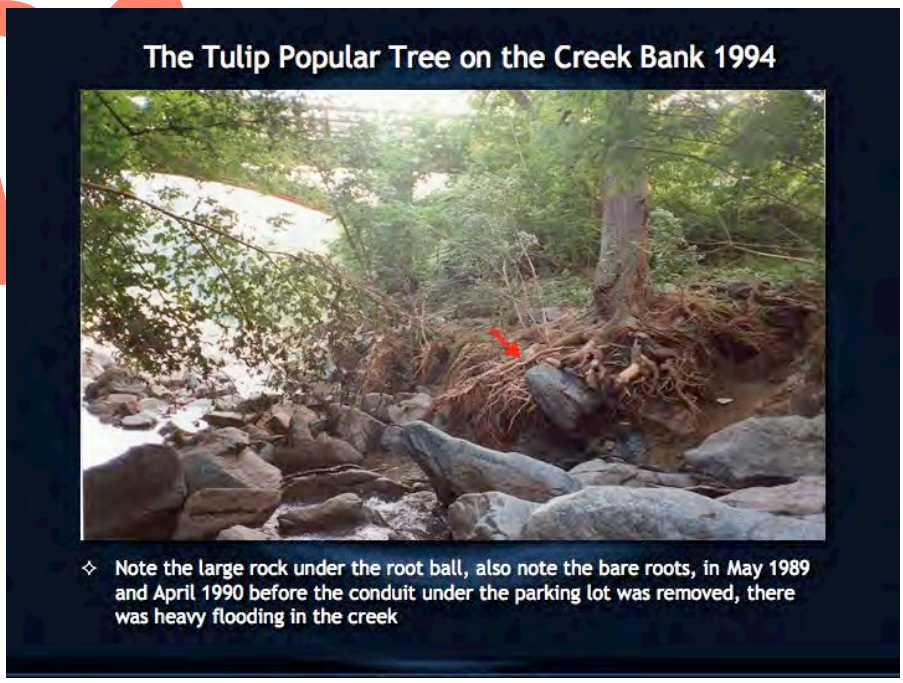
Tuesday (early June) I dropped by Cue and had a talk with Doug about the project. Doug said he was familiar with our volunteer work at the Creek over the last several years. His concern with the request to rehab the new stone from the pier sabilization was actually a misunderstanding. He thought it was a much larger project.

This is because my email did not explain the project clearly enough for him to understand exactly what I had in mind. The critical issue turned out to be bringing in foreign material to the Creek, which he objects to.

Essentially, once this point was cleared up, he had no problem with us continuing the work we have been doing, as long as I dropped the idea of bringing in foreign material to stabilize the banks. That will pose no problems, as the techniques we have been using are sufficient and the upstream erosion more than provides the material we need to complete the project

He suggested that I attach a detailed explanation to this note of concurrence on the work that follows

In April 2005, the federal highway administration people?, among other attendees at the meeting on the Minnehaha Creek bridge, were discussing what needed to happen to stabilize the bridge pier on the parking lot side of the creek. They discussed running a stone wall 100 feet on either side of the bridge. There was a tree upstream at the first falls that would have to be cut down. They thought they should cut it down right away because they said it was about to fall.



I realized then they did not understand (actually did not have all the information on that tree and the creek which had been offered to them the year before but turned down) all the information about the creek. The tree had been up [had been at that angle?] since the 1989 parking lot collapse. As I, too, had been curious at the time of the effect of the

flash flood on the lot I had started taken pictures of the tree for the past 15 or 16 years. Concerns were also expressed at that time from natural and cultural resources sections of the parkway about this channelization of the creek,and the effect on endangered species, and the historic wall on the creek bank.

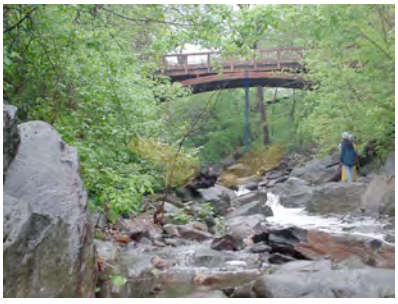
I prepared a PowerPoint presentation on what I had observed at the creek over the past 15 years, and made a case to the Supt.against putting up the wall and taking down the tree.

I also received permission to attempt to divert the stream back to the center of the creek bed and temporarily stabilize the erosion under the bridge pier.

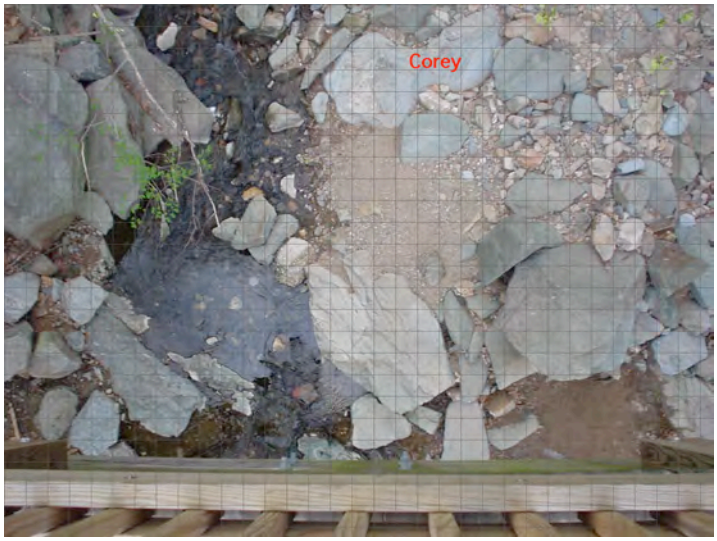
This project was to be attempted with the help of the Glen Echo Park volunteers. I met with the Parkway engineer and the Maryland state environmental inspector. I explained what I had in mind. The inspector said that as long as we were not bringing any machinery down into the creek, he would have no problem with us moving the rocks and materials that had filled the center of the creek back to the stream bank.

Of course, no one thought the volunteers could do this, and I was somewhat unsure, but I certainly knew we needed to attempt this project to try to keep the viewshed for park visitors.

In August 2005, we began work, moving the large boulders that were diverting the creek to the stream bank and causing the erosion.(a movie was made to show the work) After four weekends of work, the stream was flowing back in the center, and the volunteers had put up a rock fence that prevented the erosion of the bridge pier and actually began to stabilize the area.



As this project progressed, it became apparent that a second phase would naturally follow: the stabilization and rehabilitation of the stream bank. Early photos (center red arrow) and videos of the creek indicated that one large boulder (approx. 8 to 10 bolder we call's Corey rock) had



filled behind and added up to three or four feet of bedload to the stream.

Our observations from moving the large boulders (2 to 3 tons) was that the typical storms started to clear the channel down to the original bedrock. Working with the random storm events and the volunteers approximately 3 out of 4 weekends from August 2005 to October 2007 (when work started on the underpinning of bridge pier), we moved approximately 60 tons of bedload, consisting of boulders, cobble, gravel and sand to rehabilitate the eroded stream bank. Which also had the effect of stopping the erosion on the 1890 Chautauqua era wall

This process was carried out by the core Glen Echo Park volunteers, known as the Bumper Core, who would move several large stones on a weekend from the center area of the stream to the stream bank.

Periodically, we would get large service organizations to volunteer for one-day events, typically in the middle of the week. These groups included church organizations, junior high school classes, Brownie scout troops and other interested parties. Their task would be to move the small material, such as gravel, sand and cobble to fill in the voids in the large boulders that had already been placed.

This process was carried out by the use of two-gallon buckets and bucket brigades. A portion of the volunteers would work on the areas we call our beaches, filling the buckets with material and then passing them down the line to be dumped and placed into the voids, followed by buckets of water to percolate down and wash the fines and small gravel into the small spaces. Link to VIPs in Minnehaha

This process would repeat over and over again. I think this is called a soft rehabilitation of a creek as opposed to a

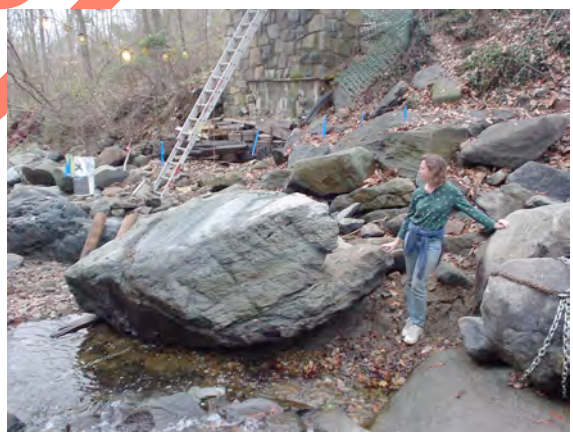
hard one, which would involve building walls.

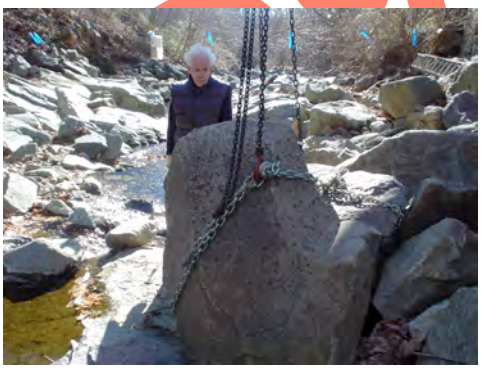
We also noticed that, as we continued removing the medium size pieces from the creek, the rock known as Corey's rock turned out to be the critical rock that caused the creek to back up and fill up behind it. This stone is seen in the earlier picture from 1991, sitting right in the middle of the creek.

Over the past 15 years, this stone has stopped the creek up.

This stone took the volunteers five months to move to its current location, diagonal to the stream (it was orthogonal). The stone now aids in protecting the bridge pier from storm flows.

In June 2006, there was a 100-year flood. At that point, we had the stream bank rehabbed from the tulip poplar tree to the bridge pier, but not under the bridge, because we knew there was be construction.

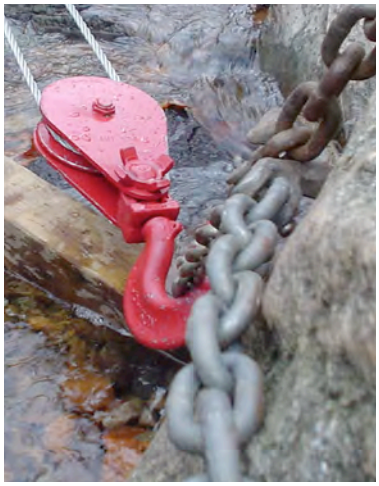




Two days of heavy storm flow tested our work to that point. We discovered that half of the job we had done was really good. The other half needed to be modified a bit upstream from the bridge needed a bit more work.

The stones that were closest to the bridge pier stayed put. The other stones, near the tree, were washed out and back into the center of the stream.

I was there that night, listening to the water rise, and I remember one 2,500-pound rock dislodging



from near the tree where we had placed it and i watch it float back to the middle of creek.

Later, we discovered why this happened. That area had been an eddy area, which meant that as any storm system retreated, it filled with sand, cobbles, etc. There was about a foot or two of that material, which dissolved out from under the big rocks we had placed there

We have since replaced some of these boulders, and they are now resting on the bedrock exposed during the 100-year storm. These rocks now seem much more stable.

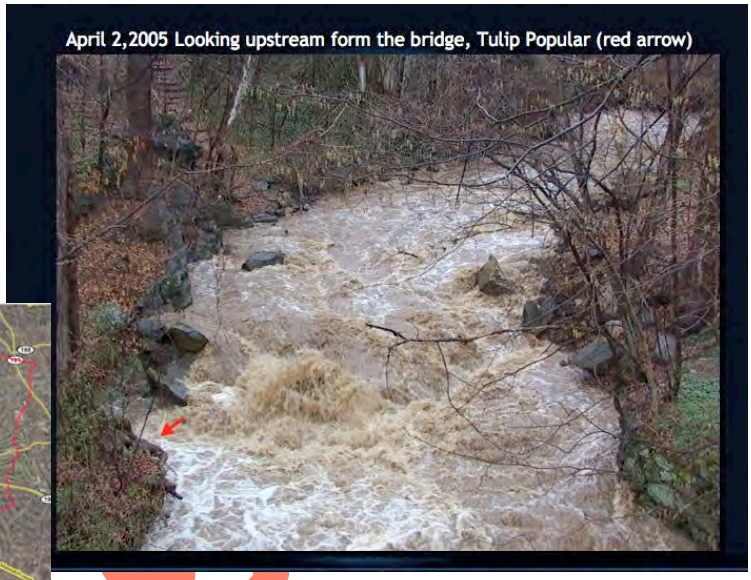
Because of the bridge restoration, we are not able to finish armoring that part of the stream bank, but enough boulders had washed downstream and are in place to have that done in a couple of weekends. That will stabilize another critical area of the stream bank.

Not necessary this part of this document but later there will be an appendix on the importance of this creek to our interpretive programs as far as the Park Service explore, discover and learn programs, no child left inside and the connection between our cultural and natural resources at the Glen Echo/Clara Barton site.

end part one

After the completion of the bridge reinforcement, the Minnehaha creek still has work that needs to be done to complete the stabilization of the stream banks. This work will be a continuation of the work that has been ongoing since Aug 2005 before the bridge pier work in Sept 2007

One area of concern is to finish the work started to protect the 1890s wall on the east side of the creek. The other is to finish the armoring of the bank beneath the tree that is undercut at the waterfalls.


April 2,2005 Looking upstream form the bridge, Tulip Popular (red arrow)

The most recent thunderstorms--five large rain events in about 10 days--accented the problem that this creek has as a storm drainage system for the Minnehaha creek watershed.

Much sediment and several large stones were forced downstream in several areas and are starting to fill the streambed, recreating the problem we had in 2005 when we started the stream restoration. At that time, we had four feet or more of streambed load over the bedrock stream, which had forced the stream to the side, eroding the stream bank


Up Stream along Goldsboro between MacArthur Blvd and Tulip Hill

and undercutting the wall.


Up Stream along Goldsboro between MacArthur Blvd and Tulip Hill

As stated earlier, we use the material that washes downstream during these storm events as source material for stabilization of the wall. Various volunteer groups contribute to the work that stabilizes these banks.

If you look at the stream above MacArthur Boulevard, you will find a stream manipulated by man for the last 50 to 60 years, with lots of outside material placed in the stream, which then migrates downstream. You can observe lots of erosion of the stream banks , both above and below MacArthur Blvd.

One of our issues is to maintain the natural bed rock streambed and thus the viewshed between the pedestrian bridge and the railroad trestle. It has been observed that, since the parking

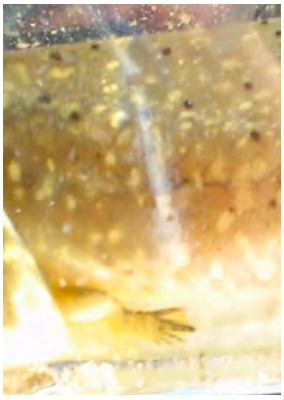
lot collapsed in 1990, this portion of the streambed has become more affected by storm events.

The building of the pedestrian bridge accelerated the erosion of the area under the bridge and upstream from the bridge. Our task is to mitigate this erosion and keep a deep channel that allows the stream to flow further downstream before it deposits its bed load material.

Another benefit of this project is that it creates ongoing education for junior ranger programs and school groups. It dovetails with the explore/discover/learn mandate of the junior ranger program and allows for expansion of the “no child left inside” aspect of park, especially since almost all of our programs at Glen Echo are historical and cultural (and mostly inside).

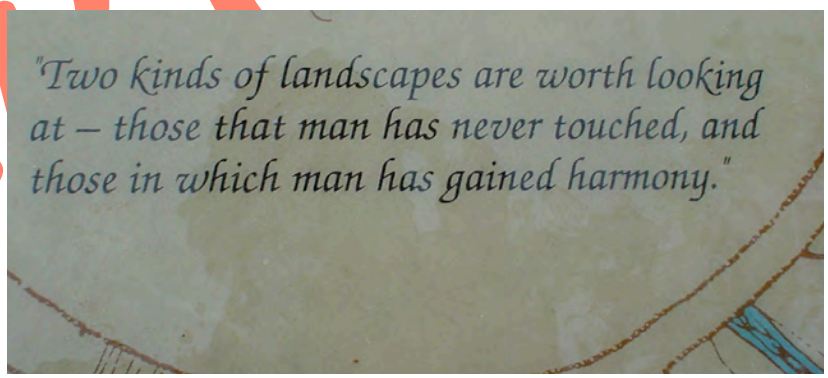
It has been observed that, depending on the storm events, random bits of aquatic

life find their way back up to the Minnehaha. The stream is isolated from the river by a box culvert with a 45-degree drop and with only about 4 inches of water flow from to the Potomac River basin. The creek can go for months or years without any observed fish, such as the black line darter. Crayfish, randomly observed, have been subject to elimination from pesticide runoff from golf course, runoff from streets and storm sewers.



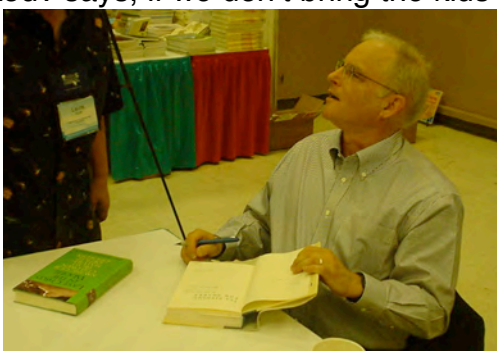
Because of this, for educational purposes, this creek is more useful as a study of the physical and geological aspects of a bedrock creek. In addition, its main value is in teaching the public, from Brownie scouts to senior citizens, about why rehabilitating and maintaining streams is so important. The Minnehaha doesn't have the ability to work as a natural stream should because of the nature of the watershed. This stream will always need attention from man to maintain its viewshed, the stability of the stream bank and its value as an educational resource.

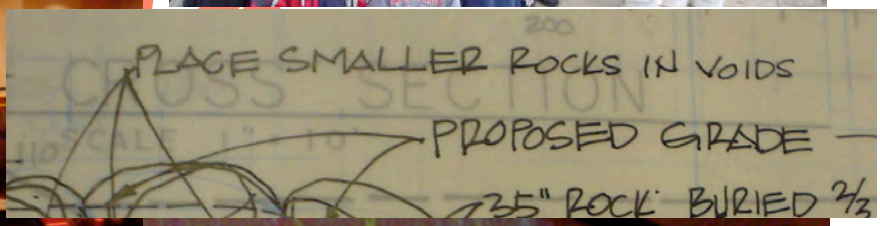
I would end with the quote that is on our creek overlook: "There are two kinds of landscape worth observing: those that mankind has not messed with and those that mankind has worked in harmony with."



Remembering the NPS enabling act: the work that our volunteers are now doing is preserving this viewshed for future generations.

These generations we are training will preserve the creek for the next one. As Richard Louv says, if we don't bring the kids out and introduce them to the creek and let them experience the power (of this rehab project) of this "who's going to take care of the environment when we're gone,especially if we don't expose the current generation to the environment.




PLACE SMALLER ROCKS IN VOIDS
PROPOSED GRADE
35" ROCK BURIED 2/3


Minnehaha Creek
Watershed