



PEEC
Pocono Environmental
Education Center

Seasons

Summer Solstice 2020

A Quarterly Publication to Advance Environmental Literacy

INSIDE THIS ISSUE

Message from the
Executive Director 2

PEEC: Helping Out
The Community 3

A PEECing Ducks
Recap of Virtual
Birding Cup 2020 4

Social Distancing and
The Great Outdoors 5

Camp Hidden Falls 6

Swift Water Rescue
on the Delaware River 8

Nine Years 9

PEEC Calendar
of Events 11-12



Does Invasive Japanese Knotweed Hurt The Aquatic Insects And Bacteria Of The Delaware River?

*By. Amy King, Dr. Jeanne Kagle,
and Dr. Gregory Moyer*

*Alliance for Watershed Education, Pocono Environmental Education Center,
and Mansfield University of Pennsylvania*

The Intense Invader

Have you seen tall, bamboo-like plants growing on roadsides and by the banks of a river near you and wondered what that weird plant was? That is most likely Japanese knotweed. Sad to say, but this plant is extremely invasive, growing up to 12 feet tall (Dyer et al. 2009). Japanese knotweed is virtually unstoppable, taking over what ever is in its path, not even to be stopped by asphalt. So far, no 100% effective solution has been found (Gerber et al. 2007). People have tried chemicals, burning, and cutting it. If the plant roots are moved and placed on the ground in any other location, it can grow (Pysek and Prach 1993; Weston et al. 2005). This invasive plant is extremely determined to grow and as a result it does not allow other plants to thrive, reducing the diversity of plants that can grow in their original, native habitat. If Japanese knotweed is not stopped, it can take over banks along rivers and streams and even our roadsides where they tend to grow (Dyer et al. 2009). Does it affect anything besides other plants? What about when the leaves fall into the streams nearby? That is one question that has not been readily explored. In a recent study done in the Susquehanna River, it was found that native American sycamore leaves decomposed at a significantly faster rate than Japanese knotweed (Fogelman et al.

Continued on page 10

**Pocono Environmental
Education Center**

538 Emery Road
Dingmans Ferry, PA
570 • 828 • 2319

peec@peec.org
www.peec.org

PEEC Board of Trustees

OFFICERS

Chairperson: Dr. K. Joy Karnas
Vice-Chairperson: Marc E. Gold
Treasurer: Brian O'Hare
Secretary: Henry Skier

TRUSTEES

Mickey Black
Dr. Barbara Brummer
Dr. Richard R. Lindsey
Norman W. Spindel
Dr. Howard P. Whidden

OF COUNCIL

Eric Hamill

PEEC MANAGEMENT TEAM

Executive Director Jeffrey Rosalsky
Director of Development Joel Penkala
Director of Business Mgmt. Kirsten Larick
Financial Director of Grants Mariann Oswald
Facilities Manager Ted Wetzel/Marc Wetzel

PEEC PEOPLE

Director of Education Stephanie Sherman
Director of Operations Derek Scott
Director of Group & Grant Coordination Emma Roth
Program Planner Jessica Brumbaugh
Weekend Workshop Manager / Volunteer Coordinator George Johnson
Assistant Camp Manager Nathan Lanan
Dining Hall Manager Erin Taylor
Public Relations/Marketing Janine Morley

INSTRUCTORS & INTERNS

Jessica Brumbaugh, Sheri Bone, James Frye,
George Johnson, Amy King, Jeff Rosalsky,
Derek Scott, Erin Taylor

PEEC Seasons is a Quarterly Publication of the Pocono Environmental Education Center Marketing and Development Office.

Design & Layout Niki Jones Agency, Inc.
Editor Janine Morley

Contributing Writers

Amy King, Jessica Brumbaugh, Sheri Bone,
James Frye, George Johnson, Jeff Rosalsky,
Derek Scott, Erin Taylor

Contributing Photographers

Jessica Brumbaugh, George Johnson
PEEC Staff Photos

Message from the Executive Director

By Jeff Rosalsky



A few months makes a huge difference. As I wrote my spring PEEC Seasons message, we were gearing up for the busiest spring season PEEC had seen in my 11 year tenure. Our amazing staff of

instructors were trained and ready to educate young minds on the environment and how they could be future stewards and scientists. Then nobody came. Schools closed; fieldtrips were cancelled; PEEC locked its doors; and, like everyone else, we were gripped by the speed and the depth of the shutdowns.

Then came the barriers in our parking lots and the silence. There were fewer cars on the roads, more people hiking and biking outdoors, and air and water pollution dropped to the lowest levels in my lifetime. The planet started recovering, as the human race slowed down.

Unfortunately, the cost has been high in human lives lost, deprivations of freedoms and choices we had taken for granted, and unprecedented economic suffering and losses. Everyone has been shaken by the global pandemic; no country and no group have been completely immune. It has polarized peoples' attitudes, reactions and abilities to cope on social and economic levels like nothing most of us can

remember. If you are fortunate enough to have shelter, food and health, it has allowed time to reflect on the stark differences between "wants" and "needs." When the pandemic ends, hopefully we will not forget these lessons and the acts of kindness to fellow humans and, inadvertently, the planet.

In the meantime, PEEC instructors are creating online programming for students stuck at home -- environmental lessons and experiences mixed with humor and whimsy. I have been struck with how we have all adapted in a crisis. I have seen talents and skills in my staff that I would never have seen in a normal year. From Jess, who has been working as a volunteer EMT throughout the crisis to Steph and her instructional staff putting together amazing online programming; Erin using PEEC kitchens to provide meals for the elderly, food pantries and emergency works; Derek working out plans for us to re-open; Kirsten working on keeping all our funding sources straight; Marc getting the campus to himself to do maintenance he has always wanted to do; Emma juggling schools to make trips happen in the fall; George's Facebook Live "Trails Less Travelled" segments; Nathan's bear bag antics in his Introduction to Camping video; and Janine's calm, friendly voice reassuring the public that PEEC is still here.

My message is one of hope for the ingenuity of humankind, for the next generation, for PEEC's role, and for the planet.



PEEC
Pocono Environmental
Education Center

FROG

FROLIC



SUNDAY, JUNE 28 • 1PM – 3PM



PEEC: Helping Out the Community

By Erin Taylor

Hello, Everyone! My name is Erin and I am the Chef Manager here at PEEC. This is my second year bringing delicious food to the visitors of our Dining Hall. As I am sure you can imagine, due to the current global pandemic, things around campus are not “business as usual”. Normally, at this time of year, our campus would be alive and buzzing with school groups from all over enjoying classes, hikes, and amazing environmental experiences. It usually our busiest time of year at the Dining Hall as well, with food prep, service, and cleaning between groups occupying our time from 6:30am-8:00pm every day. It’s been quite an eerie experience to spend my days alone with only the hum of the walk-ins or occasional staff member passing through to keep me company.

Don’t get me wrong, I count myself quite lucky and blessed to be one of a few that have a job and money coming in. I feel even more blessed to be working for such an amazing non-profit that not only looks to inspire and educate our community, but also give back and enrich it.

I am happy to say that we are working with Greater Pike Community Foundation and Pocono Pro Foods, along with local business donations from Tucker Silk Mill, in Easton PA, to provide approximately 160 meals for Pike County Meals on Wheels each week. We also received a generous donation of 8,000 bagels from Pocono Pro Foods, which we helped distribute to Jo’s Outreach, LYF Outreach, Police, Fire, and Ambulance Corps in Monroe and Pike Counties, and to our Delaware Valley Schools for kids receiving free and reduced lunches. I myself have faced times of food insecurity in my life when I was a child, so I know how important it is to reach and support each other in these times of need. In fact, that is why I became a Chef. I hope that as you read this you and your families are all safe and healthy. While I know no one knows what our world will look like moving forward, we at PEEC are here and will be here to share our knowledge, love, and passion for the environment, our community, and to help support each other through the difficult times.



A PEECing Ducks Recap of Virtual Birding Cup 2020

By: James Frye, 2020 PEEC instructor

At the beginning of May, members of the PEEC staff actively participated in Shaver's Creek Environmental Education Center's annual birding cup. What is birding cup you ask? On an annual basis, Shaver's Creek Environmental Education Center hosts an annual fundraising tournament that is a contest between bird watching teams to identify as many species of birds as possible within a 24-hour period. It's open to all birding level abilities ranging from novice birders to advanced birders. Funds that are generated prior to and during the contest are used for



When birding at Lake Wallenpaupack, birders need to log a specific county since Pike and Monroe County lines meet here.

citizen science projects, as well as new environmental education projects and facility upgrades. Normally teams are only allowed to explore natural and residential sites within the Central Pennsylvania region. However, during the COVID-19 pandemic, the center allowed the competition to become

worldwide to maintain social distancing standards. It's also interesting to learn about species of birds that are found in other states and other countries of the world. During the 24-hour competition, which began May 1 at 7:00pm and concluded on May 2 at 7:00pm, teams logged on ebird a total of 42,561 individual birds which condensed into 419 species. All these birds were seen across 22 states, the District of Columbia, Canada, Italy, Kenya, and even Australia. If you're not familiar with ebird, this program allows a birder to document the number of individual species seen at one location. It also gives birders suggestions on where to find the more rare and unusual birds that may have gotten off track during their migration period. You can also see where birds are gathering to observe many species in a single area. At the locations the PEECing Ducks visited, we totaled 726 individual birds, which condensed into 91 different species at 21 locations.

The PEECing Ducks made use of Pike County as our birding range for the 2020 birding cup. Some of our favorite sites visited include the Delaware State Forest, Pecks Pond, Lake Wallenpaupack, Promised Land State Park, and DeFrehn Farm (Rile Lane). Pike County is heavily forested which means we saw many forest interior birds such as warblers, vireos, and hawks. We also saw well known backyard birds such as White-Breasted Nuthatch, Northern Cardinal, Blue Jay, and American Robin. The lakes we visited had a nice assortment of water fowl such as green-winged teal, American black duck, mallard, and wood duck. Some species of water fowl are only seen in Pike County during the early migration period since they migrate north to reach their breeding grounds. Seeing more of the unusual water fowl species this late in the season is always a treat. Highlight birds for us were Eastern Meadowlark, Savanna Sparrow, and a Virginia Rail. Pike County consists of large tracks of contiguous forested land along with lakes and bog habitat scattered throughout. However, DeFrehn Farm (Rile Lane) contains only grassland habitat that the Eastern Meadowlark and Savanna Sparrow rely on in order to survive.



Image: Greg Pizzano taking pictures of Green-winged teal.

For the Virginia Rail, this secretive marsh bird was encountered during the early morning hours on Saturday. We traveled to Camp Hidden Falls, which is a former Girl Scout camp. Here, we played a recording of a sora, which is another marsh dwelling bird, and at times got a response from other species as well. The rail responded with a two-syllable response that was much higher in pitch. We debated between the two different species and the response was submitted to Shaver's Creek staff and later in the day it was confirmed to be a Virginia Rail. Hearing a response from any marsh bird is not as common since they live a secretive lifestyle. Also there are not many sites in Pike County to encounter marsh birds like a Virginia Rail or a sora.



Image: Virginia Rail (*Rallus limicola*)

This birding cup contest was an experience I enjoyed with my fellow team members. The long night from Friday to Saturday was well worth the hours of staying up. We saw quite a few species that will only reside here during the migration period, as well as others that are here year round. For myself, I learned better bird song and call identification skills as well as some new field identification marks and behaviors that can be seen from a distance. Two of my team members have competed in either the birding cup or similar birding contests in the past and the other is new to birding but is a quick learner. Together we made a great team of birders to explore as much of Pike County as possible within the allotted time. Get out there and see some great birds. Happy Birding everyone.



PEEC
Pocono Environmental
Education Center

***Celebration
with a Bang***

**FAMILY NATURE CAMP
JULY 3-5 • INDEPENDENCE DAY WEEKEND**

Social Distancing and the Great Outdoors

By Derek Scott

“Social Distancing” - a phrase many of us were unfamiliar with just a few months ago. This new reality many of us are still learning to live with has upended much of our lives and led to many of us being rather sedentary. Even if you're one of the people who enjoys spending more time at home, I think we're all in agreement that now more than ever, we all need a change of scenery. Luckily, regardless of where you live, the outdoors can provide you with the perfect escape (literally!). When most people think about outdoor recreation, they think of things like hiking, camping, boating, picnicking - the kind of activities you do at parks with friends and family. While most of this has been disrupted by closures and restrictions, there are plenty of other activities and hobbies you can participate in and try!



Gardening

Contrary to popular belief, you don't need a big yard or a greenhouse to get into gardening. In fact, for many people interested in picking up this hobby that couldn't be further from the truth. I've found that getting into gardening is much more enjoyable when you can put all of your effort into just a few small plants. Are you the kind of person that likes to season and garnish the food you cook? Maybe consider growing cilantro, parsley, or some other flavorful herb that you can freshly cut before serving. Are you a big tea drinker? Try growing chamomile, lemongrass, or peppermint for something different to drink depending on your mood. Just looking to brighten your day? Flowers like geraniums and begonias do well in small pots indoors. Find out what interests you the most and give it a try. Whether you're caring for one plant or 20, gardening can be a cathartic way to spend some time outside.

Bird Watching

Birding often feels like one of those hobbies where either you love it, or you don't. For the longest time, I fell into the latter of the two categories but, over time, I've realized it's an enjoyable activity you can do almost anywhere. While where you live might impact how many and what kinds of birds you see, birding is one of the few outdoor activities you can do in both rural and urban settings. If you're a novice like me, I'd strongly recommend looking into a free birding program or app like “Merlin” which can help you identify what you see with minimal information. These types of programs and apps are great at teaching you not only how to easily identify different bird species, but also include facts about where they live, their diet, and what time of year they're active in your area. If you find yourself getting really into tracking what's outside your window, there are also a number of organizations and programs where you can post data to for others to utilize.



Journaling

Not every outdoor activity involves having knowledge of plants and animals. In fact, throughout history, the outdoors has been the focus of the arts as well. While drawing or painting outdoors is a big hobby for some, if you're artistically lacking like I am, journaling can be a great alternative. And I know what you're thinking - sitting outside writing about the outdoors? How is that a hobby that anyone besides a writer enjoys? Well, until you give it a try, you won't know. In my experience, journaling about your time outside and what feelings that invokes makes the words flow onto paper faster than you think. Not only does this snapshot your experience, but over time this process makes you a better writer as well. And if you are a bit more science-oriented than artistic, regular journaling can be a wonderful way to track seasonal changes and observations for trends or anomalies.





Camp Hidden Falls

By George Johnson

So, like many other people across the nation, not too long ago I suddenly found myself with a lot of extra time on my hands. The weather was finally getting warmer and I just needed to get outside to explore. Unfortunately, PEEC's trails were closed at the moment, so I had to go exploring elsewhere. Fortunately though, I remembered about the old Girl Scout Camp located not that far from PEEC and decided to go check it out. I did a little internet researching, loaded up my hiking bag, packed some snacks, and then headed out.

That old camp was called Camp Hidden Falls, and was established by the Girl Scouts in the Heart of PA. Regrettably, back in 2012 they had to close their doors. After that, with much fundraising and preparation, The Conservation Fund was able to purchase the property in 2017. It was officially handed over to the Delaware Water Gap National Recreation Area and incorporated into the park on April 23, 2018.

The 1054-acre property is located off Sunset Drive (about a 5 min drive from PEEC) and is not directly connected to the larger Delaware Water Gap. I never saw the property when it was operational, but I imagine that the land currently looks vastly different from then; buildings are all gone, the dam for Sunset Lake is demolished, and some trails are overgrown. However, you'll be able to see remnants of what it would have appeared like if you look hard enough. There are a couple of smaller pull-offs along Sunset Drive to park, but the best place is a larger field space that I believe used to be their main offices. Coordinates: 41.177768, -74.933759

Continued...



PEEC
Pocono Environmental
Education Center



**BUG
EXPLORATION**

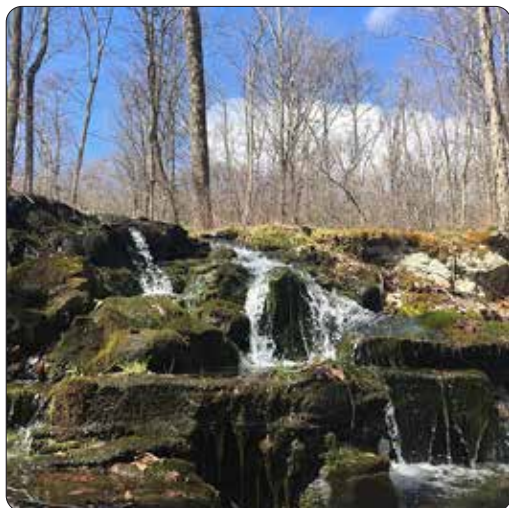
SATURDAY, JUNE 20 • 10AM - 12PM
SATURDAY, JULY 18 • 10AM - 12PM



PEEC
Pocono Environmental
Education Center

**INTRO TO
TENT CAMPING**

SUNDAY, JULY 26 • 10AM - 12PM
SUNDAY, SEPTEMBER 20 • 1PM - 3PM



The camp gets its name from the 8 smaller waterfalls located on the property, with a few that are fairly close to the main pull off. However, there are no trail maps available to guide hikers to the falls and so hikers might have to explore blindly along the road or pull-off before finding a trail head. In my experience there thus far, I've been able to locate 7 of the falls (I think) over the course of a half day adventure. There's still one more for me to find, but no available trail map makes it more elusive and difficult to find. Thankfully I enjoy that sense of adventure and exploring trails when I'm not sure where they lead.

From what I've discovered, there are 3 colored blazes for their trails. Their red trail is the longest and seems to guide hikers through their old campus and the outer edges of their property on the western side. The blue trail picks up right off Sunset Dr. and brings guests around the eastern side. If you see a white blaze, then that will generally lead out to a waterfall.

If you do choose to explore this area, then you need to be mindful of a few details. First, even though there is a lot of land to explore, please be mindful of the property lines since surrounding the area are private residences. In order to avoid any mishaps or worries, I'd advise that hikers stay on the designated trails. Speaking of the trails... the terrain can be a little difficult to navigate at times. On the outer edges there are small ridges, occasional storm damage to go around/through, and rock fields to cross, and so I would not recommend it for little ones or hikers with any ankle problems. The trail blazes as well can be a little inconsistent. There's a patchwork of old paths and trails that weave through the property, which most likely lead to cabins or previous buildings. The main trails near the old Sunset Lake are pretty well marked, but some of the further out trails either have extremely faded markers or no markers at all.

All and all though, this is a gorgeous property to explore. I've already been there 3 times for at least a few hours each time and I still haven't finished exploring the whole area. You just have to be aware of what you're in for and keep track of your surroundings. If you're not paying enough attention, then you could potentially wander off the trail or get turned around in the older unmarked pathways. But this location has a lot to offer for just about anyone. Short adventures for the whole family, longer and trickier paths for more experienced hikers to explore and some easy paths for those just wanting to stretch their legs. Happy exploring!



PEEC
Pocono Environmental
Education Center



POND PADDLE

Sunday

June 28 • 10:00am – 12:00pm

July 19 • 10:00am – 12:00pm

July 19 • 1:00pm – 3:00pm

CHECK OUT OUR
WEBSITE FOR
MORE DAYS!
PEEC.ORG

Swift Water Rescue on the Delaware River

By Jessica Brumbaugh

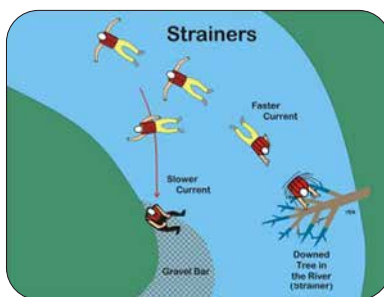
After raining for days, the weather was finally clear and perfect for a leisurely Sunday kayak. As I paddled the Delaware River alongside my fellow PEEC staff member and friend Stevie, we began to hear high pitched screams of “Help” from across the river. As we approached, we saw two young women waving their hands in panic while standing in the middle of what appeared to be a small island of downed trees at the bend of the river. The water was moving much faster on the outside bend of the turn and was threatening to entrap us as well.

When trees or other objects obstruct the flow of a river and limit the amount of water passing through, it is commonly referred to as a “strainer” in the paddling community. Strainers can be extremely dangerous. When water is forced to pass through a smaller opening, it increases in speed and builds in pressure. This movement can easily trap a boat underwater against tree branches and sometimes the boater as well. With building pressure and high speed water, evacuating the boat can be very difficult and safely removing a boat entrapped in branches can be even more so.

If a downed tree is seen hovering just over the water or sticking up out of the water, assume there are hazards underneath and avoid this area as much as possible. Sometimes the water is stronger than a person’s skill level and simply unavoidable. In this scenario, a person is advised to climb forward onto the stouter branches and work their way to shore – or beyond the downfall to open water downstream. A person forced below the surface



<http://coast-magazine.com/windstorm-fallout#lightbox-gallery-bGlnaHRib3gtMA==/0/>



https://www.frostburg.edu/faculty/rkauffman/_files/images_rafting_chapters/Ch03b-RiverDynamics_v3.pdf

should try swimming downstream using their hands to part the branches ahead.

Most importantly, before attempting to boat on any river, always know your river and your skill level. Stevie and I had received guidance and approval from a park ranger to kayak so soon after high rain fall. We knew the weather for the day, water levels, and potential hazards. We both also had extensive experience paddling and safety training. Stevie had her life guarding certification and I had experience in whitewater, certification as a wilderness EMT, and training with the Delaware Water Gap Search and Rescue. We also were well prepared with proper life vests, correct clothing for the weather and water temperature, communication devices in sealed containers, and a rescue plan in place for an emergency.

Unfortunately for our Sunday paddle victims, they had made many significant errors preparing for their trip. They had not secured their cell phones, which were lost when their boats capsized; they had no life vests, little

kayaking experience, little knowledge of the river conditions, and no safety training. They were also under the influence of alcohol, and had pre-existing conditions that made hyperventilation and excessive water intake extremely dangerous.

However, they were lucky that day. Not only were they without injury after initial entrapment, but also after multiple attempts to escape the island of downed trees. They also were able to find trees to stand on and drag their kayaks to while they waited for help.

As we approached, I had Stevie stage in a small eddy across the river as I assessed the situation. Once I was able to find my own safe location to stage, I learned that no one was seriously injured but the girls were definitely cold and in serious emotional distress after nearly drowning multiple times. From a distance I was able to calm the girls down, and then instruct them on how to drain their kayaks and get back into them.

When attempting to help someone in fast moving water, and with hazards such as strainers, it is important to maintain your distance and ensure your own safety. But there was also a second hidden hazard. As an EMT I had been treating patients almost daily with COVID-19 and, unfortunately, did not have a water-friendly mask option for this kind of situation. Not only was it important that I keep my distance because of the water, but because of my potential contagiousness.

After some encouragement, I was able to tow the kayakers out from the trees they were stuck against and give the girls instructions on how to safely maneuver through the many trees. We were then all able to ferry across the river to a waiting Stevie.

Thankfully this experience ended with everyone safe and alive. The girls were very lucky they did not drown and that Stevie and I were able to help them. Please remember on your next boating trip to know your river and know your skill level. The Delaware Water Gap National Recreation Area has so much to offer and teach us about the diversity and strength of nature. As you explore and enjoy what this environment has to offer, please do so safely.



FARM
TO TABLE
DINNER

JULY 25 • 6PM - 8PM



Nine Years - By Sheri Bone

As many of you know, I retired about a month ago. For those of you who didn't know, if you call PEEC to talk with me about setting up a school trip, you will now talk with Emma. And you will be in good hands. My run here has been a good one and the transition will be smooth.

I began my PEEC journey on May 16, 2011. I had been working at PEEC nine years (almost to the day!) when I retired. I started my position with the title "Director of Group Program Business Development." It took me 2 weeks to learn that moniker.

As time went on, I described my duties this way: "I am the Keeper of the Calendar and it's my job to keep the calendar full." I took that role quite seriously, as can be witnessed by the very full months of April, May, June, September, and October. March and November are filling nicely as well. July and August are busy, too, adding to the nicely rounded out Summer Camp schedule. You are most welcome, Education Staff, for those very active months!

In addition to keeping the calendar full, I was to ensure that all grant related programs were executed well and accurately. This meant that I was able to be an integral part of the Women on the Water (WOW – now "Watchers on the Water") program – being point person on land and sweep on the river. It must be stated that before I came to PEEC, I had NEVER canoed on a river before. Lakes and ponds, yes. Rivers, no. I was not confident that I could do that job well, but thanks to the expertise and patience of Molly Check, I learned what to do and how to plan those river excursions. I estimate that, for 7 summers, I organized and participated in at least 20 trips and interacted with over 200 high school students. That program was one of the best (and most exhausting!) things I have done when I think back on my PEEC experiences, and it was so empowering for the participants. I now consider the Delaware River mine.

I am not sure what the staff will do now that there will be less singing at PEEC. If you know the PEEC song, the Decomposing Log ditty, or "Dead Meat" by the Dermestid Beetles, then you know how I channeled some of my creative energy. In a former life as a classroom teacher, I

created songs to help kids learn, and I have been known to share my Photosynthesis song with some students at PEEC. That was one of many that I created BP (Before PEEC). I have written songs for math, social studies, and language arts, too!

It is, and has been, a theory of mine that our brains are wired to have some kind of rhythm or chant or music as a way to hook information that needs to be remembered. Think about it. How did ancient stories get handed down from generation to generation before writing occurred? They were put to song and chant. I hope there is someone to take over with some enthusiastic campfire/ecology/hike songs/chants/raps now that I am gone.

I, though, will continue to sing, making up ditties as I travel these United States. My dog, Hayley, and I are now "Location Independent" as we climb in the truck and pull our RV behind us, meeting up with new people, old friends, and family. Will I stop by at PEEC again? Why, yes! I expect to "run" (it's really a walk/jog for me!) as many 5K's as I can, and PEEC's rigorous course will help keep me in shape! I might turn up at one of the dinners, because who can resist Erin's cooking? PEEC has been a great part of my life, and even though I am at that wonderful age of retirement, I have many wonderful memories that will keep me young.



Does Invasive Japanese Knotweed Hurt The Aquatic Insects And Bacteria Of The Delaware River?

Continued From Page 1

2018). This may be an indication that the organisms responsible for the decomposition of the organic leaf matter, may be able to better decompose native species than non-native species. Aquatic organisms such as insects and bacteria play an important role in such decomposition (Webster and Benfield 1986; Cummin et al. 1989; Fogelman et al. 2018). In this research, we explored how much these insects and bacteria are actually affected by the presence of Japanese knotweed in the Delaware River, a river with invaded banks. Three different kinds of leaf packs were submerged in the Delaware River, within the Upper Delaware Scenic and Recreational River, for 29 days. Leaf packs were made of mesh produce bags that contained dried leaves within them, simulating a natural gathering of leaves against a rock in the river (Benfield 1996). The three different types of leaf packs consisted of only Japanese knotweed leaves or only native tree leaves, or a mixture of both. The leaf packs were randomly placed in two locations of the Delaware River. After the 29 days, the leaf packs were collected and from them, we gathered bacteria samples and counted the different types of macroinvertebrates (aquatic insects) found in them.

Bacteria

Some microbes, particularly bacteria, have the ability to break down cellulose, a compound often found in plant material. When they have that ability, they are given the term cellulolytic (Beguin 1993). By growing bacteria on a substance that contains cellulose, we are able to see what bacteria we collected that are cellulolytic (Mohanta 2014; Meddeb- Mouelhi et al. 2014). This tells us if the bacteria found in the leaf packs were taking part in the decomposition. We discovered that there was not a significant difference in the number of cellulolytic bacteria per different type of leaf pack (p -value= 0.53). This allows us to believe that the bacteria's ability to degrade cellulose was not affected by Japanese knotweed and can therefore still utilize it as a source of nutrients.

Aquatic insects

The aquatic insects, also known as macroinvertebrates, were identified to the taxonomic order they belong in and counted per order. We used that information to calculate the diversity or variety of insects per leaf pack. The larger the diversity, the better the aquatic insects are faring. We found that there was not a significant difference in diversity per different type of leaf pack (p -value= 0.70). This allows us to believe that the aquatic insects have the ability to utilize Japanese knotweed as a possible shelter or even as a food resource.

What does this mean?

According to our results, it appears that bacteria and aquatic insects have the ability to adjust to the invasion of Japanese knotweed. As much as a nuisance as it is to the native plants in the area of invasion, the

nearby bacteria and insects in the streams may be perfectly fine. This information may be important when considering future action against Japanese knotweed. The removal of Japanese knotweed might not be a priority over the removal of other invasive plants we are currently dealing with. Through this research, we were reassured that bacteria and aquatic insects have not been affected negatively by the Japanese knotweed that grows along the Delaware River.

Made Possible By:

This research was fully funded and supported by the Alliance for Watershed Education and the Pocono Environmental Education Center, approved by the National Park Service, and supported by Dr. Kagle and Dr. Moyer of Mansfield University of Pennsylvania.

References

- Beguin P, Aubert JP. 1994. The biological degradation of cellulose. *FEMS Microbiology Reviews*. 13: 25- 58.
- Benfield EF. 1996. Leaf Breakdown in Stream Ecosystems in *Methods in Stream Ecology*. Academic Press.
- Bottollier-Curtet M, Charcosset J, Planty-Tabacchi A, Tabacchi E. 2011. Degradation of native and exotic riparian plant leaf litter in a floodplain pond. *Freshw Biol*. 56:1798–1810.
- Callaway RM, Ridenour WM. 2004. Novel weapons: invasive success and the evolution of increased competitive ability. *Front Ecol Environ*. 2:436–443.
- Cummins KW, Klug MJ. 1979. Feeding ecology of stream invertebrates. *Annual Review of Ecology and Systematics*. 10: 147-172.
- Dyer JM, Cowell CM. 2009. Invasive Species and the Resiliency of a Riparian Environment. *Invasive Plants and Forest Ecosystems*.
- Fogelman KJ, Bilger MD, Holt JR, Matlaga DP. 2018. Decomposition and benthic macroinvertebrate communities of exotic Japanese knotweed (*Fallopia japonica*) and American sycamore (*Platanus occidentalis*) detritus within the Susquehanna River. *Freshw Biol*. 33(1): 299-310.
- Gerber E, Krebs C, Murrell C, Moretti M, Rocklin R, Schaffner U. 2008. Exotic invasive knotweeds (*Fallopia* spp.) negatively affect native plant and invertebrate assemblages in European riparian habitats. *Biological Conservation*. 141: 646-654.
- Meddeb- Mouelhi F, Mosian JK, Beauregard M. 2014. A comparison of plate assay methods for detecting extracellular cellulase and xylanase activity. *Enzyme and Microbial Technology*. 66: 16-19.
- Medina-Villar S, Alonso A, Vazquez de Aldana BR, Perez-Corona E, Castro-Díez P. 2015. Decomposition and biological colonization of native and exotic leaf litter in a Central Spain stream. *Limnetica*. 34:293–310.
- Mohanta YK. 2014. Isolation of Cellulose- Degrading Actinomycetes and Evaluation of their Cellulolytic Potential. *Bio engineering and Bioscience*. 2(1): 1-5.
- Pysek P, Prach K. 1993. Plant invasions and the role of riparian habitats: A comparison of four species alien to central Europe. *J. Biogeogr*. 20: 413.
- Webster JR, Benfield EF. 1986. Vascular plant breakdown in freshwater ecosystems. *Ann Rev Ecol Syst*. 17:567–594.

SUMMER

PROGRAMS AND GETAWAYS

2020

PRE-REGISTRATION REQUIRED
Unless otherwise indicated.

TO REGISTER:
Call PEEC at 570-828-2319

JULY

July 4th Family Camp Weekend
July 3rd-5th
Adults \$195 / 10% off ages 11-13 / 25% off
ages 7-10 / 50% off ages 4-6
Free ages 3 & under

Bring your friends and family to experience the best of what PEEC has to offer. Nature hikes, animal presentations, swimming, canoeing, fireworks, campfire and more! Price includes two nights lodging and meals from Friday dinner through Sunday lunch.



Bridge the Gap Edible & Medicinal Plant Walk
Saturday, July 11th
Free | 10am-12pm

Nature provides food & natural remedies for us in the form of many plants. Join us on a hike focused on wild edible & medicinal plants. No collecting will be done within the Park. *Lead support is provided by the William Penn Foundation.*

Waterfall Tour
Sunday, July 12th
\$10 | 9am-12pm

The Delaware Water Gap has quite a few waterfalls within the park that all flow into the Delaware River. Join us for the morning as we check out some of the larger and well known falls in the park. Spaces are limited so call early!



Bug Exploration
Saturday, July 18th
\$5 | 10am-12pm

Bugs are everywhere! Come join us as we go discover some insects on our trails and learn about what makes them so unique. Don't worry; they're not as scary as they look!

Bridge the Gap: Pond Paddle
Sunday, July 19th
Free | 10am-12pm & 1pm-3pm

Come join us for a free paddle on our ponds! Beginners are welcome—we will teach you everything you need to know! Dress appropriately—you may get wet. Spaces are limited; call to reserve a canoe or kayak! *Lead support is provided by the William Penn Foundation.*

Bridge the Gap: Pond Paddle
Saturday, July 25th
Free | 1pm-3pm

Come join us for a free paddle on our ponds! Beginners are welcome—we will teach you everything you need to know! Dress appropriately—you may get wet. Spaces are limited; call to reserve a canoe or kayak! *Lead support is provided by the William Penn Foundation.*

Farm to Table Dinner
Saturday, July 25th
\$25/person | 6pm-8pm

Welcome the coming of summer with PEEC's 4th Farm to Table Dinner. This dinner features local produce perfect for the season! Bring your friends & family to enjoy this refreshing evening. Payment is required at registration. Sold out in 2019 - call early to reserve your seat!

Intro to Tent Camping
Sunday, July 26th
\$5 | 10am-12pm

Learn everything you need to know about camping right here. From basic shelters, to common knots, and even how to build a fire from scratch. It'll be great practice for any future family vacations.

Wilderness Walkabout
Sunday, July 26th
Free for PEEC Members
\$5 for Non-PEEC Members
1pm-3pm

Get out and explore PEEC! Join Paul Kovalski, aka Dr. Dinosaur, as we hike one of our trails and discuss the natural history of our park.

AUGUST

Bridge the Gap: Guided Interpretive Hike
Saturday, August 1st
Free 1pm-3pm

Take a hike with one of our knowledgeable staff and learn a little bit more about our forests. We never know what exactly we'll find out there, so don't be afraid to ask plenty of questions along the way. *Lead support is provided by the William Penn Foundation.*



Bridge the Gap: Evening Pond Paddle
Saturday, August 1st
Free | 6pm-8pm

Come join us for a free paddle on our ponds! Beginners are welcome—we will teach you everything you need to know! Dress appropriately—you may get wet. Spaces are limited; call to reserve a canoe or kayak! *Lead support is provided by the William Penn Foundation.*

Bug Exploration
Sunday, August 2nd
\$5 | 10am-12pm

Bugs are everywhere! Come join us as we go discover some insects on our trails and learn about what makes them so unique. Don't worry; they're not as scary as they look!

Continued on Page 12

SUMMER PROGRAMS AND GETAWAYS

Continued from Page 11

AUGUST

Pocono Quilt Camp

August 7th-14th

\$630 Full Workshop - Call us for day rates

Quilters of all skill levels are welcome to a week of fabric fun. In this workshop, led by Patti Shreiner, enjoy a nice relaxing weekend with your fellow quilters. Come prepared to start some new projects guided by our leader. Includes lodging and meals!

Bridge the Gap: Edible & Medicinal Plant Walk

Saturday, August 8th

Free | 10am-12pm

Nature provides food & natural remedies for us in the form of many plants. Join us on a hike focused on wild edible & medicinal plants. No collecting will be done in the Park. *Lead support is provided by the William Penn Foundation.*

Wilderness Walkabout

Saturday, August 8th

Free for PEEC Members

\$5 for Non-PEEC Members | 1pm-3pm

Get out and explore PEEC! Join Paul Kovalski, aka Dr. Dinosaur, as we hike one of our trails and discuss the natural history of our park.

Frog Frolic

Sunday, August 9th

\$5 | 10am-12pm

Spend the afternoon with us at our ponds and streams! Learn about some of our frog friends as we gently catch and release these hopping amphibians. Wear boots and plan on getting wet and muddy.

Bridge the Gap: Fishing for Beginners

Saturday, August 15th

Free | 1pm-3pm

There are plenty of fish waiting to be caught in our ponds! Spend the afternoon learning some of the basics for fishing with a rod and reel and see how many you can get. Strictly catch and release! Call ahead to reserve your spot. *Lead support is provided by the William Penn Foundation.*



Bridge the Gap: Pond Paddle

Sunday, July 19

Free | 10am-12pm & 1-3pm

Join us for a paddle around our ponds! Beginners are welcome – we teach you everything you need to know! Dress appropriately – you may get wet. Call in advance to reserve a boat. *Lead support is provided by the William Penn Foundation.*

Nature at Night

Saturday, August 29th

\$5 | 8pm-9:30pm

A pleasant summer evening is the perfect time to head outside. Take a walk in the woods to listen for owls, look at stars, and enjoy the music of the night. Enjoy fun activities that test your night vision. We recommend you bring a flashlight!

Waterfall Tour

Sunday, August 30th - \$10 | 9am-12pm

The Delaware Water Gap has quite a few waterfalls within the park that all flow into the Delaware River. Join us for the morning as we check out some of the larger and well known falls in the park. Spaces are limited so call early!

SEPTEMBER

Labor Day Family Camp Weekend

September 4th – 7th

Adults \$225 / 10% off ages 11-13 / 25% off ages 7-10 / 50% off ages 4-6

Free ages 3 & under

Bring your friends & family to experience the best of what PEEC has to offer. Interpretive hikes, animal presentations, canoeing, campfire and more! Includes three nights lodging & meals from Friday dinner through Monday lunch.

Volunteer Day – Pike County Day of Caring

Saturday, September 12th

Free | 9am-2pm

Lend a hand and help us out with some seasonal projects. This is the perfect day to become involved with our volunteer program! Preregistration required. Lunch will be provided.



Like
PEEC?

Show it on Facebook!



PEEC
TWEETS

Follow us on Twitter:
@peec_tweet