ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM

Summer 2019

Esopus Creek NEWS

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Esopus • Birch • Bushnellsville • Fox Hollow • Peck Hollow • Broadstreet Hollow • Woodland Valley • Stony Clove • Beaver Kill • Little Beaver Kill • Traver Hollow • Bushkill

IN THIS ISSUE

WHY NATIVE PLANTS MATTER TO STREAMS

You may have noticed the Ashokan Watershed Stream Management Program (AWSMP) promotes the use of native plants along streams – a lot! That's because native plants are good for people, streams, and wildlife. Here's why. Insects, including those aquatic insects critical to stream food webs have co-evolved with native plants. Most landscaping plants available in nurseries are exotic species from other countries. They may be prized for qualities that make them poor food sources for native wildlife – like having leaves that are unpalatable to native insects and caterpillars. They are typically unsuited to stream conditions and may have low survival rates near streams.

Research by entomologist Doug Tallamy demonstrates the difference between native and non-native ornamentals. Tallamy has shown that native oaks support more than 550 different species of butterflies and moths alone. *Prunus* like wild cherry and plum can yield up to 456 species; and maples support up to 297 species. The non-native ginkgo tree supports just 5.

Even a relatively small proportion of non-native plants can make a habitat unsustainable for native bird species. In areas made up of less than 70 percent native plant biomass, Carolina chickadees will not produce enough young to sustain their populations. At 70 percent or higher, the birds can thrive.

Tallamy's work points to native landscaping as a key tool in increasing insect and bird diversity and abundance. "Eighty-six percent of the country is privately owned, so when you create landscapes out of [introduced] Bradford pear and crape myrtle, there are almost no caterpillars," Tallamy says. "That's not just the end of reproduction for chickadees, but of all the birds out there that need those insects."

Isonychia mayfly exoskeletons on Esopus Creek boulder by E. Ostapczuk; Isonychia mayfly dun by M. Loete. Duns (adult mayfly) seek shelter in vegetation on river banks.

The typical diet of many fish, including trout, is dominated by aquatic insects. Most aquatic insects have adult life stages in which they emerge from the water into riparian (streamside) habitat to mate in the spring and summer. Trout also consume a substantial portion of their diet from terrestrial insects. What we plant near steams directly affects terrestrial insect variety and abundance with important consequences for fish that subsidize their diet with terrestrial insects.

While many trees can handle a week or two of flooding without long-term problems, trees that are native to floodplains can withstand months of inundation. At the other extreme, upland trees such as pine, hickories and most oaks may be damaged after a week or less of flooding. Creating layers of vegetation using flowering herbaceous, shrub, and tree species, deflects pounding rains, increasing the chance

Article continues on Page 2

for water to be absorbed by soils before running off into streams.

Trees that can survive flooding and rushing water not only offer food sources for fish and wildlife, but contribute to clean water by stabilizing stream bank soils and resisting erosion.

Many of us were shocked by the recent United Nations report that one million plant and animal species are on the verge of extinction. According to the study co-authors from around the world, more plants and animals are threatened with extinction now than any other period in human history. The loss of species is linked to human activity.

The biodiversity crisis is one issue where each of us can make a difference in the places we live, by planting native plants for our fish, wildlife and clean water. Even if we can only grow native plants on a small lot or patio, it adds to regional diversity.

Tallamy writes: "Species are lost in the same proportion in which a habitat is reduced in size. The good news is that extinction takes a while, so if we start sharing our landscapes with other living things soon, we should be able to save much of the biodiversity that still exists."

Sources:

https://www.audubon.org/news/why-native-plants-are-better-birds-and-people

https://www.americanforests.org/magazine/article/backyard-biodiversity/

https://www.washingtonpost.com/climate-environment/2019/05/06/one-million-species-face-extinction-un-panel-says-humans-will-suffer-result/?utm_term=.9c122749319a

https://www.smithsonianmag.com/smithsonian-institution/ecologists-have-simple-request-homeownersplant-native-180970655/

Resources:

See a **Guide to Native Riparian Plants of the Catskills** for a list of native plants that do well along streams: http://ashokanstreams.org/wp-content/uploads/2012/10/Issue-1_Native-Plant-Guide.pdf

Also see an article in the Winter 2017 edition of **Esopus Creek News** on "What to Plant Where" along streams: http://ashokanstreams.org/wp-content/uploads/2012/09/ECN-Winter-2017.pdf

Contact the **Catskill Streams Buffer Initiative** for customized assistance with restoring native stream buffers: http://catskillstreams.org/catskill-streams-buffer-initiative/

New York Nature Explorer is an online tool - users may choose a county, town, or watershed, or specify their own location on a map and receive a list of the animals, plants, and natural communities that have been found there: http://www.dec.ny.gov/animals/57844.html

Enter your 5-digit zip code to use **Audubon's Native Plants Database** and explore the best plants for insects and birds in your area, as well as local resources and links to more information: https://www.audubon.org/native-plants

The Ulster County Soil & Water Conservation District and Extension Master Gardeners offer annual plant sales that include native species. For more info, visit: https://ucswcd.org/TreeShrubSale.html and http://ulster.cce.cornell.edu/gardening/master-gardener-program

Warner Creek Restoration

The Ulster County Soil and Water Conservation District (SWCD) is preparing to restore two stream sites to stable condition in Warner Creek. In conversation with landowners, the SWCD is setting goals for the projects that include improving water quality, stabilizing the channel to protect a town road from future erosion, and reducing bank erosion near a private structure.

Warner Creek flows through Silver Hollow and is a major tributary to the Stony Cove Creek in the Town of Shandaken. The two project sites are located 1.2 miles and 1.5 miles upstream from Warner Creek's confluence with Stony Clove Creek along Silver Hollow Rd. About 550 feet of stream will be treated at each site.

During a flood in January 2010, the Warner Creek channel "avulsed," which means the stream abandoned its channel and cut a new course through mature floodplain forest. The SWCD has tracked the pace of erosion since the avulsion. The NYC Department of Environmental Protection and USGS have continuously monitored water quality near the sites.

The avulsion brought stream flows into contact with fine sediments lining the channel's bed and banks. The sediments

Glacial lake clays leaching from a streambank.

were deposited by Glacial Lake Peekamoose during a time when glaciers covered parts of the Earth. About 14,000 years ago, the lake formed behind a huge ice dam that extended between Overlook and High Point Mountains.

This summer, the SWCD will work with subcontractor Milone & MacBroom, Inc. to complete geotechnical survey at the sites. Surveyors will walk the sites with a Ground Penetrating Radar unit, about the size of a lawnmower, to locate areas with deep layers of stream cobble (rock). The channel will be relocated over the cobbles to avoid contact with fine sediments like clay.

Designs for the stream restorations will be complete this fall. SWCD will then release a bid to find a construction contractor. Some trees may be cleared this winter to avoid harming bats during the spring and summer. If all goes well, the projects will be constructed in 2020.

Stream Corridor Wildlife: Black Bear

Most black bears have shaggy black fur and a short, inconspicuous tail. Their signature rounded ears are broad and erect. Both front and hind feet have five toes, each with a large claw. Black bears may have a white blaze on the throat or chest.

Black bear at the Ashokan Reservoir. Photo by E. Ostapczuk

Occasionally, the stream program observes a black bear (*Ursus americanus*) wandering through a stream channel. Stream corridors provide bears with access to water, food, and maybe a place to cool down! Like other wildlife, bears may also use wooded stream corridors to travel between forest patches.

The NYS Department of Environmental Conservation (NYSDEC) estimates 30-35% of New York's black bear population resides in the Catskills. Black bears are large – an average adult male weighs 300 pounds while females average about 170 pounds. Males can reach up to 600 pounds. They are the second largest mammal in New York State behind the moose.

Black bears are excellent climbers and can run at speeds of 25 mph. They remain dormant for up to five months in the winter. Cubs are born in winter dens and stay with their mothers for over a year and then disperse as yearlings on their own.

Black bears are the only wild bear species in the eastern United States. Black bears once occurred over most of North America from Alaska and Canada south into the central regions of northern Mexico, but are now absent from parts of the central and north-central U.S. The Catskills are one of three historic bear ranges in New York, in addition to the Adirondack and Alleghany mountain ranges. According to Cornell University researchers, the black bear population in southern New York has grown and expanded in range since the early 1990s, which has led to increased encounters with humans, even in agricultural and urban areas.

Still, black bears are most abundant in wilder areas. They prefer dense, secluded forests. Mixtures of forest openings with luxuriant raspberry or blackberry plants and old-growth timber providing mast (acorns, beechnuts) and dens, offer ideal habitat.

Black bears eat a surprising amount of small food for such large animals. Approximately 90 percent of their diet is plant material consisting of not less than 30 different plant species. The remainder is primarily insects. Bears can dig out plant tubers or small rodents, tear apart rotten logs to find grubs, climb trees and break off branches to gather nuts, "pick" raspberries and blueberries, and travel long distances in search of new food resources.

Bears are intelligent and curious and spend a lot of time searching for food. Anyone camping should take precautions to secure their food away from bears. From NYSDEC, if you encounter a bear:

- Never approach, surround or corner a bear – they will defend themselves when they feel threatened.
- Never run from a bear – stay calm, speak in a loud and calm voice, slowly back away and leave the area.
- Do no throw your backpack or food bag at an approaching bear.
- From your yard, at a safe distance, make loud noises by shouting or banging pots to scare the bear away.

The NYSDEC encourages homeowners to call their regional wildlife conservation office if a foraging bear causes any damage to property. In the Catskills, call the Schenectady office at (518) 357-2355, the Stamford office at (607) 652-7367 or the New Paltz office at (845) 256-3098.

Protect yourself and your property by not feeding bears and by reducing bear attractants. Visit NYSDEC's website on reducing human-bear conflicts: https://www.dec.ny.gov/animals/6995.html#Backcountry

To better understand the growing bear population, Cornell has launched a free citizen-science app for reporting black bear signs and encounters called iSeeMammals. Learn more at: https://iseemammals.org

Sources:

Expanding Black Bear range: https://news.cornell.edu/stories/2017/04/black-bears-move-upstate-new-york

Black Bear facts: https://www.esf.edu/aec/adks/mammals/black_bear.htm

Black Bear encounters: http://www.dec.ny.gov/animals/94710.html

FIELD NOTES

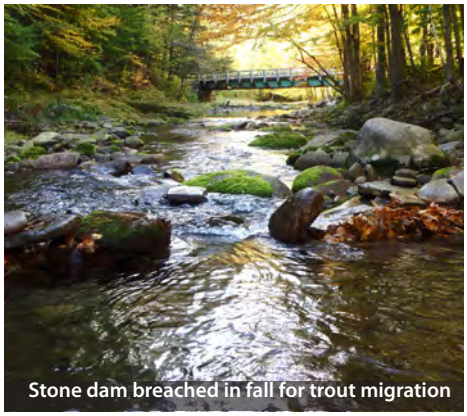
Landowners Helping Trout

Streamside landowners in the Ashokan watershed play an important role in preserving water quality and our famous trout fishery. You may be an angler or enjoy the occasional dip in a goose-bump inducing stream pool on a hot day. Here are two things you can do to help manage the trout fishery while enjoying streams:

1. **Don't tread on redds.** Trout spawn in the spring and fall. A female trout digs a depression in the gravel with her tail called a "redd." She deposits eggs in the redd and waits for a male trout to fertilize them. Rainbow Trout spawn in late spring and Brown Trout and Brook Trout spawn in the fall. Be kind to our trout and try not walk on a redd. A redd should appear like a depression with clean gravel inside, and may be lighter or darker than the surrounding gravel. Redds are often observed in the "tailout" of a pool.

2. **Dismantle stone dams.** If you build a stone dam to deepen and hold back water to create a swimming pool, please dismantle or breach your mini "dam" before fall. If left intact, stone dams can severely impact the ability of wild trout to spawn. Trout migrate upstream seeking clean gravel beds to lay their eggs. Trout use smaller tributaries where temporary stone dams tend to occur. The entire dam need not be removed; just an opening created where water is free flowing once again - forming a passageway for fish to move upstream.


Trout redd in local stream


Stone dam breached in fall for trout migration

Photos by E. Ostapczuk

Announcing Ashokan Watershed Month!

Our watershed is immensely special to those who live or visit here. Because of that, we've decided to designate this September as Ashokan Watershed Month.

Throughout September, the AWSMP will offer fun and educational programs that appeal to everyone from families to athletes and artists. Invited speakers will discuss topics such as Ashokan Reservoir operations, and wetland and forest management. We'll offer a stream paddle along a section of the Little Beaver Kill and a youth-friendly stream walk. Satisfy your spirit of adventure by joining a watershed scavenger hunt to win a prize. We're excited to host a Plein Air watercolor painting workshop along a local stream. We're partnering with Trout Unlimited for a chance to try out fly casting.

More events are planned throughout the month of September, so check our website at www.ashokanstreams.org for details as they become available. We hope you'll attend an event during Ashokan Watershed Month!

Introducing the Bedloader

AWSMP recently unveiled a new educational tool. The "Bedloader" is an apparatus that simulates the physics involved in a stream's ability to move the rocks that make up the stream bed. In Catskill Mountain streams, bed particles are a mix of gravel, cobbles (tennis ball sized rocks), and boulders (larger than a basketball). These large particles move by bouncing, rolling, and sliding along the stream bed, a process called bedload transport. This occurs at high flows when it can be dangerous to be in or near a stream. The Bedloader gives a unique glimpse into what this hidden process looks like.

The erosive force of moving water is known as shear stress. It is calculated by multiplying the average water depth by the stream slope. The Bedloader allows students to calculate the critical shear stress required to move large rocks by manipulating slope and depth. An adjustable 16-foot wooden ramp simulates slope while depth is mimicked by a 5-gallon carboy strapped to a skateboard.

Sediment moves in a stream when the force of the flowing water is greater than the forces acting to keep the particle stationary. Factors that influence a particle's resistance to movement include its weight, shape, size, orientation to flow, and degree of embeddedness.

A heavy duty plastic plough on the front starts differently sized rocks rolling down the ramp, but only if there is sufficient shear stress.

Less Road Buffers, More Stream Buffers

Highway managers of the Ashokan watershed are hoping landowners will plant fewer trees next to roads. Your beautiful native trees and shrubs would be better used to shade streams!

Keeping shade off roadways makes a big difference in the Catskills. An open roadway exposed to sunlight will dry more quickly, before water can turn to ice in the winter. In comparison a wooded roadway will stay wet for days, especially on the north side of a mountain.

Keeping roads open allows highway crews to reduce the amount of salt, sand, or grit applied to roads in winter – the risk is these fine sediments could wash into streams. Fines cloud the water and road salt harms aquatic animals.

So, mow next to roads and keep a no mow zone near streams.

Allison Lent, AWSMP Stream Assessment Coordinator (second from left), presented to a National Academy of Sciences committee evaluating the NYC watershed protection program during a field tour of stream restoration and monitoring sites in May.

Bedrock Provides the Stability Streams Need

This summer, stream program staff are conducting a Stream Feature Inventory (SFI) in the upper Esopus Creek. One feature recorded during an SFI is the presence of bedrock. Bedrock is highly resistant to erosion. It provides a naturally hard boundary that helps to maintain stream stability. The red color often seen in Ashokan bedrock comes from the process of oxidation, similar to when metal objects rust when left outside. This bedrock is composed of compressed ancient river sediments. When the material was exposed to oxygen, iron molecules oxidized and turned red.

Approximately 380 million years ago, the land mass beneath us was located near the equator, forests were just beginning to colonize the land, and a Himalayan sized mountain range laid just to the east. Ancient streams drained these mountains and deposited sand, silt, and clay materials on the landscape, just as they do now. Over time, these oxidized deposits were buried, compressed, and re-exposed as the bedrock we see today.

Examples of red bedrock can be seen throughout the watershed. Each exposure is a glimpse into history. Fossilized root traces, ferns, and even tree trunks have been found in these geologic units. Similar bedrock outcrops near Gilboa Dam in Schoharie County contain fossilized remnants of the Earth's earliest forests. To learn more online, visit: https://en.wikipedia.org/wiki/Gilboa_Fossil_Forest

Don't Risk It!

A flash flood is a rapid rise in stream flows reaching well above streambanks. Flash floods usually result from heavy rains over a short period of time, often several hours. Along rivers with large watersheds, the timing and elevation of flood peaks can be predicted in advance and with some accuracy. Check the National Weather Service to monitor river flows and flood forecasts near you: https://water.weather.gov/ahps/. In smaller basins, flooding is harder to predict with useful warning times.

If you suspect that your area is susceptible to flash flooding do not wait for an evacuation order. Move to higher ground immediately. If you are in a car and the water begins to rapidly rise around you, abandon your vehicle immediately and seek higher ground.

Just six inches of moving water can knock you down, and one foot of moving water can sweep your vehicle away.

Learn more: https://www.ready.gov/floods

WHAT IS CLEAN DRINKING WATER?

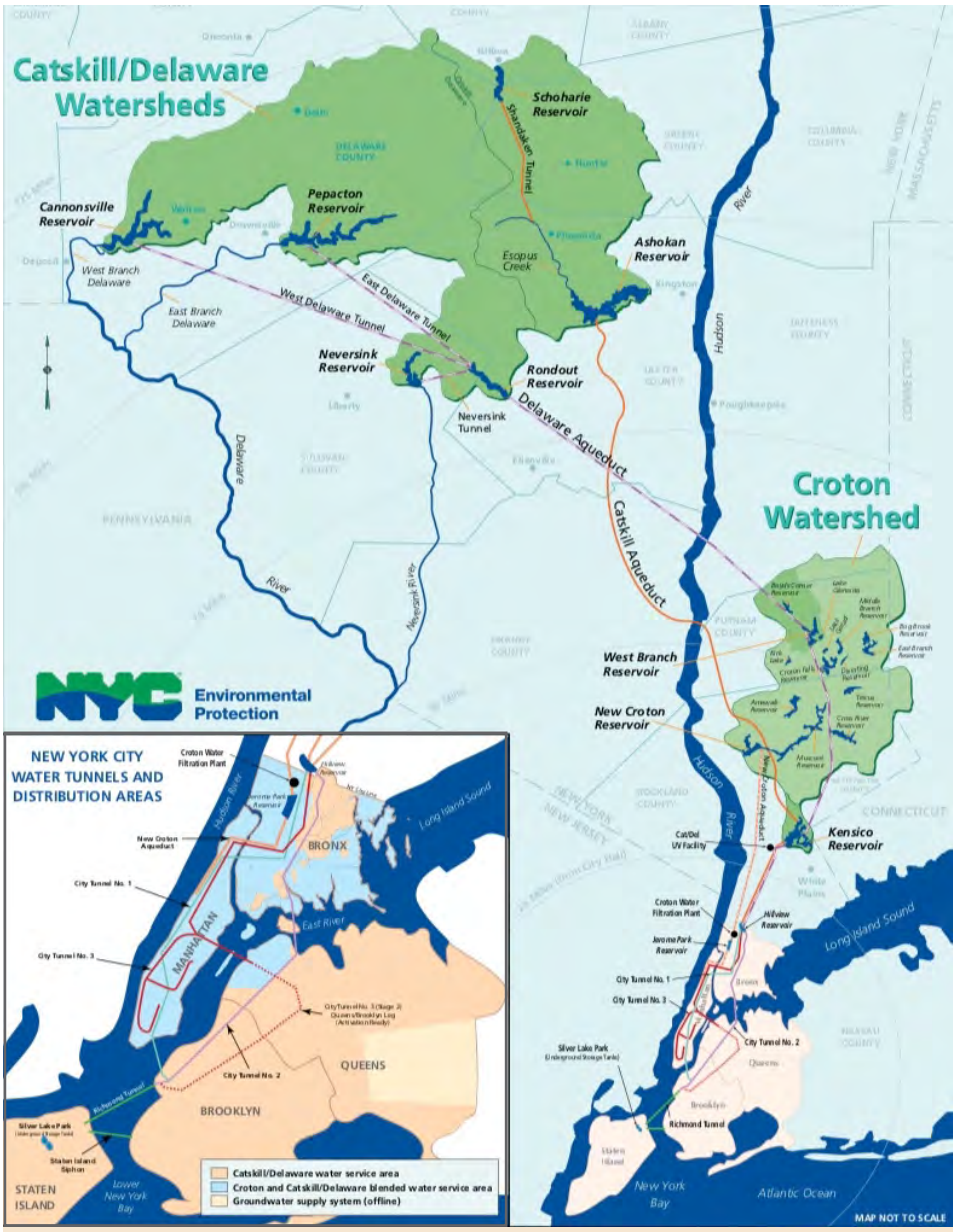
When it comes to drinking water, how clean is clean? One of the challenges public water supply managers face is convincing the public that tap water is safe to drink. After hearing disaster stories about water contamination in Flint, Michigan or closer to home in Newburgh, NY, water users feel justified in asking their municipalities for thorough testing regimes and high standards.

New York City is one of only five large cities in the country with a surface drinking water supply that does not utilize filtration as a form of treatment. Rather, the Catskill/Delaware supply (see sidebar at right) operates under a Filtration Avoidance Determination (FAD), and the water from the supply is treated using two forms of disinfection to reduce microbial risk.

The NYC Department of Environmental Protection (DEP) monitors the water in the distribution system, upstate reservoirs and feeder streams, and wells that are sources for New York City's drinking water supply. DEP continuously monitors and conducts analyses for a range of water quality parameters, including microbiological, chemical, and physical measures.

In 2018, DEP performed approximately 414,000 analyses on 37,500 samples from the distribution system. Additionally, DEP performed approximately 240,000 analyses on 15,700 samples from the upstate reservoir watersheds, and took close to 1.3 million robotic monitoring measurements to support FAD watershed protection programs and to optimize water quality.

DEP also regularly tests water quality at nearly 1,000 water quality sampling



NYC's DRINKING WATER SYSTEM RELIES ON VAST RESERVOIRS, LARGE DAMS, HUNDREDS OF MILES OF AQUEDUCTS, AND THOUSANDS OF MILES OF STREAMS.

The NYC Water Supply System is the source of drinking water for over 9 million New Yorkers, including 8.6 million residents of New York City and nearly one million people living in upstate communities. New York City's need for clean drinking water is fed by three individual water supplies called the Catskill/Delaware supply, located in Delaware, Greene, Schoharie, Sullivan and Ulster counties; the Croton supply in Putnam, Westchester, and Dutchess counties; and a groundwater supply in southeastern Queens. In 2018, the Catskill/Delaware supply provided approximately 94 percent of the water.

stations throughout New York City. The monitoring results show that New York City drinking water met all drinking water standards in 2018.

The primary standard for a water quality parameter is called the Maximum Contaminant Level (MCL) set by federal and state authorities. The MCL is the level of contaminant in drinking water below which there is no known or expected risk to health. Goals for the MCL provide for a margin of error to ensure drinking water safety.

Some monitored parameters are detected in the water supply at levels below regulatory limits set for safe drinking water and pose no health risks at the doses we receive through drinking water.

For example, nitrate is a parameter that can enter water supplies as runoff from lawn and farm fertilizer, sewage and manure, and erosion of natural deposits. Nitrate is a common groundwater contaminant in rural areas and is regulated in drinking water to protect infant health.

The US Environmental Protection Agency and the NYS Department of Health set the standard for short-term exposure to nitrate in drinking water at 10 milligrams per liter (mg/l). The range of nitrate detected in 2018 samples from the NYC water supply was 0.06 - 0.48 mg/l with an average value of 0.13 mg/l. A total 309 samples were analyzed for nitrate in 2018. Nitrate levels never exceeded the MCL of 10 mg/l and were detected well below levels of concern, even at the maximum amount detected.

No parameter monitored in the NYC Water Supply in 2018 exceeded its MCL.

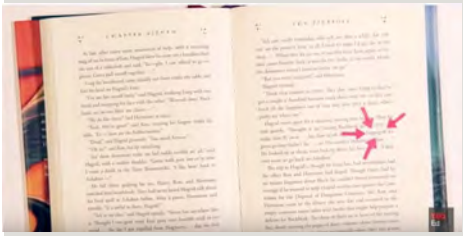
The Ashokan Watershed Stream Management Program exists as part of a larger watershed protection and pollution prevention effort in the Catskill/Delaware Water Supply System. Watershed protection depends on partnerships between upstate communities and downstate water users and those partnerships are currently producing drinking water that meets and exceeds scientific standards.

When you get a chance, drink up and enjoy New York City's famous tap water - its mainly supplied by the forested slopes, wetlands, and streams of the Catskills.

ONE MILLIGRAM PER LITER

Milligram per liter is a unit of measurement equivalent to one part per million. It's a way to measure concentrations when a small amount can make a big difference. It's frequently used to measure concentrations of water quality parameters. Here are ways to visualize one part per million:

Four drops of ink in one 55-gallon barrel of water (mixed thoroughly) would produce an ink concentration of one part per million.



The English version of the Harry Potter series has 1,084,170 words, which makes "hippogriff" on page 221 of the Prisoner of Azkaban a little less than one part per million.

Whether this amount of anything is toxic depends on the substance. The toxicity of a substance is determined through scientific testing.

Source: Ted-Ed Animations

Resources:

New York City DEP's 2018 water quality monitoring report contains more information on the city's water testing program and a section on steps to minimize exposure to lead in the plumbing of older homes. The report is available online at:

https://www1.nyc.gov/assets/dep/downloads/pdf/water/drinking-water/drinking-water-supply-quality-report/2018-drinking-water-supply-quality-report.pdf

The U.S. EPA regularly publishes Maximum Contaminant Limit goals that include a reference dose and cancer risk values for drinking water contaminants. EPA also reports information on Community Water Systems and the number of violations for those systems online at:

https://www.epa.gov/dwstandardsregulations/drinking-water-contaminant-human-health-effects-information

and

https://www.epa.gov/ccr

For more information on nitrate health effects in drinking water, see this fact sheet:

http://psep.cce.cornell.edu/facts-slides-self/facts/nit-heef-grw85.aspx

See a Ted-Ed animation on how to visualize one part per million:

https://ed.ted.com/lessons/how-to-visualize-one-part-per-million-kim-preshoff-the-ted-ed-community

Read about the "hotly debated question" of whether New York City's water makes bagels and pizza taste better:

https://www.foodandwine.com/fwx/food/new-york-water-bagels-pizza

Esopus Creek News

AWSMP UPCOMING EVENTS

July and August

Stream snorkeling returns! Snorkel the Esopus Creek behind the Emerson Inn and learn about stream life and water quality. Dates are July 12, 19, 26 and August 16. To register, visit: www.ashokanstreams.org or call the AWSMP at (845) 688-3047 for more information. See an informational video at:

https://youtu.be/fj0QGVVHJQk

July 30-August 4

Visit us at the Ulster County Fair in the Youth Building! We'll offer stream table demos, watershed activities and prizes.

September 7

See us at Olive Day in the Davis Park, West Shokan with the stream table and demos.

Ashokan Watershed Stream Management Program

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Soil and Water Conservation District

NYC Environmental Protection

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