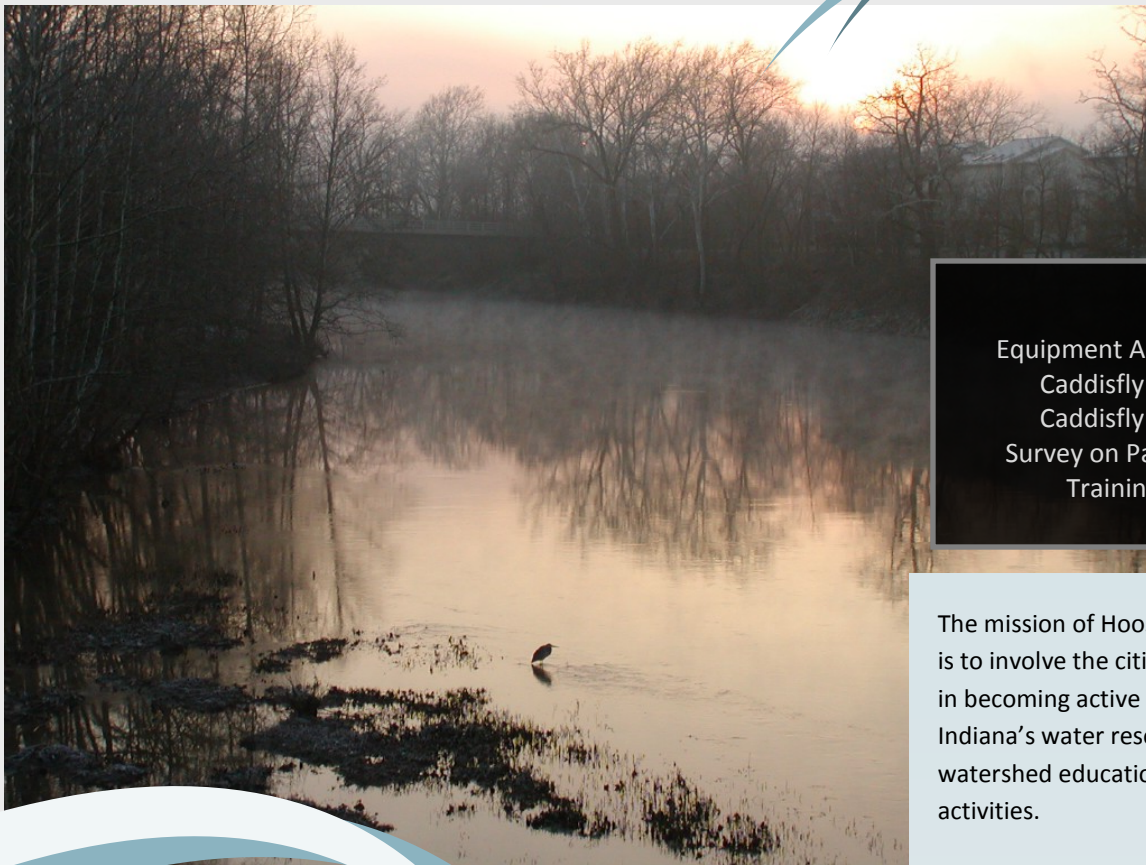


Riffles & Pools

May/June • 2013



White River

Riverwatch News

"May and June. Soft syllables, gentle names for the two best months in the garden year: cool, misty mornings gently burned away with a warming spring sun, followed by breezy afternoons and chilly nights. The discussion of philosophy is over; it's time for work to begin."

- Peter Loewer

As I write this, it appears that we are on a warming trend and maybe spring will make her arrival. Some of you probably had the itch a month ago and decided to hit your local stream to start the 2013 season. Many of you are probably waiting until the weather is tolerable (that would be me). In any case, now is the time to take stock of your inventory; is anything expired, are my waders' stream ready? In addition, I encourage you think about your goals for the season. What water quality questions do you want to answer? For example, is there a threat of pollution entering the stream from a nearby parking lot? This definition will influence you decisions on what, where, and when to monitor.

this issue

Equipment Applications P.2
Caddisfly Fact Sheet P.3
Caddisfly Fact Sheet P.4
Survey on Partnerships P.5
Training Schedule P.6

The mission of Hoosier Riverwatch is to involve the citizens of Indiana in becoming active stewards of Indiana's water resources through watershed education and clean-up activities.


Hoosier Riverwatch is sponsored by the Indiana Department of Environmental Management



Riverwatch News Continued

I am excited to announce that our new website is up and running. You can now find out information about Riverwatch, workshop calendar, on-line manual, etc. at www.idem.in.gov/riverwatch. As with most things during the transition, we are continuously redefining and vamping our resources. I welcome suggestions as to content you think would be worthy to place on our website.

Happy Monitoring



2013 Riverwatch Equipment Applications

Applications are now available for equipment packages. Hoosier Riverwatch equipment is available to groups that meet the following criteria.

- Be affiliated with a non-profit organization, school, or government agency
- Agree to the Cooperative Agreement (pg. 4), including:
 - Attend a Basic Training Workshop (Must be registered for a 2013 workshop upon submission of application)
 - Monitor and submit data online at least 4 times per year for 2 years (*Total of 8 data sets by December 31, 2015*)
- Return the completed 2013 Equipment Application no later than **September 1, 2013**.

NOTE: Applications are processed on a rolling basis. Equipment Packages available beginning in **April 2013**. The award process is competitive, so please complete your application in detail so that we may fully assess your organization's suitability as a recipient.

Please visit, <http://www.in.gov/ideM/riverwatch/2334.htm>, for your application. You may contact the Riverwatch office at riverwatch@idem.in.gov with additional questions.



Riverwatch Newsletter Subscription

If you subscribe to newsletters from the state, you may have received word that we are transitioning to a new delivery service. Instead of being delivered through Outlook, GovDelivery will be used starting with the next newsletter.

Please visit, <http://www.in.gov/ideM/riverwatch/2361.htm> and click on the link to re-subscribe to the *Riffles & Pools* newsletter. Unfortunately, I cannot transfer you all over, so please take a moment to renew.

I will also continue to post a .PDF version on the website.



Stream Team Academy Fact Sheet Series

- #1 Tree Planting Guide
- #2 Spotlight on Big Muddy
- #3 Lewis & Clark
- #4 Missouri Is Number One?
- #5 Responsible ATV Use
- #6 Headwater Streams
- #7 Whatology?
- #8 Exotic Does Not Mean Beauty
- #9 Wetlands
- #10 Stream Sedimentation
- #11 Emerald Ash Borer Found in Missouri
- #12 Protecting Prairies = Protecting Streams
- #13 Life Cycle & Natural History of Aquatic Insects (Part 1)
- #14 Life Cycle & Natural History of Aquatic Insects (Part 2)
- #15 Life Cycle & Natural History of Aquatic Insects (Part 3)
- #16 Life Cycle & Natural History of Aquatic Insects (Part 4)

Watch for more "Stream Team Academy Fact Sheets" coming your way soon. Plan to collect the entire educational series for future reference! Contact us at 1-800-781-1989 if you'd like a copy of previous Fact Sheets or a binder for storing them.

Stream Team Academy Fact Sheet #16

LIFE CYCLES & NATURAL HISTORY OF AQUATIC INSECTS

Part 4 – The Caddisflies (Trichoptera)

An Educational Series For Stream Teams To Learn and Collect

By Paul Calvert

The Trichoptera (caddisflies) are an Order of insects that are primarily adapted to life in the water as immature stages with only a few exceptions in the world and none in North America. Their closest insect relatives are the Lepidoptera (butterflies and moths), an Order of insects that are primarily terrestrial with only a few species worldwide adapted to aquatic life. Caddisflies can be divided into three groups based on case-building behavior. These are free living forms, net spinners/retreat builders, and case makers (saddle case makers, purse case makers, and tube case makers).

Like mayflies (Ephemeroptera) and stoneflies (Plecoptera), caddisflies most likely evolved in cold, fast flowing streams. It is theorized that as they developed their case building abilities, they were able to diversify ecologically due to a respiratory mechanism that replenishes oxygen by allowing a continuous flow of water through the case. This, in turn, enabled them to survive in warmer, slower moving systems.

LIFE CYCLE

Caddisflies are holometabolous, meaning that they have a complete life cycle which includes a pupal stage. They typically lay their eggs in gelatinous masses, either in or out of the water. This mass helps minimize water loss and maximize respiratory exchange. In some families it allows for continued development of the eggs in completely dry habitats. Eggs are deposited in several different modes. Some species drop eggs in the water during flyovers. Others descend under the water and attach eggs to the substrate. Species that inhabit ephemeral pools lay eggs in the basins when the pools are dry. The eggs develop in the gelatinous matrix while waiting for the pools to fill.

Most caddisfly species are univoltine (having one generation per year), although a few are multi-voltine (having multiple generations in a year). Others are semi-voltine, taking two years to complete a generation. Larvae generally undergo five instars before pupating. After completing larval development, case makers and retreat builders seal off the ends of their cases or retreats and attach them to the substrate while free living forms spin silken cocoons. The pupal stage usually lasts two to three weeks, although some species overwinter as pupae.

Caddisfly pupae have mandibles that they use to chew through their case or cocoon when adults are ready to emerge. Once emerged, adults are commonly active during the evening or nighttime hours. They can live from a few weeks to as long as several months.

Depending on the species, caddisfly mating can occur in flight, on the ground, or on vegetation near aquatic habitats.



Some caddisfly larvae build cases out of materials like sand, twigs, leaves, and other debris. (Photo by Chris Riggert, Missouri Department of Conservation.)

Stream Team Academy Fact Sheet #16

FEEDING

Caddisfly larvae occupy every functional feeding group. They are shredders, grazers, filter feeders, or predators. It was once thought that the net spinners collected food indiscriminately, eating anything captured in the net. Recent evidence, however, suggests that they are capable of selecting the food that is most nutritious and cleaning the net of the rest of the material. Grazers similarly feed preferentially. They select feeding territories and defend these beds fiercely, often out-competing other grazers. All free living and some tube case making caddisfly larvae are predatory on other aquatic macroinvertebrates, sometimes even including other caddisflies. Adult caddisflies feed on nectar or do not feed at all.

RESPIRATION

Caddisflies breathe in three primary ways. Many case makers and some retreat builders maintain spacing between their bodies and the case with small bumps (tubercles) located on the first abdominal segment. The larva then maintains a current through the case and over its gills by undulating its abdomen, continuously replenishing its oxygen supply. Non-case-bearing forms either have numerous branched abdominal gills or depend on cuticular respiration (uptake of oxygen through the exoskeleton). These forms are typically more sensitive to changes in dissolved oxygen levels.

CONCLUSION

Caddisflies can vary widely in their forms and behaviors. From their case building habits, to their feeding groups and even their habitats, which can consist of both cold and warm water, lotic and lentic systems, caddisflies are incredibly diverse.

Caddisflies are important in water quality monitoring, but temperature and oxygen levels aren't always the limiting factors for these insects. Caddisflies are sensitive to a variety of pollutants and, while case builders are more tolerant of low oxygen levels, free living forms and net spinners require cool, flowing, highly oxygenated water. No matter what the particulars of the species, when we find caddisflies in our streams, with or without stoneflies and mayflies, we are excited!



Hydropsyche orris, a common net spinning form of caddisfly. (Photo by Amy Meier, Missouri Department of Conservation.)



Adult caddisflies feed on nectar or not at all. (Photo by Amy Meier, Missouri Department of Conservation.)

Our next fact sheet will cover the aquatic beetles, our largest and most diverse group of insects. Don't forget to send your questions to streamteam@mdc.mo.gov or call 1-800-781-1989.

Sources:

Freshwater Macroinvertebrates of Northeastern North America. Barbara L. Peckarsky et al. 1990.

Aquatic Entomology—the Fishermen's and Ecologists' Illustrated Guide to Insects and Their Relatives. W. Patrick McCafferty. 1998.



New Survey and Case Studies Focused on Partnerships and Volunteer Monitoring

Posted: 03/07/2013

Author: Merritt Frey

The goal of a new River Network report -- [Creative Partnerships in Volunteer Water Quality Monitoring: A What Works Snapshot](#) -- is to provide creative ideas for river and watershed groups that are considering either creating a new volunteer monitoring partnership effort or adding a partnership component to their existing efforts. River and watershed groups often struggle to secure the financial and technical capacity to conduct good, long-term monitoring that effectively documents success (or failure) in protecting or improving water quality or habitat. As budgets have shrunk over the last several years, these challenges have only loomed larger. One strategy for stretching water quality monitoring resources is to partner with others who bring complementary skills and resources to the table.

In this report, we present an overview of the extent to which volunteer monitoring efforts are incorporating partnering into their strategies, and how those partnerships work. We present two types of information: 1.) results of a short, national survey of monitoring project leaders and 2.) a selection of case studies demonstrating different types of volunteer monitoring partnerships.

So get inspired! Read [Creative Partnerships in Volunteer Water Quality Monitoring: A What Works Snapshot](#) for ideas on how to design a new monitoring collaboration or to improve the one you have. And if you have ideas or questions, please share them in the comments section or feel free to [contact me](#) directly.

Recycle Tires

River Network is pleased to continue its partnership with Bridgestone Americas on their One Team, One Planet Spent Tire Program. Since Earth Day 2012, this program has salvaged and recycled nearly 25,000 tires from more than 80 river cleanups.

Do you have a cleanup planned for this spring or summer? Fill out the [Community Event Request Form](#) and Bridgestone will collect your tires for free! They ask that you submit your request at least one month before your cleanup event.



As part of Bridgestone's goal to reclaim one tire for every tire sold, 100% of spent tires received by the stores will become part of asphalt, mulch, playground surfaces or other beneficial everyday items. BSRO stores have other environmental initiatives too – they use steel versus lead wheel weights for tire balancing since the lead variety often come loose, fall off and enter the eco-system, potentially contaminating soil and water. And, do-it-yourselfers can take their used oil or used automotive batteries to any location for recycling at no charge.

Loaner Trunks

Riverwatch has Loaner Trunks located throughout the state. Loaner Trunks have all the equipment you need to monitor and may be borrowed for varying lengths of time.

Arrangements are made on an individual basis for each location.

To locate a Loaner Trunk in your area, email Lisa at riverwatch@idem.in.gov for a map and contact information



Training Calendar

Volunteer Water Quality Monitoring "Basic" Training introduces citizens and educators to water quality monitoring utilizing hands-on habitat, chemical, and biological assessment methods. The sessions are held both inside and outdoors.

Although training workshops are free, you must contact the local host in advance to register. Most workshops are held from **8:30 am - 4:30 pm** unless noted.

Saturday, April 20

Indianapolis, IN - Holliday Park (9:00 am-4:00 pm)

To register contact John Ulmer at watersheds@tds.net or 317-769-3500.

Saturday, May 11

Zionsville, IN - Lions Club Park (9:00 am-4:00 pm)

To register contact John Ulmer at watersheds@tds.net or 317-769-3500.

Tuesday, May 14

Peru, IN - Peru Wastewater Treatment Plant

Credits pending approved:-7 technical drinking water operator and/or 2 technical & 5 general wastewater operator.

To register contact Jamin Beisiegel at perustormwater@gmail.com or 765-473-7651.

Friday, May 17

Peru, IN - Peru Wastewater Treatment Plant

Credits pending approved:-7 technical drinking water operator and/or 2 technical & 5 general wastewater operator.

To register contact Jamin Beisiegel at perustormwater@gmail.com or 765-473-7651.

Friday, May 17

Bristol, IN - Bonneyville Mill County Park (9:00am - 4:00pm)

To register contact Krista Daniels at krista@elkhartcountyparks.org or 574-875-7422.

Saturday, May 25

Hammond, IN - Gibson Woods Environmental Center (9:00 am - 4:00 pm CST)

To register contact the Lake County Parks & Recreation Department at 219-769-7275.

Wednesday, June 5

Winslow, IN - Sugar Ridge Fish & Wildlife Area

To register contact Ann Ice at ann.ice@in.nacdnet.net or 812-385-5033 x 110.

Tuesday, June 11

Battle Ground, IN - Brier Environmental Education Center, Tippecanoe Battlefield

To register contact Mary Cutler at mcut@msn.com or 765-567-2993.

Friday, June 14

Lake County, IN - TBD (9:00 am - 4:00 pm CST)

To register contact the Lake County SWCD at 219-663-7042.

Thursday, June 20

Brook, IN - Brook Conservation Club

To register contact Darci Zolman at darci.zolman@in.nacdnet.net or 574-267-7445, x3

Saturday, June 22

Frankfort, IN - Camp George C. Cullom

To register contact Leah Harden at leah.harden@in.nacdn.net or 765-659-1223 x3.

Thursday, June 27

North Webster, IN - North Webster Community Center

To register contact Wendi at the Tippecanoe Watershed Foundation at twf-wendi@kconline.com or 547-834-3242.

Saturday, July 13

South Bend, IN - St. Patrick's County Park

To register, contact the park office at 574-654-3155.

Tuesday, July 16

Bloomington, IN - Twin Lakes Lodge (This class includes a \$5 facility fee.)

To register, contact the Hoosier Riverwatch office at riverwatch@idem.in.gov or 317-308-3392.

Saturday, September 14

Indianapolis, IN - Holliday Park

To register contact John Ulmer at watersheds@tds.net or 317-769-3500.

Saturday, September 28

Elkhart, IN - Elkhart Conservation Club

To register contact Nancy Brown at nancy.brown@in.nacdn.net or 574-533-4383 ext. 3.

E. coli Workshop

If you have already attended a Riverwatch Basic Training but would like more information on E. coli, attend this advanced workshop.

Saturday, September 21

Zionsville, IN - Zion Nature Center (9:00 am—12:00 pm)

To register contact John Ulmer at watersheds@tds.net or 317-769-3500.

Protecting Our Watersheds

Hoosier Riverwatch will be partnering with Earth Force to offer a Protecting Our Watersheds workshop. This community action program from Earth Force / GREEN guides your middle school / high school class or adult watershed organization through the process of analyzing your data, determining where problems may exist in your watershed, and taking action in your community to protect water quality.

Friday, June 28

Indianapolis, IN - IDEM Shadeland Office (9:00 am – 4:00 pm)

To register contact Hoosier Riverwatch at Riverwatch@idem.in.gov or 317-308-3392