



# WATERSHED

CONSERVATION RESEARCH CENTER

## ALLEGHENY COLLEGE

April 2023 Newsletter

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## One Year Strong: Celebrating Ecological Progress at the WCRC

The WCRC is approaching the one-year mark and has packed the past 12 months with success and fun. Allegheny students are continuing to show enthusiasm towards the WCRC, and in total, thirteen students have already taken advantage of this incredible new resource through work study, independent projects, and senior theses. These students have been instrumental for the WCRC to meet our mission of engaging in strategic conservation activities and training future watershed stewards to protect, restore and enhance our land and water resources for future generations. The WCRC now has a website ([sites.alleggheny.edu/wcrc](https://sites.alleggheny.edu/wcrc)) as well as a Facebook Page and Instagram. Visit these pages to learn more about what we are up to and how to become involved with the WCRC. We look forward to another year of scientific research, student mentoring, and engaging with our community partners!



From left: Kelly Pearce (Co-Director), Briana Sebastian (Assistant Research Scientist), Casey Bradshaw-Wilson (Co-Director), Mark Kirk (Research Scientist).

### Mission Statement

Our mission at the WCRC is to engage in strategic conservation activities and train future watershed stewards to protect, restore and enhance our land and water resources for future generations in the upper Allegheny River basin, focusing on the French Creek Watershed.



## Empowering the Next Generation of Watershed Stewards: Current Students of the WCRC

Since opening last year, the WCRC has mentored several students throughout the academic year. Josh Heiser ('23) and Milo Watson ('26) joined us as work study students for both the fall and spring semesters, and Travis Dear ('24) joined for the spring semester. They learned different field techniques such as electrofishing and camera trapping, and each student took the lead on a portion of lab work for our current projects. Milo learned to analyze camera trapping photos, and Josh and Travis learned techniques for sorting and processing macroinvertebrate samples. Another way students have been involved is through independent studies. In the fall, Jake Folaron

('25) explored habitat usage of brook and brown trout (*Salvelinus fontinalis* and *Salmo trutta*), and this spring semester, Eden Brody ('24) is doing a project in the Caldwell Creek watershed, Eva Kerr ('23) is collecting data at Bousson Environmental Research Reserve in salamander habitats, and Colleen Vine ('25) is analyzing camera trapping data to assess mammal



Grace Camarata ('23) holds a trout while sampling streams for her project.



Hailey Stupay ('23) analyzes macroinvertebrate samples for her project.

diversity at FCVC sites. In addition, the following seniors' comprehensive theses revolved around on-going research the WCRC is currently conducting: Grace Camarata ('23), Hailey Stupay ('23), Austin Ferguson ('23), Eva Kerr, and Chase Chodlowski ('23). Congratulations seniors!



# Monitoring Restoration in the French Creek Watershed



Woodcock Creek site 2 months after restoration.

Two priorities for the WCRC have been facilitating instream habitat improvement projects and conducting pre- and post-monitoring of these projects within the watershed. We are partnering with PA Fish and Boat Commission and the Crawford County Conservation District for another in-stream habitat improvement project this June to complement the one completed during the summer of 2022. Pre-restoration surveys will

continue until the site has been restored, and post-restoration surveys will continue at both restoration sites for at least five years to monitor changes in these streams across different seasons/years. In addition to surveys of fish and macroinvertebrate communities, we measure water chemistry parameters, water velocity, substrate, nutrients and bacteria, sediment, and riparian habitat. Culvert replacements (with the Crawford County Conservation District) are also occurring in the Woodcock Creek watershed, and we will continue to monitor these sites as well. While a lot of restoration practices take place throughout the world, having data both pre- and post-construction is rare and valuable to help assess changes in the stream system.



Crew conducts surveys at the second restoration site.



Single log vane deflectors installed at the Woodcock Creek site.





## Allegheny College's Bousson Environmental Research Reserve: Past and Future

During a cold weekend in November, Allegheny students and WCRC staff set out to restore a project that was interrupted by the pandemic. Spotted salamander (*Ambystoma maculatum*) populations had been monitored at Bousson Environmental Research Reserve (BERR), an experimental forest owned by Allegheny College, since 1993 (with Dr. Scott Wissinger who has since passed away) but have not been



Allegheny students take a break from volunteer work to pose for a picture.

monitored since the start of the COVID-19 pandemic in 2020. Nature quickly tried to reclaim the project, but over a dozen student volunteers helped to repair and rebuild. Now that the project has been restored, WCRC personnel and students have once again started monitoring spotted salamanders at the BERR. Spotted salamanders migrate to ponds at the BERR every spring during warm, rainy evenings to mate and reproduce after spending the

majority of the year burrowed in subterranean habitats. We set pit-fall traps to capture the salamanders then bring them to the lab to record data on the length, weight, sex, and migratory distance before returning them to their pond. The goal of the long-term monitoring project is to better understand annual variation in body size, migration timing, and breeding dynamics. Senior Allegheny student, Eva Kerr (Environmental Science & Sustainability major), is also conducting an independent study that examines terrestrial and pond temperature data, to help identify the susceptibility of subterranean habitats and pond habitats to climate change. Thus far, 952 spotted salamanders have been caught at the BERR through April 6 as salamanders have become more abundant as nightly temperatures warm above freezing.



Allegheny student holds a spotted salamander (*Ambystoma maculatum*) after measuring.



## Bousson: Past and Future, continued

We are hoping to expand this project to other locations, including a recently acquired property by the French Creek Valley Conservancy that includes a half dozen vernal pools. Vernal pools are temporary bodies of water that, due to their lack of fishes, act as nurseries for a variety of amphibians and invertebrates. It is exciting to have this project up and running once again in these unique and critical habitats!



Mainstem Caldwell Creek.

## Caldwell Creek

WCRC personnel and students have started data collection on stream macroinvertebrates and sedimentation levels in the Caldwell Creek watershed, northeast of Titusville, on properties owned by the Foundation for Sustainable Forests (FSF), a partner of the WCRC. Historically, the Caldwell Creek watershed was considered a high quality brown trout (*Salmo trutta*) fishery, but landowners have expressed concerns about numerous environmental impacts affecting the health of the watershed. As mentioned above, Eden Brody ('24) is conducting an independent study that compares stream macroinvertebrate communities, substrate sediment levels, and total suspended sediment levels in mainstem Caldwell Creek and other streams within the watershed to determine what may be affecting trout populations in the mainstem. The other streams in the watershed contain high quality brown trout populations that serve as important comparisons to the quality of the fishery in Caldwell Creek. Brody will also be summarizing historical fish survey data to determine if trout populations have declined over time in Caldwell Creek.



Travis Dear ('24), Josh Heiser ('23), and Milo Watson ('26) take a break from lab work to take a photo.



## Invasive Species Alert: Our Latest Round Goby Update

For those who study the French Creek Watershed, the Round Goby (*Neogobius melanostomus*) invasion is still on everyone's mind, and collaborative research is tremendously helpful in measuring the invasion. Last fall, Casey Bradshaw-Wilson (Co-Director) and WCRC staff partnered with PFBC to survey lakes, tributaries, and the main stem of French Creek with new occurrences discovered in the mainstem of French Creek. Another year of environmental DNA (eDNA) surveys with the ENWR and USFWS is planned for this summer, which will give Bradshaw-Wilson and PFBC an idea of where to spend time and effort on sampling efforts. Allegheny alum, Grace Hemmelgarn ('22), worked closely with Bradshaw-Wilson during her time at Allegheny

and a manuscript is in the works regarding round goby larval drift as a means of range expansion. Briana Sebastian helped finish identifying all larval fishes from that study, including round gobies. Hemmelgarn's research indicated that larval gobies are drifting and likely expanding their range in the French Creek watershed through drift.



A round goby (*Neogobius melanostomus*), about 8 mm, under a microscope.



Briana Sebastian identifies a larval fish under a microscope.

Lastly, Bradshaw-Wilson was the plenary speaker at this year's PA Chapter of the American Fisheries Society Technical Meeting in February, where she spoke about the last decade of research and partnerships that have come about through her work on Round Gobies. Invasive species continue to pose a threat to French Creek's native fauna, but we will continue monitoring the spread and impacts to help inform management agencies and outreach specialists.





# Capturing the Wild: Exploring Biodiversity through Camera Trapping

The WCRC has continued surveying FCVC properties using camera traps. Three new sites were chosen and surveyed over fall and winter seasons, and the same sites will be surveyed this summer season as well. Bears, coyotes, and skunks were just some of the mammals caught on camera, and in total, 18 species of mammals have been cataloged since the start of this project in fall 2021, including 9 new species since summer 2022. First year student, Milo Watson is beginning to analyze the data to determine if the size of the preserve and year since FCVC involvement/ownership influences mammal diversity at each site. In the next coming years, the goals are to survey all sites across different seasons, assess diversity at each site, and discuss which sites should be prioritized for conservation plans.

## WCRC Student Experience

By: Grace Camarata ('23)

I am still so grateful that I was able to work with the WCRC in the summer of 2022. I was fortunate enough to be able to work in GIS and in the field each week. I love being in nature so working outside in the stream was very peaceful. It was my first time doing hands-on work in the field which led to the discovery of my comp project that Mark Kirk introduced to me. The title of my comp is "Effects of Stream Crossing Type on Fish Assemblages and Stream Ecosystem Conditions" and the project has allowed me to better understand how important restorations in stream ecosystems are. After college, I want to begin working in marine ecosystems or continue research in stream ecology/conservation.



Top: A deer (*Odocoileus virginianus*) munches on some food; middle: a red fox (*Vulpes vulpes*) explores a log; bottom: a black bear (*Ursus americanus*) passes through.



## Spreading the Word: Educational Outreach Events

The WCRC crew isn't only playing in streams and forests! We also attended conferences and participated in community outreach. In November, Briana Sebastian and Jake Folaron ('25) presented talks at the Regional Science Consortium's 18th Annual Research Symposium, and Casey Bradshaw-Wilson was a session chair. At the PA Chapter of the American Fisheries Society Spring Technical Meeting in February, Casey presented her work on round gobies as the plenary speaker and Mark Kirk and Briana gave talks regarding WCRC projects. In the fall, Mark, Briana, and Wendy Kedzierski from Creek Connections led a Maplewood High School science class in a local stream. The day was packed with electrofishing, fish



Briana Sebastian shows local 4th graders a lamprey (*Lethenteron appendix*).



Co-Director, Casey Bradshaw-Wilson teaches how to identify a Jefferson salamander (*Ambystoma jeffersonianum*).

identification, and macroinvertebrate sampling. In February, the WCRC also participated in "4th graders as scientists" at Allegheny College; Briana led classes on the French Creek watershed. In March, Casey led a Vernal Pool Exploration event with the Foundation for Sustainable Forests for the public. This month, Briana and Casey took spotted salamanders into Saegertown Elementary's 4th grade to talk with them about the importance of vernal pools and the role salamanders have in the ecosystem. The WCRC will also participate in the Creek Connections Student Research Symposium for middle and high school students in April. You will also see the WCRC at summer events, such as FCVC's Summer Sojourn on June 10th!













## Fieldwork Awaits: Summer Research Plans

As the weather gets warmer, the fieldwork gets busier and this summer is set to be no different. A new batch of students will join us for the summer season to hone their ecological research skills and participate in a variety of projects with the WCRC crew. The second restoration site is scheduled to be restored in early summer and biotic surveys will continue at both restoration sites. Water sampling across the watershed, camera trapping at FCVC properties, electrofishing for the Unassessed Waters Initiative (UAW), Round Goby work, the MAPS (Monitoring Avian Productivity and Survivorship) Program with the Erie Bird Observatory, NAACC (North Atlantic Aquatic Connectivity Collaborative) surveys, and more grant writing will all continue for yet another year!

## Steering Towards Success: A Note from our Co-Directors

It's been almost a year since our ribbon cutting in May of 2022 and we are excited to share this newsletter that highlights what we have accomplished so far. We are proud to report on the hard work of our staff and students over this past year, giving every project the dedication it needed to get started or restarted. We have made many critical connections within the community and have been asked to partner on valuable and strategic conservation endeavors. Winter was busy with managing on-going projects, attending and presenting at conferences, and exploring funding opportunities to support our efforts, but spring and summer kick us into a whole new gear of field work and data collection. Our new set of students start in June and we are looking forward to providing them with the hands-on experiences they're craving and preparing them to become watershed stewards. We thoroughly enjoy seeing our students graduate from Allegheny with the necessary tools to move into graduate school or a career and hope they take with them the knowledge they've gained into whatever watershed they move to! In addition, we will be saying goodbye to our WCRC Assistant Research Scientist, Briana Sebastian in August. She has been accepted into a PhD program at Texas A&M and while we will miss her tremendously, we are thrilled she gets to continue working towards her career goals and are excited that the WCRC played a role in helping her get there.

We encourage you to stay connected with us through our website and social media and thank you for your support of the WCRC and our commitment to conservation in the Upper Allegheny River Basin.

*- Casey and Kelly*



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