



Great Swamp Watershed Association

The Passaic River **WATERKEEPER®** ALLIANCE Affiliate



Across the Watershed

Fall-Winter 2018



Protecting our Waters and our Land for More Than 35 Years

From the Desk of the Executive Director

Rolling Knolls Landfill

by Sally Rubin

Rolling Knolls landfill is an approximately 200 acre site located in the Green Village section of Chatham Township which was used as an unlined landfill from the early 1930s through 1968. During its use, it received municipal solid waste, construction and demolition debris. According to the Chatham Board of Health, waste included tree stumps, scrap metal, tires, household refuse, residential septage waste and industrial waste.

Herbicides and pesticides were used to control weeds, insects and rodents. Oil was applied on facility roadways to control dust. The majority of the site is privately held, however, approximately 30 acres are owned by U.S. Fish and Wildlife Service as part of the Great Swamp National Wildlife Refuge.

Landfill operations contaminated soil, sediment, surface water and groundwater. Contaminants consist of elevated levels of arsenic, lead, mercury, polycyclic aromatic hydrocarbons (PAHs), pesticides, phthalates, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), freon compounds, dioxin and furans.

After many years of investigation, the EPA determined that the site was a threat

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Excitement is in the Air for Our 2018 Gala

On Thursday, October 11, hundreds of members and friends will gather at the nearby Brooklake County Club in Florham Park to join us in celebrating our 37th year of environmental service to the communities of the Great Swamp Watershed and the greater Passaic River region. We sincerely hope that you will be among them!

Attendees can look forward to champagne and premium open bar throughout the evening. A delectable variety of passed hors d'oeuvres will be served, as guests peruse the exciting silent auction prizes that include vacation destinations, dining experiences, sports and music tickets, artwork, fine wine, and so much more! We also have a Live Auction planned with even more fabulous prizes! A full sit-down dinner with wine service follows in the main ballroom.

When you buy a ticket to attend our Gala or purchase an ad in our Gala Program & Auction Guide, great things happen! Not only do you book yourself a wonderful festive evening of fun, but you also help our event to be a big success. The money raised by our Gala event helps GSWA continue and expand our important water quality monitoring, environmental stewardship, community education, and advocacy programs.

We are delighted to announce former Governor Thomas Kean is this year's Gala Honoree.

As the state's 48th governor, Tom Kean has been rated among America's most effective state leaders by Newsweek magazine, and is revered for, among other major accomplishments, creating landmark environmental policies. Shake hands with elder statesman and former New Jersey Governor Thomas Kean at our intimate VIP cocktail reception pre-Gala!

Come help us celebrate the many achievements of former Governor Kean, as he reflects upon his illustrious career, shares his views on environmental issues, and takes a few moments to pay tribute to former Governor Byrne.

Tickets and VIP passes may be purchased online at GreatSwamp.org. Going to be out of town and can't attend? You can still support GSWA by bidding on our auction online! Watch for the auction to be online in early October!

Gala Program ads are a great way to help GSWA as well. If you're interested in a business ad, or would just like to print your congratulations to GSWA or former Governor Kean, contact Debbie Rice.

Questions? Contact our Gala Coordinator, Debbie Rice, by email at DRice@GreatSwamp.org or give us a call at (973) 538-3500, Ext. 14.

See you at the party!

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Across the Watershed

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Rolling Knollw *(continued from page 1)*

to people and the environment and the site was placed on the Environmental Protection Agency National Priorities List for cleanup in 2003. What exactly does this mean?

In 1980, after toxic waste dumps such as Love Canal received national attention and the public learned about the risks to human health and the environment caused by contamination, Congress established the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), more commonly known as Superfund. The Superfund law allows the EPA to clean up contaminated sites, including requiring responsible parties to perform the cleanup or pay for it.

According to the EPA, Superfund goals are:

- Protect human health and the environment by cleaning up polluted sites
- Make responsible parties pay for cleanup work
- Involve communities in the Superfund process, and
- Return Superfund sites to productive use

After having listed Rolling Knolls as a Superfund site, the EPA identified potentially responsible parties (PRPs) who then conducted a lengthy remedial investigation through soil and water sampling and a risk assessment. The next step in the process is an analysis of potential cleanup alternatives, called a Feasibility Study and identification of a preferred proposed cleanup plan. The Rolling Knolls Feasibility Study and proposed cleanup plan are due to be released by the EPA in September 2018. This will be followed by a 30 day public comment period. At a Public Information Session held by the

EPA in June, the following potential cleanup options were listed:

Soil Alternatives:

- No action
- Site controls (such as institutional controls, fencing, signage)
- Site controls, capping of selected areas to reduce overall risk and remediation of additional areas of concern
- Site controls, excavation and offsite disposal of selected area to reduce overall risk and remediation of additional areas of concern
- Site controls and capping of all landfill material

Groundwater alternatives:

- No action
- Source control and monitoring
- Source control and monitoring, with a contingent remedy

The proposed cleanup plan will summarize preliminary conclusions and delineate why the selected option appears most favorable. The proposed plan must be protective of human health and the environment and must comply with the law. Additionally, seven other factors are weighed in determining the preferred cleanup plan. They are:

- Long term effectiveness
- Reduction of toxicity
- Short term effectiveness
- Implementability
- Cost
- State acceptance
- Community acceptance

It is the last step, community acceptance, where we, the community, must play an important role. GSWA is in the process of

(continued on opposite page)

Summer Draws to a Close and so Does Your Pool

by Sandra LaVigne, Director of Water Quality

As we wind down to the last warm days of the summer, we all want to get those pools closed before the leaves come down. However, the draining of pool water into the environment can have detrimental effects on the wildlife and water quality in your area, possibly killing sensitive aquatic wildlife such as crayfish and dragon flies. Here are some smart environmentally friendly guidelines to follow before you drain down for the winter:

- Allow the pool to de-chlorinate by letting the water stand (without adding further chlorine) for 7 to 10 days before draining
- Never drain directly into storm drains or streams — allow pool water to filter through your grass
- Drain slowly, over a few days if necessary, to prevent erosion or pooling in your yard. 🌳

Rolling Knolls *(continued from opposite page)*

establishing a Community Advisory Group (CAG) through the EPA. A CAG is made up of representatives with diverse community interests, including residents near the site and who may be impacted by the site, local environmental groups, local government officials, local businesses, and possibly responsible parties. The CAG purpose is to provide a public forum for the community to present and discuss their needs and concerns and to offer input to the EPA. **We will have a kick-off meeting on September 17, 7-8:30 p.m., at the Helen Fenske Visitor Center, 32 Pleasant Plains Rd, Basking Ridge. If you are interested in being a CAG member, please reach out to Sally Rubin at srubin@GreatSwamp.org as soon as possible.**

In addition to forming a CAG, we are working with the EPA to obtain an

independent professional to review and explain information to the community, including the Feasibility Study and proposed cleanup plan, through the EPA's Technical Assistance Services for Communities (TASC) program. The TASC program will provide a technical advisor to help us understand complex environmental information. This will be followed up with a more formal request for a Technical Assistance Grant (TAG).

Since the fight to stop the jetport over 50 years ago, the residents of our local communities have fought to preserve and protect our environment. Let us continue that tradition and ensure that the Rolling Knolls Superfund is restored to protect human health and the environment through ecological revitalization which supports functioning and sustainable habitat. 🌳

GSWA Music Festival Makes a Splash

by Val Thorpe, Director of Communications and Membership

Hartley Farms Polo Field in Harding Township provided the perfect backdrop for our inaugural music festival fundraiser on Sunday, June 10, 2018. High energy and great vibrations were in the air, along with some unexpected moisture. But not even a little rain could dampen the mood of the 350 festival goers. A big tent provided a dry, comfortable oasis for attendees to spread out blankets and chairs and groove to the live music. Others braved it out with rain jackets and umbrellas, while children kicked beachballs around the field. No matter where they spent the afternoon, there was commonality — smiling faces.

Solo artist, Jeff Webb, kicked off the festival with a rousing rendition of “Who’ll Stop the Rain” and kept the music going between the musical acts. Four local bands, The Gammon Brothers, Hub Hollow, Not Enough Jeffs, and Stomp Box, entertained the crowd with a variety of music genres, providing over four hours of continuous live music.

Café Beethoven of Chatham and Minuteman of Morristown fed the crowd throughout the afternoon, and local merchandise vendors offered unique items for sale. Free potable water was available to everyone thanks to NJ American Water, and the antique fire truck from Washington House in Basking Ridge dispensed beer and wine.

Keeping everything flowing in the right direction were the more than 55 volunteers and GSWA staff members who helped with



Richard Sziaretta, Harding Township

setup and breakdown, and everything in between. Eight “Explorers” (Junior police ages 14-17) and two police officers assisted with parking. Where would we be without our awesome volunteers?

When the planning committee sat down at our very first meeting, the one thing we knew for sure was that we were in uncharted territory. We took a journey together and somewhere along the way we realized, “Hey, we’re actually going to put on a music festival, and it’s going to be great!” (And it was!) We are thrilled to report that we exceeded our financial goals and our own expectations. And now that we have a structured plan in place, we are prepared to blow it out of the water next year! Mark your calendar for **Sunday, June 9, 2019**, for our 2nd Annual Great Swamp, Great Music Festival.

Many thanks to: Nic Platt, GSWA Board Chairman, for offering the Hartley Farms Polo Field and for getting it in order

(continued on opposite page)

by Sally Rubin, Executive Director

I've always known GSWA is smart (lower case), but did you know we're also SMART (upper case)? In this case, it's Paterson SMART, and it's Stormwater Management and Resource Training.

Paterson SMART is a collaboration working to bring together community organizations, community members, educators, researchers, developers and property owners to incorporate green infrastructure to generate multiple benefits derived from stormwater management techniques. Our primary goal is the establishment of green infrastructure to improve water quality and reduced combined sewer overflows (CSOs), using stormwater management, urban design, and education.

Sustainable green infrastructure provides multiple benefits, including resiliency

to flooding, reducing CSO events, and improving quality of life. Green infrastructure is cost effective, sustainable, and environmentally friendly. It captures, filters, absorbs, and reuses stormwater. Through a grant from NJ DEP to Rutgers Water Resources program, several green infrastructure projects have already been installed in Paterson, including the rain gardens at three schools GSWA facilitated and wrote about in our last newsletter. Another rain garden is planned for this fall at a new park.

GSWA has recently become the facilitator for this collaboration and we look forward to working with Paterson and SMART to continue implementing green infrastructure initiatives. 🌳

Music Festival *(continued from opposite page)*

(including mowing the field one last time!); the neighbors living at Hartley Farms for embracing the event; the music festival planning committee for their countless hours of focused energy and critical thinking; our generous sponsors: Normandy Real Estate Partners, Peapack Gladstone Bank, Atlantic Health, Matt and Agi Krauser, Debra and John Apruzzese, and our other wonderful sponsors; the bands and Jeff Webb for donating their time and talent to benefit GSWA; David Kramer of Edmund M. Kramer Photographers for capturing

so many great moments; Mark Scheer for designing and building our Swamp Shack; Chatham Print for graphic design; the GSWA staff for spending their day off doing whatever was asked; all of our amazing volunteers; and everyone who came out and supported this event!

See you at our 2019 music festival, and hopefully even before then at some of our many hikes, speaker programs, workshops, and gatherings. Details about our upcoming events can be found in this newsletter, and at GreatSwamp.org. 🌳

Upcoming Events

Volunteer Work Day at the CMA Saturday, September 8, 9 a.m.—12:30 p.m.

GSWA Conservation Management Area (CMA), 53 Tiger Lily Lane, Harding Township, NJ

Come help us maintain and improve our 73-acre Conservation Management Area. Tasks will include trail maintenance, fence repair, and invasive plant removal. Lighter tasks will also be available. Bring your best energy and enthusiasm! Conditions may be wet or muddy. Long pants and sturdy shoes or boots are encouraged. We'll bring the coffee and donuts to help fuel you along. Participants under 14 must be accompanied by a parent — community service hours can be earned for your school. Registration is required. Register online at GreatSwamp.org or call 973-538-3500. ***Can't make this date? No worries — we will also conduct CMA volunteer work days on October 13, November 10, and December 8, 9:00 a.m. – 12:30 p.m. Pick a date that works best for you!***

Rolling Knolls Landfill Superfund Update and Community Advisory Group Kickoff Meeting Monday, September 17, 7–8:30 p.m.

Helen Fenske Visitor Center, 32 Pleasant Plains Road, Basking Ridge, NJ

Come join us for an update from the EPA on the status of the Rolling Knolls Landfill in Green Village, Chatham Township. We are looking for a few good men and women to participate in a Community Advisory Group (CAG).

As discussed in the cover article, the CAG will provide a public forum for the community to discuss their concerns and offer input to the EPA on the cleanup as it moves forward. Even if you are not interested in being a member of the CAG, please join us to learn more about the process. Registration is required. Register online at GreatSwamp.org or call 973-538-3500.

Evening Briefing: GSWA — In a Nutshell Wednesday, September 19, 6:30–8 p.m.

Location to be announced

What is Great Swamp Watershed Association all about and what's new? We love answering these types of questions! In a nutshell, we provide: environmental education, water quality monitoring, land preservation and land stewardship, and advocacy for the Great Swamp, and the Passaic River region, from the Great Swamp headwaters to Newark Bay. But what does that really mean? Come find out more about what we do, and how it affects you, your family, and future generations. Registration is required. Register online at GreatSwamp.org or call 973-538-3500.

Evening Briefing: All About Pollinators Wednesday, September 26, 6:30–8 p.m.

Location to be announced

Pollination — it's not just for bees. Spend the evening with GSWA and learn more about the many different pollinators and what you can do to attract them to your garden. You may be surprised to learn

how easy it is to enhance your yard as a home for pollinators throughout the year, and encourage pollinators such as bats, butterflies, birds, bees, and more. Leave with lists of pollinator-friendly plants for your use at home. Registration required. Register online at GreatSwamp.org or call (973) 538-3500.

**Create Your Own Walking Stick
Thursday, October 4, 5–8 p.m.**

GSWA Conservation Management Area (CMA), 53 Tiger Lily Lane, Harding Township, NJ

Learn how to make your very own walking stick so you can hit the trails with confidence. Retired science teacher turned walking-stick-guru, Brad Koller, leads a fun-filled DIY workshop where you will choose from a variety of rough sticks including red cedar, maple, beech, and iron wood, and walk away with a finished product — and the ability to create one on your own! All tools and safety equipment will be provided. This is one of our most popular workshops and space is limited, so don't miss out — sign up today. Register online at GreatSwamp.org or call (973) 538-3500. \$30/person.

**GSWA 2018 Gala
Thursday, October 11, 6–9 p.m.**

Brooklake Country Club, 139 Brooklake Road, Florham Park, NJ

Join us as we honor former New Jersey Governor Thomas Kean for his many environmental contributions. Enjoy an evening of cocktails, scrumptious food,

and our popular silent auction consisting of magnificent items like luxury vacations, dazzling nights on the town, specialty wines, cool event passes, sports packages and so much more. Come out and support our fabulous fundraiser! Register online at GreatSwamp.org or call (973) 538-3500.

**Volunteer Work Day at the CMA
Saturday, October 13, 9 a.m.–12:30 p.m.**

GSWA Conservation Management Area (CMA), 53 Tiger Lily Lane, Harding Township, NJ

See description for September 8.

Can't make this date? No worries — we will also conduct CMA volunteer work days on November 10, and December 8, 9:00 a.m. – 12:30 p.m. Pick a date that works best for you!

Natural and Cultural History of Jockey Hollow Then and Now

Thursday, October 18, 6–7:30 p.m.

Jockey Hollow section of Morristown National Historical Park, Tempe Wick Road, Morristown, NJ

Join Eric Olson, Jockey Hollow Park Ranger and Historian, and our own Hazel England, Director of Education and Outreach and Land Steward, for a hike and outdoor talk on natural history — then and now. We will look and listen for owls and other nightlife and hear an 18th century viewpoint on how the early century colonists viewed the darkness. Registration required. Register online at GreatSwamp.org or call (973) 538-3500.

(more events on next page)

Upcoming Events *(continued from previous page)*

Stream Assessment Training

Saturday, October 20, 10 a.m.—3 p.m.

*Florham Park Library, 107 Ridgedale Ave,
Florham Park, NJ*

Interested in learning how to monitor a stream or gaining a better understanding about stream health? This one-day, two-part training session is for you! An indoor classroom session teaches you how to conduct visual and biological stream assessments and recognize environmental factors that may impact stream health. An outdoor session lets you practice your new-found skills at a local stream site. By the afternoon, you will be a fully trained visual stream assessment volunteer and ready to conduct an assessment. Tools and supplies will be provided. Be sure to wear shoes that are suitable for walking outside and getting dirty. Preferred volunteers are 15 or older. Younger volunteers are welcome with parent participation. This training will be conducted in conjunction with the AmeriCorps New Jersey Watershed Ambassador Program. Registration required. Register online at GreatSwamp.org, or call (973) 538-3500.

Change of Colors Hike

Saturday, October 20, 10 a.m.—noon

*Garret Mountain Reservation, 8 Mountain
Ave, Woodland Park, NJ*

October is the perfect time to head outdoors and check out all the vibrant colors of autumn. GSWA Education Associate, Adam Palmer, will take you on a journey through the trails of Garret Mountain and help identify the many varieties of trees and plants as they begin to prepare for a long winter's nap. Be sure to grab your camera and fill up your re-usable water bottle. Wear

your hiking boots and dress for the weather. Registration required. Register online at GreatSwamp.org, or call (973) 538-3500.

Evening Briefing: Recycling – What are the Basics?

Wednesday, October 24, 6:30—8 p.m.

Location to be announced

Can I recycle the cap on a plastic water bottle? Are plastic food trays recyclable? Do I still need to tie up my newspapers? We all know that recycling means separating out paper, plastic bottles/containers, glass bottles/jars and aluminum and tin cans from our trash. But understanding the fundamentals of recycling is what helps us make informed decisions on what and how we sort. Learn how “aspirational recycling” can actually be detrimental to the recycling process. Our recycling expert will sort the myths from the facts about the ins and outs of recycling and pass along this knowledge to you, so you can share with others. Light snacks will be served. Registration required. Register online at GreatSwamp.org, or call (973) 538-3500.

Volunteer Work Day at the CMA

Saturday, November 10, 9 a.m.—12:30 p.m.

*GSWA Conservation Management Area
(CMA), 53 Tiger Lily Lane, Harding
Township, NJ*

See description for September 8.

Can't make this date? No worries — we will also conduct CMA volunteer work days on December 8, 9:00 a.m. – 12:30 p.m.

Breakfast Briefing: Small Mammal and Plant Survey Results from Top Area Biologists
Tuesday, November 13, 8–9:30 a.m.

GSWA Headquarters, 568 Tempe Wick Road, Morristown, NJ

It's a double-header with Drew Biology Professor, Dr. Tammy Windfelder, and NJ Conservation Foundation Ecologist, Dr. Emile DeVito, as they report back on current research from our own Conservation Management Area (CMA). Emile will report on forest recovery results gained from a recent plant survey conducted inside our 30-acre deer enclosure and a local comparison unfenced location. Tammy will talk about what 10 years of research on the small mammals at the CMA and Drew University teach us about these species. Come hear about the responses of these wild animals to restoration efforts, competition, and disease. Light snacks will be provided. Registration is required. Register online at GreatSwamp.org or call 973-538-3500.

Wine and Cheese, Yes Please!
Wednesday, November 14, 5:30–7:30 p.m.

GSWA Headquarters, 568 Tempe Wick Road, Morristown, NJ

What's more pleasant than pairing tasty wine with just the right cheese? Doing it for free! Join GSWA for this much anticipated event. We will sip a variety of wines from around the world, and sample cheeses varying from soft to crumbly, and mild to sharp that are selected to complement the wine. Variety is the spice of life, so be sure to try them all! Here's how it works: **non-GSWA members are free**. Members: simply bring along a friend or two and it's free for all

of you. Or, come alone for a \$25 donation! Registration is required. Must be over 21. Register online at GreatSwamp.org or call (973) 538-3500.

Post-Thanksgiving CMA Cleanup & Hike
Sunday, November 25, 9 a.m.—noon

GSWA Conservation Management Area (CMA), 53 Tiger Lily Lane, Harding Township, NJ

Stuffed from your big Thanksgiving meal? Us too. The cure is activity. C'mon outside and get your blood pumping for a good cause. We need to get our CMA in tip-top shape for the winter, and we could use your help. After we spend some time sprucing up the area, we will reward ourselves with a scenic hike through the trails. Hiking boots recommended and be sure to dress for the weather. Registration is required. Register online at GreatSwamp.org or call (973) 538-3500.

Evening Briefing: Current Water Quality Issues
Wednesday, November 28, 6:30–8 p.m.

Location to be announced

Ever wonder about the water quality in the streams in your neighborhood? Come and learn about the quality of the water in your community and get ideas on how you can help to protect and improve it. Registration is required. Register online at GreatSwamp.org, or call (973) 538-3500.

(Events continued on page 14)



An Invasive Change: How a Warming Planet Helps Non-Native Species

by Adam Palmer, Education Associate

Climate change is a mixed bag of problems, and it's happening fast. The World Wildlife Foundation best states some of the more obvious threats, like the fact that “sea levels are rising and oceans are becoming warmer. Longer, more intense droughts threaten crops, wildlife and freshwater supplies. From polar bears in the Arctic to marine turtles off the coast of Africa, our planet's diversity of life is at risk from the changing climate.”¹ You may be thinking *but how will this affect me here, in New Jersey?* My answer for you? **It already is**, and it has to do with our planet's biodiversity.

Invasive species have been a problem for quite some time, in fact, ever since life first started on Earth. Many people associate invasive species with human activities like the exotic pet trade, or the increase of global commercial trade, and in the case of plants, even landscaping; but invasions have been happening naturally before *Homo sapiens* even existed as a species. One of the largest in recorded history, known as The Great American Interchange, saw a mass exodus of land and freshwater animals from South America to North America, and the other way around when the Isthmus of Panama erupted from the sea due to volcanic activity and connected the two formerly separated continents. All of this was happening three million years ago, as the geography and climate of the Earth were undergoing changes during the Pliocene Epoch. By definition, an introduced species is “any non-native species that significantly modifies or disrupts the

ecosystem it colonizes”² and this wave of invasions ushered in large extinction events, including the loss of the unique saber-toothed marsupials of South America, as new non-native species outcompeted the native inhabitants. Not all introduced species are successful in this regard, however, and many of them do not have the adaptations required to survive and establish a population in the climate/ecosystems of their new habitats. But those that do have some evolutionary advantage tend to become invasive, as they fight for resources or prey upon their new co-inhabitants and alter the ecosystem's dynamic, usually for the worse. For example, we can look at one of the poster-children of invasive species, the lionfish. Introduced to the coastal waters of Florida most likely due to a negligent pet owner, this fish has dominated its new ecosystem, preying on species that have no evolutionary defense against it, and surviving predation from predators who have no way of dealing with its venomous spines. Because most native species have evolved alongside each other over hundreds of generations and have been selected for certain traits in a sort of natural arms race, when a new contender arrives it is akin to bringing a knife to a gun-fight.

But how does this all connect to a warming planet and a changing climate? Because just as certain evolutionary traits can give advantage to a species, climate change is making it easier for some of these species to survive in a new ecosystem, which may originally have had a climate it was not

well adapted to. For example, the aquatic plant hydrilla (*Hydrilla verticillata*), native to Asia, was introduced to Florida during the 50's when they tried cultivating it in the canals to be used as an ornamental plant in aquariums. The plant quickly became rampant in the waterways and still today it can be found in most areas of Florida, which spends millions each year in control efforts. Luckily, its continued spread is usually hindered by winter dieback in the more temperate northern parts of the state and U.S.³ This all could change with a warming planet, as the sea becomes hotter and the winters less severe, the abundance and range of hydrilla is capable of increasing. We could face a similar problem here in New Jersey, where we have an invasive aquatic plant of our own, the Water Chestnut.

Those of you who have joined us on our pond clean-up days know that water chestnut grows rapidly in large clumps; its tangling and quickly spreading roots and leaves can also impede and choke out the flora and fauna of our freshwater ecosystems. It also, like the hydrilla, sees significant dieback in the winter when the waters become too cold for the plants to survive, save only the hearty spiked seeds in the warmer sediment which grow back and start anew the next season. Here climate change could affect the abundance of this plant, as less severe winters don't provide as significant of dieback as necessary to hinder the plants continued success.⁵

But if the climate is shifting won't native species also have a chance at expanding their ranges? Not quite. As Hellman et al. point out in their 2007 paper *Consequences of Climate Change for Invasive Species*, "dispersal traits and other mechanisms enabling invasion will allow existing invasives to expand their ranges into newly suitable habitat more quickly than native species. Species that shift ranges quickly could have a competitive advantage if native populations become progressively poorer competitors for resources in a changing climate."⁴ Not only will the natives be kicked out of their historic ranges, they will more than likely not even have a shot at expanding into the newly available ones.

Animals also will see increased advantages to a warming planet as their usually temperature-limited ranges expand farther and farther north. If you have been in the Swamp after a particularly rainy day or week (which we have had quite a few of this summer), you may be well aware of this fact from the buzzings in your ear and bites through your shirt. The culprit? The Asian Tiger Mosquito (*Aedes albopictus*), which has been slow to expand its way up the eastern seaboard since its first detection in the U.S. in 1985, eventually finding its way to New Jersey. One of the limiting factors in its spread is the winter temperatures, which get too low for the eggs to survive most of the time. With climate change this no longer will become


(continued on next page)

Invasive Change *(continued from previous page)*

a restricting factor, and predictably we will see its continued spread across the U.S., especially northwardly as winters become less severe and flooding more frequent. This poses a particular threat to us all as a population, as with most mosquitos they can be vectors for a host of not-so-fun diseases.⁶

So while you might hear climate change and automatically think of melting icecaps, rising sea levels and droughts and flooding, which at times can seem quite distant from us all here in New Jersey, you should also think of the invasives. Our ecosystems are changing almost as rapidly as the climate, and it is just another reason why it is so important for us all to come together and work to combat the manmade issues of our changing climate.

Citations:

1. Climate Change <https://www.worldwildlife.org/threats/effects-of-climate-change>
2. Invasive Species <https://www.britannica.com/science/invasive-species>
3. Hydrilla <http://edis.ifas.ufl.edu/ag404>
4. Hellman et al. https://www.researchgate.net/publication/5279379_Five_Potential_Consequences_of_Climate_Change_for_Invasive_Species
5. Water Chestnut <https://www.invasivespeciesinfo.gov/aquatics/waterchestnut.shtml>
6. Tiger Mosquito <http://vectorbio.rutgers.edu/outreach/species/albo.htm> 

Events *(continued from page 11)*


Volunteer Work Day at the CMA **Saturday, December 8, 9 a.m.–12:30 p.m.**

GSWA Conservation Management Area (CMA), 53 Tiger Lily Lane, Harding Township, NJ

See description for September 8.

Breakfast Briefing: Update on the Lower Passaic River Superfund **Tuesday, December 11, 9–10:30 a.m.** **(Note special time)**

GSWA Headquarters, 568 Tempe Wick Road, Morristown, NJ

Come join us for an update from Ana Baptista, Chair of the Passaic River Superfund Community Advisory Group. We'll hear the status of the cleanup of the lower 8.3 miles of the Passaic River, the largest environmental dredging project in the history of the Superfund program. Registration is required. Register online at GreatSwamp.org or call 973-538-3500. 

Like GSWA
and join the cause on

facebook

by Wade Kirby, Director of Development

Not long ago, Sally Rubin received a call from Interior Designer and artist Joan Eisen. Joan is a published author, master gardener, and award winning fine artist, among many other accomplishments. She has participated in Mansion in May Show houses and her interiors have been published in numerous magazines and newspapers.

Joan lives in Morristown and has been an annual donor to the Great Swamp Watershed Association for the past several years. Having recently seen the documentary, "Saving the Great Swamp/Battle to Defeat the Jetport" produced by Larry Fast and Scott Morris, she was inspired by the relentless effort of the citizens to save our swamp! Her appreciation for our work was the motivation to support organizations that have made a strong impact on our community. She told Sally that, in updating her estate plans, a bequest to us would be included as part of her legacy... a welcome and surprising message to receive in the middle of a winter NorEaster!

Joan has attended our Eco-Friendly Products presentation, a recent fundraising event, and has spoken favorably about our work to other donors from whom we have received support. We are most grateful and

we hope that Joan's generosity will be the catalyst for others to leave a legacy gift to the Great Swamp Watershed Association as part of their estate plans.

The vast majority of planned giving occurs through bequests, however, some vehicles exist to benefit both the donor and the charity during the donor's lifetime. Charitable gift annuities and charitable remainder trusts provide a cash flow to the donor during his or her lifetime. In each case, the designated charity receives cash upon the donor's death. A charitable lead trust can be set up with a designated cash flow to the charity during the donor's lifetime and consisting of a specific term by which the payments cease. At the term's conclusion, the remaining amount passes along to the next generation. You should consult with your own professionals for specific advice.

Please let us know if you are considering or have already arranged for the GSWA to be a beneficiary in your will. We would love to acknowledge your generosity. For 37 years we have protected the places you love, and with your help we hope to continue for many years to come. 🌿

Know Someone Who Would Like to Become a Member?

GSWA relies on members like you to help protect our watershed's natural resources. So please pass this newsletter along, and encourage your friends and neighbors to join us! Visit GreatSwamp.org for more information.

GSWA Commences New Educational Collaboration with STEM-focused Organization

by Hazel England, Director of Education and Outreach

Since GSWA expanded our organizational mission two years ago, broadening both scope and geography to focus our efforts on the Passaic River from source to sea, our educational programs have also been moving downstream. We have been building long-term relationships with partner schools in Newark and Paterson, offering our highly regarded science-based experiential learning through a combination of in-class, in playground, and in the field programming to elementary through high school students. We are excited to be furthering this educational role with a new collaboration with a fellow non-profit organization focused on educational excellence, Students 2 Science (S2S). The organization's mission is simple — to 'inspire, motivate, and educate elementary,

middle and high school students to pursue careers in science, technology, engineering and math (STEM subjects).’ S2S has until this point focused primarily on exposing students to chemistry and biochemistry programming, and to scientists in those careers who act as mentors. The program comprises both virtual labs and hands-on lab sessions, and students gain exposure to science concepts and science careers with the goal of encouraging them to pursue STEM careers.

Beginning this fall, GSWA will partner with S2S to offer students a new outdoor learning option, that of a hands-on Environmental Science field day. Following the successful program structure we have established in our environmental education field experience programming over the last several years, high school students will experience a day of hands-on field sciences with GSWA staff, volunteers and mentors. These are biological and environmental professionals who are more likely to wear rubber boots and jeans than lab coats and glasses, presenting students a different face of STEM science careers!

Students will undertake two activities during their field experience. The first is a water quality activity, where they will deepen their understanding of water quality issues, performing chemical and biological analysis along with visual assessment of a stream to gain exposure to how scientifically based sampling can answer real world questions

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How Much Rain Fell in Your Back Yard?

by Sandra LaVigne, Director of Water Quality

The NJ State Climatologist wants to know! CoCoRaHS (The Community Collaborative Rain, Hail and Snow Network) is a nationwide, community-based group of volunteers who take a daily measure of rain, hail, and snow right in their own back yards. A fun activity for adults and children alike to learn more about the weather and participate in the gathering of data. The equipment is easy to set up and inexpensive, you can get started right away. For more information visit www.cocorahs.org or send an email to: njcocorahs@climate.rutgers.edu. 🌱



GSWA's CoCORaHS gauge

STEM *(continued from opposite page)*

such as 'how clean is the water.' The second activity will develop their ecological skills and understanding of a floodplain forest in protecting biodiversity, and its role in protecting against downstream flooding. Students will use the species observed, and knowledge they will gain through sampling of the soils of the area to determine if the patch of forest should be 'saved or developed' in a hypothetical development scenario.

During this pilot year, GSWA will provide ten programs in the fall and ten in the spring for a total of approximately 1,000 high school students from underserved communities.

We will develop a program mirroring that already in place at S2S other lab experiences where scientists with relevant experience can mentor and volunteer to expose students to a broad range of STEM career paths. We are excited to take the successful programs we have developed over the years and partner with S2S to provide these experiences to a wider student population. If you are a science professional, current or retired, and are interested in getting involved as a volunteer/mentor, we would love to have you! Please email Hazel England, Director of Education and Outreach, at hazele@GreatSwamp.org. 🌱

With Sincerest Thanks to The Horizon Foundation for New Jersey

by Rick Porter, Director of Institutional Relations

Great Swamp Watershed Association (GSWA) firmly believes that connecting children and adults to the natural world is fundamental to their health and wellbeing. We are very grateful to The Horizon Foundation for New Jersey for its support of our stewardship work and programming at our Conservation Management Area (CMA) in Harding, NJ, that helps us make this connection for thousands of citizens in our watershed and across the greater Passaic River region.

In 2014, our first grant award from The Horizon Foundation for New Jersey helped GSWA complete a significant amount of habitat restoration and trail development

at the CMA, which is a 73-acre wetlands forest open to the public daily, free of charge, for passive recreation such as hiking and bird watching, and which serves as our outdoor education center for environmental and wellness programming. The beautiful Horizon Trail was officially opened at the CMA in October 2015.

Over the past two years, the Foundation's support has funded more than 20 half-day outdoor experiential opportunities at the CMA for over 500 children from towns and cities across the Passaic River region. Students have attended from schools as far away as Newark, and Paterson, as well as locally, from Cornerstone Family Programs in Morristown, which The Horizon Foundation for New Jersey also supports.

Children participate outdoors in safe, age-appropriate, healthy programs that are normally not available to them where they live. Students participate in physical activity, hiking the more than two miles of trails at the CMA, including the Horizon Trail. They do visual assessments of stream conditions at Silver Brook, learning how the presence of macroinvertebrates in the stream indicate water quality, and are immersed in a terrestrial ecology program exploring all parts of the

(continued on page 31)



Child from Cornerstone Family Programs in Morristown enjoying healthy nature programming at the CMA, underwritten by The Horizon Foundation for New Jersey.

2017 – 2018 School Water Monitoring on the Passaic (SWaMP)

by Sandra LaVigne, Director of Water Quality

The 2017–2018 SWaMP Program was once again a great success. GSWA staff and interns worked with middle school, high school, and college students from throughout the Passaic Watershed, taking them out to the Passaic River or their local tributary of the Passaic, to collect water quality data first hand. Students in the program participate in collecting chemistry data, (including chemical test kits for ph, phosphorus, nitrogen and dissolved oxygen) visual assessments, and in some instances, biological data (macroinvertebrate collection and identification). This year we had 16 schools participate in the program, including three new schools. Many schools participate both in the fall and again in the spring, so they can compare data and conditions at different times of the year. Schools range from the local Great Swamp Watershed region all the way down to the Newark Bay area. Students from Madison High School are seen here testing the water clarity on Loantaka Brook using a turbidity tube.

Students who engage in outdoor educational experiences like this have a better connection to the environment and the issues facing their communities. Some schools, such as Chatham High School, incorporate the program into a deeper assessment of a particular issue in their community. The Chatham students are challenged to select an issue they are interested in and utilize the data they collect to make informed decisions about positive action that can be enacted in



their school or community. Their projects are presented at the end of the school year to the school administration, local Environmental Commission Members, and GSWA staff and local corporate community members.

A few of our downstream schools from the Paterson area were able to sample the Passaic River in Paterson as well as coming upstream to the GSWA Conservation Management Area to test the Silver Brook (a Passaic tributary) and see the differences and talk about what changes they can make that could help improve the river in their area. Overall, the SWaMP year was very successful and we are already planning and scheduling with schools for the coming year 🌲.

GSWA Teams Up with NJDEP for Bacteria Sampling in the Passaic Watershed

by Sandra LaVigne, Director of Water Quality Programs

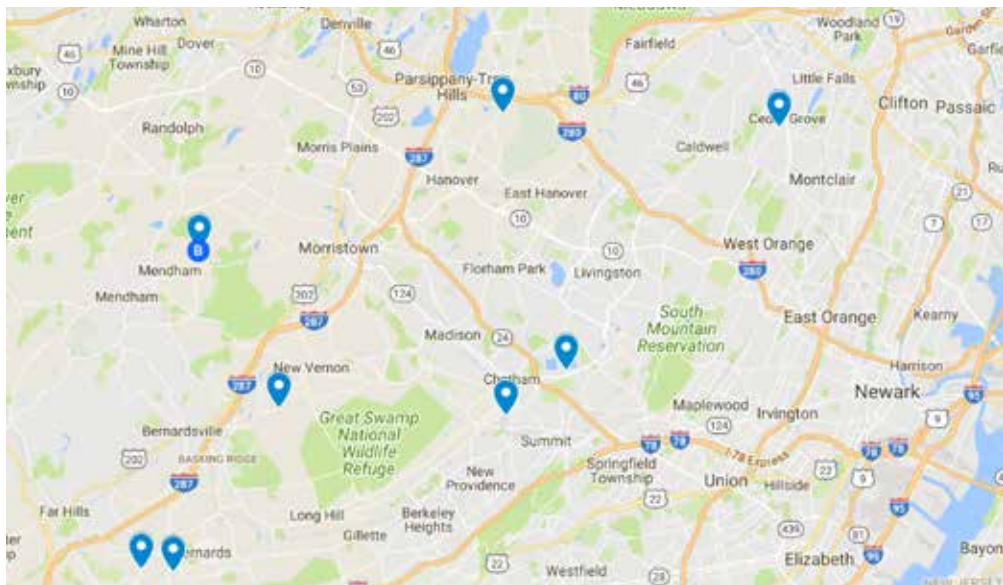
Earlier this year, the NJDEP reached out to GSWA for assistance with their 2018 Summer Ambient Surface Water Bacterial Monitoring Program. NJDEP has been monitoring the surface waters for bacteria since 1993. The program has grown and changed over the years to meet current EPA standards and presently works on a rotating basis throughout the state, collecting samples in different regions of the state in different years. In 2018, the NJDEP focus was on the northwest and northeast regions of the state, including portions of the Great Swamp Watershed and the Upper Passaic River. Due to the large area being covered, NJDEP reached out to organizations like GSWA for assistance. Of the sites selected for monitoring, we chose eight that aligned with our current sampling area or areas downstream in the Passaic Watershed. See the map below.

Bacteria sampling is a way to monitor the presence of *E. coli* bacteria in our waterways. These bacteria are found naturally in the guts of warm blooded animals such as people, dogs, birds and deer. Some strains of *E. coli* can be harmful, such as the ones we hear about when food products are recalled, but these varieties are not likely to be present in our local streams. However, the presence of *E. coli* in our streams can be used as an indicator of possible contamination with fecal matter which may still cause health issues if people or pets come into prolonged contact with it. The presence of fecal matter can also cause elevated levels of algae to be

produced in the water which may cause issues for aquatic biota. This is why sampling programs conducted by GSWA and NJDEP are so important. The sharing of data and results from these similar programs gives us a better understanding of the issues impacting our streams.

Both GSWA and NJDEP utilize the Colilert method developed by IDEXX Laboratories to test our samples for bacteria levels. This method is approved by the USEPA and allows us to easily compare results between programs. In order to meet the NJ allowable standard for *E. coli*, bacteria sampling was conducted over five consecutive weeks on the same day at approximately the same time each day. GSWA began sampling on July 12th and concluded on August 9th. Some of the NJDEP sites aligned exactly with historic GSWA collection sites which will add to our own database for the area. When the results have been calculated, NJDEP will share that data with GSWA and it will be included in our annual Water Quality Report Card.

GSWA also conducted our annual bacteria monitoring in 2018 utilizing the same protocols as outlined above. With the help of nine volunteers, we sampled at 22 locations (in addition to the NJDEP sites) throughout the Great Swamp Watershed and the Upper Passaic River. GSWA sampling began July 17th and ran through August 14th. These results will be reviewed and follow up monitoring will take place at sites where continued elevated results were



noted. Often, we will see lower results in dry weather and elevated results immediately following rain events. The runoff from storms carries animal waste directly into our streams, including waste from wild animals and geese as well as pet waste. One way members of the community can help prevent this is to be sure to pick up after your pets. Whether you walk your dog on a path

or in the park or just in your own back yard, be sure to pick up after your pet right away so that the next rain storm doesn't carry that waste into our streams.

As always, I would like to thank everyone who came out to support this important project. Look for our results on our web page and in our 2018 Water Quality Report Card later this winter. 🌲

GSWA Experts Available to Speak to Area Groups

Do you wonder, "What is in my water?" or "What can I do to ensure clean water for my children?" These and other questions about water quality, land preservation and local efforts to protect the environment can be answered by GSWA's Speakers Bureau, who will present interesting, hands-on presentations that will educate and inspire members of your local club or group. Call today for more details: (973) 538-3500, or email Sally Rubin at srubin@GreatSwamp.org.

Plastic Pollution Not Just an Ocean Problem

by Sandra LaVigne, Director of Water Quality

The issue of plastics in our oceans is not a new one but it has been more prevalent in the media lately, raising public awareness about the problem. Pictures of wildlife wrapped in plastic bags or with stomachs filled with microplastic particles are frequently seen on social media and in periodicals. In 2015, due to growing concern about the increasing amount of small plastics in the oceans and their effect on wildlife and the ecosystem, Congress passed the Microbead-Free Waters Act phasing in a prohibition on the manufacture and sale of cosmetic products containing microbeads (plastic particles less than 5mm in diameter) which is now fully in effect. Recently, companies such as Starbucks and Ikea have announced they are phasing out certain single use plastics at their retail stores as well. In NJ shore communities including Long Branch, Ventnor and Monmouth Beach, bans have been enacted on various types of single use plastics such as bags, straws, Styrofoam takeout containers, and even balloons, to keep these items off the beaches and out of the ocean.

However, plastics are not just an ocean problem; they are a problem everywhere. GSWA's mission talks about protecting the river from source to sea because that is how it flows. What happens in the headwaters effects the downstream areas and the ocean beyond. The plastics we use here can easily end up in our streams and rivers harming local wildlife and effecting the water quality in our streams and beyond.

In our local communities, we are happy to report that a number of restaurants have begun to lead the way in reducing or eliminating single use plastic items from their facilities to help the environment. I recently spoke with Leia Gaccione, the owner of South + Pine in Morristown and Central + Main in Madison. These establishments have stopped (or are in the process of stopping) using plastic straws, cutlery and even paper napkins. Leia is also taking steps to remove plastic, disposable cups for children, offering instead something they will be able to use more than once. She stated, "We are happy to make small changes like this in both of our businesses." Even though it seems small, if everyone did it, it could make a big difference. Karen Lee, proprietor of the Market Taverne in Morristown, was also happy to tell us of the environmentally friendly steps they have taken to reduce the single use products from their restaurant to protect the local environment and water quality. They utilize specially filtered water within the facility so that patrons can enjoy both fresh and sparkling water (they use their own bottling system with glass bottles) with no need to bring in single use plastic bottled water. They also eliminated plastic take out containers and use paper bags. Finally, they have replaced plastic straws with paper straws (on request only) working towards eliminating straws all together. Karen told GSWA that last year alone they used over 40,000 plastic straws. Afterwards she said, "We put our heads together and

came up with a plan to actively reduce the consumption of single use plastics that end up harming our environment.” Way to go, Karen!

Though the Microbead Act reduces direct input of small particles of plastic into our waters from cosmetics, there are many more sources that need to be addressed. Larger items such as Styrofoam containers and single use plastic bags can quickly break down into small particles in the environment. Even more “rugged” items such as single use plastic straws, plastic beverage bottles, and juice bags, can break down into small particles or microplastics, that are easily carried by rainwater into our storm drains and then into our streams.

Starting in the fall of 2018, GSWA will be launching a program to sample the microplastics in the waters of the Great Swamp Watershed and the Upper Passaic. Sample sites will be chosen based on flow patterns in the watershed and using data collected by NY/NJ Baykeeper, who conducted a study in 2016 that included select sites in the Upper Passaic River, and indicated some areas of concern. The study

will focus on identifying areas of concern and working with communities on solutions to the mounting problem of plastics in our waterways.

With more community involvement, both in business and in homes, we can make a difference that will be felt both upstream and down. Here are some ideas that everyone can use to help reduce their plastic use:

- Use re-usable bags — not just at the super market but wherever you shop
- Bring your re-usable coffee or tea mug to the coffee shop and ask them to fill it instead of a disposable cup with a plastic lid
- Put a re-usable bag with a few re-usable storage containers in your car and bring them into a restaurant if you might have leftovers to bring home
- At restaurants, ask for a drink with no stirrer or straw; if you like to use a straw bring a reusable one
- Carry your own travel cutlery in your car for take-out or on-the-go eating
- And support local businesses that are making changes to reduce their plastic use. 🌲

Please be sure to let us know if you change your e-mail address. Send a note with your name, address, and old e-mail address to knecovska@GreatSwamp.org so you don't miss out on our monthly e-newsletters.

The Fungal Jungle

by Kristina Necovska, card-carrying member of the NJ Mycological Society

Here at GSWA, this torrentially wet summer had us all grumpily wondering, what next? It certainly put our wetlands to the test — if you're a resident of our watershed and haven't experienced flash flooding or a leaky basement, consider yourself a beneficiary of a functional wetland. While this overcast wet weather hasn't been the greatest for growing Jersey tomatoes, it's been a boon for another under-appreciated crop: mushrooms. But what exactly are they doing out there and why does it matter to me? The answer is, lots.

What are they, how do they work?

I will not belabor Bio 101, and fungi are incredibly complex organisms. Simply put, they are a little different than the rest of us. Neither plant nor animal nor bacteria, they share some characteristics with each. Their iconic shape, in the form of the Amanitas with cap and stem, is instantly recognizable,

but fungi come in every color and array of shapes and forms: branching corals fungi, clubs, gelatinous slime molds, mildew, mold, rusts, lichens, and some exotic forms living entirely within bodies of plants known as endophytes. All share one characteristic: **they must obtain their food by digesting their substrate in a process known as heterotrophy.**

Heterotrophs come in a variety of types: biotrophs, necrotrophs, or saprotrophs, the primary difference being how they get their nutrients. **Biotrophs** are also known as mutualistic fungi; they provide goods and services to other organisms in exchange for nutrients. They play nice, mostly. **Necrotrophs**, by contrast, break down a living host rapidly and are often terrifying, blighting and catastrophic. Some examples include the zombifying parasite cordyceps which hijacks the nervous system



Left to right: Crown coral, oyster mushroom, Destroying Angel (*Amanita phalloides*, one of the most toxic mushrooms in the world) all found here in Morris County. Photo credit: K Necovska

Laetiporus sulphureus, “Chicken” mushroom-saprotroph and occasional weak parasite.
Photo credit: K Necovska



of insects, plant blights (such as Dutch elm disease), and catastrophic animal parasites like the aquatic chytrid fungi which have crashed amphibian populations worldwide. White-nose syndrome (*Pseudogymnoascus destructans*), the disease affecting North American bats, is now classified as one of the most catastrophic animal diseases of modern history. The third type, **saprotroph**, is also extremely beneficial in nature, and lucky for us, delicious. They break down organic materials of usually already dead bio-matter into nutrient rich soil. The majority of our edible mushrooms are of this variety, such as the coveted chicken of the woods. They occasionally cause problems for humans in the form of wood rot and food spoilage when they invade old human structures.

A Fungi's Place in the World

They are the decomposers, recyclers and soil facilitators. Fungal “roots,” termed hyphae, are now believed to be in a symbiotic relationship with 90% of all vascular plants on Earth. This knowledge has only really been studied for about a century. Prior to that, the idea that fungal networks improved plant health was a fringe idea not to be taken seriously, and there is still much to be discovered about the depth of the relationship between these organisms. This relationship, called a mycorrhizal network, works whereby fungi colonize the roots of plants and increase their surface area and bioavailability of the soil's nutrients and water to them. Plants, in turn, produce sugars and

amino acids for the fungi. This relationship is the underpinning of the establishment of forests. In fact, trees and shrubs are often unable to colonize new or disturbed areas when the soil fungal networks have been compromised. When mycorrhizal networks are present and healthy, plants require less fertilizer to grow, require less water, and are less susceptible to poisoning from toxic pollution. If you're interested in gardening with fungi, check out ***Teaming with Fungi: The Organic Growers Guide to Mycorrhizae***, by Jeff Lowenfels, for a technical breakdown of this fascinating relationship.

Mushrooms in Medicine and Mealtime

The most famous medicine derived from fungi is the anti-bacterial penicillin mold discovered by Alexander Fleming. However, fungi have been used medicinally and spiritually for thousands of years. Psilocybin and Fly agaric are the two most famous psychotropic “magic mushrooms” used by humans for their psychoactive effects. In recent times, biotech has refined a historically trial-and-error process by deriving bioactive compounds from fungi to treat a variety of

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Fungi (continued from previous page)

illnesses; high cholesterol, mycoses (fungal borne illnesses), malaria, diabetes, and even treatments for certain cancers using metabolites produced by fungi. Besides their use in medicine, mushrooms are a beneficial addition to our diets containing complete proteins and are a significant source of B vitamins (riboflavin, niacin, pantothenic acid), ergosterol (a component of Vitamin D2), and minerals like selenium, zinc, potassium and phosphorus. I would also be remiss to omit an eco-friendly application of fungi in the food industry. Since the 1980s, the business of developing commercially viable strains of myco-proteins took off in a bid to develop a low-waste low-cost food source to offset forecasted protein shortages on the horizon. The protein shortage didn't occur as predicted but what did happen was a discovery of a healthy food source lacking animal fat and cholesterol isolated from the fungi *Fusarium venenatum*. I am referring to Quorn™ of course (no, it's not a paid ad, but a sponsorship would be nice if any one reading this knows the right people!) — just one interesting development in food history.

Fungi and the Animal Kingdom

Humans aren't the only animals who have learned to exploit the fungal world. It is estimated that 80% (tens of thousands of species) of microarthropods are fungivores. The gardening ants of the neotropics are among the most famous exploiters of fungus; leaf-cutter ants of the Amazon decimate forests to provide material for their subterranean fungal gardens. Beetles, too, have learned to exploit this ubiquitous food source, but where ants farm them in huge social colonies, solitary wood-boring beetles

evolved structures in their shells which transport yeast-like fungi into their tree burrows. Unfortunately, the associations of animals and fungi are rarely studied, but it is interesting to note that fungal gardening among invertebrates evolved during periods of global warming on Earth. Might it arise again?

Fun with Fungi

What does the fall have in store for us? Far from over, the fruiting period of edible wild fungi is still underway. According to New Jersey Mycological Society foray finds, over 460 species of fungi were recorded in the State of New Jersey between September and October of 2016. In Morris County alone, 95 species were recorded during this two-month period. What is unfortunate is that the commercially available mushrooms, like buttons and portobellos, are often the least flavorful. The bright side is that many farmers markets and grocers now offer chanterelles and morels, which are always wild forage. And of course, the wild mushroom collection should be left in the hands of experienced individuals who have identified their specimens without a shadow of a doubt. Just for fun, you can see what species were found by visiting NJMyco.org/njmushrooms.html.

They make wonderful subjects for photography and familiarizing yourself with what's out there is the first step to eventual collection and identification. Human innovations have irrevocably and permanently incorporated these fascinating lifeforms into our daily lives. The applications of fungi far outnumber the space allotted in this newsletter. but it would

(continued on opposite page)

by Sue Levine, Director of Finance

Last fiscal year was a terrific year for us financially. One of the most important accomplishments was to implement an employer sponsored retirement plan in October with a company match component. We are strong believers that every employee should be involved in saving for retirement and I am happy to report that we are now at 100% participation. Our efforts were successful in raising \$817,000 in the fiscal year 2017-2018. This is an increase versus the prior fiscal year of \$111,000 primarily due to an incredible annual event honoring Christine Todd Whitman, our first annual Music Festival at Hartley Farms, and the 401K program support from an individual donor. In addition, our expenses were below budgeted expenses, resulting in a net income of \$41,000. Our employees are an amazing group of dedicated individuals who are making a significant difference in protecting the watershed so I am delighted to share that

some of these excess funds have already been slated for increases in education staff hours as well as establishing an account for 401k company matching funds for the future.

Our Finance Committee continues to keep a close watch on our Endowment investments, particularly in a challenging market environment. The team has established some new review procedures and does a terrific job ensuring the funds are monitored and invested in a balanced and conservative portfolio. Although we were pleased with our previous auditor, the Finance Committee decided to hire a new auditor based on the recommendations in the Sarbanes Oxley principals for nonprofits.

Also on the financial side last year, we funded the acquisition of the LaMorgese property on Tiger Lily Lane which expands our footprint and increases trail systems. This tightened our cash flow for the last fiscal year and heading into this fiscal year. 🌲

Fungi *(continued from opposite page)*

be trite to mention that without these fungal innovations we'd have no beer, no bread, no cheese... in reality, without fungi we'd have no forests, gardens or even any life at all. 🌲



GSWA is blogging at
<http://GreatSwamp.org/blog>

Taking Back the Tap and Busting Bottled Water Myths!

by Hazel England, Director of Education and Outreach and confirmed tap water drinker

If you believe the hype, (or at least the adverts) — drinking bottled water not only hydrates you, but can also make you smarter, improve your sports



ability, and transport you to crystal clear streams in pristine forests or remote Fijian islands, and all just by cracking open a bottle of water! Consumers seem to be buying the hype and sales of bottled water of all types have soared in recent years. Recent 2017 research by *The Guardian* revealed that more than 20,000 plastic water bottles are sold every second, an unimaginable 480 billion with a B in 2016 alone (www.theguardian.com/environment/2017/jun/28/).

Americans account for 50 billion of that annual total (www.ecowatch.com/plastic-bottle-crisis/). But, contrary to popular belief, bottled water is not necessarily cleaner, purer, or any healthier for you, and its detrimental impact on the environment takes many forms.

So, let's debunk some of the many myths surrounding bottled water and the bottled water industry and try and convince you to *Take Back The Tap!!*

MYTH: Bottled water is safer than tap water.

All bottled water is regulated as a food product and is therefore subject to the regulation of the Food and Drug

Administration (FDA), whereas municipal tap water supplies are regulated by the more stringent and rigorous drinking water standards of the Environmental

Protection Agency (EPA). I know which one I'd want regulating the water I put in my body.

MYTH: The water you buy is always from a pristine underground source!

According to Food and Water Watch's Take Back the Tap Campaign, (www.foodandwaterwatch.org), by 2009 almost 50% of bottled water sold originated from producers bottling filtered municipal tap supplies! A 2010 survey also found only a minority of companies provide the public with the same level of information regarding origins and purity of bottled water compared to that provided for tap water, including the specific source, how the water supply was treated, and what results of water quality testing on the water revealed. Indeed, independent testing of bottled waters conducted by the Environmental Working Group (www.ewg.org/) found that ten popular brands of bottled water, purchased from grocery stores and retailers in nine states and Washington, DC, contained 38 different chemical pollutants, with an average of eight contaminants per brand (EWG Water Survey results).

MYTH: Bottled water is an economically sound choice.

This myth lasts only as long as it takes to do the math — bottled water is thousands of times more expensive than tap water! Compare the \$0.0002 cents/gallon for most municipal tap waters to the range of \$0.89-\$8.26/gallon for bottled waters. Some elite brands from exotic locales sell for \$3 dollars for a single bottle, which translates to a whopping \$40/gallon. If you consider how many plastic bottles you buy annually, you will be horrified at what you are spending in comparison to the savings you could make by switching to tap water. Just think what a great donation you could make to GSWA with all those savings!!

MYTH: It's ok that I drink bottled water — I recycle the bottles.

The short answer is that whilst plastic water bottles are made of polyethylene terephthalate (PET) — a highly recyclable type of plastic — fewer than 50% of bottles purchased are even collected for recycling and only 7% of bottles collected are turned into new water bottles again — a process called closed loop recycling. Most end up in the landfill or the ocean, and the prediction by the Ellen MacArthur Foundation (www.ellenmacarthurfoundation.org/) is that by 2050 there will be more plastic bottles in the ocean than fish! Since plastic bottles also require petroleum to produce the plastic, energy to fill, ship, distribute and dispose of the bottles, it becomes clear that plastic water

bottles are much more energy intensive and environmentally unfriendly by whatever metric one considers. So recycling bottles doesn't outweigh the environmental costs of production.

MYTH: Bottled water is purer than tap water.

Imagine a plastic water bottle as it waits to quench your thirst — after cooling its heels in your fridge for a week or two, perhaps it rolls around in your backseat for a couple of days enjoying the toasty confines of a red-hot car in a Jersey summer. Over time the type of plastic used in most water bottles (PET) degrades due to heat, light and pressure, and chemicals used during construction in the plastic itself, to make the bottles flexible and expandable, can leach into the water stored within — many of these chemicals are known human health toxins. For this reason, water in plastic bottles should be consumed quickly, and stored in a cool, dark environment before use. Re-using plastic water bottles can lead to increased leaching of chemicals and bacterial build up, as bacteria thrive in warm, moist environments.

MYTH: Tap water tastes awful and is full of nasty stuff.

If you receive your water from municipal supplies — in our region most are served by New Jersey American Water or the municipally owned supplies of Madison and Chatham, you might know that once a year, along with your water bill, you receive

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Bottled Water *(continued from previous page)*

an analysis of the water you receive through the tap. Though you might feel you need a chemistry degree to understand the results, you can also get an easy to understand snapshot of what's in your water by visiting the Environmental Working Group website and typing in your zip code. You can learn if there are any known quality issues in the tap water you drink, and what can be done to address them (www.ewg.org/tapwater). This site also has a great review of different water filters that can remove the taste that tap water naysayers say they find off-putting. Chlorine, added at treatment to ensure bacteria-free drinking water, can sometimes linger to affect the taste of tap water. Running taps first thing in the morning or leaving pitchers of water for several hours before drinking allows the chlorine to harmlessly diffuse out of tap water, improving the taste. Likewise, pitcher-style filters by Brita and other manufacturers can remove lead or other chemicals of concern and improve taste.

We understand that plastic one-use bottles are convenient and easy to use for a busy New Jersey lifestyle — we really do — so what steps can you take to wean yourself off their use?

Use our quick guide to help you take back the tap!

1. Reduce your bottled water consumption, one bottle at a time. Try and challenge yourself to a water-bottle-free day or week. Think through the times you tend to reach for a bottle of water and trouble shoot tap water alternatives that will keep you hydrated without the plastic bottle. If you take care of kids, encourage them to go bottle free too- they may grumble

about inconvenience initially, but will soon make new, healthier habits. Re-usable bottles are available that roll up or telescope down when empty, allowing easy storage when out and about.

2. Purchase a re-usable water bottle — and use it!! Lined aluminum, steel, and glass bottles are durable, functional, and a great alternative to plastic one-use bottles. They send a statement to the world that you care what you drink and what effect it has on your health and the environment. They also often allow you to show your support for various nonprofit organizations. Hard plastic bottles (Nalgene type) that are BPA-free are also good re-usable solutions. Plastic bottles with the numbers 2, 4 and 5 are safest for use. Research what they are made of and avoid the softer bottles where possible. Hand wash and air dry bottles to ensure they stay clean and bacteria free.
3. Do the math! Figure out what your household spends on bottled water annually, or each month — including those expensive water purchases while you are out on the go, and not just the cases of water you purchase from the box stores. You'll be horrified what the total is. Now plan what you will do with the money you will save by drinking cheap, safe and environmentally sound tap water after you make the switch!
4. Tally the number of plastic bottles you save from use, and once you break the bottle habit, you can encourage others



to do the same. If convenience is the main reason you use bottles, fill all your re-usables at the same time every few days and store them in the fridge so that they are ready to grab and go and provide the same convenience of a bottle.

5. Keep a filter pitcher in your fridge to ensure you always have cold water on tap. This saves time when you want a drink so that you don't have to wait for the tap to run and get cold. You

can also store your tap water in a jug with slices of fruit to impart flavor and enhance the taste — creating your own Gucci water! Try mint, lemon, or cucumber for a treat.

6. If you do use plastic water bottles, never re-use them and make sure you and all around you recycle correctly. Keep a bag in the car to act as a temporary recycling bin for when you do use a bottle, so that lack of facilities doesn't stop you from committing to recycling every single bottle you use.
7. If everyone reading this article pledged to use just 30% fewer plastic water bottles, it would have an immense knock on effect — so pull out the glasses, take down the Nalgens, track down the water fountains and let's take back the tap!!

Our river will thank you! 🌱

Horizon *(continued from page 18)*

CMA. One special part of the program so many enjoyed was using binoculars for the first time to identify trees, birds and other wildlife. The students also helped with GSWA's restoration efforts on the property by adding native plants to wetland areas.

Thank you notes we receive, like this one from Arianna, a 5th grade student at St. Michael's school in Newark, make us all proud of the impact we are having on program participants:

“Great Swamp was the best trip yet. My favorite part was hiking and watching the birds. I learned about the water, if it was healthy or not. I wish I can go back there with my family.”

GSWA is sincerely grateful for the continued support of The Horizon Foundation for New Jersey, and for their Executive Director Jonathan Pearson's comments:

“Our grant to the Great Swamp Watershed Association supports our commitment to working alongside organizations that make New Jersey healthier. We are pleased to work with GSWA to provide free access to outdoor spaces and programming at the Conservation Management Area in Morris County that promotes physical activity and wellness for families.” 🌱



Great Swamp Watershed Association

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