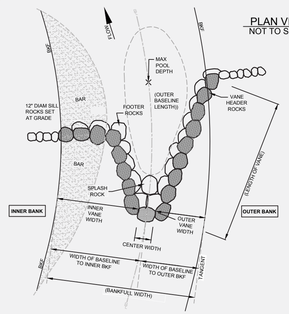
Towne Branch Stream Restoration

This photo shows the construction of the stone wall to repair the eroding stream bank along Depot Street.

As part of the stream restoration, a specially designed stream bed mix was installed to improve stream bed stability.



Five grade control structures were installed to stabilize the stream and create pools.

Remnants of a stone wall believed to be from Wade's Mill, mid-19th century, can still be seen along the stream bank.

Site History

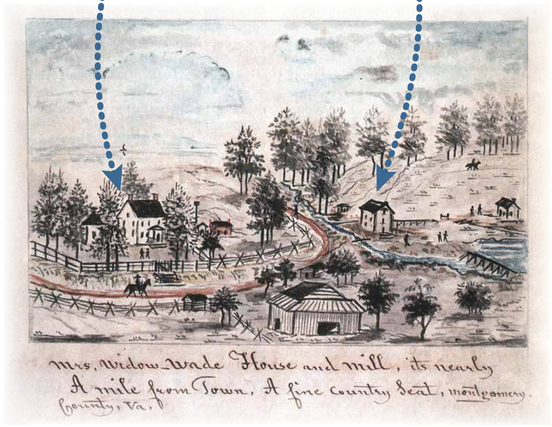
Archaeological records are a great way to catch a glimpse of the past and better understand a site's history.

The map to the right shows a portion of Montgomery County from 1864. Several mills are depicted north of the Town of Christiansburg.

One of these mills, Wade's Mill, was situated on the eastern bank of the stream restoration project area. The bottom photo at the left is a stone wall that may have been part of Wade's Mill, possibly part of the mill pond dam itself.

The sketch to the right was drawn by a German folk artist named Lewis Miller around the year 1850. In the sketch you can see the Wade residence and mill which are depicted on the map above.

To operate the mill, the stream was dammed to create a pond. Water from the pond was then channeled into a mill race, through a flume, and used to power the mill mechanism.



Get to Know Your Stream

- The Towne Branch stream restoration project was completed in 2018
- 1,180-acre urban watershed
- > 40% impervious (roads, rooftops, parking lots)
- ~2,000 feet of stream restored

Stream restoration design by:

Wetland Studies and Solutions, Inc.® a DAVEY company

Towne Branch Stream Restoration

Riparian Buffer Planting

The Towne Branch Stream Restoration project included planting the riparian buffer with native vegetation. A healthy riparian buffer is imporant for the health of the stream because it filters sediment and nutrients from storm water. Riparian buffers also help to stabilize streambanks to prevent excessive amounts of erosion and create excellent habitat for local wildlife.

How many of these plants can you find?


Pin Oak


White Oak


Northern Red Oak


Willow Oak


Red Maple


Black Gum


Black Willow


Arrowwood


Buttonbush


Brookside Alder


Eastern Redbud

What's Under That Rock?

Macroinvertebrates! Macroinvertebrates are spineless organisms that spend at least a portion of their life cycle in the stream. They are a critical component of the stream's ecosystem. In addition to being a major food source for larger organisms, macroinvertebrates also serve the purpose of nutrient cycling through the breakdown of organic matter such as leaf debris. The presence (or absence) of certain types of macroinvertebrates can tell us a great deal about the water quality of the stream. For example, if stonefly and mayfly larvae are present in the stream, we can conclude that the stream has good water quality because these types cannot tolerate pollution. On the other hand, if midge and blackfly larvae are the only types of macroinvertebrates found, then we can conclude that the water quality is too poor to support other species typically found in better water quality.

Can you find any macroinvertebrates?


Midge Larvae


Pouch Snails


Damselfly Larvae


Fishfly Larvae


Dobsonfly Larvae


Mayfly Larvae


Stonefly Larvae

Poor Water Quality (High Pollution Tolerance)

Leeches

Blackfly Larvae

Moderate Water Quality (Moderate Pollution Tolerance)

Cranefly Larvae

Crayfish

Dragonfly Larvae

Good Water Quality (Low Pollution Tolerance)

Caddisfly Larvae

Gill Breathing Snails

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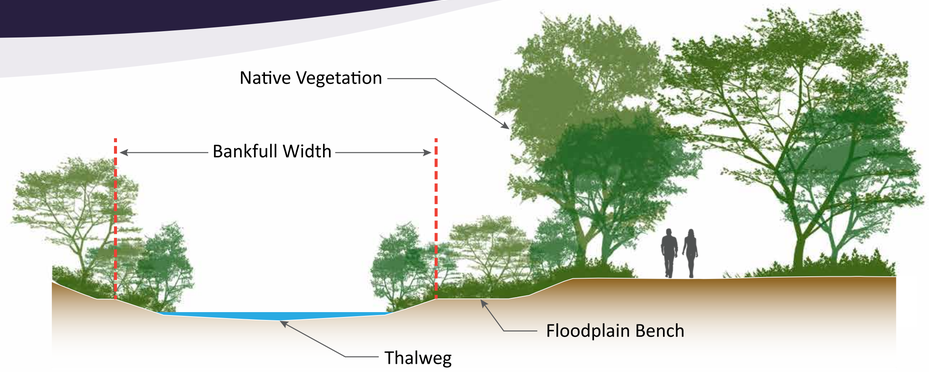
Towne Branch Stream Restoration

Why Restore Towne Branch?

- Address sediment impairment on Crab Creek
- Reduce erosion/sediment inputs from stream banks
- Improve habitat/ecology
- Restore native vegetation along stream (riparian buffer)
- Protect infrastructure (sanitary sewer, roads)
- Foster enhanced interaction between nature and Town residents



Characteristics of a Healthy Stream

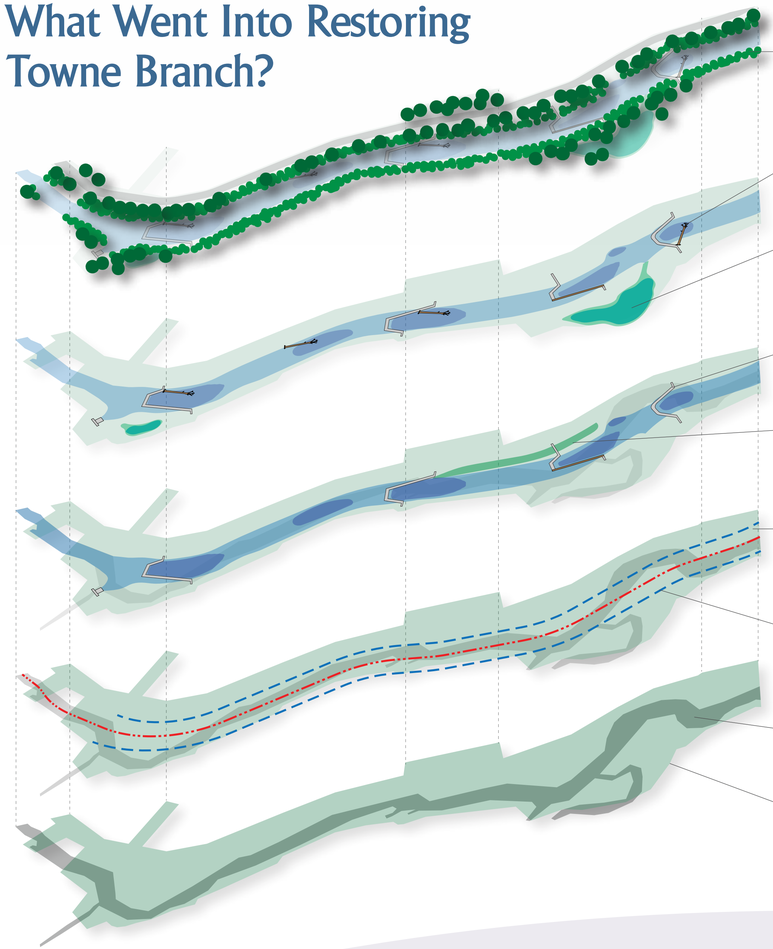
- Stable, diverse habitat features (fast-flowing riffles; slow, deep pools)
- Well-vegetated stream banks
- Room to flood
- Clean, clear water

Towne Branch Watershed

Statistics:

- 1,180 acres
- Greater than 40% impervious (rooftops, roads, and parking lots)
- Drains downtown areas
- Network of piped and open channels

What Went Into Restoring Towne Branch?



STEP 5

Plant the riparian buffer with native vegetation. Native vegetation helps stabilize the stream banks and also provides food and habitat for wildlife.

STEP 4

Incorporate woody debris habitat features. Woody debris provides shelter and food for aquatic organisms.

Create overbank wetland areas. Wetlands are created from portions of the old stream channel to promote habitat diversity.

STEP 3

Incorporate grade control structures. Structures stabilize the stream channel by resisting the erosive force of water.

Raise stream and create a floodplain bench. Floodplains allow for energy dissipation and filter pollutants during storm events.

STEP 2

Determine new stream alignment. The new alignment can be designed to reduce bank stresses in sharp bends, preserve trees, and protect infrastructure.

Determine bankfull channel dimensions based on watershed size and characteristics. Sized to allow periodic, but controlled flooding.

STEP 1

Analyze existing stream channel characteristics. Studies of the existing channel inform the design of the new channel.

Determine limits of restoration work. The project area must account for a number of environmental and cultural limitations.

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