



Fishkill Creek Watershed Water Quality

What is a Watershed?

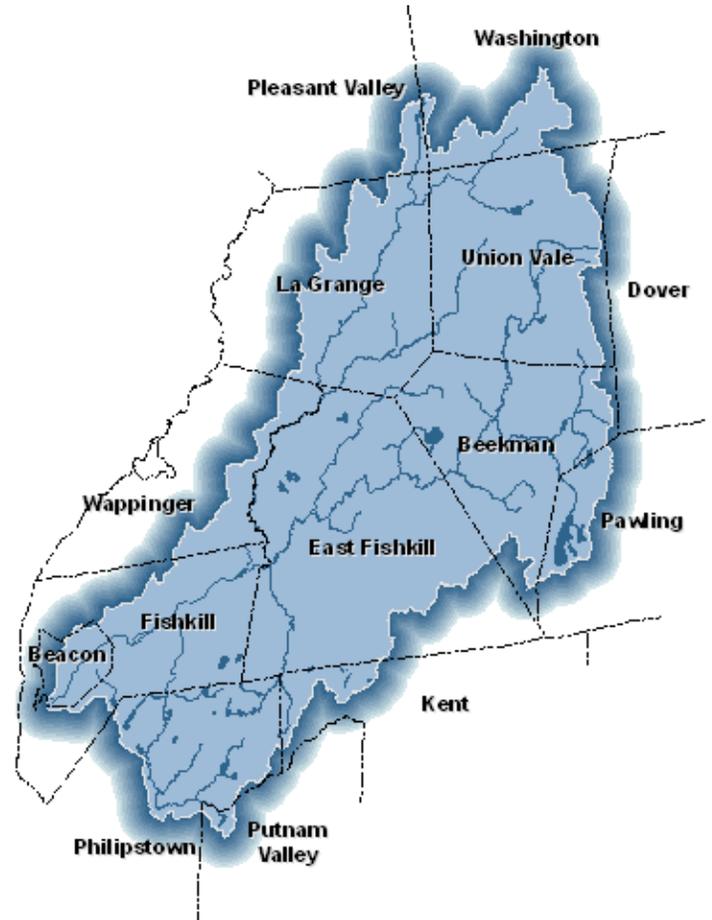
A watershed is an area of land where all of the water that falls on it (e.g. rain, snow) drains into a waterbody - such as a stream, lake or wetland.

The quality of the water in streams, lakes, and wells is a product of the surrounding land - therefore our daily actions have an impact on water quality, even we don't live near a waterbody.

Watershed Information

The Fishkill Creek watershed, located in Dutchess and Putnam Counties, NY, drains from approximately 193 square miles (123,627 acres) in eleven Dutchess County and three Putnam County municipalities. The main stem of the Fishkill Creek is approximately 38 miles long and begins in the center of Union Vale, flowing southwest, and enters the Hudson River in Beacon.

The predominant land use within the watershed is forestland (45.8 %) followed by residential land. The percentage of residential land in the watershed (22.7 %) has been increasing, while agricultural areas have been decreasing (11.8%).



Water Quality

Water quality is a term that describes the physical, chemical, and biological properties of water, usually with respect to a set of standards for a particular use or purpose. The most common standards used to assess water quality relate to the health of ecosystems, safety of human contact, and drinking water. Common water pollutants include:

- **Nitrogen** and **phosphorus** from runoff that includes excess fertilizers, leaky septic systems, waste water treatment discharge, or even pet waste, can lead to excessive aquatic plant and algal growth; this is not only unpleasant to look at, but also harmful to fish and other aquatic life living in the waterbody.
- **Nitrate** (the most mobile form of nitrogen) in high amounts can also present a human health concern.
- **Turbidity** is a measure of the clarity of water. The more turbid the water, the greater amount of sediment and silt that is floating in the water and the "dirtier" it appears. Turbidity can be caused by soil erosion and urban stormwater runoff.
- **Chloride** is an elemental part of salt (formed by sodium and chloride) and most often ends up in waterbodies due to the salting of roads.
- **Excess chloride and turbidity** can be harmful to aquatic plants and animals.



High amounts of nutrients, like phosphorus and nitrate, can lead to algal blooms in waterbodies.

Watershed Management Plan

The Natural Resource Management Plan for the Fishkill Creek Watershed was developed to assist municipalities in the watershed with planning to protect their water and biological resources.

The Management Plan provides useful information and recommendations for decision-makers to encourage protection of the watershed's environmental resources, and support economic growth and quality of life.

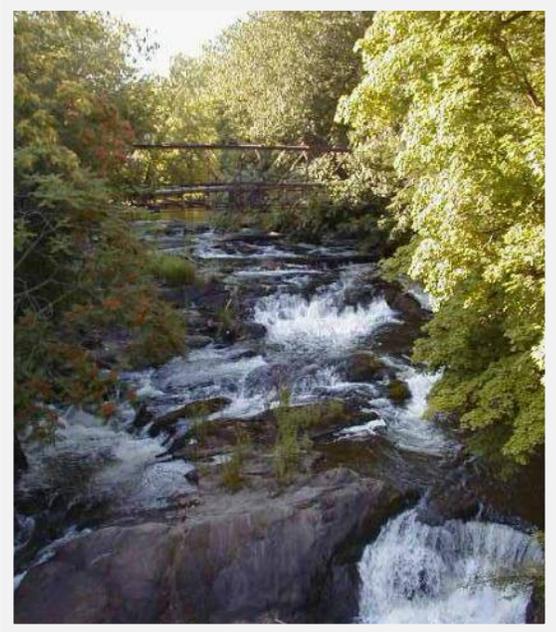
Water Quality Results

In 2004, water samples were collected every two months from seventeen Hudson River tributaries to evaluate in-stream water quality. Samples were analyzed for nitrate, phosphate, sulfate, chloride, pH, specific conductance, dissolved oxygen, turbidity and salinity. The Fishkill Creek was sampled where the creek runs through Madam Brett Park in the City of Beacon. Nitrate concentrations in the Fishkill Creek were higher than all other tributaries studied (median = 8.87 mg/L) and above the literature threshold for undeveloped/non-impacted streams (0.087 mg/L, Clark et al. 2000). This extremely high reading, which was replicated in three samples, most likely reflected confirmed broken sewer lines leaking raw sewage into the stream upstream of the sample site. The median phosphate (the most mobile form of phosphorus) concentration for the year (0.014 mg/L) was slightly above the literature threshold for undeveloped streams (0.010 mg/L, Clark et al. 2000). The median value of chloride sampled (78.3 mg/L) was relatively high but below the US EPA's threshold of 230 mg/L.

The table shows the annual median nitrate, phosphate & chloride concentrations found in the Fishkill Creek during a 2004 study.

Watershed	Nitrate (mg/L)	Phosphate (mg/L)	Chloride (mg/L)
Fishkill Creek	8.87	0.04	78.3
Literature Concentration for Non-impacted Streams	0.087 (Clark et al. 2000)	0.010 (Clark et al. 2000)	230 (4 day avg.) (US EPA 2005a)

The lower Fishkill Creek is currently listed on the NYS DEC Priority Waterbodies List as having *Minor Impacts*. This segment of the stream begins above Clove Creek near Brinckerhoff Road and ends where the creek meets the Hudson River (and includes Madam Brett Park, the sampling site of the 2004 study). Sampling by the NYS Department of Environmental Conservation (DEC) in 2002 indicated slightly impacted water quality conditions due to “nonpoint source nutrient enrichment and possible toxic inputs from municipal/industrial sources”. Similar results were found during sampling that was conducted by the DEC in 1997, 1998, and 1999. These findings, along with the 2004 data, indicate that non-point source pollution of nutrients to the Fishkill Creek is a serious concern that should be addressed.



The Fishkill Creek near Beacon.

Hillside Lake and Sylvan Lake, located in the Town of East Fishkill, are both lakes within the Fishkill Creek Watershed that are currently listed as *Impaired* on the NYS DEC Priority Waterbodies List. Hillside Lake is also included on the NYS Section

Fishkill Creek Watershed Association (FCWA)

The Fishkill Creek Watershed Association is a local volunteer non-advocacy organization that works for the protection of the natural environment within the watershed.

Municipalities:

Dutchess County:

Beacon
Beekman
East Fishkill
Fishkill (T)
Fishkill (V)
LaGrange
Pawling
Pleasant Valley
Union Vale
Wappinger
Washington

Putnam County:

Kent
Philipstown
Putnam Valley

303(d) List of Impaired Waters due to phosphorus. Phosphorus levels in Hillside Lake consistently exceed (and often significantly exceed) the state guidance levels for impacted or stressed recreational uses and are believed to be caused by leaking on-site septic systems. Inputs of phosphorus, likely from failing on-site septic systems and waterfowl (geese) that frequent the lake, are leading to low dissolved oxygen levels in Sylvan Lake. Low levels of dissolved oxygen are harmful to aquatic life such as Trout species, which Sylvan Lake should be able to support according to its classification.



Waste from animals, including waterfowl such as geese, can increase levels of nutrients in a waterbody.

Recommendations

Nutrients, such as nitrogen and phosphorus, have been identified as problems affecting the water quality of Hillside Lake, Sylvan Lake, and the lower Fishkill Creek. The following best management practices implemented throughout the watershed would help reduce the inputs of these pollutants into the lakes and creek.

- **Vegetated streamside buffer zones** –

The roots of trees and shrubs along the stream banks of creeks do an excellent job of holding onto sediment, preventing erosion, and filtering excess amounts of phosphorus and nitrogen in groundwater before it reaches the creek. Residents along streams can work to maintain their vegetated buffers.

Municipal ordinances that create a “buffer zone” around a creek to protect the vegetation help to ensure that residents maintain these beneficial plants along the creek. Municipalities can also take advantage of programs like the NYS DEC Hudson River Estuary Program’s “Trees for Tribs” initiative that provide free native trees and shrubs for streamside buffer planting/restoration projects in the Hudson River Estuary watershed.

For more information visit:

<http://www.dec.ny.gov/lands/43668.html>



A NYS DEC “Trees for Tribs” planting in Dutchess County.

For More Information:

For further information about the Fishkill Creek watershed and the other watersheds in Dutchess County, visit:

Dutchesswatersheds.org

The website provides a free community forum, general information about watershed and water quality issues, links to useful resources such as model ordinances, green infrastructure practices, septic maintenance, and much, much more.

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- **Septic maintenance and education** – Educating homeowners on how to properly maintain their septic systems, including pumping every 3-5 years, and how to identify when it is failing, will help reduce inputs of phosphorus to the watershed, especially in areas of high density and around many of the impacted lakes in the watershed.
- **Stormwater management and green infrastructure practices** – Much of the non-point source pollution that makes it into our waterbodies comes from urban/suburban stormwater runoff. Municipalities, businesses and residents can put green infrastructure practices in place to help reduce stormwater runoff – including installing rain barrels, rain gardens, pervious pavement and other practices.
- **Reducing salt** – Installing computerized salt monitors on deicing vehicles controls the amount of salt and deicing chemicals applied to roads during the winter. It prevents excess product from being applied when trucks slow down or come to a stop which not only benefits water quality but can also save municipalities substantial amounts of money.
- **Intermunicipal Cooperation** – Municipalities can work together through intermunicipal cooperation to address residents concerns, and collectively work on upstream and downstream measures to help improve water quality.



Regular maintenance of septic systems includes pumping every 3—5 years.



Permeable, or porous, pavement allows water to seep into the ground instead of flowing over the land as part of stormwater.



Excess road salt can be transported via stormwater to a waterbody where it can have negative impacts.

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