

# Two Walks in the Woods

December 8, 2015

January 6, 2016

Informal Overview of Mill Creek  
in Bella Vista Private Open Spaces

**“DRAFT”**



## Sign on Brackenville Road

Mill Creek is a tributary of White Clay Creek, whose entire watershed has been designated “Wild and Scenic” by the Federal government.



## **Wild & Scenic?**

Some nice day, get out of your car near that sign (park safely on a side road) and see for yourself. Sure enough! Very pretty! Looked wild and scenic, too!

The view made me wonder, “What about sections of Mill Creek here in Bella Vista?”

# Introduction

I am a 30-year property owner in Bella Vista, a residential development in Hockessin, New Castle County, Delaware.

I became intrigued one day when I saw the sign near Mill Creek indicating it had something to do with White Clay Creek and its designation as a Wild & Scenic River. Mill Creek runs right behind our own property, not out in the wilderness somewhere. “Wild & Scenic?” How could that be?

It was true. Mill Creek flows into White Clay just before the whole affair joins the Christina River in Stanton. However, the three branches of that more famous stream appeared to be getting most of the attention. To me that seemed unfair!

I am now a few months into my quest, and I must say that three conservation-oriented organizations associated with White Clay have been welcoming and generous with their time. More about them and their guidance in a minute.



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Mill Creek has waited patiently, down slope (ultimately) from every Bella Vista home, these three decades. The “private open spaces” through which Mill Creek passes have remained in whatever condition they could achieve on their own while responding to extreme flow variations, silt, sand, human-induced runoff, and adjacent land use practices.

I invite your attention to what I have learned so far. Fall and winter rambles can’t tell the whole story, but they do help an observer spot things hidden when foliage is dense.

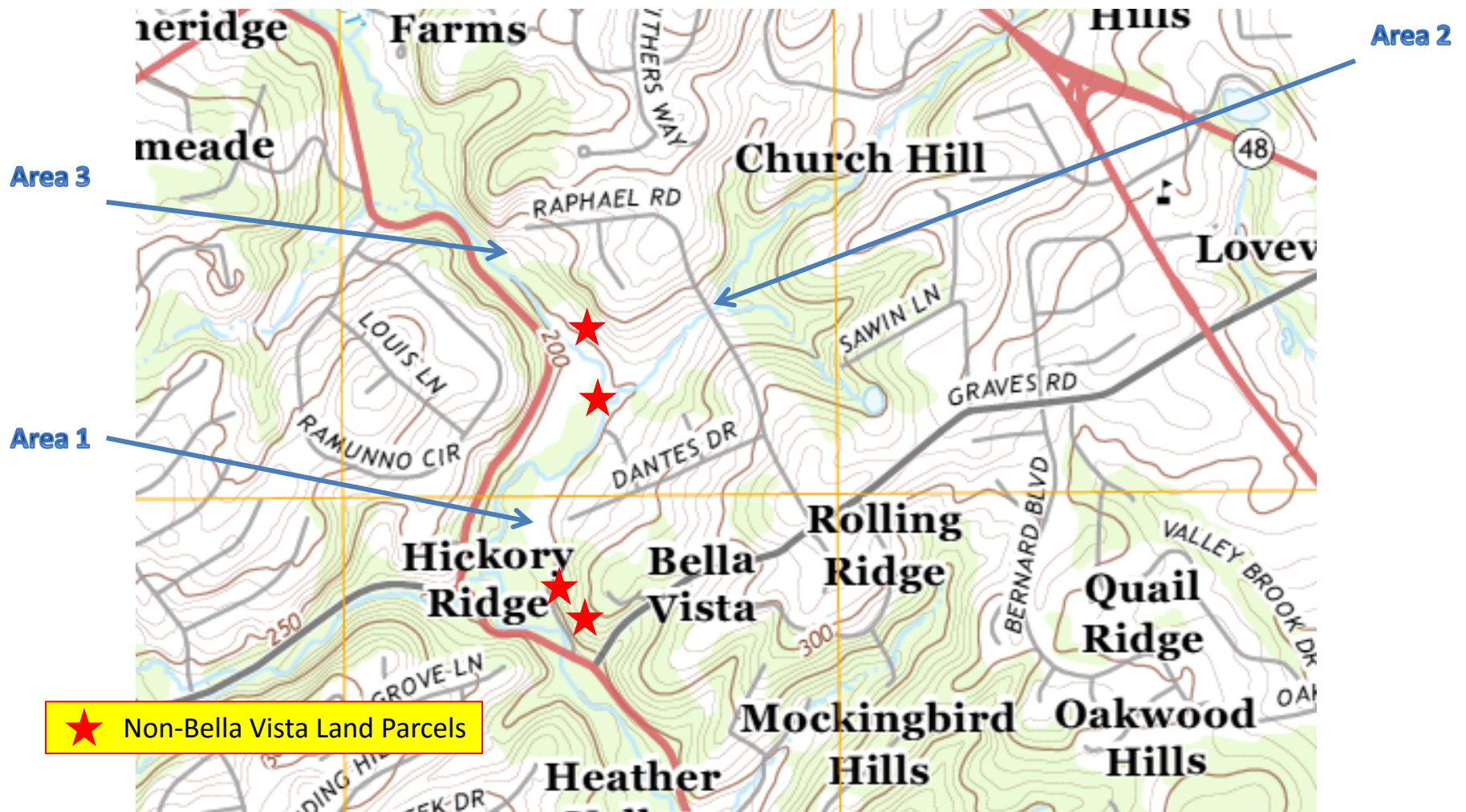
## Disclaimer

I listened and learned from knowledgeable people and did some research on my own, including a third walk on January 13.

This collection of images and remarks is my creation, and I’m responsible for the observations and opinions in it. Bella Vista is too old at this point to point fingers, and nothing like that is intended.

But my information could be incomplete or wrong. I hope you will point out any errors or misconceptions. Above all, please become interested in our creek.

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### Three Watershed Areas

Bella Vista includes three dedicated “private open spaces” still owned by the original development company, according to County maps. Two spaces straddle the main stem of Mill Creek, and one encompasses a tributary down in the Raphael Road “dip.”



## **Relatively Untouched**

Scene in Area 3 near the end of Raphael Road.



## **Not Doing As Well**

Scene in Area 1 behind Dante's Drive properties

# What Happened Then?

I became acquainted with the activities of the White Clay Watershed Association and, within that group, the Wild & Scenic River Steering Committee.

Members and scientists generously came to Bella Vista for a first-hand look.

Two Bella Vista residents graciously allowed access to the open spaces across their properties.

## Participants

- Dana Cooley – 144 Dante’s Drive
- Kathy Kwiatkowski – 63 Raphael Road
- Craig Rinschler – 150 Dante’s Drive
- Shane Morgan – Watershed Coordinator, White Clay Wild & Scenic Program
- Beth Burnam – Senior Planner for Natural Resources, Brandywine Conservancy
- Rob Daniels – Associate Planner, Brandywine Conservancy
- Melinda Daniels, Ph.D. – Associate Research Scientist, Fluvial Geomorphology, Stroud Water Research Center











## Scouring and Undercut

Bend in Mill Creek in the area near the end of Dante's Drive. The left bank has been scoured and undercut during periods of high flow, and the leaning group of trees will eventually fall into the stream. While these are "natural" processes, they make it more difficult for a stream to return to health on its own.



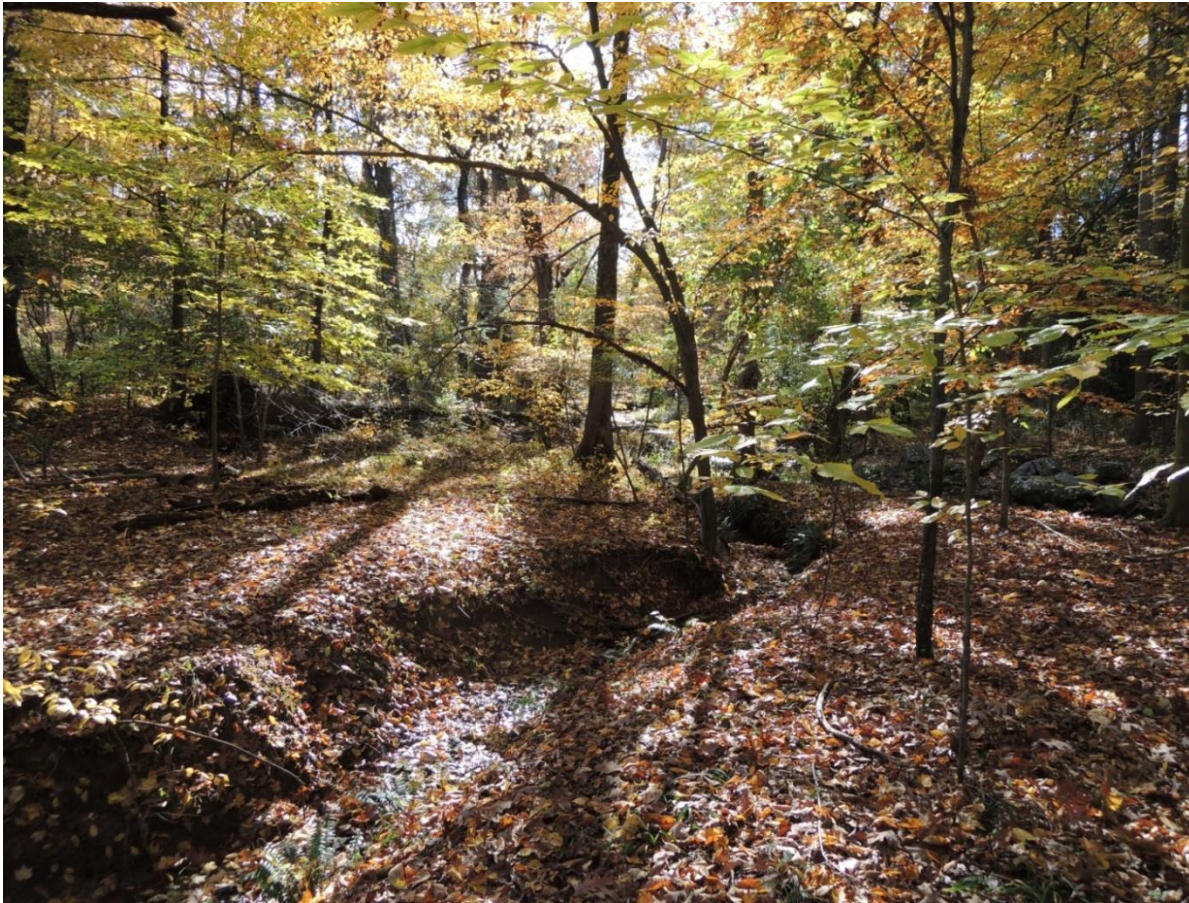
## Scouring and Undercut

This undercut tree behind my own house has fallen as have several others nearby. To some extent the resulting tangle can be beneficial in absorbing stream flow energy, but the effects are unpredictable and may make the situation worse.



## Scouring and Undercut

In contrast, this section of Mill Creek adjacent to the end of Raphael Road appears in much better shape. Banks slope relatively gently on both sides, and trees grow right to the stream edge. Naturally occurring large rocks in the stream bed create energy-absorbing riffles.



## **Storm Water Runoff**

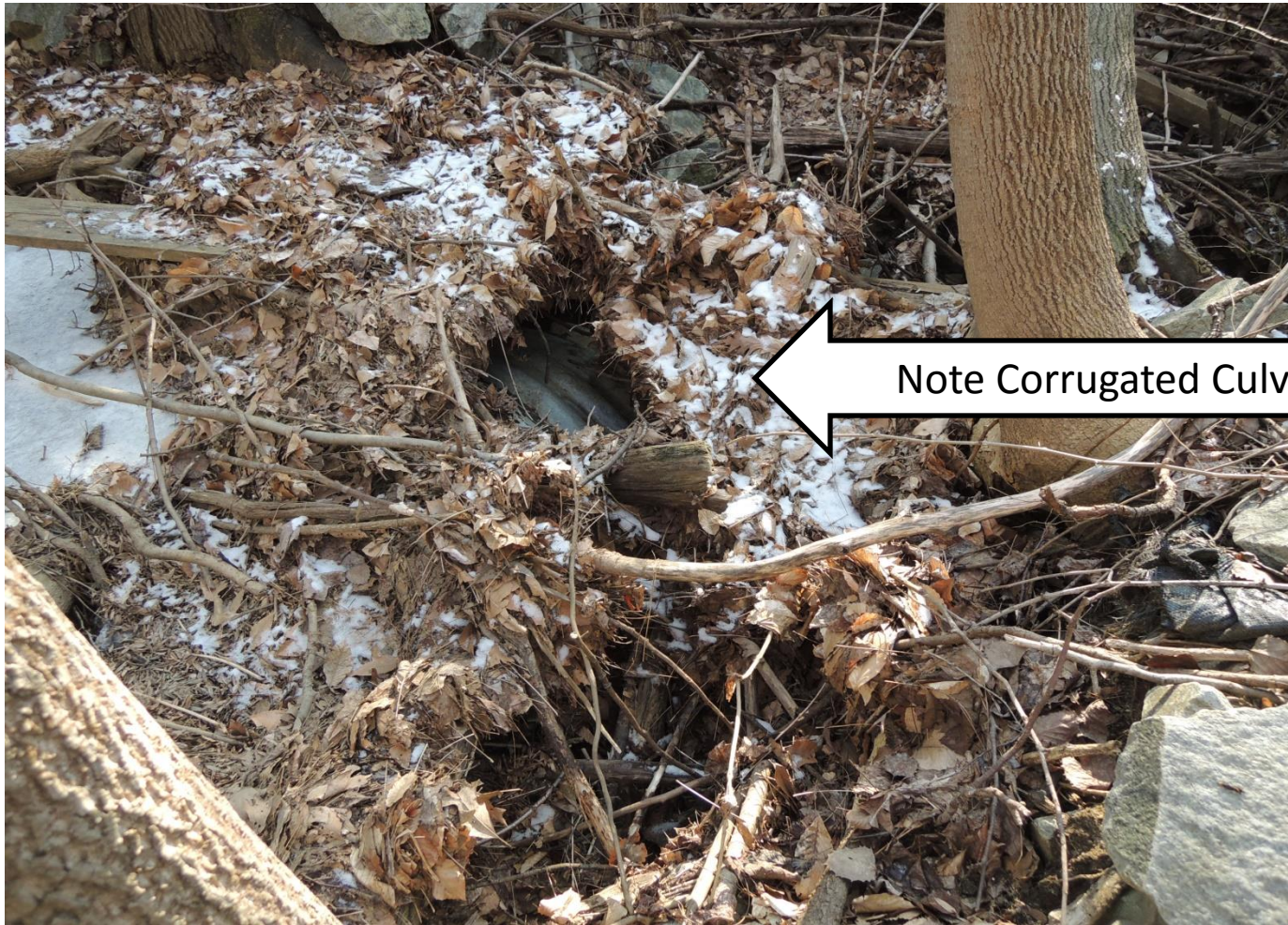
Bella Vista was built to stormwater runoff control standards of the mid 1980s, not those in effect today for new construction. One result is this channel running directly from the end of storm drain piping in Raphael Road. Luckily the ditch is filled with leaves and debris that reduce flow velocities. Developments today often use engineered basins and even underground tanks to delay stormwater runoff from paved surfaces.



### **Deteriorated Culvert**

Unnamed tributary emerging from the culvert under the Raphael Road “dip.” The culvert piping is in poor shape, and it is substantially clogged with leaves and debris at its entrance on the other side of the road. The partial blockage actually may help abate the effects of flash flooding. An engineering expert may need to assess the culvert.





Note Corrugated Culvert

### **Deteriorated Culvert**

Upstream side of the “dip” culvert showing accumulated debris. Cleaning it out would enhance drainage but also hasten rain event flow from approximately 20-30 acres (Sanford School and Sawin Lane) into the main body of Mill Creek. Could be an example of “Be careful what you wish for.”



## **Sand Bar**

Not enough boat traffic these days to worry about keeping the channel open, but a sand bar like this is not natural to Mill Creek. When erosive water slows down, heavier grains in its sediment load settle out. Origins could have been winter road sanding or construction.

## Tree Cover

Mature tree cover is one indicator of a potentially healthy stream.

This section of Mill Creek near the end of Raphael Road may have been less disturbed by construction and/or farming.

Many of the undesirable invasive plants in northern Delaware arrived in the mid 20<sup>th</sup> century, but in areas like this the pre-existing tree canopy and root systems help resist undesirable seedlings taking hold.

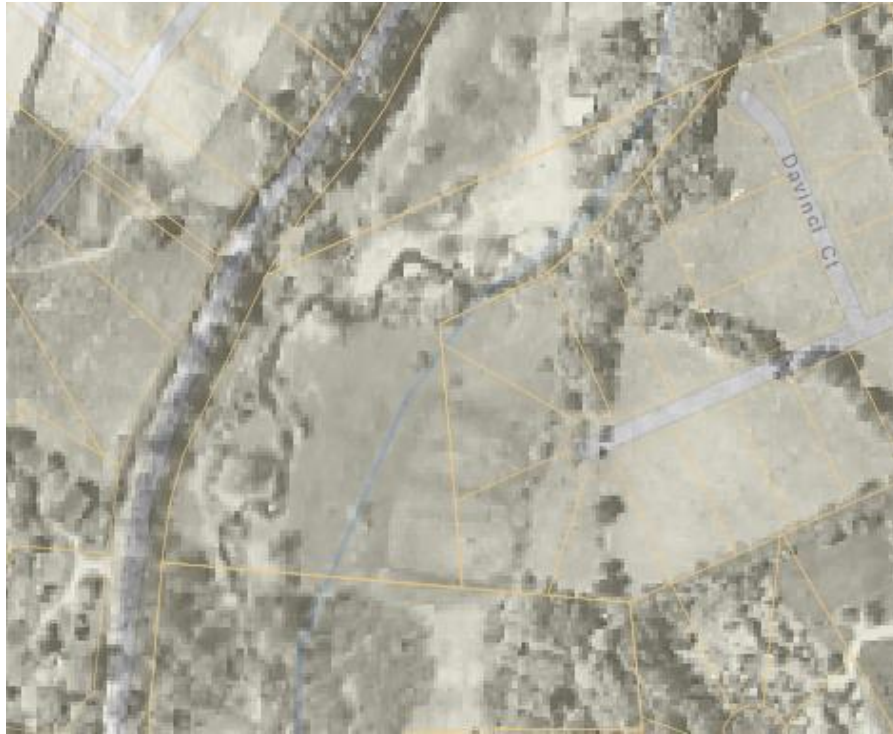
One of the best things landowners can do is help trees get established again.





## Tree Cover

An area without tree cover has a hard time regenerating it naturally. If deer don't browse seedlings first, invasive vines will climb into desirable saplings and literally pull the trees down before they mature. Opportunistic plants like stilt grass take over, dying annually but forming a dense mat as in Area 1 below Dante's Drive.



1961



2012

### **Maps Can Tell a Story**

New Castle County maintains an excellent set of aerial photos online that show the “history” of Mill Creek, overlain to make present-day property boundaries visible. This is a comparison of Area 1 from 1961, well before Bella Vista existed. Hedgerows partitioned the area into meadows, but much of the area was open pasture. The general course of the stream is unchanged, but some of the bends and meanders have altered over time.



1992



2012

### Maps Tell a Story

20 years can make a difference. Note the hook that has disappeared through erosion in the lower left corner of the private open space near Dante's Drive (see next image).



## Maps Tell a Story

This is the now-empty stream bed hook shown in the 1992 map. Such alterations to the landscape do not disappear quickly.



2007



2012

### Maps Tell a Story

The five year interval before a relatively recent New Castle County photo. Is the stream course stabilizing on its own? Is there a way to lock in the gains?



## Classic Invasive

News you can use from the experts.

If you have growing things that look like these, even in your backyard, clip (or saw) them at the base and again chest high.

Let nature dry everything out and the higher vines will fall down in a couple of years while you keep an eye out for new shoots.

Every bit helps (next time I will carry a pair of shears!)



## Stealthy Invasive

During a walk one of the experts noticed a couple of scraggly dwarf nandina bushes, half-dead, that I had tossed onto our section of the stream bank, thinking they would add to the mix and not hurt anything (unlike matted grass clippings which I knew were bad).

Wrong! My jettisoned 'Harbour Belle,' although bought from a responsible garden center, was a potentially invasive bad actor. I pledged to right my wrong and hauled the withered shrubs to the yard waste bag.

Next question: Where will they go from there?





## Mowing

In this Area 1 scene near the end of Dante's Drive, a property owner has mown broad walking paths across the relatively flat land, leaving swaths of taller vegetation. With no great effort or expense (no added seed or fertilizer), healthy turf is has established itself. The tall, "wilder" plants filter rainwater and add visual appeal.

This slows overland flow on its way to a creek and promotes infiltration. Grass should be kept reasonably high (>6 inches), and owners should never mow all the way to the stream edge.

## Bamboo

Stand of tall bamboo on a Raphael Road property near Mill Creek.

Bamboo may seem like a good idea at first, but it spreads quickly via underground runners, chokes out desirable plants, and offers little nourishment or cover for wildlife.

Most experts agree that bamboo is invasive and does not belong in a natural, northeastern U.S. landscape.





### **Rampant Invasives**

This mass of wild grape-like vines (possibly porcelainberry) has overwhelmed other vegetation in a Michelangelo Court backyard somewhat inland from the creek. The only solution is to cut it down, remove roots to the extent possible, plant desirable species, and monitor for regrowth.



## Severe Bank Cutting

This is a view looking south toward a stream bank paralleling Dante's Drive. I live nearby but had never ventured across the creek to look at it. Distinct sediment layers (probably quite old) are visible in the face of the cut. This might interest a professional in warmer weather! See next image for a closeup.



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## **Storm Drain Discharge**

This drain conveys roadway runoff into Mill Creek along Dante's Drive. High flows from it do not seem to have adversely affected the stream bed here.



## Rip Rap – the Good

A previous owner along Dante's Drive installed this stone rip rap, at least 20 years ago, possibly with help and/or oversight by the County. It seems to be in good condition and has done its job of protecting the stream bank.





## **Rip Rap – the Bad, the Ugly**

Downstream, however, this rip rap seems to bear out the maxim that it solves your erosion problem by sending it to your neighbor. Rip rap tends to speed stream flow past the protected bank only to wear away the next one. Here yet another Mill Creek tree in Bella Vista is getting ready to fall.

# Reasonable Actions for Homeowners

- Strategies that can benefit all Bella Vista residents (human and otherwise), not just those whose properties abut Mill Creek
  - Mow grass higher, less often, and never all the way to a creek edge.
  - Inform yourself and think before applying fertilizers and pesticides.
  - Avoid using the stream bank as a yard waste dump.
  - Clip invasive vines at ground level and chest high (let nature dry them up and blow them down).
  - Multiflora rose needs to be pulled entirely from the ground or it will come back.
  - Add inexpensive, wildlife-friendly native shrubs like black willow to your streamside buffer or sparsely-vegetated stream bank (planted as living, dormant stakes – about \$1 each)
  - Plant native trees – they cool land and water, slow overland storm flows, and offer habitat to birds and other wildlife. Protect them from deer and invasive plants.



Multiflora Rose Penn State Photo



Deer Protection Tubes Cornell University Photo

# Best Left to the Profe\$\$ionals

- Large scale invasive removal, including selection and use of herbicides
- Stream bank recontouring
- Fallen tree and stump removal if needed to avert flooding. Woody debris can be helpful to dissipate flow energy.
- Design and installation of stream flow energy absorbers like log or stone revetments and root ball “wads.”
- Obtaining regulatory approvals and abiding by requirements.
- Not every earth moving contractor understands the special needs of stream restoration.

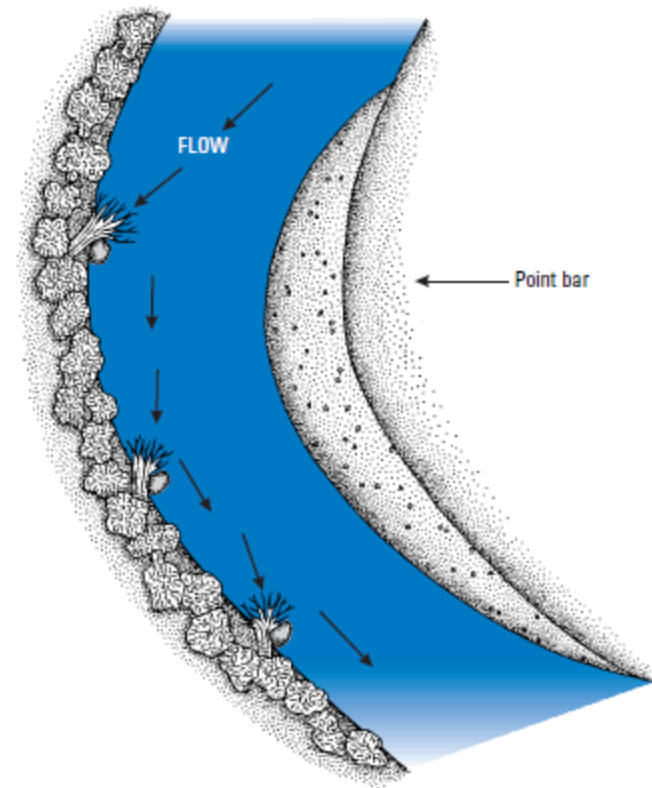


Figure: NC State Cooperative Extension Service



### **Let Sleeping Logs Lie**

This old trunk is well on its way “back to the land” in Area 1. Wherever possible, these should remain, providing plant, insect, and animal habitat as well as nature’s own time-release soil nutrients.



### **Question with No Single Correct Answer**

If you try turning the calendar back and “restore” natural vegetation, how far do you go? This is a section of Dante’s Drive in 1984 before the “natural” pasture was disrupted.

## **Arrival of Early Settlers (1984)**

Typical pioneer family (us) trekking down Dante's Drive in search of a better life. Our Buick was no match for the terrain.





If only development could have stopped here (1985)...



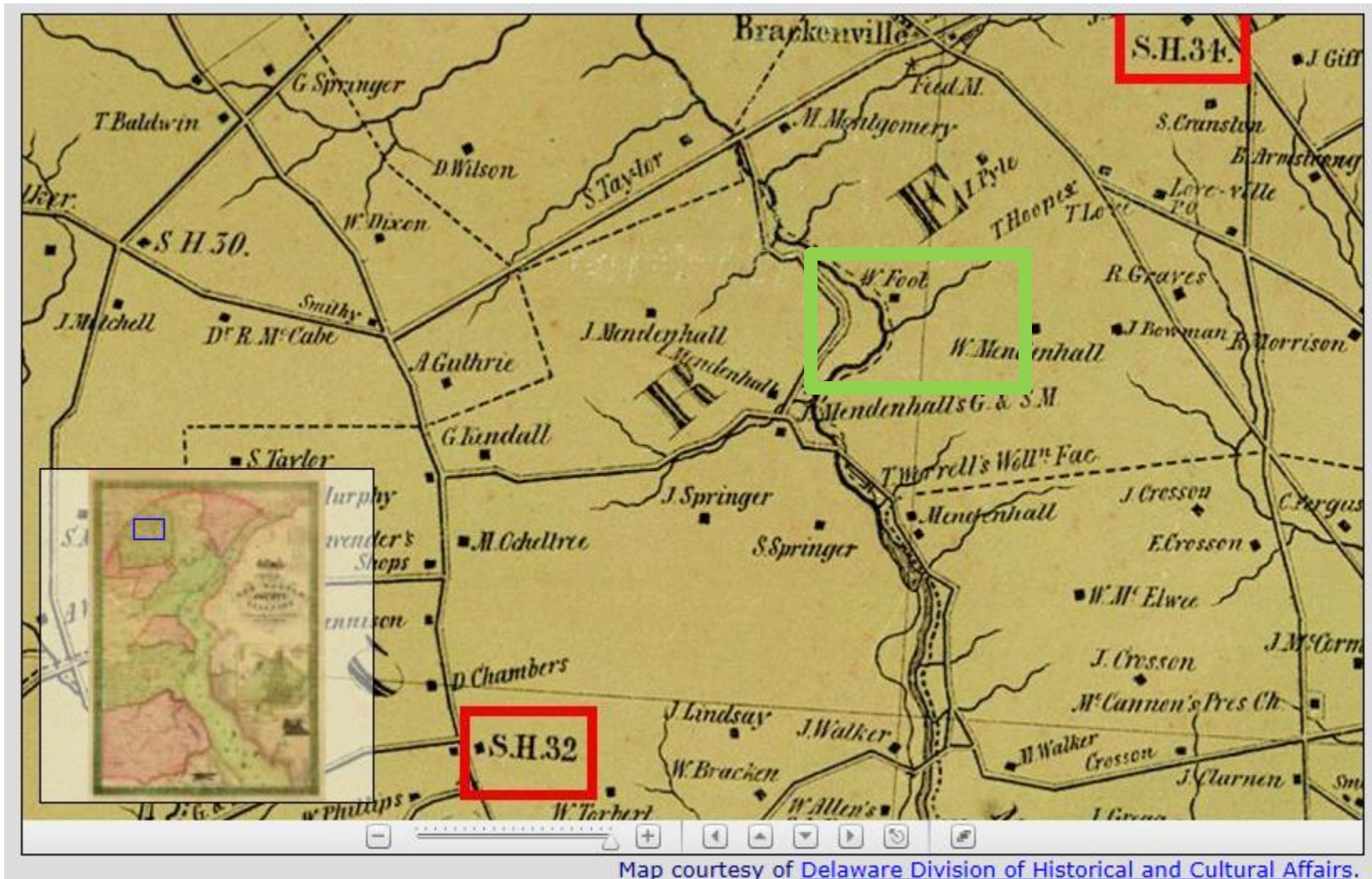


In 1988 these horses got loose and crossed the stream from healthy pasture that now lies untended (sadly, not part of Bella Vista's private open spaces).



**Question with No Single Correct Answer**

How about 1937? We have a map for that!



**Question with No Single Correct Answer**

Prefer even earlier? Here is 1849. Lot of Mendenhalls in the area back then. Bella Vista is inside the green rectangle.



**Anyway, cheer up! Spring is coming!**

Photo by Kathy Kwiatkowski

