

Riffles & Pools

Office of Water Quality www.idem.IN.gov



Deer's Mill covered bridge straddles Sugar Creek near Shades State Park, Montgomery County, Indiana. See page 3 for more info on the flowers shown in the foreground here.

Photo by Scott Frosch

Greetings Riverwatchers!

Happy spring, Readers! The flowers are abloom and leaves are springing forth on trees again. Office of Water Quality staff here at the Indiana Department of Environmental Management (IDEM) have started the chemistry sampling portion of the new season, with biological and other crews getting ready to roll.

Several HRW-trained volunteers have also been busy collecting and entering data into the HRW online database. Shout out to Jennifer D. (Little Calumet-Galien Watershed), Pam R. (Lower East Fork White), and Paige S. (Mississinewa) for sampling as early as January of this year! Reminder to our trained volunteers to let us know your monitoring equipment or [supply needs](#).

We are pleased to welcome back HRW Coordinator, Carol Newhouse! She is looking forward to working with all of you and *getting her feet wet* in Indiana's wadeable streams once again.

COVID continues to pose challenges, but we encourage the training of Hoosiers interested in water quality monitoring. We request you follow state and local protocols for social distancing and wearing of face masks during workshops.

– Kristen Arnold, Technical and Logistical Services Section Chief
Watershed Assessment and Planning Branch

Spring 2021

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MARK YOUR CALENDARS!

Upcoming Workshops

May 15 – Bristol

June 17 – Pine Village

Sept. 3 – Bristol

And more to come as we work to reopen workshops in 2021!

Hoosier
Riverwatch is
administered by



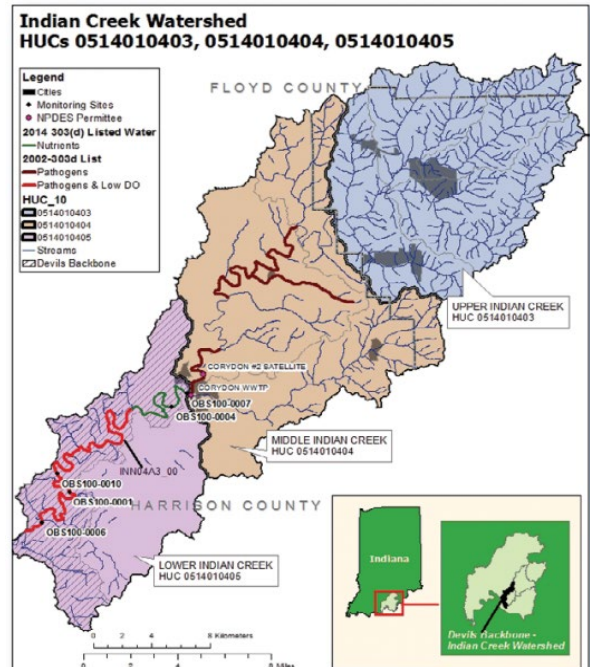
Watershed Success Stories: Devil's Backbone

The 11th installment of the stories of watershed success efforts collected by IDEM staff and grant recipients over the years.

The Devil's Backbone section of Indian Creek, Harrison County is a 21-mile reach in south central Indiana. It lies just upstream of Indian Creek's confluence with the Ohio River (see hatched area in lower left of the map shown here, as indicated in the legend). The Devil's Backbone section is largely forested. However, areas upstream contain significant livestock, as well as some row crop farming operations, in addition to the towns of Corydon and Galena.

Water quality data collected by IDEM in 2000 indicated that water quality standards for *Escherichia coli* (*E. coli*) and dissolved oxygen (DO) were not being met. (See data table on the following page.)

The 30-day geometric mean of weekly *E. coli* samples was 163/100 mL (above the state standard of 125/100 mL). Of the six DO samples collected, only one was above the state standard of 5 mg/L daily average, while four were below the state minimum of 4 mg/L needed to sustain fish life. Due to these results the Devil's Backbone section of Indian Creek was listed by IDEM on its 2002 Clean Water Act (CWA) [Section 303\(d\) List of Impaired Waters](#) for failing to attain aquatic life and recreational uses.



From 1996 until 2010, implementation activities to improve water quality were conducted in this area as follows:

- 1996 to 2006 [The Nature Conservancy](#) (TNC) reforested 4.4 miles of riparian corridor. They also added 61 acres of land to the Harrison-Crawford State Forest to protect an additional 0.6 miles of riparian corridor.
- 2006 to 2008 the Harrison County Commissioners tasked the [Harrison County Regional Sewer District](#) (HCRSD) with developing a [watershed management plan](#) (WMP) to determine the location and type of [best management practices](#) (BMPs) needed within and above the Devil's Backbone area. Problems identified in the watershed included poor riparian habitat, run-off from row crops, livestock access to streams, and leaking or failing septic systems.
- TNC partnered with the HCRSD and [Harrison County Health Department](#) to mail septic system maintenance reminders to county residents.
- Project partners subsequently installed 3,155 acres of pasture/hay planting; 2,177 acres of prescribed grazing; ~1,112 acres in no-till farming; ~592 acres of cover crops; ~160 acres of permanent grass plantings; 116 acres of stream habitat improvement; ~102 acres of riparian buffers; ~47 acres of filter strips; 2.5 acres of critical area plantings; and 145,100 feet of fencing to exclude livestock from streams.

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Watershed Success Stories: Devil's Backbone (cont.)

The restoration of Devil's Backbone was supported by numerous federal, state, and local partners, as listed here:

- \$950,000 through [Harrison County Soil and Water Conservation District](#)'s county-funded, cost-share program for agricultural BMPs,
- \$687,567 provided by the [Natural Resources Conservation Service](#) for financial and technical assistance for use with [Environmental Quality Incentives Program](#) funding,
- \$210,000 provided by TNC to fund stream restoration and septic tank owner outreach,
- \$99,930 awarded by IDEM's CWA [Section 205\(j\) grant funding](#) to the HCRSD to create the WMP, and
- \$55,094 in [Farm Service Agency](#) funding to support [Conservation Reserve Program](#) practices.

Date	Site Number	<i>E. coli</i> ¹ (MPN/100 mL)	Date	Site Number	DO ¹ (mg/L)
Pre-project <i>E. coli</i> data			Pre-project dissolved oxygen data		
7/12/2000	OBS100-0006	243	5/16/2000	OBS100-0001	9.87
7/19/2000	OBS100-0006	708	7/12/2000	OBS100-0006	7.83
7/26/2000	OBS100-0006	40	7/19/2000	OBS100-0006	3.98
8/2/2000	OBS100-0006	20	7/26/2000	OBS100-0006	4
8/9/2000	OBS100-0006	833	8/2/2000	OBS100-0006	2.52
	Geomean:	162.88	8/9/2000	OBS100-0006	3.06
Post-project <i>E. coli</i> data			Post-project dissolved oxygen data		
5/17/2010	OBS100-0010	35.5	5/17/2010	OBS100-0010	9.16
5/24/2010	OBS100-0010	142.1	6/1/2010	OBS100-0010	8.72
6/1/2010	OBS100-0010	20.9	6/7/2010	OBS100-0010	7.63
6/7/2010	OBS100-0010	12	6/14/2010	OBS100-0010	7.16
6/14/2010	OBS100-0010	16.9	7/28/2010	OBS100-0010	7.46
	Geomean:	29.24			

¹ Values in red indicate exceedances of state water quality criteria.

Subsequent IDEM monitoring of *E. coli* during 2010 showed that water quality standards were being met (data table to the left here). As you can see from the table, the geometric mean (i.e., of five samples collected at regular intervals over a 30-day period) had dropped to 29.24/100 mL (or MPN/100mL); well within the State's recreational standards for full body contact recreational use. Note that none of these samples exceeded the single sample maximum of 235/100 mL.

IDEM also measured DO in the watershed during 2010. At no time did the DO fall

below the minimum daily average criterion of 5 mg/L or minimum single sample criterion of 4 mg/L. Based on these data, all four segments of the Devil's Backbone section were removed by IDEM from its 2014 CWA Section 303(d) List of Impaired Waterbodies.



The cover photo chosen for this edition hinted at these native wildflowers (also photographed by Scott Frosch): the lovely yellow "spring aconite" is shown to the left, while "snowdrops" are the white flowers shown below.



Inhale the future.
Exhale the past.

- Layne R., Ohio

Quote seen inside a Dove dark chocolate wrapper.

Earth Day 2021

Earth Day as a global event has been celebrated annually since 1970. People use this time to clean up their communities, plant trees, and take action to show their love for the planet. Each year, IDEM staff members participate in events across the state to spread awareness on topics such the protection of Indiana's natural resources, composting, recycling, and (more recently) handling of [e-waste](#).



This year IDEM staff members conducted 300 Earth Day virtual presentations in classrooms across the state. Interactive presentations are vital to teaching students ways they can positively impact the world around them. With COVID-19 precautions still in place, IDEM's environmental education coordinator made extensive updates to the previous live presentation formats; adding and updating photos, short videos, and whiteboards via an online, game-based learning platform called [Kahoot!](#).

IDEM also participated in a few live Earth Day events. On Thursday, April 22, from 4 p.m. to 7 p.m., the City of Marion hosted an Earth Day celebration at the Gardens of Matter Park. Admission was free for all ages. There were activities for kids, food vendors, free composting, and more. IDEM will also be participating in the [Earth Day Indiana Festival](#) scheduled for June 5.

Suddenly, it's almost Spring and the new blue sky is full of clouds, blowing and tossing like somebody's wash, even though the air's still cold and the ground still hard. If you look hard, you can see but starting to swell, stick their little chests out, and look, here are the first stabs at green crocus and daffodils piercing their way through dirt's dark cloth. Even though finches are still wearing their winter coats, those dull serviceable tweeds, the fields on the tawny hills have shifted into green, full speed ahead, and robins have set their alarm clocks and are up early, catching the worm. Everywhere, bare branches toss in the wind, hello, hello, hello.

- Barbara Crooker, author



(Left) Alverna Creek awakens in the Daubenspeck Community Nature Park in Indianapolis.



(Above) Pogue's Run graces many a park and neighborhood on the near eastside of Indianapolis.



(Right) Spring turns into summer a little earlier at Clifty Creek, located in Clifty Falls State Park, Madison, Indiana.

Fare Thee Well, John Ulmer!

How fortunate the Hoosier Riverwatch (HRW) program has been to have had John Ulmer as an instructor for the past 16 years! Many of you have likely benefited from his tutelage as he has instructed over 325 people in more than 33 basic Riverwatch workshops and more than 11 advanced *E. coli* workshops, with a number of those across the state and many conducted at Holliday Park in Indianapolis.

John is a life-long Hoosier who was born in Indianapolis where he was active in scouting and attended Crooked Creek Grade School and North Central High School. He graduated from Rose-Hulman Institute of Technology and then went to work for the RCA Record Club as a programmer/analyst and manager of mailing systems.



John Ulmer drops in at the IDEM office for supplies.

John's dedication to citizen science and his contributions to HRW are significant and greatly appreciated! Thus, we asked him to share his thoughts with us on the following questions:

Q: How did you learn about the HRW program and what interested you in becoming a HRW volunteer?

A: I think I heard of Hoosier Riverwatch at a Master Naturalist training. As I like to fish it seemed like a natural follow on.

Q: When did you get involved in the HRW program and when did you become an instructor?

A: Completed HRW training in October 2001. I have my original ID card (was told to keep it on my person at all times). I became an instructor in April of 2004.

Q: What did you find most compelling/enjoyable about the HRW program?

A: Enjoyed presenting the program as a "system" - habitat, chemistry and biology of the stream. Really fun as to the diverse backgrounds of people who signed up. Actually, I had a guy I worked with at RCA in the 1960's who lives in Madison, Indiana show up in a workshop at Holliday Park.

Q: What watershed or stream did you monitor?

A: Eagle Creek, Upper White River watershed. My monitoring was infrequent (do as I say not as I do syndrome). I became pretty active with Eagle Creek Watershed Alliance and IDEM Grants.



Received Instructor of the Year award in 2008.

Q: Did you see changes or trends in the water quality, habitat, and/or biological communities of the stream(s) you monitored?

A: We could see some localized improvement from BMP's that were installed. However, these were somewhat transitory due to funding. Eagle Creek watershed is small geographically and is pretty "flashy" with stormwater and soil erosion as major problems.

Q: If so, to what would you attribute those trends?

Continued on next page>

Fare Thee Well, John Ulmer (cont.)

A: I think the amount of development in the watershed is way above average for the state. Rooftops, driveways, sidewalks, paved trails have completely changed the character of Eagle Creek. (Last week the CFS discharge went from 90 to 4000 overnight with one heavy rain.)

It is a complex problem, especially when the transition is from a rural/agricultural area to a suburban one. Stormwater management changes from County Surveyor Ditch Law of moving the water off the land as soon as possible to subdivision ordinances controlled by the use of retention ponds. While retention ponds offer “some” mitigation I do not feel it is commensurate with the amount of runoff from more streets, roofs, driveways, sidewalks and such.



Demonstrating use of a turbidity tube to workshop participants in Shelbyville.

The above coupled with the increase in intensity of storms, as indicated by an increase of over 400% of discharge in less than 24 hours, pretty much scours the banks and bars and fill the streams with sediment.

Q: What role does/can the HRW program play in improving the quality of our streams and rivers?

A: The Mission of HRW is “To involve the citizens of Indiana in becoming active stewards of Indiana’s water resources through watershed education, water monitoring, and clean-up activities.” Increasing workshop participation would be a start in fulfilling the HRW mission.



Representing HRW at Zionsville's Earth Day festival ZGreenfest.

I have always thought the gem of HRW was the database and from my background found it to be way ahead of its time. The main problem with the HRW database is ... lack of DATA. Fewer volunteers mean less data collection opportunities. Having robust data not only speaks to the success of HRW but also provides trend data for the health of Indiana’s waters.

Volunteer-collected data is critical as it is collected in the headwaters, where pollution starts, of our streams and rivers. There are many more volunteers, past, present and future than staff available to sample throughout the state.

Q: What would you say to someone considering volunteering as a HRW monitor?

A: The workshop training is very good, and you will get a better understanding of what is going on outside of your electronic environment. There is an opportunity to contribute to the data that is used in formulating state policy.

Q: What are your plans post “retirement” from the HRW program?

A: I have always “promoted” Indiana as a cool state. You can easily drive to environmentally and ethnically diverse areas on a daytrip. That is why I always enjoyed my “have trunk will travel” workshops so much. My age will probably creep in as in “well I remember when so and so was right there”. I still have a bug net and macro book so I might contribute to the database some.

Words cannot express our gratitude to John for his service to HRW, teaching, and water quality! Fare thee well, Mr. Ulmer!

Flora Photo Page (For Fun and Your Viewing Pleasure)



(Top L to R) **Skunk cabbage** is first to make its appearance in much of Indiana, followed soon after by the **trout lily** (or dogtooth violet) and later by blooms of understory trees such as the **redbud**.

Trout lily photo by Scott Frosch.



(Middle row, L to R)
Harbinger-of-spring peaks up through leaves and fragrant **Virginia bluebells** satisfies the hunger of a tiger swallowtail butterfly.

Both photos by Scott Frosch.



(Bottom, L to R) Another understory tree, the **dogwood** blooms in conjunction with the redbud, quickly shading out the early blooming **bloodroot** and the **sharp-lobed hepatica** (the leaves of which are not visible here but give it its name).

Second two photos by Scott Frosch.



Fauna Photo Page (Additional Fun and Education)



(Clockwise, starting at upper left)

Amphibian eggs photographed by Scott Frosch, IDEM Emergency Responder while on one of his many caving forays. I love the photos he posts on social media of stream and life underneath the Indiana and Midwest landscape. Working at a state fish hatchery a few years ago, I was pleasantly surprised at how many salamander “efts” (their version of a tadpole) were in the ponds in addition to all the frog and toad tadpoles. Hard to tell which they are at this age since eftts also start out life without legs.



Macroinvertebrates collected by IDEM staff during the summer season, being sorted and identified later in the year by the same staff. Very similar to how HRW collects macros, only we get to release our samples back to the streams alive.

Heptageniid mayfly nymph collected by IDEM staff.

Brachycentrid caddisfly larva, shown with its log-cabin-shaped case made from plant material.

Same larva as previous, but outside of its self-made case. Also collected and identified by IDEM staff. Be glad, Riverwatchers, that we volunteer monitors do not have the arduous task of identifying down to these taxonomic levels!



Mark Your Calendars

2021 Basic Training Workshop Schedule

A Hoosier Riverwatch Basic Training workshop introduces you to hands-on water quality monitoring methods. You will learn about aquatic habitat, chemical, and biological assessment techniques. Sessions are held in- and out-of-doors. All interested persons, age 18 and over, are welcome to attend. Once trained, certified educators are qualified to teach these methods and topics to their students.

Workshops are free of charge. But it is important to register in advance using the contact given for the workshop you are interested in. Training does come at a cost to the program, however, as well as to the host and/or instructor. So, please, contact your instructor or host if you will *not* be able to attend the workshop that you have signed up for.

Please remember that volunteers and instructors should abide by state and local protocols for social distancing, hand washing, and wearing of face masks at the time of their training. Thank you for helping us keep you safe and healthy!

Saturday, May 15 **Bristol, IN** – Bonneyville Mill County Park (9 a.m. – 4 p.m.). Instructor will be Krista Daniels. Please register using this Google form: <https://forms.gle/XfYcnmqqtFRakC6W8>. Masks are required.

Saturday June 17 **Pine Village, IN** – Warren County; Pine Creek Camp, 2218 E 700 N (9 a.m. – 4 p.m.). Instructor will be Seth Harden. Contact Seth at seth.harden@tnc.org to register. Masks may still be required at this time.

Friday, Sept. 3 **Bristol, IN** – Bonneyville Mill County Park (9 a.m. – 4 p.m.). Instructor will be Krista Daniels. Please register using this Google form: <https://forms.gle/XfYcnmqqtFRakC6W8>. (Guess we will see if masks are still being required at this time.)

Please watch for updates to the [workshop schedule](#) later this season.

Advanced Training Workshop Information

Advanced workshops are typically half-day in length. Participants must have completed a full-day, basic training workshop prior to signing up for an advanced workshop. The most common advanced topic asked for and offered is training for *E. coli* sampling. Additional topics might include database usage, advanced macroinvertebrate identification, data presentation, and so forth.

We look forward to having you join us!



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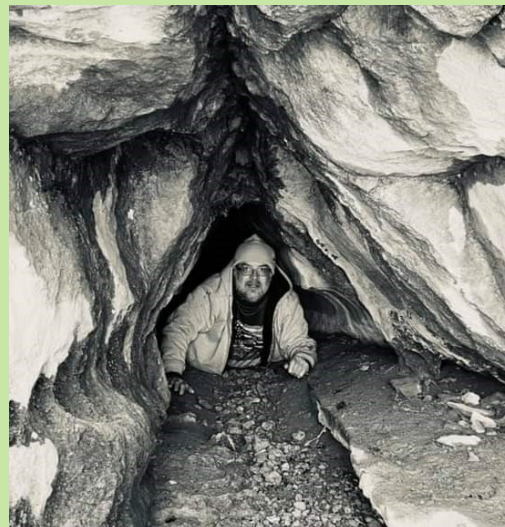
IDEM Office of Water Quality Mission

The Office of Water Quality's mission is to monitor, protect, and improve Indiana's water quality to ensure its continued use as a drinking water source, habitat for wildlife, recreational resource, and economic asset.

The office achieves this by developing rules, guidance, policies, and procedures; assessing surface and groundwater quality; regulating and monitoring drinking water supplies and wastewater facilities; protecting watersheds and wetlands; and providing outreach and assistance to the regulated community and the public while supporting environmentally responsible economic development.

Hoosier Riverwatch Mission

The mission of Hoosier Riverwatch is to involve the citizens of Indiana in becoming active stewards of Indiana's water resources through watershed education, water monitoring, and cleanup activities. [Hoosier Riverwatch](http://www.hoosierriverwatch.com) is a water quality monitoring initiative sponsored by the Indiana Department of Environmental Management's *Office of Water Quality*.



Left - IDEM staff member, ardent caver, and a favorite photographer of HRW staff, Scott Frosch in one of his favorite haunts.

Lower left – A little waterfall in Putnam County.

Lower right – Rock Creek in Warren County.

Photos courtesy of Scott Frosch.

