



# Channels

**6202**  
**Stream Teams**  
**Strong!**

Information for and about **Missouri Stream Teams** - Winter Issue 2021

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## 1st Quarter Prizes

- ◆ Hanging Camping Fan
- ◆ Moonshine and Watermelons
- ◆ Go Wise 5.8 qt 8 in 1 Air Fryer
- ◆ Wise Owl Camping Hammock
- ◆ Cooling Boonie Hat
- ◆ FindMag Fishing Magnet Kit
- ◆ Youth Prize: Digital USB Microscope



Please keep sending us your Activity Reports . . .  
**You might win NEXT!**

# A Wonderland of Winter Stoneflies

By Laura Richardson, DNR VWQM Coordinator

Henry David Thoreau once said, “Time is but the stream I go a-fishing in.” With staying in and social distancing for COVID-19 precautions, this winter can feel like we’re all a-fishing in stagnant water. If you’re itching to get outdoors and explore your local streams, you might be surprised to find some macroinvertebrates emerging from their homes as well. Stoneflies, unlike most other macroinvertebrates, can be found emerging from streams at any point throughout the year. There are two families of stoneflies that have learned to not only emerge, but to survive and mate in the winter. They are aptly named the winter stonefly (Family Taeniopterygidae) and small winter stonefly (Family Capniidae). Here are some interesting things to keep in mind if you head out in search of these unique, cold-loving stoneflies.



Adult *Allocapnia* stoneflies resting after emergence (Family Capniidae). Photo by Stan Szczytko, University of Wisconsin-Stephens Point.

The timeline for a winter stonefly’s life cycle is opposite to what we expect for most insects. Their eggs hatch late winter to early spring and the young, developing nymphs eat until the water begins to warm in the late spring. Then, the nymphs bury up to one meter down into the stream substrate, where they enter a phase of diapause (a hibernation-like state) for three to six months. Once the water cools again, the stoneflies re-emerge, become active, and resume eating in preparation for their most significant growth and development phase during fall and winter. These stonefly nymphs are also known as “shredders - detritivores” which means that their diet typically consists of living or decaying plant material and organic matter. Studies have shown that the small winter stonefly can consume up to 30% of its body weight daily during this time period! Once fully developed, the stoneflies will emerge from the water in the late winter and early spring. You can easily spot them crawling near the streambanks on backdrops of snow or ice!

Adult winter stoneflies have developed special features to allow them to survive winter’s freezing temperatures. Physically, they tend to be darker in color than most other stoneflies, which may allow them to absorb more heat. They also tend to gather on mineralized surfaces which retain heat, like cement bridges and stones, hunker down in caverns formed within snow and ice, or hide under rocks and leaf debris for insulation against the cold temperatures. Since small winter stoneflies often emerge in temperatures too cold for flight muscles to work, they can often be found crawling and their wings can take on multiple forms like fully developed, partially developed, or no wings at all. It is hypothesized that winter stoneflies are either freeze-tolerant (can survive being partially frozen) or freeze avoidant (their bodies produce antifreeze-like compounds). However, the winter stoneflies’ adaptations for surviving the winter months may have developed to provide them with a competitive advantage over other organisms, since the fish and other macroinvertebrates competing for the same food and resources are less active during this time.

So, if you feel cabin fever starting to set in this winter, try to get outdoors. If you find yourself near a stream, don’t forget to keep your eyes peeled for some emerging winter stoneflies!

# Farewell and Congratulations to Molly Vannoy!



We are saddened and happy to announce that Molly Vannoy is moving on from the Volunteer Water Quality Monitoring program to take on her new role of being a mother. Molly began with the program in the spring of 2016 and in her tenure, she has helped train and coach hundreds of citizens to assess water quality in their local watersheds. She has been a source of support and guidance for volunteers to get involved with the Program, and also advocated the importance of providing an avenue in which citizens can become involved with the state's natural resources to help promote, protect, and assess local waterbodies. Molly was an engaging mentor and she shared her passion and experience to help grow and improve the Program's water quality data and to follow-up on areas that showed water quality concerns. She

also helped review thousands of data sheets, add hundreds of new monitoring sites, and provide countless insights or data requests for stream conditions to the public. On top of that, Molly always recognized and commemorated volunteers for their monitoring efforts and data contributions. Behind the scenes, Molly also worked to improve educational resources, organize and register folks for workshops, and create budgets and reports for the Program. Regardless of the task, Molly always performed her work with care, diligence, and thoughtfulness. We are thankful for all of her work and efforts with the Volunteer Water Quality Monitoring Program. Please join us in celebrating Molly's contributions and the new adventures that lay ahead for her and her family. We are also pleased to share that on October 7<sup>th</sup> the Vannoys welcomed their healthy baby daughter into this world.

## NOTICE!

### Missouri Stream Team Workshop Announcement

**NEW:**  
**VIRTUAL-HYBRID WORKSHOPS!**  
INTRODUCTORY LEVEL  
Water Quality Monitoring Workshops  
are open for registration.

**Sign up soon!**

Register at [www.mostreamteam.org](http://www.mostreamteam.org) or  
[streamteam@dnr.mo.gov](mailto:streamteam@dnr.mo.gov)

### EPT CREEK COURSE has been scheduled!

Want to learn more about mayflies, stoneflies, and caddisflies? Join us for our next virtual Creek Course: an Introduction to EPTs this March. This will be a four-part series highlighting the biology, ecology, and taxonomy of these three sensitive orders of insects. Register online at [www.mostreamteam.org](http://www.mostreamteam.org).

## Monitoring Minute Winter Chloride Monitoring

By Sam Daugherty, MDC VWQM Assistant

Winter may be a slow time for many Stream Team volunteers, but it is a great time to monitor streams for chlorides. Road salt is a primary source of chloride pollution, so chloride levels can often spike following winter weather. Monitoring regularly in winter, especially after snow/ice melts, can show just how high chloride levels get and for how long, which is important when considering the acute and chronic toxicity levels of chloride for aquatic life.

If interested, Level 1 and above volunteers can request chloride test strips. Missouri Stream Team provides Chloride QuanTab test strips from Hach. Two kinds of these strips are available depending on the level of chloride pollution. Low range test strips measure chloride concentrations between 30-600 mg/L, while high range strips measure chloride levels between 300-6,000 mg/L. Each pack contains about 40 test strips.

The test strips are very easy to use. Just place the strip upright in a water sample collected in a small cup or vial, with just enough water to submerge the bottom part of the strip. Water will rise up the strip via capillary action until the strip is fully saturated. After just a few minutes, a moisture-sensitive yellow string at the top will darken to a black or dark blue color, signaling that the strip is ready to be read. During the chemical reaction, a white column will form in the center of the strip, rising from the bottom. This is because any chlorides present in the water sample will react with the silver ions in the strip to create silver chloride, which appears white. The length of this white column in the strip is proportional to the chloride ion concentration in the sample.

To determine the chloride levels in the water sample, simply see where the white column ends on the strip, then use the chart on the back of the bottle to convert this value to a chloride concentration in mg/L. However, keep in mind that the chart may vary bottle to bottle as each lot of strips is calibrated independently by the manufacturer, so be sure not to mix and match strips from different bottles.

# The Riffle Review

a bi-monthly glimpse of Stream Team activities

Since our last issue of Channels, Stream Team members reported:

- 208 total activities
- 1,289 total participants
- 5,407 total hours
- 31 tons of trash collected
- 51 water quality monitoring trips
- 500 trees planted

Check out more highlights below . . .

**Team 41** The Ozark Wilderness Waterways Club continued their decades-long tradition of exploring and cleaning up a different stream each year. Last year, it was the Elk River/Big Sugar Creek, where this passionate group collected 22 bags of trash/recyclables, 19 tires, and another memorable experience. What a wonderful tradition!

**Team 2301** After the loss of a beloved family pet, the Gauchat family needed something to help take their minds off of their grief, so a two-night trip on the Eleven Point River may have been just the right medicine for the soul. In that time they still managed to collect eight bags of trash along the way while enjoying the beauty of the wild and scenic river.

**Team 3895** The City of Manchester didn't goof around on their last cleanup along Grand Glaize Creek last fall, recruiting 145 volunteers to remove a total of three one-ton truck loads of trash and debris. Wow!

**Team 4260** The newly formed Stormwater Subcommittee of St. Joseph's Sustainable Environmental Sustainability Committee (SEAC) buckled down to beautify the native garden in front of the city building, which will help filter rainwater while providing aesthetic value for visitors, which will be quite rewarding in the future!

**Team 4540** The Student Action for a Greener Earth (SAGE) group from Ladue Horton Watkins High School cleared a huge dense thicket of mature bush honeysuckle about 35 yards long and 20 feet deep, and took a photo holding one particularly large trunk like a "big fish" to show their accomplishment, all with big smiles.

**Team 5118** After 10 years of trying to find a pit cave full of old junk, the Stygian Grotto Team finally found it under some old farm equipment, and boy was it a doozy! The Team pulled 1.75 tons out, including six tires, two microwaves, an oven, two lawnmowers, four car batteries, and much, much more.

**Team 5168** The League of Watershed Guardians had quite the productive 2020 despite the pandemic. In just the city of Arnold alone, 615 hours were spent by the Team to collect nine tons of metal, tires, and trash within the city limits! The City very much appreciates their efforts, and it's great to see such a dedicated partnership in action.

**Team 5806** The Cooley (one-man) Cleanup Crew spent a LOT of time on the water in 2020, picking up trash all throughout Clay County and beyond at nearby lakes and along the Missouri River, totaling his trash tally to nearly half a ton on his own. Nice!

**Team 6165** It took a little bit of elbow grease, but Team Duckie dug into the ground to get that pesky pickup bench seat out of Turnback Creek in Lawrence County. In addition, they collected another three bags of trash and a car door panel. Team work makes the dream work!

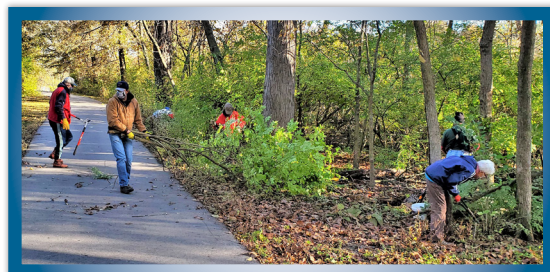
# Team Snapshots



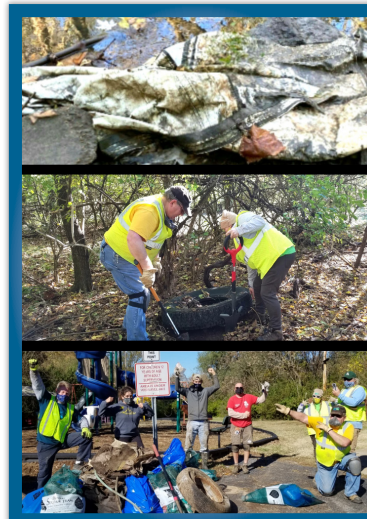
*Social distancing can be a challenge when performing water quality monitoring, but it was worth it when Team 1790 discovered all the crawdads living in Bonne Homme Creek, brightening the day of the young gal participating for her first monitoring trip.*



*A productive day on Little Piney Creek for Team 6137, who gathered chunks of Styrofoam from a broken watercraft that stretched over two miles of stream in addition to 10 tires, 10 bags of trash, and lots of miscellaneous other items along the way. Now that's dedication!*



*The woods around Spanish Lake are now a little clearer thanks to the efforts of a group of Master Naturalists – Great Rivers Chapter to spend a lovely autumn day hacking away at the invasive bush honeysuckle that was choking the trail.*



*Oooh scary! The amount of trash found in Gravois Creek, that is. But never fear, the Salty Scuds (Team 5683) and friends came to the rescue on Halloween Day to rid the stream of more than a ton and a half of garbage.*

# THE MISSISSIPPI RIVER PLASTIC POLLUTION INITIATIVE

## CLEAN RIVER, CLEAN SEAS



The Mississippi River is the drainage system for all or part of 31 states in the United States. Plastic litter and other debris easily travel through storm drains, creeks, and tributaries into the Mississippi River to the Gulf of Mexico, and eventually into the ocean. In September 2018, mayors of cities and towns along the Mississippi River and state legislators made a commitment to reduce plastic waste in the Mississippi River Valley.

The Mississippi River Cities and Towns Initiative (MRCTI), in partnership with the United Nations Environment Programme, National Geographic Society and the University of Georgia, are working to combat plastic pollution along one of the world's greatest waterways. With cooperation from volunteer citizen scientists from local communities, this effort will record data on the status of plastic pollution at key sites along the river. The data will be used to generate a 'plastic pollution map' that will help policy makers, businesses, and citizens take action.

Three cities along the Mississippi River have been selected to represent the river for the first (pilot) phase of the project - St. Paul, MN, St. Louis, MO, and Baton Rouge, LA. Plastic litter data will be collected using the Marine Debris Tracker app in conjunction with cleanup events between April 1<sup>st</sup> and April 18<sup>th</sup>. Until then, local partner organizations will be selecting locations along the river and throughout the cities, promoting the project, training on the app, and working on logistics for the events.

This project is the first essential step to determine how to prevent plastics from entering our precious waterways in the first place.



# COALITION CORNER

News from Stream Teams United

## AmeriCorps Members Continue to Serve During Pandemic

By Mary Culler, Stream Teams United Executive Director

2020 was a year unlike any before – that may be a small understatement! At Stream Teams United, when the pandemic began, we had just started a multi-year [AmeriCorps project](#) to host up to six AmeriCorps members at Stream Team sites around the state. The overall goal of the project is to build capacity of water education programs and create more opportunities to connect youth in underserved communities with nature. Like everyone, we had to adapt!

Despite the challenges of 2020, the AmeriCorps members serving for this project have done outstanding service and have contributed greatly to their local communities. Members serving during the last year have included Laura Semken and Anna Miller at [Missouri River Relief](#), Rowan Castle and Kaitlin Marshall at [Watershed Committee of the Ozarks](#), Queen Wilkes at [Little Blue River Watershed Coalition](#), and Ashley Packwood at [James River Basin Partnership](#). Members have been able to serve remotely at their homes when needed due to the pandemic. Member activities have included creation of website content, research for grants, recruitment and management of volunteers, outreach to partnering schools and organizations, fundraising, and development of a native plant program.

We anticipate several openings for new members in 2021 as we continue this project. Check out our website for up-to-date information: <https://www.streamteamsunited.org/americorps.html>.



AmeriCorps members Rowan Castle and Kaitlin Marshall served at [Watershed Committee of the Ozarks](#) in Springfield during 2020. They helped build the capacity of a native plant program ([Watershed Natives](#)) and created online training opportunities for volunteers. The Watershed Natives program will be used to provide native plants for ecosystem restoration projects, also part of a 3-year program called the Environmental and Natural Resource Management Pathway at nearby Hillcrest High School.

AmeriCorps member Anna Miller began serving at [Missouri River Relief](#) in August 2020 and has helped create the "[Watershed Expeditions at Home](#)" program to provide virtual water education opportunities to students. Missouri River Relief offered socially distanced boat excursions on the Missouri River during 2020 to provide people an opportunity to experience nature in their community.