

# Riffles & Pools

Office of Water Quality

idem.IN.gov



## Greetings Riverwatchers

Happy spring to everyone! Countless flowers are blooming, and green foliage is starting to bud out on our treetops. The sweet smell of spring is accompanied by seasonal rain showers, filling up our creeks and rivers. Temperatures are on the rise and our volunteers are beginning to visit their sites for the first time this year, although we have a handful of “early birds” that get out during the winter months. (Shout out to Jim Bancroft of Carmel Clay Parks for the earliest sampling this year – January 11<sup>th</sup>!)

As the sampling season ramps up, I’m excited to be offering a schedule full of workshops. I’ve had the pleasure of conducting several workshops myself already this year, two of which were instructor trainings which added to our talented pool of workshop leaders. In addition, we were able to show our appreciation to our instructors by hosting a day-long gathering at Fort Harrison State Park in February (see below for the story).

Enjoy the sunshine and flowers this spring. When getting your feet wet this season, please don’t hesitate to reach out for technical assistance or equipment needs.

Dylan Allison  
Hoosier Riverwatch Coordinator

### Spring 2023

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#### *Upcoming Workshops*

July 25 – Vincennes, IN

August 7 – Michigan City

August 8 – Michigan City

Sept. 9 – Bristol, IN

Sept. 9 – South Bend

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## 2023 Instructor Gathering

Hoosier Riverwatch would not have the same positive impact without the trained volunteer instructors that offer workshops throughout the year. The “train the trainer” model used in the program allows for a greater reach across the state. Our instructors can be found from the Michigan-Indiana state line to the Ohio River. In addition to conducting Hoosier Riverwatch workshops, instructors often collect data, conduct youth outreach, and coordinate watershed management plans. To show appreciation for our instructors, we organized a gathering held at The Garrison at Fort Harrison State Park in February.



The event was held at the historic Garrison Banquet & Conference Center. This World War II era building was the Officer Club when Fort Harrison was an active Army post. Nowadays, The Garrison offers meeting spaces like the original ballroom, dining options for lunch and dinner, and a pro-shop for the Fort’s 18-hole golf course.

The gathering provided a slate of speakers who presented on a variety of topics. Addison Seidler of IDEM, pictured at right, discussed diatom identification and cyanobacteria (blue-green algae) sampling methods.







IDEM's Dylan Brown (on left) and Mitchell Owens presented on macroinvertebrate identification and sampling methods. They showed off an assortment of equipment and resources.

Attendees enjoyed the sunny day with a guided hike led by park naturalist Emilie Sweet. The hike took participants past Delaware Lake, pictured at right, and Fall Creek, a tributary of the White River.



**Congrats to our 2022 instructor award recipients!**

Most 2022 Workshops – Darci Zolman

Longest Active Volunteership – Lyn Crighton

Most 2022 Database Entries – Carrie Parmenter

Thank you to all Hoosier Riverwatch instructors for their hard work and commitment!





## NONPOINT SOURCE SUCCESS STORY

# Indiana

## Aquatic Life in Big Creek Benefits from Land Conservation Practices

### Waterbody Improved

Nutrients from fertilizer, livestock, and failing septic systems are the primary detriments to water quality in the Big Creek and Central Muscatatuck watershed. In 2010, the Indiana Department of Environmental Management (IDEM) listed three segments of Big Creek and one unnamed tributary segment on the state's Clean Water Act (CWA) section 303(d) list of impaired waters. Forty-four miles of stream were listed for failure to support aquatic life after a 2006 survey revealed that the fish community consisted of mostly tolerant species and few sensitive fishes. Project partners implemented a variety of land management and best management practices (BMPs) in the watershed between 2006 and 2019. Sampling in 2019 revealed that the water quality standards for aquatic life use are now being met. As a result, IDEM removed the three segments of Big Creek and the unnamed tributary segment from the 303(d) impaired waters list.

### Problem

The Big Creek area of the Muscatatuck watershed is in southeastern Indiana and includes parts of Jennings, Jefferson, and Ripley counties (Figure 1). Big Creek was designated by the Natural Resources Commission as an outstanding river in 1997 due to the stream's environmental and aesthetic interest. This section of Big Creek flows through the Big Oaks National Wildlife Refuge. Despite the high-quality landscape directly surrounding part of the stream, the watershed receives nutrient runoff from septic systems and agricultural practices in the Big Creek headwaters. Other impairments have been documented due to exploded ordnances and metal contamination from a former military base that is now part of the Big Oaks Wildlife Refuge.

### Story Highlights

IDEM used CWA section 319 funds to help support the creation of a watershed management plan in 2006. The plan for the greater Central Muscatatuck watershed was completed in 2009. State and federal programs were used to install BMPs in the Big Creek area of the watershed, including cover crops (340 acres), livestock exclusion fencing (382 feet), heavy use area protection (561 acres), animal trails and walkways (480 feet), watering troughs and facilities (15 units), pasture and hayland planting (81 acres), and others (Figure 2).

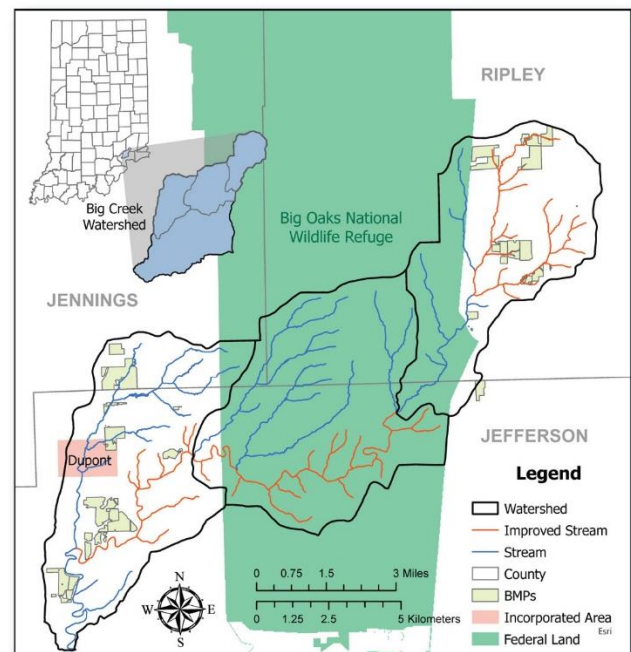


Figure 1. The Big Creek watershed is in southeastern Indiana.

The 319-funded BMP implementation phase for Central Muscatatuck watershed began in 2009 with the first of three implementation projects. The third and final phase of implementation was concluded in 2021. Land management practices in the Big Oaks National Wildlife Refuge likely contributed to



improvements and included invasive species control, pollinator habitat restoration, and controlled burns. Habitat enhancements also included dams built by beavers that were encouraged to expand their range on the refuge. The vegetation and wetlands created by the habitat restoration slowed the seepage of water into streams and allowed for greater filtration of nutrient runoff.

## Results

IDEM reassessed the biological community in 2019 and determined that the fish communities showed improvement and met water quality standards for fully supporting aquatic life use. For a waterbody to be considered as fully supporting aquatic life, the index of biotic integrity (IBI) score must be at least 36. A waterbody is classified as biologically impaired if the fish community IBI score is below the target benchmark. Results of the 2019 sampling event showed improvement in the fish community IBI compared to the 2006 sampling (Table 1). Due to these results, IDEM removed the four segments (INW0714\_02, INW0712\_01, INW0711\_T1002, and INW0711\_01) from the 303(d) list of impaired waters in 2022.

## Partners and Funding

Multiple partners collaborated to restore the biotic communities in the Big Creek watershed. IDEM provided four rounds of funding totaling \$1,589,757 in CWA section 319 grants to Historic Hoosier Hills Resource Conservation & Development (RC&D), who coordinated the cost-share program to implement the Central Muscatatuck watershed management plan. Historic Hoosier Hills RC&D provided \$975,990 in landowner and in-kind matching funds to complete the projects that benefited the Big Creek area and the greater Central Muscatatuck watershed (hydrologic unit code [HUC]-10s: 0512020706 and 0512020701). The U.S. Department of Agriculture provided \$140,678 and \$49,838 in funding for BMPs in the Big Creek area (HUC-12s: 051202070101, 051202070102, and 051202070104) through the Environmental Quality Incentives Program and the Conservation Reserve Program, respectively. The Indiana Department of Agriculture provided \$538,535 in Clean Water Indiana funding for projects throughout Ripley, Jennings, and Jefferson counties, and they provided technical assistance for the installation of BMPs.



Figure 2. Multiple BMPs were implemented to improve water quality in the watershed, including fencing to keep livestock out of streams (top), a watering facility installed on a concrete heavy use protection area pad (bottom left), and cover crops (bottom right).

Table 1. Fish community IBI scores, before (2006) and after (2019) restoration, for four stream segments in the Big Creek area of the Central Muscatatuck watershed.

Stream segment	2006 IBI score	2019 IBI score
Camp Creek – Big Creek (INW0714_02)	32	48
Marble Creek – Big Creek (INW0712_01)	18	50
Headwaters Big Creek (INW0711_T1002)	28	36
Headwaters Big Creek (INW0711_01)	26	36



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## Camptown Creek Stomps

Favorable weather during the early days of spring has opened up opportunities for hands-on sampling. In addition to the workshops hosted for adult volunteers, several outreach events have been held with Indianapolis-area schools. Hoosier Riverwatch Coordinator, Dylan Allison, partnered with Camptown to engage with students from elementary through high school.

Indy Met High School was introduced to Hoosier Riverwatch last winter (see Riffles & Pools Winter 2023 issue), but the students were now able to conduct field sampling at Fall Creek. The activities helped the students earn their Teen Indiana Master Naturalist certification.

Additionally, local elementary students were able to revisit a creek for a second round of hands-on sampling. Groups from Christian Park, Thomas Gregg, and Francis Parker elementary schools stopped by Pleasant Run at Christian Park to test the water chemistry, catch macroinvertebrates, and examine habitat. Comparisons were made between findings from the fall sampling and the spring sampling.



Photos on this page are courtesy of IDEM



## IDEM Celebrates Earth Day

Hundreds of classrooms from around the state requested environmental programs to celebrate Earth Day, and IDEM staff answered the call! IDEM employees were able to volunteer during the month of April to travel to schools to present on a variety of “green” topics. Lesson plans included activities in air, land, water, and recycling.

Hoosier Riverwatch Coordinator, Dylan Allison, was able to join the fun this year. He presented at IPS Eleanor Skillen Elementary for both 2<sup>nd</sup> and 4<sup>th</sup> grade classes. The lesson plan was called “The Incredible Journey” and demonstrated a water droplet’s movement through the hydrologic cycle. Students themselves played the role of a water droplet, rolling dice to direct their movement to different stations, such as ocean, clouds, river, groundwater, etc. Students added a colored bead to their bracelet at each station and shared their “journey” at the end of the activity. No classmates had identical bracelets, showing that our water’s path through different environments can be varied and unique. The students were engaged as they learned the importance of water, and the school staff requested that Dylan return to share again next April.



Photos on this page are courtesy of Eleanor Skillen Elementary School.



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## ***Welcome to Our New Instructors!***

- Jenna Wait, Elkhart County SWCD
- Ally Pudlo, St. Joseph County SWCD
- Amanda Heltzel, Kosciusko County SWCD
- Kate Barrett, St. Joseph River Basin Commission
- Jim Hess, Elkhart County SWCD
- Jessica Hatt, Indiana State Dept. of Agriculture
- Billy Pigg, Vermillion Parke SWCD
- Ashley Sharkey, Indiana DNR
- Leslie Dorworth, Purdue University Northwest

## ***Mark Your Calendars***

### **Tuesday, July 25<sup>th</sup>**

Vincennes, IN – Ouabache Trails Park Nature Center (9:30 AM – 3:30 PM)

Instructor: Carrie Parmenter. Email [Christopher.nettles@in.nacdn.net](mailto:Christopher.nettles@in.nacdn.net) to register.

### **Monday, August 7<sup>th</sup>**

Michigan City, IN – Krueger Memorial Hall (9 AM – 4 PM)

Instructor: Ashley Sharkey. Registration link coming soon!

### **Tuesday, August 8<sup>th</sup> (Advanced *E. coli* workshop – basic training required)**

Michigan City, IN – Krueger Memorial Hall (9 AM – 1 PM)

Instructor: Ashley Sharkey. Registration link coming soon!

### **Saturday, September 9<sup>th</sup>**

Bristol, IN – Baldwin Schoolhouse, Bonneyville Mill County Park (9 AM – 4 PM)

Instructors: Krista Daniels and Jenna Wait. Register by September 1st at

<https://www.elkcoswcd.org/hrw/>.

### **Saturday, September 9<sup>th</sup>**

South Bend, IN – St. Patrick's County Park (8:30 AM – 4:30 PM)

Instructors: Jan McGowan, Dr. Kate Barrett, Ally Pudlo. Register by September 1st by calling (574) 654-3155.

***More Workshops Coming Soon!***

## ***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 clean-up activities. Hoosier Riverwatch is a water quality monitoring initiative sponsored by the **Indiana Department of Environmental Management's Office of Water Quality**.

For more information, go to [idem.IN.gov/riverwatch](http://idem.IN.gov/riverwatch).