

Post-Storm Inspections September 12, 2011

How much did it rain?

According to a WSSI rain gauge located at Fairfax County Parkway and Sunset Hill Boulevard, 9.65 inches of rain fell in just three days from Monday, September 5, 2011 through Thursday, September 8, 2011. A third of the rain (3.21 inches) fell Monday through Wednesday with the remaining 6.44 inches falling on just Thursday. In terms of the return period, or frequency, of this storm event, 5.1" of rain fell in just 3 hours that afternoon - this well exceeds Fairfax County's 3-hour, 100-yr storm of 4.9 inches (PFM Table 6.19), and falls between National Oceanic and Atmospheric Administration's (NOAA) 200 and 500 year storms (4.66 and 5.40 inches, respectively) according to Atlas 14¹. Over a 6-hour period that same afternoon, 5.97" fell in Reston, which exceeds Fairfax County PFM's 6-hour, 100-yr storm of 5.4 inches, and also falls in the range of NOAA's 200-500 year, 6-hour storm (5.89" – 6.92", respectively). Overall, Reston experienced exceptional flooding on that Thursday afternoon from the heavy rains as the ground was already saturated from the rain that fell from the days prior^{2,3}.

WSSI and RA Inspections

WSSI and RA staff completed post-storm inspections of all 47,000 linear feet of restored streams that are part of the completed sections of the Northern Virginia Stream Restoration Bank (NVSRB) on Monday September 12, 2011. Our inspections found that the streams fared very well despite the extreme weather, especially in the areas where the vegetation had been established for a couple of growing seasons. Below is a quick summary of the areas in Snakeden Branch, The Glade, and Colvin Run that will require some work, along with their estimated repair schedule.

¹ National Oceanic and Atmospheric Administration. *Point Precipitation Frequency (PF) Estimates, NOAA Atlas 14, Volume 2, Version 3*. Retrieved from http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=va

² Goff, Karen. Reston Patch. (September 8, 2011). *Downpour wrecks havoc on Reston*. Retrieved from <http://reston.patch.com/articles/downpour-wrecks-havoc-on-reston#photo-7666789>

³ Goff, Karen. Reston Patch. (September 8, 2011). *Rain in Reston Was Once-in-500-Years-Event*. Retrieved from <http://reston.patch.com/articles/rain-in-reston-was-once-in-500-years-event>

Snakeden Branch. Most of the vegetation in Snakeden Branch is well established, and its fourth growing season. Beyond cleaning debris from bridges and culverts, no stream repairs are required.



Photo 1: Snakeden Branch - Reach 3



Photo 2: Snakeden Branch - Reach 4

The Glade. Beyond the specific problem spots identified below, WSSI crews will be repairing any loose fabric on the banks and replanting areas where plants were washed away in the storm within the coming months. In a few areas, sediment washed downstream and covered portions of the structures. Though this is not an immediate concern, we have identified a few areas where small construction equipment will be used to redistribute sediment where it is now collected in sufficient quantities that it may re-direct flow into the banks.

The Glade - Reaches 1 & 1A: No stream issues identified in these upper reaches of The Glade. However, in Reach 1A another tree (a smaller one fell earlier this spring). Neither are adversely affecting the stream at this time. WSSI and RA will continue to monitor. RA will be repairing the pedestrian path that crosses 1A.



Photo 3: The Glade - Reach 1A
Most recent tree fall.



Photo 4: The Glade - Reach 1
No issues at rock wall installed where stream goes onto a private residence.

The Glade - Reach 3: Sediment deposits immediately downstream of culvert (at the top of the reach) will be redistributed. A rock wall (approximately 6" above ground) will be installed to help prevent this accumulation in the future. Work will commence this month.



Photo 5: The Glade - Reach 3
Sediment Accumulation on the right bank will be redistributed and a rock wall installed.

The Glade - Reach 4A: The only stream structure with a problem in the entire NVSRB stream network is the two-step cross vane immediately downstream of the first bridge. One rock in the vane was popped out of place allowing fill material behind the vane to wash downstream. The erosion is isolated around the structure itself and does not affect the bridge or wall immediately upstream. Crews have already mobilized and are scheduled to finish this week.



Photo 6: The Glade - Reach 4A
Crews already mobilized to repair vane



Photo 7: The Glade - Reach 4A
Rack line throughout floodplain shows depth of water during height of storm

The Glade - Reach 5: Approaches to the pedestrian bridge immediately downstream of Soapstone Drive were washed away. Repairs should be complete this month.



Photo 8: The Glade - Reach 5
Pedestrian bridge approaches washed away



Photo 9: The Glade - Reach 5
Stream and vegetation recovered well

The Glade - Reach 6: The most downstream portion of this channel has eroded 200 feet along the right bank. This repair will potentially require installation of new structures and grading of a bankfull bench and, as such, will require some survey and engineering design work. Repairs are expected this fall/winter. For now, the damage does not pose an imminent risk but will be monitored until the required design and permits can be completed.



Photo 10: The Glade - Reach 6
Looking upstream at erosion along pine forest



Photo 11: The Glade - Reach 6
Looking upstream immediately upstream of pine forest. No issues in floodplain or along restored channel.

Colvin Run. The two streams restored in this watershed were completed less than three months ago. Many of the newly installed plants washed away because their roots were unable to fully establish in this short timeframe. The lack of mature vegetation also allowed more of the bed and bank material to be displaced than in other areas of the NVSRB.

Colvin Run - Forest Edge North. The upper portion of this reach performed well. The area that will require some repair is located between the last bridge and the culvert that crosses under North Shore Drive. A wall and series of step pools were installed to drop the stream down into this existing culvert. The structures are stable, but bed material has been deposited in the step pools – this will be removed and re-distributed in the upstream channel. Additional planting and some top dressing with fines will also be performed within the coming months.



Photo 12: Colvin Run - Forest Edge North
Looking downstream at last step pool series where sediment deposits will be redistributed upstream.

Colvin Run - Forest Edge South. All the structures held very well with no failures. However, bed material displacement (including washout of the fines within the bed mix) was prevalent throughout this reach and will be corrected within the coming months. This will also include some minor grading and top dressing with finer material and top soil, replacement of coir matting, and re-planting as most of the stream side plantings were washed away. Contractors will use small construction equipment to re-grade these areas and prepare the channel for replanting in the spring.



**Photo 13: Colvin Run - Forest Edge South
Looking upstream at bank erosion**



**Photo 14: Colvin Run - Forest Edge South
Looking upstream where fabric will be trimmed**

The pedestrian approaches washed away on both sides of the new bridge along the Cross-County Trail (CCT) that was installed just upstream of Lake Fairfax. The good news is that despite the fact that water was flowing over the top of the bridge itself, it did not sustain any damage. Work is expected to be completed in the coming weeks.



**Photo 15: CCT Bridge approaches washed away,
but bridge is unharmed**



**Photo 16: CCT Bridge
Water was over the bridge as confirmed by debris
accumulation on bridge**

Beyond these few problem spots, the streams handled the rain events extremely well with most areas already completely recovered. Below are a couple photos from our storm inspections showing how remarkable the streams looked only a couple days after the storm.



Photo 17: Snakeden Branch - Reach 12



Photo 18: The Glade - Reach 4B

Contact Information

Frank Graziano is the WSSI Project Manager for all the stream repairs, and can be contacted by phone 703.679.5651 or email fgraziano@wetlandstudies.com. Reston Association will also be supervising all the stream work. Please feel free to contact Nicki Bellezza (nicki@reston.org; 703.435.6560) with any questions. A post-storm status report will be presented at the next Reston Association Board and Design Review Board meetings. On-going status reports will continue to be presented monthly to both Boards.

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