is in a rural area with little riparian cover. North of this site, Elk Creek flows through a large wooded area, part of which is Sebald Park. Weatherwax Golf Course is just northeast of Sebald Park, farm fields lie just to the east of this site and light development and farm fields lie beyond the riparian zone on the west side.

Even though Elk Creek watershed drains a lot of agricultural land, it has a riparian zone for most of its length. So we would like to think that the riparian zone would help mitigate any high concentrations of nutrient run-off from the agriculture fields, or landscaping applications. So what we're going to look at are the means of the Stream Team sample data collected from 2007 to 2014 for these sites and compare them with the acceptable ranges as identified on the Butler County Stream Team website under What We Test and

water, then 1:45-2:45 at wastewater which is just a little further along Groh Lane. [Sign up online.](#)

### **Volunteer Spotlight - Teresa Barnes**

Teresa is one of our "long term" volunteers – having started consistently sampling sites in 2007 - but, you may remember her from the volunteer breakfast back in February as she is taking over the administrative side of Stream Team. Before getting into what that means – how about a little background first.

I graduated from Lakota High School (back when it was only Lakota High School) in 1990. Having grown up camping and visiting lots of National Parks, I have always been interested in doing things with the environment – so – I started my college education at Bowling Green State University majoring in Environmental Science. Following this program gave me the opportunity to work with the USFS and be a naturalist at a camp north of Ely, Minnesota for the summer. (it was about 8 miles from Canada – at least as the crow flies) While I returned to Bowling Green for my sophomore year, the north woods of Minnesota would not let go. So I transferred to the University of Minnesota, Duluth – where I earned a Bachelors of Science in Hydrogeology in 1994. Due to various reasons, I returned to southwest Ohio and was hired by a company that managed existing water and sewer systems. Through this position, I also became interested in the engineering side of things. The company worked with me to allow me to go back to school again and start to earn a Bachelors of Science – Civil Engineering.

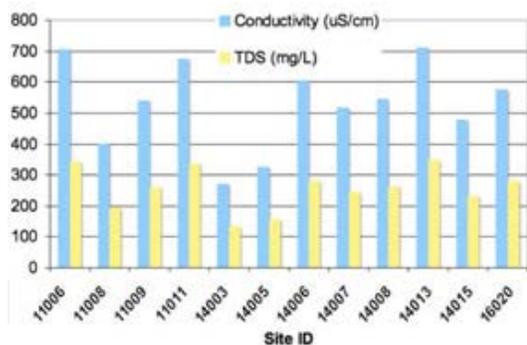
Why ([www.butlercountystreamteam.org](http://www.butlercountystreamteam.org)). However, the number of samples taken vary at each site and not all the sites have had samples collected in 2014, so the number of samples varies quite a bit. The mean values are summarized in the graphs below.

### Conductivity and Total Dissolved Solids (TDS)

As you may recall from the Stream Team website, conductivity tells us how well the water sample can carry an electric current. Conductivity readings provide an estimate of dissolved ionic matter in the water (Annis Water Resources Institute [www.gvsu.edu/wri/](http://www.gvsu.edu/wri/)) and can alert us to environmental problems based on the acceptable ranges for human health and aquatic life versus where the samples are taken. The normal "wadable" stream guideline range is between 50-500 umhos/cm, with 500 umhos/cm being the maximum (<http://www.butlercountystreamteam.org/Procedures/>). The acceptable range for aquatic life is between 150-500 umhos/cm. Low values can indicate low nutrient loads and therefore higher quality streams. High values can signal high nutrient loading. Very high values can warn us of a possible pollution events (AWRI).

Total Dissolved Solids (TDS) are tiny particles of matter that have dissolved in the water, like iron, phosphates, and nitrates. TDS measures all of the dissolved solids in the water column, but it doesn't tell exactly what the dissolved solids are. Too much or too little can effect water temperature and effect the growth of aquatic life, making the water unsuitable for the plants and animals that depend on it. The TDS range for fresh water is 25-250 mg/L, with the acceptable human health average being 500 mg/L (<http://butlercountystreamteam.org/Resources/Pdf/Research/RiveraHernandezReport.pdf>)

Most of the Elk Creek sites show conductivity levels above the aquatic life range. The Elk Creek headwater sites and site 14013 have the highest values. However, the conductivity for sites 14003 and 14005 (midway points) are significantly lower than the other sites and well within the acceptable range. TDS values follow the same pattern with sites 14003 and 14005 having the lowest values. With 8 out of 12 sites exceeding even the drinking water standard over a 7-8 year span, this would suggest a chronic run-off problem that can have negative implications for not only aquatic life, but human health as well.



### Nutrients

As you may recall, nitrates and phosphates easily dissolve in water, are naturally occurring and are necessary to aquatic plants and animals. There is usually not a problem unless they are found in the water in very high levels. Sources of high levels are typically runoff from fertilizer use, leaking from septic tanks, sewage, erosion of natural deposits (<http://water.epa.gov/drink/contaminants/#List>), and industrial discharges. The result is algae blooms that deplete oxygen in the water, causing die-offs of aquatic life, sometimes disrupting aquatic ecosystems on a large scale. The recent Lake Erie algae bloom that impacted the Toledo area drinking water demonstrates how large-scale use of phosphorous-containing fertilizers can degrade the quality of our water resources, risk our health, and disrupt our daily lives.

While the US EPA sets a maximum human health limit at 10 mg/L for nitrates, the EPA's maximum aquatic use level for most stream is only 1.1 mg/L. However, it only takes nitrate values above 0.5 mg/L with high phosphorous levels to contribute to algal blooms. As you can see on the graph below, mean values in all of the sites sampled on

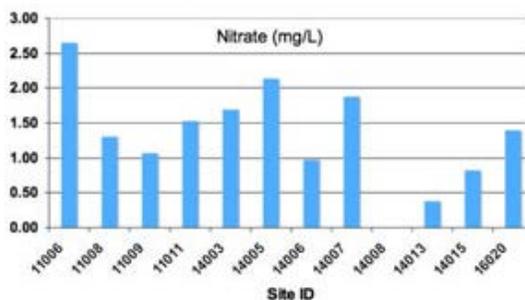
Through the University of Cincinnati, I was also able to work with H.C. Nutting performing QA/QC for construction sites. I graduated in 2000 with my second Bachelors Degree. I moved to San Antonio, Texas in November of 2001 and shortly after, started working for a civil engineering firm there. However, in 2004, with the opportunity to work for Butler County Engineer's Office, I moved home once again. And here I will stay. I really enjoy working for both the Butler County Engineers Office and the Butler County Storm Water District. I received my P.E. (professional engineer license) in 2005 and get to do a wide variety of things, so the days are never boring.

It is through the Storm Water District that I have come to take over the administrative side of Stream Team. This essentially means that I will be undertaking much of the "paperwork" that goes along with all that we do. It is our goal to be able to become a Level 2 – Credible Data project that provides data to the State of Ohio. For us to do this, there is quite a bit of documentation and such that has to be maintained and submitted to the state on a regular basis. I hope to be able to provide all of you with updated site packets and additional information at the next Appreciation Breakfast, February 14, 2015 – so save the date.

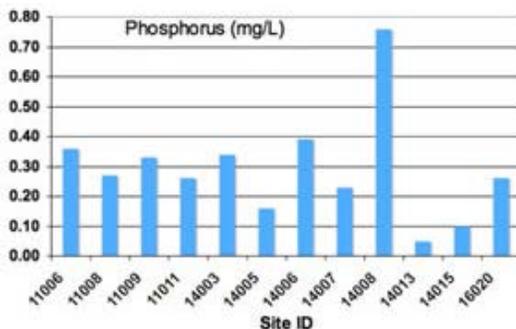


When not at work, I am a single mother taking care of Miranda, my 13-year old. We both enjoy

Elk Creek exceeded the 0.5 mg/L value, except for site 14013. However, compared with the nitrate graph based on land use type presented at the 2014 Volunteer Brunch, Elk Creek's nitrate values are typical for agricultural land use. Site 14008 (unnamed tributary) only had six samples available for this site, so it is difficult to explain this result.



Standards for phosphate depend on size of stream; OEPA exceptional warmwater habitat for small streams = 0.04 mg/L (<http://butlercountystreamteam.org/Resources/Pdf/Research/RiveraHernandezReport.pdf>). Elk Creek in Butler County has been designated as an Exceptional Warmwater Habitat for aquatic life use in a 2011 OKI Water Quality Management Plan for Butler, Clermont, Hamilton, and Warren Counties in Ohio (<http://www.oki.org/pdf/wqm/Fulldocument.pdf>). Unfortunately, the phosphorous values combined with the nitrate values indicate that algal blooms have occurred along Elk Creek. Then there is site 14008 on the unnamed tributary. It is significantly different from the other sites. Out of six samples, one large value of 1.7 mg/L appears to have contributed to the mean phosphorous at this site being high. Perhaps an early spring fertilizer application of phosphate, followed by a rain event, caused the high reading. Or maybe we have some bad samples. A greater number of samples would provide a truer picture of what is happening at the sites and improve the data's reliability.



## Turbidity

This value refers to the cloudiness of the water, or the concentration of suspended particles of all kinds. Just as with other parameters like TDS, the amount of particles floating in the water can effect its temperature, its oxygen level, and indicate levels of disease-causing microorganisms such as viruses, parasites and bacteria (US EPA). Turbidity is a function of soil runoff. So the more turbid the water is the particles to absorb heat, the less oxygen in the water for aquatic life. However, since turbidity itself is not a major health concern (US EPA), there is no standard. The graph below shows that site 14008 is again significantly different from the other sites. Out of six samples, two were from a January and a February sample, when use of road salt and/or sand would be the highest. The turbidity levels are low for all the other sites, below 10 NTU, which we would expect to see for this type of land use.

traveling and visiting all the wonders this county has to offer, especially the National Parks. As of this past Saturday, Miranda has earned 94 Jr. Ranger Badges, with 4 more to come next week. I am looking forward to figuring out where to go for her 100<sup>th</sup>....???......

I look forward to working with all of you as the Butler County Stream Team continues to build an invaluable database of information to continue painting the picture of water quality within our Butler County Streams.

## Crisis Spot

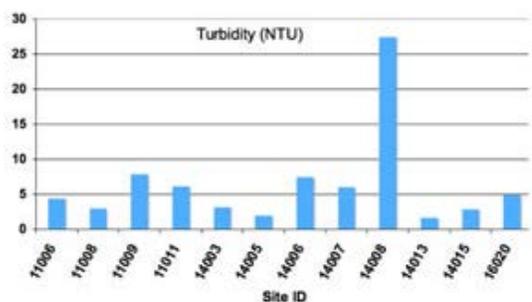
You are our eyes in the field, the first line of defense for streams in Butler County when there is a problem. As you are out sampling or just out for a walk along the waterways and see something wrong, email us. Once the problems have been reported to us, we can pass it along to the appropriate agencies. We always want to hear from our volunteers and especially if there is a problem that can be corrected. Thanks again for all you do for Butler County Stream Team!

Crisis Spot emails can be sent to Teresa Barnes at [barnest@bceo.org](mailto:barnest@bceo.org)

## Lending Library

We all have lots of books that we would love to share with someone who has similar interests. So we thought this might be a way to share some books with people we know like streams! The books are in the Stream Team lab, ready to be borrowed by anyone who would like to do so.

If you have books, DVDs or other things - especially about water - that you would like to contribute, feel free to bring



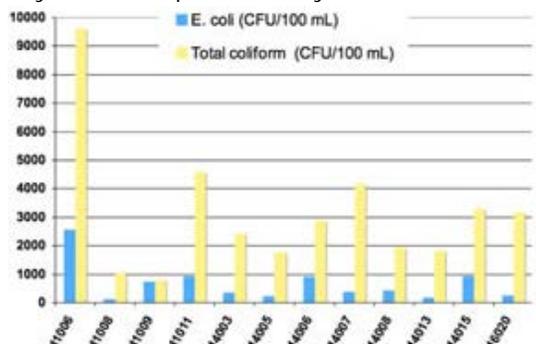
## Bacteria

E. coli and total coliforms are the measures of fecal contamination of water. The sources of human and animal feces contamination would be leaking septic systems, wastewater treatment plants, feedlots and water runoff. We use the former OEPA frequent primary contact standard and the secondary contact level as our range, giving us a range of 2,000CFU/100mL - 5,00CFU/100mL.

The graph below shows that site 11006 is significantly different from the other sites, having a value of 9,625 CFU/100mL for total coliform. There could be a feedlot problem, since it is in a rural area. Interestingly, the site just downstream, #11008, has the lowest E. coli value of 136 CFU/100 mL. Even though sites 11006, 11008, and 11009 are physically very close together, they have only four data points each. That makes the data from these points less reliable, because we don't have enough information to draw accurate conclusions from.

The other sites all have total coliform values either within range or below. Time of year could account for the elevated values found at sites 11011 and 14007.

The good news is all E. coli values either within range, like #11006, or well below the range. This may indicate that residence are properly maintaining their septic systems and any treatment plants nearby are likewise monitoring and maintaining their plants.



## What does this all mean for the Elk Creek watershed?

The 2011 OKI Updated Watershed Management Plan identified the causes of nonpoint sources of impairments to Elk Creek as flow alteration and nutrients. The sources of the impairments were also identified as sedimentation, channelization, contaminated sediments, landfills, natural (deer feces), non-irrigated crop production. The report classified the impaired uses for aquatic life and human health.

What does this all mean for the Elk Creek watershed? This could mean that in the face of large-scale agriculture, perhaps the current riparian zones are not able to effectively absorb the large applications of chemical nutrients that are being applied. Also, there may be some landowners who may not be aware that their lawn or farm chemical applications need to be adjusted. What is clear is the need for continued sampling, consistent sampling, and continued monitoring of this watershed as the area develops and puts additional pressure on the Elk Creek environment. So let's keep working at it so we don't lose that Exceptional rating for Elk Creek. After all, isn't that why we care enough to volunteer?

them along anytime. Or, if there are particular books you would like us to buy, let us know and once a year or so we can add a few to our collection.

Here's our list to date:

- \*A Guide to Common Freshwater Invertebrates of North America
- \*A Guide to Ohio Streams
- \*After the Storm - DVD
- \*An Introduction to the World's Oceans
- \*Bugs of the Underworld: a fly fisher's guide to the natural history of aquatic insects (DVD - available on request)
- \*Exploring the World Ocean
- \*Fostering Sustainable Behavior: An introduction to community-based social marketing
- \*Guide to Aquatic Insects & Crustaceans
- \*Gulf Hypoxia: Action plan 2008
- \*Handbook for Developing Watershed Plans to Restore and Protect Our Waters
- \*Introductory Oceanography
- \*Life in the Soil: A guide for naturalists and gardeners
- \*Marine Ecology
- \*Migratory Shore and Upland Game Bird Management in North America
- \*Monitoring Guidance for Determining the Effectiveness of Nonpoint Source Controls
- \*Oceanography
- \*Ohio's Lake Erie Public Access Guidebook,
- \*Ohio's Lake Erie Public Access Guidebook: Rivers Edition
- \*Ohio Vernal Pools: Diamonds in the Rough (DVD - available on request)
- \*Our Waters, Our Health
- \*Pond and Brook: A guide to nature in freshwater

environments

- \* Rainbows of Rock, Tables of Stone: The natural arches and pillars of Ohio,
  - \* River of Words
  - \* Stemming the Tide of Coastal Fish Habitat Loss
  - \* Swamp and Bog: Trees, shrubs, and wildflowers of eastern freshwater wetlands
  - \* The Colorado: A river at risk
  - \* The Evolution of North America
  - \* The Face of the Deep
  - \* The Mill Creek: An Unnatural History of an Urban Stream
  - \* Watersheds: A Practical Handbook for Healthy Water
- If you have any comments, concerns, or suggestions, please contact us at [whitelr@butlercountyohio.org](mailto:whitelr@butlercountyohio.org).

Butler County Stream Team Monthly Newsletter

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