Watershed Forestry – 364 West Street, Hopedale's Watershed May 2023

The Hopedale Water & Sewer Commission has consistently stressed the importance of the 364 West St property due to the property's hydrological connection to Hopedale's public water supply. The property, aka the Hopedale Watershed, is vitally critical to the current, and future, water quality and quantity.

From the September 2019 DPU Intervener status filing to the June 2022 Residual Designation Petition submitted to the EPA, the W&S Commission has documented this environmental details supporting this position. Recent activities and current industry information continue to emphasize the importance of Hopedale's Watershed. In addition to the flooding issues, there is a vast and ever expanding source of information documenting the importance of watersheds highlighting the link between watershed forestry and public water supplies:

Forests are the most beneficial land use for protecting water quality, due to their ability to capture, filter, and retain water, as well as air pollution from the air.

This is the exact situation between 364 West St, the Hopedale Watershed, and Hopedale's public water supply. To expand, directly from the EPA, Mass Audubon, American Forest, World Resource Institute and other similar organizations:

- There are few resources, if any, more vital to life than water.
- Water is one of the most important natural resources flowing from forests.
- Forested watersheds improve water quality and enhance water storage, naturally regulate stream flows, reduce flood damages and stormwater runoff, replenish groundwater and provide a myriad of other benefits.
- Forests in nearby watersheds can protect water supplies from pollutants, prevent soil erosion and filter sediment, keeping surface waters and aquifers cleaner
- **Healthy forests are vital to clean and abundant supplies of water**

Protecting watershed forestry is critical:

- Mature, native forests provide these benefits more reliably than plantations, so preventing deforestation in watersheds is critical.
- Deforestation increases downstream streamflow.
- A review of treatment costs and watershed characteristics for 27 drinking water utilities found that for every 10% increase in forest cover of the source water area, chemical and treatment costs decrease by 20%.
- Changes to forest structure and composition can alter underlying hydrologic processes within a watershed affecting the capture, storage and filtration of water, and the regulation of streamflow (NRC 2008; Osterkamp and Hupp 2010).
- In a North Carolina Watershed study (Kays, 1980) the mean soil infiltration rate went from 12.4 in/hr to 4.4 in/hr when a site was converted from forest (duff layer on soils) to suburban turf.

- As we begin to remove forest canopy … we immediately have impact on watersheds….and decline in water quality..

364 West Street's 155 acres of forestry and wetlands **WAS** Hopedale's Watershed, providing the natural protection to Hopedale's public water supply, critical to the future of Hopedale's public water supply.

That is exactly why the Town protected this property to remain as forestry by designating, then exercising, Hopedale's Chapter 61 rights along with multiple Town Meeting votes directing the Town to acquire the property and preserve it as forestry and wetlands.

Additionally, soil compaction from machinery used to deforest areas from the ongoing site work at West Street has a negative impact on water. (https://ubt.opus.hbz-nrw.de/opus45-ubtr/frontdoor/deliver/index/docId/1991/file/DISSERTATION_EVM_Publikation_Mitteilung_90-23.pdf) Specifically, it leads to increased runoff, exacerbated soil erosion, enhanced mineralization of the soil, and increased nitrogen runoff into surrounding waters.

Background info -

https://www.epa.gov/hwp/benefits-healthy-watersheds

https://www.americanforests.org/article/the-important-relationship-between-forests-and-water/

https://www.fs.usda.gov/managing-land/national-forests-grasslands/water-facts

https://www.americanforests.org/what-drives-us/water/

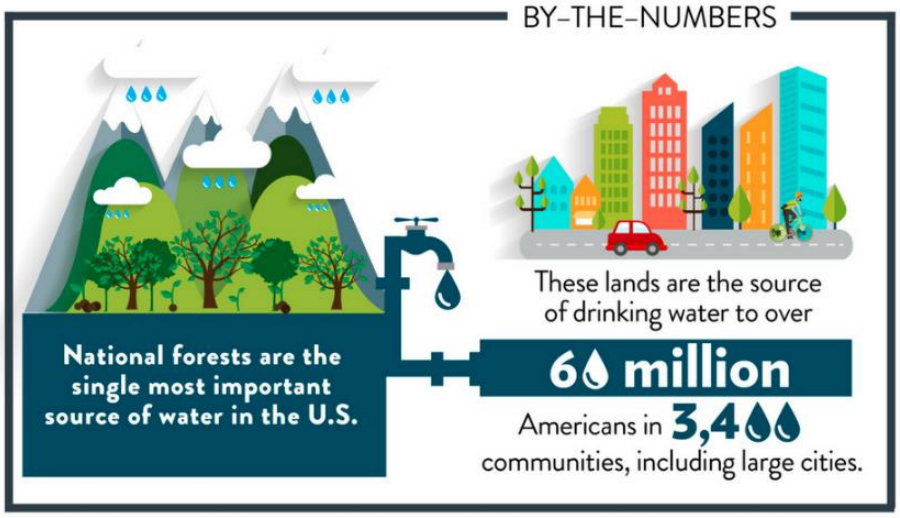
https://forestadaptation.org/focus/forested-watersheds

https://www.wri.org/insights/forests-benefit-cities

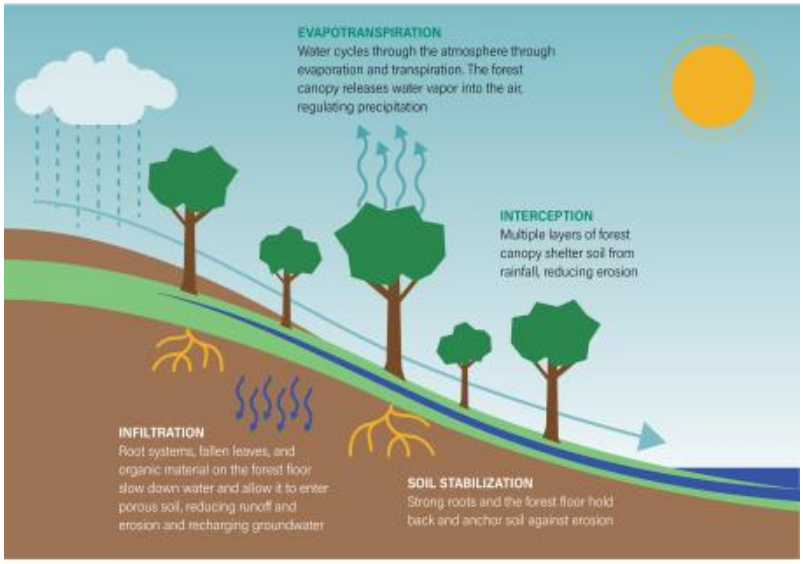
https://www.massaudubon.org/our-conservation-work/policy-advocacy/local-climate-resilient-communities/the-value-of-nature

https://extension.psu.edu/the-role-of-trees-and-forests-in-healthy-watersheds

https://ok-watersheds.sites.olt.ubc.ca/files/2021/03/Deforestation-forestation-and-water-supply-Science.pdf



How Forested Watersheds Protect Urban Water Supplies



Source: Authors. Adapted from Qin and Gartner 2016.

WORLD RESOURCES INSTITUTE

FORESTS ARE NATURAL WATER FILTRATION SYSTEMS.
Each forested acre that drains into a public water source filters 543,000 gallons of drinking water per year.