

# MEMORANDUM

**TO:** Mike Rolband

**FROM:** Alison St.Onge

**CC:** Ben Rosner, Mark Headly, Scott Petrey

**RE:** Northern Virginia Stream Restoration Bank  
The Glade- Reaches 2, 3, 4A, and 4B  
Supplemental Biological Monitoring 2011 (Year 2)  
WSSI #20030, Task M1

**DATE:** September 14, 2011

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Per maintenance and monitoring requirements defined in the “Northern Virginia Stream Restoration Bank Banking Instrument”, Section VI.B.2.(i), biological monitoring will be conducted prior to stream restoration, then in years 1, 5, and 10 in The Glade- Reach 2, 3, 4A, and 4B. However, monitoring was undertaken voluntarily in Year 2 (2011) at biomonitoring Reaches 1-D through 1-G, 2-A, and 3-A to better understand and document the effects of stream restoration on the benthic community within The Glade Watershed. Field work was conducted by WSSI environmental scientists Alison St.Onge, CT and Matthew Brennan on May 24, 2011. Benthic macroinvertebrate habitat field data sheets and benthic macroinvertebrate bench sheets for each reach are enclosed within.

Habitat results for Year 2 (Post-Construction) show that all of the biomonitoring reaches sampled in The Glade have “Optimal” habitat conditions ([Table 1](#), [Figure 1](#)). The average habitat assessment score for all restored biomonitoring reaches assessed in 2011 is 176 (Optimal) out of 200 following restoration. These results show improved habitat conditions following restoration, with scores exceeding the pre-restoration average of 125 (Sub-Optimal) out of 200. This improvement is due to the continued stability of the restored stream and the increase in density of the reforested riparian zones.

The results of our data analysis indicate that the benthic macroinvertebrate community at all six biomonitoring reaches were in “Severe Stress” in 2011, based on their Stream Condition Index for Virginia Non-coastal Streams (VA-SCI)<sup>1</sup> scores ([Table 2](#), [Figure 2](#)). The average VA-SCI numerical score for all reaches assessed in 2011 is 28.76 (“Severe Stress”). Note that while all the reaches still remain in “Severe Stress”, on average, the VA-SCI scores increased when compared to the average pre-construction VA-SCI score of 23.74 (“Severe Stress”) and the post-construction 2010 average of 24.56 (“Severe Stress”).

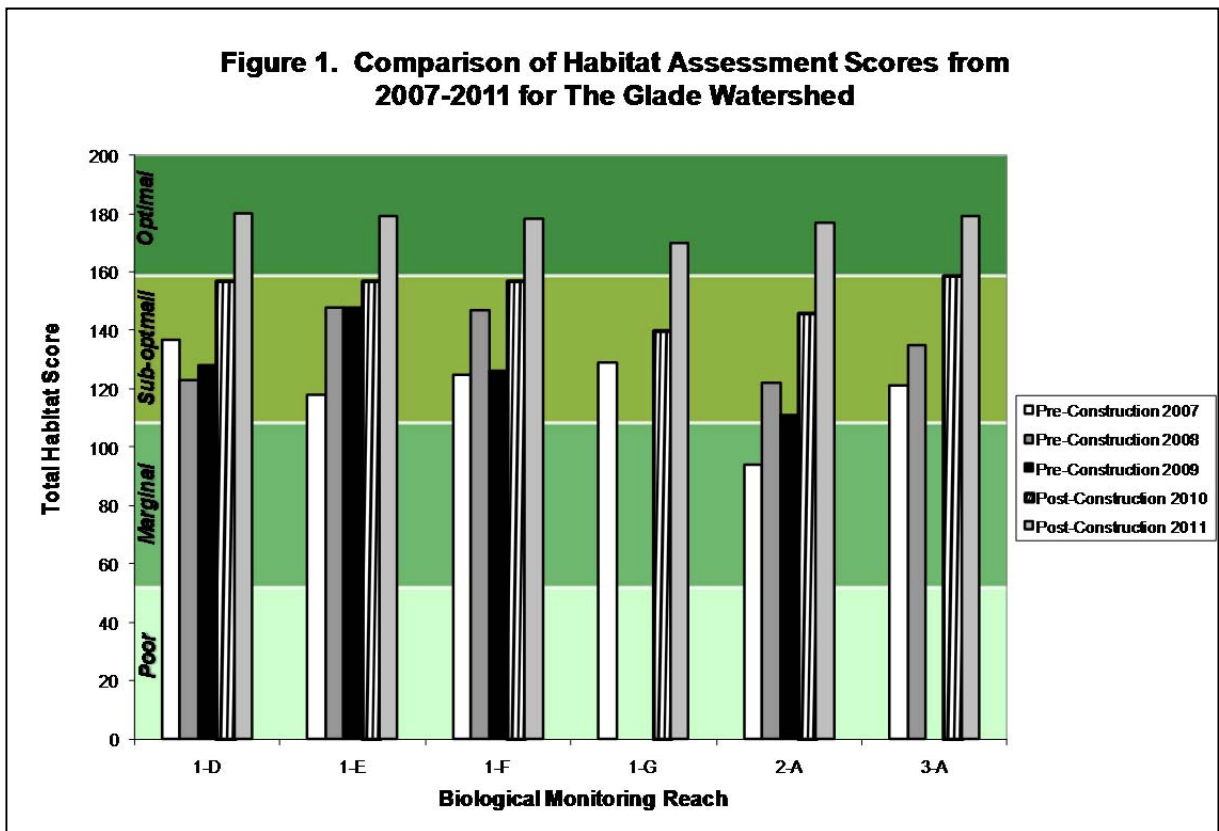
In conclusion, the results of the 2011 supplemental monitoring indicate that there has been a continued improvement of habitat scores and a slight improvement of the benthic community composition in the 2011 sampled reaches as compared to previous years.

Enclosures

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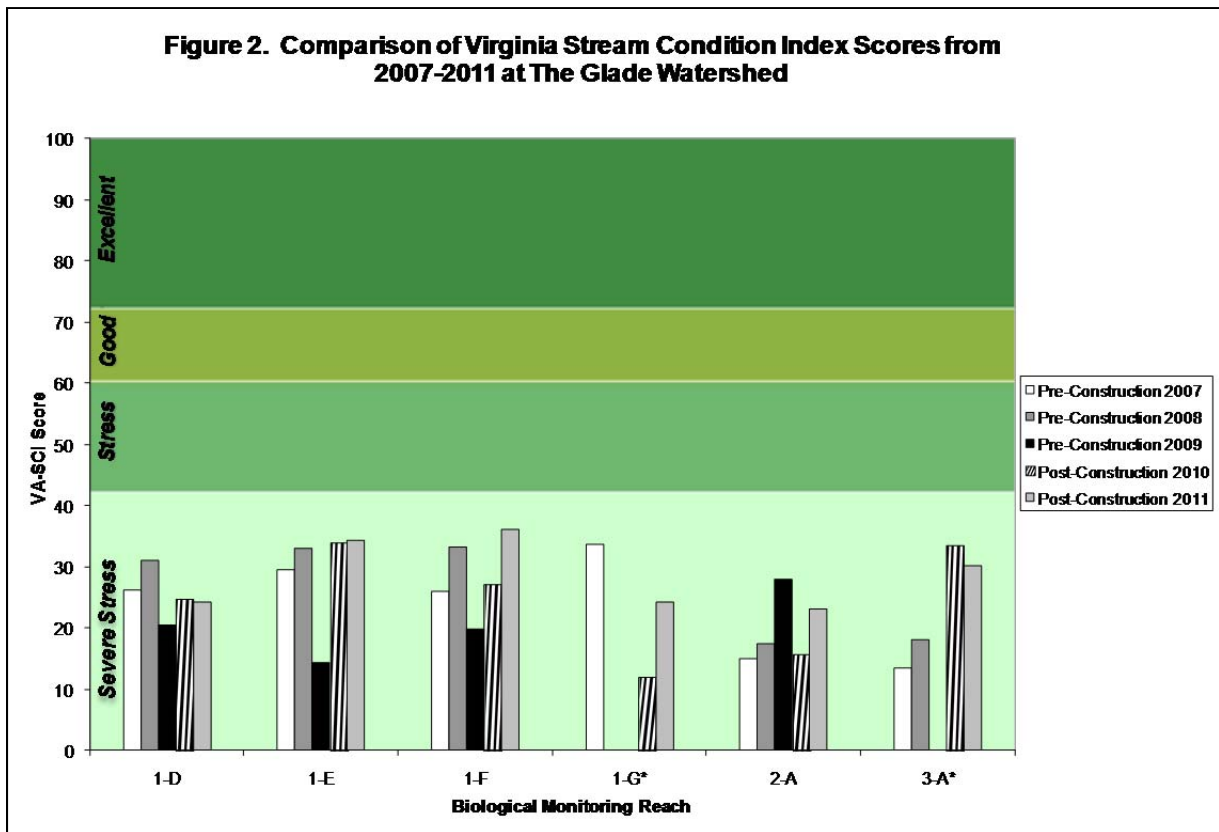
<sup>1</sup> *The VA-SCI is a multi-metric Index of Biotic Integrity developed for the DEQ to assess Streams of the Commonwealth.*

Table 1. 2011 Total Habitat Assessment Scores		
BIOMONITORING REACH	Total Habitat Score	Narrative Rating
1-D	180	Optimal
1-E	179	Optimal
1-F	178	Optimal
1-G	170	Optimal
2-A	171	Optimal
3-A	179	Optimal
<b>Average</b>	<b>176</b>	<b>Optimal</b>



*\*Note that biological monitoring reach 1-G was not assessed in 2008 and 2009 and biological monitoring reach 3-A was not assessed in 2009 due to the lack of flowing water during the time of the sampling fieldwork.*

Table 2. 2011 Biotic Metric and Index Weighting and VA-SCI at The Glade.						
WEIGHTED METRIC	BIOLOGICAL MONITORING REACH					
	1-D	1-E	1-F	1-G	2-A	3-A
Total Taxa	40.91	36.36	36.36	31.82	27.27	31.82
EPT Taxa	0.00	0.00	0.00	0.00	9.09	0.00
Percent Ephemeroptera	0.00	0.00	0.00	0.00	0.00	0.00
Percent Plecoptera + Trichoptera (Excluding Hydropsychidae)	0.00	0.00	0.00	0.00	0.00	0.00
Percent Scrapers	24.22	19.21	14.77	0.00	1.86	3.49
Percent Chironomidae	33.65	72.07	86.67	52.48	45.19	77.48
Percent Top Two Dominant	29.18	41.66	45.42	14.31	19.45	23.43
HBI	66.18	105.72	106.30	94.93	83.00	105.99
<b>VA-SCI Numerical Score</b>	24.27	34.38	36.19	24.19	23.23	30.28
<b>VA-SCI Narrative Score</b>	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress
<b>Average VA-SCI Numerical Score</b>	<b>28.76</b>					
<b>Average VA-SCI Narrative Score</b>	<b>Severe Stress</b>					



\*Note that biological monitoring reach 1-G was not sampled in 2008 and 2009 and biological monitoring reach 3-A was not sampled in 2009 due to the lack of flowing water during the time of the sampling fieldwork.