



BIOLOGICAL MONITORING REPORT #2

Pre-construction Monitoring

NORTHERN VIRGINIA STREAM RESTORATION BANK

Snakeden Branch Watershed
(±21,000 LINEAR FEET)

FAIRFAX COUNTY, VIRGINIA



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WSSI Project #20003 – Task D

OCTOBER 24, 2008

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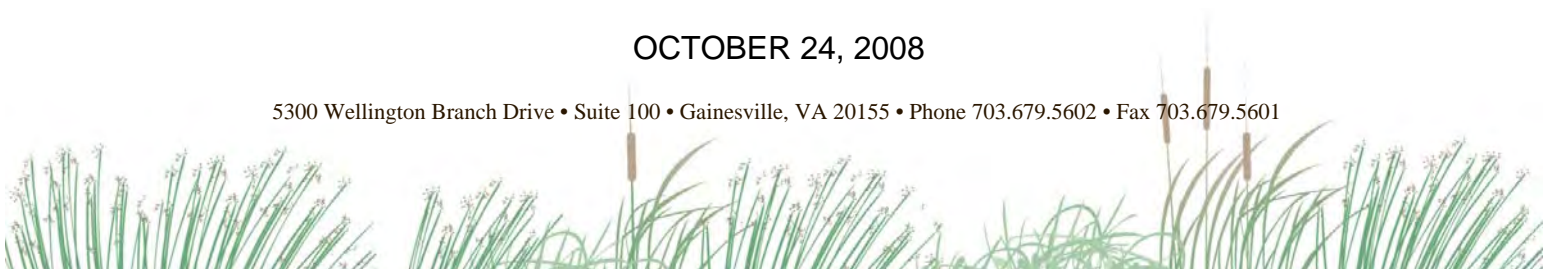


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Biological Monitoring Report #2
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October 24, 2008

I. Executive Summary

As set forth in the “Northern Virginia Stream Restoration Bank Banking Instrument” (Banking Instrument), approximately 21,000 linear feet of streams and drainage features within the Snakeden Branch Watershed will be stabilized and restored. This stream restoration project should result in a direct improvement of in-stream habitat and an indirect improvement in water quality.

Wetland Studies and Solutions, Inc. (WSSI) conducted pre-construction biological stream assessments along the Snakeden Branch Watershed portion of the Northern Virginia Stream Restoration Bank (NVS RB) in 2007 and 2008 pursuant to the maintenance and monitoring requirements defined in the NVSRB Banking Instrument, Section VI.B.2.(i). The purpose of this pre-construction monitoring is to determine the baseline conditions of the streams within the Snakeden Branch Watershed Portion of the NVSRB, against which future biological monitoring in the study area will be compared. This report summarizes the 2008 preconstruction monitoring.

Biological stream monitoring was conducted along nine permanent biological monitoring reaches using benthic macroinvertebrate and habitat data. Fieldwork was conducted on February 12 and 14, 2008, prior to the beginning of the construction on February 18, 2008. Benthic macroinvertebrate data was used to calculate a Stream Condition Index for Virginia Non-coastal Streams (VA-SCI) and habitat data was used to calculate the percentage of best possible habitat for each reach.

Our baseline habitat results indicate that habitat of the streams within the Snakeden Branch Watershed portion of the NVSRB in 2008 is “Poor” to “Fair”, with habitat assessment scores of 142 (out of 200) or less. The low habitat assessment scores are due to the lack of epifaunal substrate/available cover for stream macrofauna, highly embedded epifaunal substrate, overwidened stream channels, bank instability, and lack of vegetation protection along the stream banks. The habitat conditions in 2008 are similar to the conditions observed for the 2007 pre-construction monitoring.

Baseline benthic macroinvertebrate results indicate that the benthic macroinvertebrate community of the streams within the Snakeden Branch watershed portion of the NVSRB in 2008 is in “Severe Stress”, with VA-SCI scores below 35 (out of 100) for all streams assessed. The low VA-SCI scores are likely due to several confounding abiotic factors, including highly impervious land cover within the watershed, high nutrient, toxicant and sediment input from adjacent land use, channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, and lack of epifaunal substrate/available cover. These results are similar to the 2007 monitoring, where the benthic macroinvertebrate community at all nine reaches was also in “Severe Stress”. However, since 2007, almost all of the VA-SCI scores have increased. The lower VA-SCI scores in 2007 may be attributed to natural variability in both abiotic and biotic conditions, as no restoration activities or other water quality enhancements occurred within the study area prior to the 2008 monitoring.

II. Introduction

As set forth in the “Northern Virginia Stream Restoration Bank Banking Instrument” (Banking Instrument), dated February 17, 2006 and prepared by Wetland Studies and Solutions, Inc. (WSSI), Northern Virginia Stream Restoration, L.C. will restore approximately 14 miles of streams and upland buffers, within portions of the Snakeden Branch, Colvin Run, and The Glade watersheds in Reston, Virginia. As required in Section VI.B.2.(i) of the Banking Instrument, biological monitoring will be conducted within restored streams within these watersheds. These stream restoration activities should result in a direct improvement of in-stream habitat and an indirect improvement in water quality. Using benthic macroinvertebrate and habitat data, this second pre-construction monitoring report provides additional characterization of the baseline conditions of the streams within the Snakeden Branch Watershed portion of the NVSRB in 2008, against which future biological monitoring in the study area will be compared. With these data, and data from previous and subsequent monitoring reports, we propose to determine the effect of stream restoration on the condition of streams within the Snakeden Branch Watershed portion of the NVSRB¹, as well as aid in the development of numerical success criteria for non-coastal stream restoration projects in Virginia.

III. Project Area

The study area includes approximately 21,000 linear feet of stream along Snakeden Branch and several unnamed tributaries of Snakeden Branch, as well as the adjacent riparian corridor. The study area is located southeast of Reston Parkway (Route 602) and immediately northwest of Lake Audubon in Fairfax County, Virginia. Exhibit 1 is a vicinity map that depicts the approximate location of the study area.

The study area is covered mostly by mixed-deciduous forest. Snakeden Branch flows in a southeasterly direction through the central portion of the study area. An asphalt recreational trail, which crosses Snakeden Branch multiple times, is located parallel to the stream and to several of its unnamed tributaries. The study area is gently to moderately sloping. The topography can be seen in the excerpt from the Vienna, Virginia-Maryland 1994 USGS topographical quadrangle map included as Exhibit 2, as well as in the background topography on the Biological Stream Monitoring Map (Exhibit 3).

The boundaries of jurisdictional wetlands and other waters of the U.S. located within the study area were delineated and survey-located by WSSI as described in the Snakeden Branch Reach 1 and Snakeden Branch Reach 2 delineation reports, dated February 14, 2005 and May 18, 2005, respectively. The U.S. Army Corps of Engineers verified the Snakeden Branch Reach 1 and Snakeden Branch Reach 2 delineation, with jurisdictional determinations (JD) dated May 17, 2006 (JD #05-R0601 and JD #05-R1495, respectively)².

¹ Note that monitoring reports for the Colvin Run and The Glade watershed portions of the NVSRB will be provided under separate cover.

² Note that for design purposes, Snakeden Branch Reach 1 and Snakeden Branch Reach 2 have been further divided into 17 manageable restoration reaches, as depicted on the NVSRB – Snakeden Branch plan sets, dated May 2007, August 2007, October 2007, November 2007, December 2007, July 2, 2008, and July 10, 2008). The biological monitoring reaches for this report are located within a portion of these 17 reaches. The locations of the biological monitoring reaches relative to these 17 reaches are depicted in Figure 1 and described in Footnote 5.

IV. Overall Methodology

Per maintenance and monitoring requirements defined in the Banking Instrument, Section VI.B.2.(i), biological stream assessment reaches are to be established for every 2000 linear feet of stream restoration along samplable streams at the NVSRB. Once established, these reaches are to be monitored prior to stream restoration, then in years 1, 5, and 10. The following methods are to be employed:

- Biological Reconnaissance (BioRecon), following guidance established in the U.S. Environmental Protection Agency’s “Rapid Bioassessment Protocols for Use in Streams and Wadable Rivers” (EPA’s RBP; Barbour et al. 1999)³.
- Biological stream assessment for Calculating the Stream Condition Index for Virginia Non-coastal Streams (VA-SCI), following guidance established in “A Stream Condition Index for Virginia Non-Coastal Streams” (Tetra Tech 2003) and “Using Probabilistic Monitoring Data to Validate the Non-Coastal Virginia Stream Condition Index” (DEQ 2006a)⁴.

V. Biological Stream Monitoring

Biological Stream Monitoring Methodology. The biological stream monitoring consisted of two components: 1) Stream habitat assessment and 2) benthic macroinvertebrate assessment. The habitat assessment field work was conducted using guidance established in the DEQ standard operating procedures for stream habitat assessment (SOPs; DEQ 2006b) and the EPA’s RBP for habitat (Barbour et al. 1999). The benthic macroinvertebrate assessment field work was conducted using guidance established in the SOPs for multi-habitat benthic macroinvertebrate sampling (DEQ 2006b).

WSSI assessed the nine permanent sampling reaches that were selected in Biological Monitoring Report #1 (Reach 1-A through 1-F, 2-A, 2-B, and 3-A). The locations of these nine sampling reaches relative to the 17 restoration design reaches are depicted in Figure 1, below⁵. As required by the SOPs, each reach is 300 linear feet. The approximate location of each reach is depicted on the Biological Stream Monitoring Map (Exhibit 3). Photographs of each reach are included on Exhibit 4. Benthic macroinvertebrate sampling and habitat assessment field work

³ Note that the BioRecon was used to aid in the selection of permanent monitoring reaches during the first year of pre-construction monitoring and is not required in subsequent monitoring years. The results of the BioRecon are described in “Biological Monitoring Report #1, Pre-construction Monitoring, Northern Virginia Stream Restoration Bank, Snakeden Branch Watershed”, dated January 29, 2008.

⁴ This method is to be used in all monitoring years and is accompanied by a habitat assessment, following guidance established Virginia Department of Environmental Quality’s (DEQ) standard operating procedures for stream habitat assessment (SOPs; DEQ 2006b) and the EPA’s RBP for habitat (Barbour et al. 1999).

⁵ Note that the nine permanent monitoring reaches correspond with reaches of the NVSRB-Snakeden Branch plan sets, as follows: Reach 1-F corresponds with Reach 1 of the May 2007 plan set; Reach 1-E corresponds with Reach 2 of the August 2007 plan set; Reach 3-A corresponds with Reach 4 of the October 2007 plan set; Reaches 1-D and 1-C correspond with Reaches 5 and 7, respectively of the November 2007 plan set; Reaches 2-A and 2-B correspond with Reaches 13 and 15, respectively of the July 2, 2008 plan set; and Reaches 1-A and 1-B correspond with Reaches 12 and 17, respectively of the July 10, 2008 plan set.

was conducted by WSSI environmental scientists Sean D. Sipple, CT, PWS⁶ and Taylor S. Sprenkle WPIT⁷ on February 12 and 14, 2008, prior to the beginning of construction on February 18, 2008.

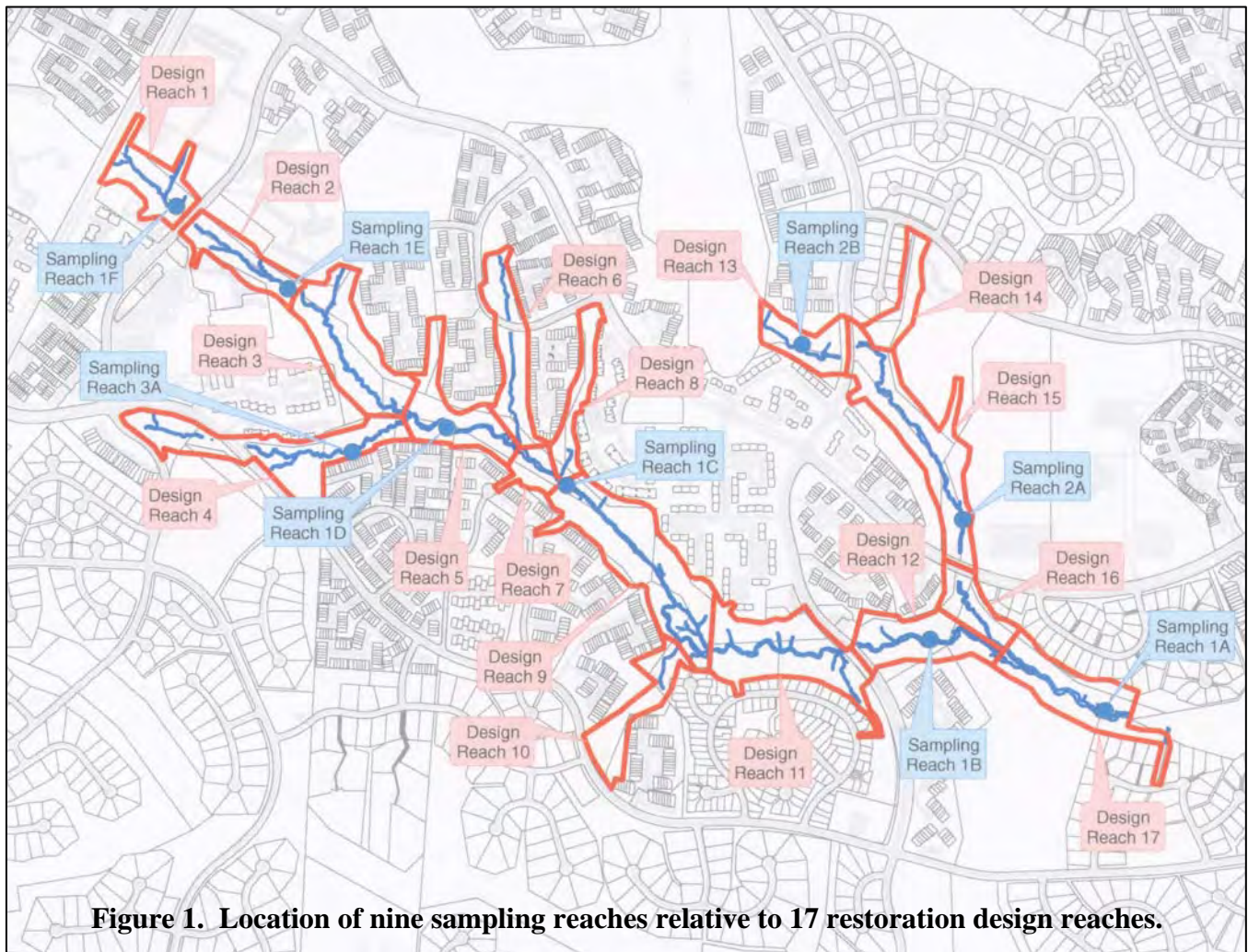


Figure 1. Location of nine sampling reaches relative to 17 restoration design reaches.

In accordance with the SOPs, habitat conditions were assessed by qualitatively rating ten habitat parameters, including Epifaunal Substrate/Available Cover, Pool Substrate Characterization, Pool Variability, Sediment Deposition, Channel Flow Status, Channel Alteration, Channel Sinuosity, Bank Stability, Vegetative Protection, and Riparian Vegetative Zone. The overall habitat quality of each reach was determined by calculating the percentage of

⁶ Professional Wetland Scientist #1730, Society of Wetlands Scientists Certification Program, Inc.; North American Benthological Society (NABS) Certified Level 2 Taxonomist: EPT Taxa (Ephemeroptera, Plecoptera, Trichoptera).

⁷ Wetland Professional in Training, Society of Wetlands Scientists Certification Program, Inc.

the best possible score⁸, where the best possible score for each reach equals 200. The following formula was used to determine the percentage of best possible score for each reach:

$$\text{Percentage of Best Possible Score} = (\text{Total Habitat Score}) / (200) * 100$$

Each reach was then assigned a narrative rating according to the calculated percentage of best possible score, where “Excellent” is >90, “Good” is 75-88, “Fair” is 60-73, and “Poor” is <58. WSSI Habitat Assessment Field Data Sheets (developed from the EPA’s RBP Habitat Assessment Field Data Sheets) for each reach are included as [Exhibit 5](#).

To assess benthic macroinvertebrate condition, 60 linear feet of best-available habitat was sampled in each reach using a D-Framed Net. Habitat types sampled include cobble/gravel, snags/leafpacks, under-cut banks, root-wads, and submerged vegetation. Benthic field data was recorded on WSSI Benthic Macroinvertebrate Field Data Sheets (developed from the EPA’s RBP Benthic Macroinvertebrate Field Data Sheets), which are included as [Exhibit 6](#).

Benthic macroinvertebrate samples were processed and subsampled by WSSI staff using guidance from the SOPs. Specifically, a fixed-count method was used, where one hundred twenty organisms were randomly picked from a gridded (numbered) tray and the organisms were identified to the family level (if possible) using a dissecting microscope. Each individual (containing a head) found in a sample was recorded and enumerated on a WSSI Benthic Macroinvertebrate I.D. and Enumeration Bench Sheet ([Exhibit 7](#)).

Benthic macroinvertebrate data were analyzed by calculating the Stream Condition Index for Virginia Non-coastal Streams (VA-SCI), following guidance established in “A Stream Condition Index for Virginia Non-Coastal Streams” and “Using Probabilistic Monitoring Data to Validate the Non-Coastal Virginia Stream Condition Index”. The VA-SCI is a multi-metric Index of Biotic Integrity developed for the DEQ to assess Streams of the Commonwealth. The VA-SCI uses seven biotic metrics and one biotic index including Total Taxa, EPT Taxa, Percent Ephemeroptera, Percent Plecoptera + Trichoptera (Excluding Hydropsychidae), Percent Scrapers, Percent Chironomidae, Percent Top Two Dominant Taxa, and Hilsenhoff Biotic Index. The individual metrics and index used are defined and described as follows:

- **Total Taxa Richness.** Total Taxa Richness represents the total number of taxa in a sample. Total Taxa Richness is expected to be relatively high in undisturbed streams and is expected to decrease in response to environmental disturbance. Total Taxa Richness can range from 0-22 for the VA-SCI.
- **EPT Taxa Richness.** EPT Taxa Richness represents the number of taxa from the aquatic insect orders Ephemeroptera, Plecoptera, and Trichoptera. EPT taxa are generally very sensitive to pollution. Total EPT Taxa Richness is expected to be relatively high in undisturbed streams, and it is expected to decrease in response to environmental disturbance. EPT Taxa Richness can range from 0-11 for the VA-SCI.
- **Percent Ephemeroptera.** The Percent Ephemeroptera represents the ratio of members of the aquatic insect order Ephemeroptera (mayflies) to the total number of individuals in a sample. Mayflies are generally very sensitive to pollution, thus Percent Ephemeroptera is

⁸ *The SOPs indicate that overall habitat quality is determined by calculating the percent similarity to reference score. Since reference reaches were not available to assess, WSSI used the best possible score as the reference score.*

expected to decrease in response to environmental disturbance. Percent Ephemeroptera can range from 0-61.3 for the VA-SCI.

- Percent Plecoptera + Trichoptera (Excluding Hydropsychidae). The Percent Plecoptera + Trichoptera (Excluding Hydropsychidae) represents the ratio of members of the aquatic insect orders Plecoptera (stoneflies) and Trichoptera (caddisflies) (excluding the those in the pollution tolerant family Hydropsychidae) to the total number of individuals in a sample. Percent Plecoptera + Trichoptera (Excluding Hydropsychidae) is expected to decrease in response to environmental disturbance. Percent Plecoptera + Trichoptera (Excluding Hydropsychidae) can range from 0-35.6 for the VA-SCI.
- Percent Scrapers. The Percent Scrapers represents the ratio of taxa adapted primarily for scraping food from a substrate to the total number of individuals in a sample. Percent Scrapers is expected to decrease in response to environmental disturbance. Percent Scrapers can range from 0-51.6 for the VA-SCI.
- Percent Chironomidae. The Percent Chironomidae represents the ratio of members of the aquatic insect family Chironomidae (non-biting midges) to the total number of individuals in a sample. Because chironomids are generally tolerant to pollution, Percent Chironomidae is expected to increase in response to environmental disturbance. Percent Chironomidae can range from 0-100 for the VA-SCI.
- Percent Top Two Dominant. The Percent Top Two Dominant is the ratio of the top two most abundant taxa in a sample to the total number of individuals in a sample. Percent Top Two Dominant is expected to increase in response to environmental disturbance. Percent Top Two Dominant can range from 30.8-100 for the VA-SCI.
- Hilsenhoff Biotic Index (HBI). The Hilsenhoff Biotic Index is the abundance-weighted average tolerance of assemblage of organisms (Family taxonomic level). The HBI is expected to increase in response to environmental disturbance. The HBI can range from 3.2-10 for the VA-SCI.
- The VA-SCI was calculated by taking the weighted average of the individual metric (and index) scores, with an VA-SCI range of 0-100. The weighting is as follows:
 - Total Taxa: Score = $100 \times (X/22)$, where X = Metric Value
 - EPT Taxa: Score = $100 \times (X/11)$, where X = Metric Value
 - Percent Ephemeroptera: Score = $100 \times (X/61.3)$, where X = Metric Value
 - Percent Plecoptera + Trichoptera less Hydropsychidae: Score = $100 \times (X/35.6)$, where X = Metric Value
 - Percent Scrapers: Score = $100 \times (X/51.6)$, where X = Metric Value
 - Percent Chironomidae: Score = $100 \times [(100-X) (100-0)]$, where X = Metric Value
 - Percent Top 2 Dominant: Score = $100 \times [(100-X) (100-30.8)]$, where X = Metric Value
 - Hilsenhoff Biotic Index: Score = $100 \times [(100-X) (100-3.2)]$, where X = Metric Value

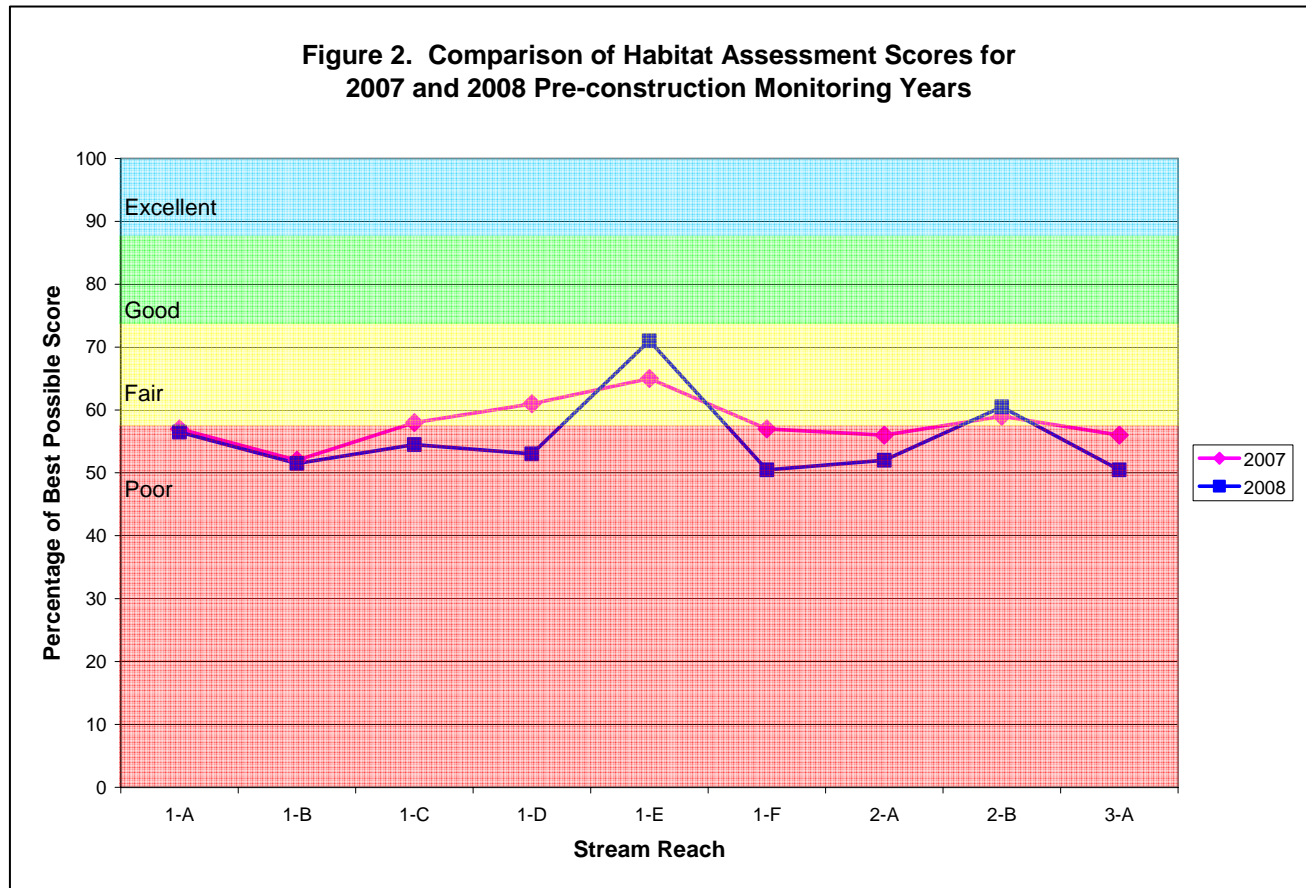
Each reach was then assigned a narrative rating according to the calculated VA-SCI, where “Excellent” is >73, “Good” is 60-72, “Stress” is 43-59, and “Severe Stress” is <42.

Biological Stream Monitoring Results and Discussion. Habitat results for 2008 show that all nine stream reaches (Reaches 1-A through 1-F, 2-A, 2-B, and 3-A) have either “Poor” or “Fair” habitat conditions (Table 1, below; Exhibit 5). Reach 1-E and 2-B have the best habitat, with habitat assessment scores of 142 out of 200 (“Fair”) and 121 out of 200 (“Fair”), respectively. Reach 1-F and 3-A have the worst habitat, both having a habitat assessment score of 101 out of 200 (“Poor”). The low habitat assessment scores are due to the lack of epifaunal substrate/available cover for stream fauna, highly embedded epifaunal substrate, overwidened stream channels, bank instability, and lack of vegetation protection along the stream banks. The average habitat assessment score for all streams assessed within the Snakeden Branch Watershed portion of the NVSRB in 2008 is 111, which is 56 percent of the best possible score (“Poor”).

Table 1. 2008 Snakeden Branch Watershed Total Habitat Assessment Scores			
REACH	Habitat Assessment Score	Percent Best Possible Score	Narrative Rating
1-A	113	57	Poor
1-B	103	52	Poor
1-C	109	55	Poor
1-D	106	53	Poor
1-E	142	71	Fair
1-F	101	51	Poor
2-A	104	52	Poor
2-B	121	61	Fair
3-A	101	51	Poor
Average	111	56	Poor

The habitat conditions in 2008 are similar to the conditions observed for the 2007 pre-construction monitoring, as all reaches in 2007 had either “Poor” or “Fair” habitat assessment scores (Figure 2, below). The average habitat assessment score for all streams assessed within the Snakeden Branch Watershed portion of the NVSRB in 2007 was 117, which is 58 percent of the best possible score (“Fair”).

Figure 2. Comparison of Habitat Assessment Scores for 2007 and 2008 Pre-construction Monitoring Years



Benthic macroinvertebrate results show that individuals from 24 taxa⁹ were collected from all nine reaches collectively (Table 2, below; Exhibit 7) during the 2008 pre-construction benthic macroinvertebrate monitoring. These 24 taxa include ancyloid, physid, and ramshorn snails (Families Ancyliidae, Physidae, and Planorbidae, respectively); fingernail clams (Family Sphaeriidae); oligochaete, horsehair, ribbon, and flat worms (Families Tubificidae and Family #1, Phylum Nematomorpha, Phylum Nemertea, and Class Turbellaria, respectively); scuds (Family Crangonyctidae); aquatic sowbugs (Family Asellidae); crayfish (Family Cambaridae); non-biting midge, crane, aquatic longlegged, shore, and unknown fly larvae (Families Chironomidae, Tipulidae, Dolichopodidae, Ephydriidae, and Diptera Family #1, respectively); common net-spinning and fingernet caddisfly larvae (Families Hydropsychidae and Philopotamidae, respectively); broadwinged and narrowwinged damselfly larvae (Families Calopterygidae and Coenagrionidae, respectively); green-eyed skimmer dragonfly larvae (Family Corduliidae); and water scavenger and crawling water beetles (Families Hydrophilidae and Haliplidae, respectively). Of all 24 taxa collected, non-biting midge larvae and oligochaete worms comprised the majority of individuals in each reach (Table 2, below).

⁹ Although 27 taxa are listed in Table 2, Diptera, Gastropoda, and Oligochaeta were not included as part of the total taxa collected within the study area, because individuals were too damaged to identify to the family-level.

Table 2. 2008 Snakeden Branch Watershed Raw Data										
TAXA	REACH									Total
	1-A	1-B	1-C	1-D	1-E	1-F	2-A	2-B	3-A	
Ancyliidae	-	-	-	1	4	-	-	-	-	5
Asellidae	-	1	-	-	1	-	-	-	-	2
Calopterygidae	1	1	-	-	1	-	-	-	-	3
Cambaridae	-	-	-	-	1	-	-	-	-	1
Chironomidae	53	51	32	19	42	5	3	89	4	298
Coenagrionidae	-	1	-	-	4	-	-	-	-	5
Corduliidae	-	-	-	-	-	-	1	-	-	1
Crangonyctidae	5	-	-	1	-	-	1	-	-	7
Diptera	1	-	-	-	-	-	-	-	-	1
Diptera Family #1	-	-	-	-	-	1	-	-	-	1
Dolichopodidae	1	-	-	-	-	1	-	-	-	2
Ephydriidae	1	-	-	-	-	3	-	-	-	4
Gastropoda	-	-	-	1	-	-	-	-	-	1
Haliplidae	-	-	-	-	-	-	1	-	-	1
Hydrophilidae	-	-	-	-	-	1	-	-	-	1
Hydropsychidae	3	-	1	-	8	-	-	-	-	12
Nematomorpha	-	1	-	-	-	-	-	3	-	4
Nemertea	-	1	-	-	1	-	-	-	-	2
Oligochaeta	11	7	22	53	46	68	7	1	29	244
Oligochaeta Family #1	-	-	-	1	-	-	-	-	-	1
Philopotamidae	-	-	-	-	2	-	-	-	-	2
Physidae	-	11	-	4	-	-	1	3	1	20
Planorbidae	-	2	-	1	-	-	-	1	-	4
Sphaeriidae	4	6	-	5	-	-	7	5	64	91
Tipulidae	2	2	2	1	1	14	2	-	-	24
Tubificidae	-	2	-	13	7	11	2	-	10	45
Turbellaria	-	1	-	-	-	-	-	-	1	2
Total	82	87	57	100	118	104	25	102	109	784

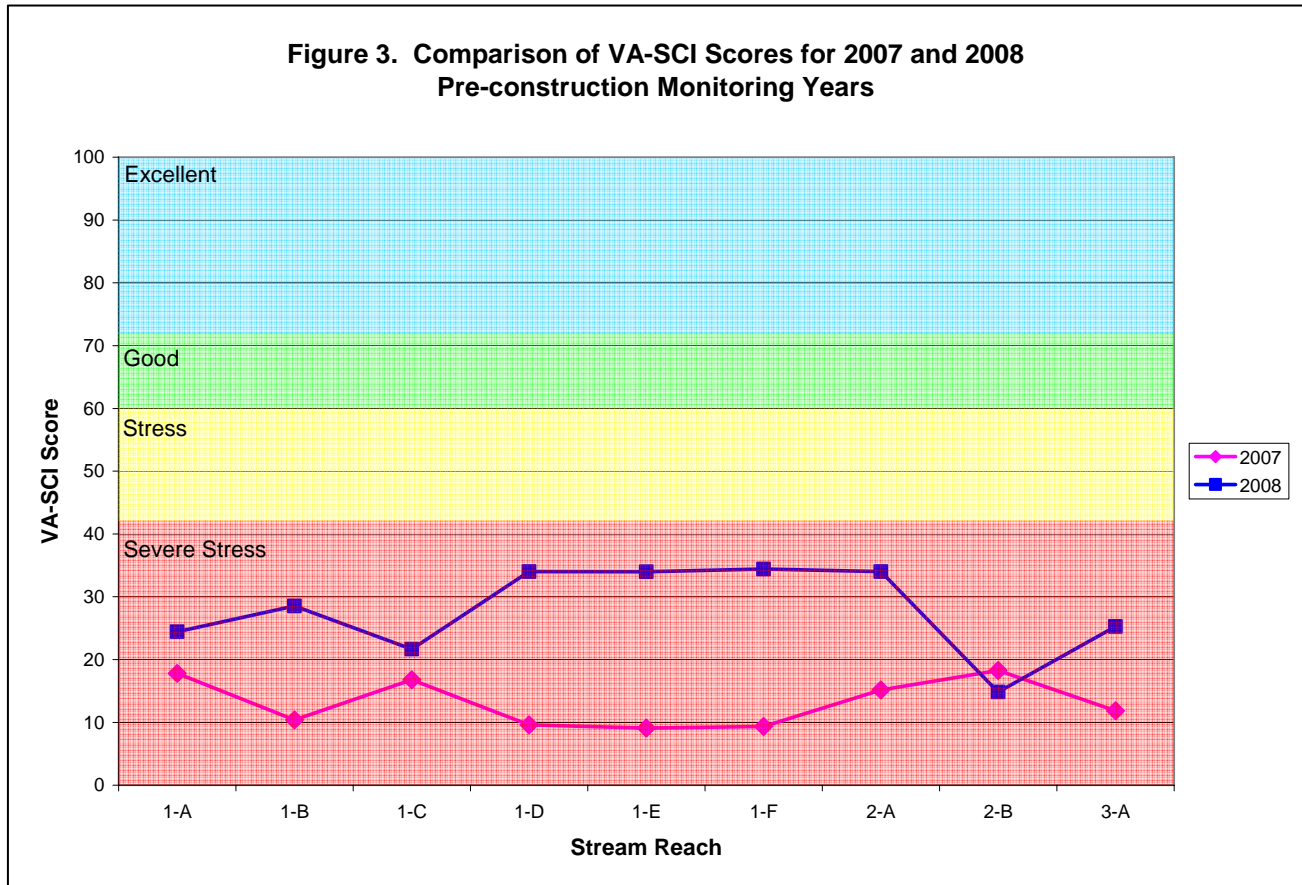
The above data collected for each reach were used to calculate the biotic metrics as shown in Table 3, below. The VA-SCI requires that these metrics be weighted to determine the VA-SCI, as shown in Table 4, below. The results of our data analysis indicate that the benthic macroinvertebrate community at all nine stream reaches (Reaches 1-A through 1-F, 2-A, 2-B, and 3-A) is in “Severe Stress” in 2008 prior to stream restoration activities, based on their VA-SCI scores (Table 4, below). The highest VA-SCI score was observed at Reach 1-F (34.40) and the lowest VA-SCI score was observed at Reach 2-B (14.85). The average VA-SCI numerical score for all streams assessed within the Snakeden Branch Watershed portion of the NVSRB in 2008 is 27.46 (“Severe Stress”).

Table 3. 2008 Snakeden Branch Watershed Biotic Metric Scores								
Reach	Total Taxa	Total EPT Taxa	Percent Ephemeroptera	Percent Plecoptera + Trichoptera (Excluding Hydropsychidae)	Percent Scrapers	Percent Chironomidae	Percent Top Two Dominant	HBI
1-A	9	1	0.00	0.00	0.00	64.63	78.05	4.67
1-B	12	0	0.00	0.00	14.94	58.62	71.26	5.79
1-C	4	1	0.00	0.00	0.00	56.14	94.74	3.56
1-D	9	0	0.00	0.00	6.00	19.00	72.00	3.32
1-E	11	2	0.00	1.69	3.39	35.59	74.58	3.81
1-F	7	0	0.00	0.00	0.00	4.81	78.85	2.00
2-A	8	0	0.00	0.00	4.00	12.00	56.00	4.80
2-B	6	0	0.00	0.00	3.92	87.25	92.16	5.93
3-A	5	0	0.00	0.00	0.92	3.67	85.32	5.91

Table 4. 2008 Weighted Snakeden Branch Watershed Biotic Metrics and VA-SCI									
METRIC	REACH								
	1-A	1-B	1-C	1-D	1-E	1-F	2-A	2-B	3-A
Total Taxa	40.91	54.55	18.18	40.91	50.00	31.82	36.36	27.27	22.73
EPT Taxa	9.09	0.00	9.09	0.00	18.18	0.00	0.00	0.00	0.00
Percent Ephemeroptera	0.00	0.00	0.00	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	4.76	0.00	0.00	0.00	0.00
Percent Scrapers	0.00	28.96	0.00	11.63	6.57	0.00	7.75	7.60	1.78
Percent Chironomidae	35.37	41.38	43.86	81.00	64.41	95.19	88.00	12.75	96.33
Percent Top Two Dominant	31.72	41.53	7.61	40.46	36.74	30.57	63.58	11.33	21.21
HBI	78.37	61.87	94.69	98.24	91.10	117.65	76.47	59.83	60.17
VA-SCI Numerical Score	24.43	28.53	21.68	34.03	33.97	34.40	34.02	14.85	25.28
VA-SCI Narrative Score	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Severe Stress
Average VA-SCI Numerical Score	27.46								
Average VA-SCI Narrative Score	Severe Stress								

These scores are the result of the low number of total taxa, low number of total EPT taxa, lack of Ephemeroptera taxa, low percentage of Plecoptera + Trichoptera (excluding Hydropsychidae taxa), low percentage of Scraper taxa, high percentage of Chironomidae, high percentage of top two dominant taxa, and high HBI found within the reaches assessed (Table 4).

These results are similar to the 2007 monitoring, where the benthic macroinvertebrate community at all nine reaches was also in “Severe Stress” (Figure 3, below). However, since 2007, almost all of the VA-SCI scores have increased. The lower VA-SCI scores in 2007 may be attributed to natural variability in both abiotic (e.g., amount of precipitation) and biotic conditions, rather than benthic macroinvertebrate recovery, as no restoration activities or other water quality enhancements have occurred within the study area prior to the 2008 monitoring.



Given the low habitat scores, it is not surprising that the VA-SCI scores are low as well. In general, biological diversity and habitat in streams are closely linked (Raven et al. 1998). Thus, the low VA-SCI scores are likely due to several confounding abiotic factors, including highly impervious land cover, high nutrient, toxicant and sediment input from adjacent land use, channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, and lack of epifaunal substrate/available cover.

An analysis of land use within the watershed of each stream reach indicates that each watershed is highly developed, with all reaches having greater than 20 percent impervious land cover (with a weighted watershed average of 38 percent), as depicted in the Land Cover Map (Exhibit 8), and Table 5, below. Reach 1-E has the highest imperviousness, with 50 percent impervious land cover. Reaches 2-A and 2-B have the lowest imperviousness, with 26 and 25 percent impervious land cover, respectively. It has been documented that increases in watershed imperviousness reduce macroinvertebrate diversity, such that when imperviousness exceeds 10

to 15 percent, macroinvertebrate diversity becomes low (Klein 1979). Runoff from the highly impervious land within these watersheds produces a high volume and velocity of flowing water and sediment in the stream channels during storm events. Because the streams we studied are laterally unstable (e.g., overwidened channel, lack of vegetative protection along the stream banks, and bank instability) and incised, these streams likely do not overflow their channel during bankfull flood events. As a result, epifaunal substrate/available cover within these streams becomes highly mobile and benthic macrofauna can not easily colonize the available substrate (Debrey and Lockwood 1990) or get buried and killed by high sediment deposition (Wood and Armitage 1997).

REACH	Watershed Acres	Percent Impervious	VA-SCI
1-A	863	38	24.43
1-B	540	45	28.53
1-C	386	46	21.68
1-D	291	45	34.03
1-E	77	50	33.97
1-F	55	47	34.40
2-A	256	26	34.02
2-B	169	25	14.85
3-A	75	49	25.28

Nutrients, pesticides, and other chemical pollutants that enter the streams through runoff can also have a negative effect on the macroinvertebrate community (Wright et al 1995; O’Halloran et al. 1996; Kiffney and Clements 1994). Sources for such pollutants within the streams we assessed likely include residential lawns, roads, the Reston National Golf Course, waterfowl and faulty sewer lines. Evidence of nutrient pollution input into Snakeden Branch can be found in the DEQ Final 2006 305(b)/303(d) Water Quality Assessment Integrated Report (Integrated Report), dated October 30, 2006 and approved by the EPA on October 16, 2006. In this report the DEQ identified Snakeden Branch as an impaired water body, based on high numbers of *Escherichia coli*, which is an indicator of fecal bacterial contamination from urban/residential areas within the watershed (Exhibit 9¹⁰; DEQ 2006c). High amounts of such pollutants into streams inevitably result in a shift in macroinvertebrate community composition, where pollution tolerant taxa such as non-biting midges and oligochaete worms out-compete pollution sensitive taxa such as EPT (Shueler 1994). Thus, it is not a surprise that our baseline benthic macroinvertebrate data show low VA-SCI scores and non-biting midges and oligochaete worms as the dominant taxa. However, because the proposed stream restoration should result in an improvement of in-stream habitat and water quality, there should also be an improvement in the benthic macroinvertebrate community over subsequent monitoring years.

¹⁰ *Exhibit 10 contains an excerpt from Appendix A – List of Impaired (Category 3) Waters in 2006 from the The DEQ Final 2006 305(b)/303(d) Water Quality Assessment Integrated Report (Integrated Report), dated October 30, 2006 and approved by the EPA on October 16, 2006.*

VII. Conclusions

The above results indicate that the habitat of the streams within the Snakeden Branch watershed portion of the NVSRB is “Poor” to “Fair” and the benthic macroinvertebrate community of the streams are in “Severe Stress”. The low VA-SCI and habitat scores are likely due to several confounding abiotic factors, including highly impervious land cover, high nutrient, toxicant and sediment input from adjacent land use, channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, and lack of epifaunal substrate/available cover.

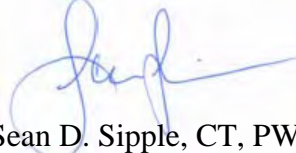
VIII. Limitations

This study is based on examination of the conditions on the site at the time of our review and does not address conditions in the future. Such conditions may change over time and will be addressed in subsequent monitoring reports. Our biological monitoring report has been prepared in accordance with generally accepted guidelines for the conduct of such evaluations. We make no other warranties, either expressed or implied, and our report is not a recommendation to buy, sell or develop the property.

We offer no opinion and do not purport to opine on the possible application of various building codes, zoning ordinances, other land use or platting regulations, environmental or health laws and other similar statutes, laws, ordinances, code and regulations affecting the possible use and occupancy of the property for the purpose for which it is being used, except as specifically provided above. The opinions set forth above are rendered only and exclusively for the benefit of the addressees, the COE, the DEQ, and no other parties, successors or assigns. The foregoing opinions are based on applicable laws, ordinances, and regulations in effect as of the date hereof and should not be construed to be an opinion as to the matters set out herein should such laws, ordinances or regulations be modified, repealed or amended.

This document is solely for your benefit and is not to be quoted in whole or in part or otherwise referred to in any statement or document (except for purposes of identification) nor is it to be filed with any governmental agency or other person (other than the COE and DEQ), without the prior written consent of this firm, unless required by law.

WETLAND STUDIES AND SOLUTIONS, INC.



Sean D. Sipple, CT, PWS
Environmental Scientist



Mark Headly, PWS, PWD
Vice President

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Vicinity Map
Snakeden Branch
WSSI #2003
Scale: 1" = 2000'





**USGS Quad Map
Vienna, VA-MD 1994
Snakeden Branch
WSSI #20003
Scale: 1" = 2000'**



Latitude: 38°55'59" N
Longitude: 77°21'00" W
Hydrologic Unit Code (HUC): 02070008
Stream Class: III
Name of Watershed: Snakeden Branch

BIOLOGICAL STREAM MONITORING NOTES:

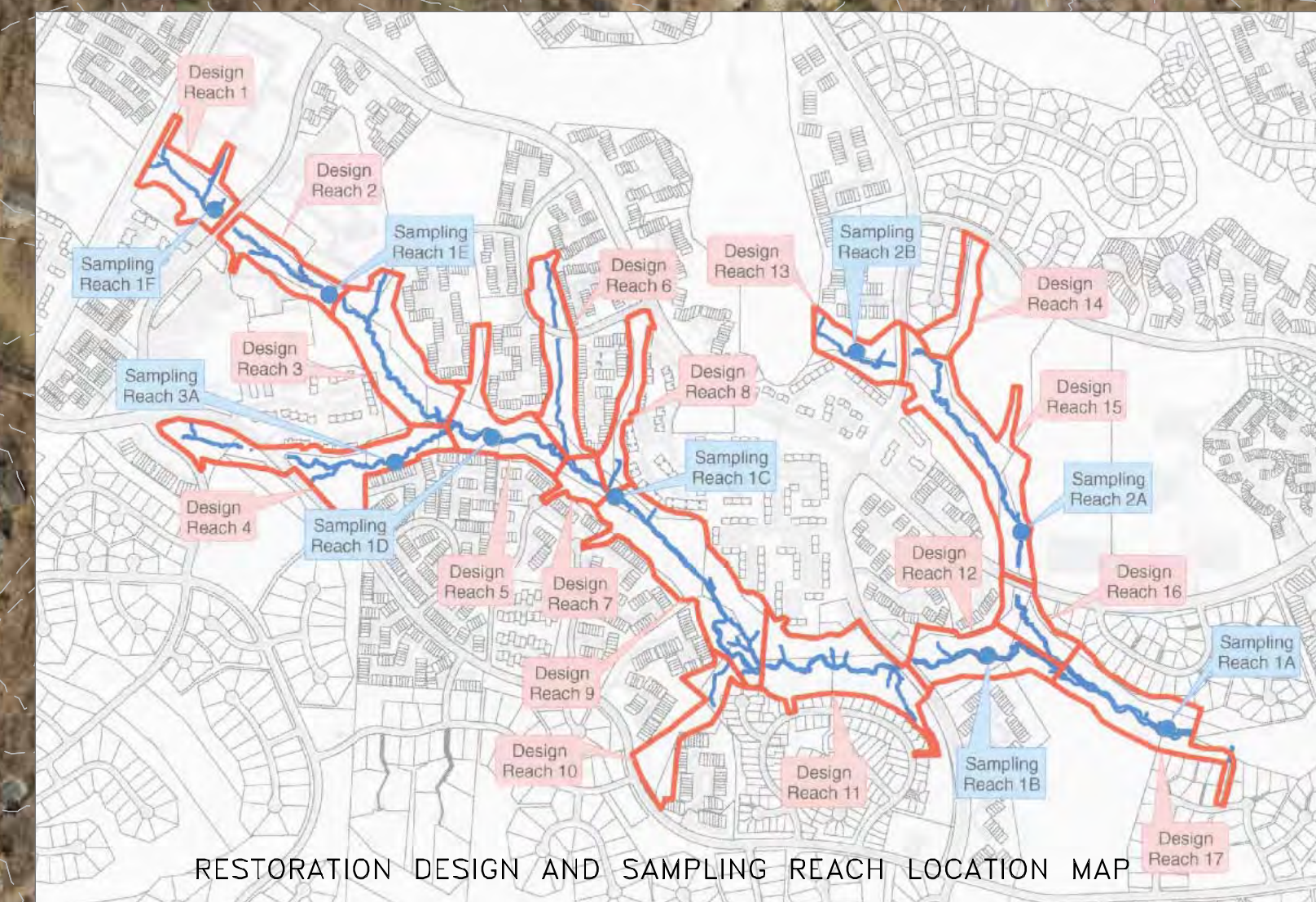
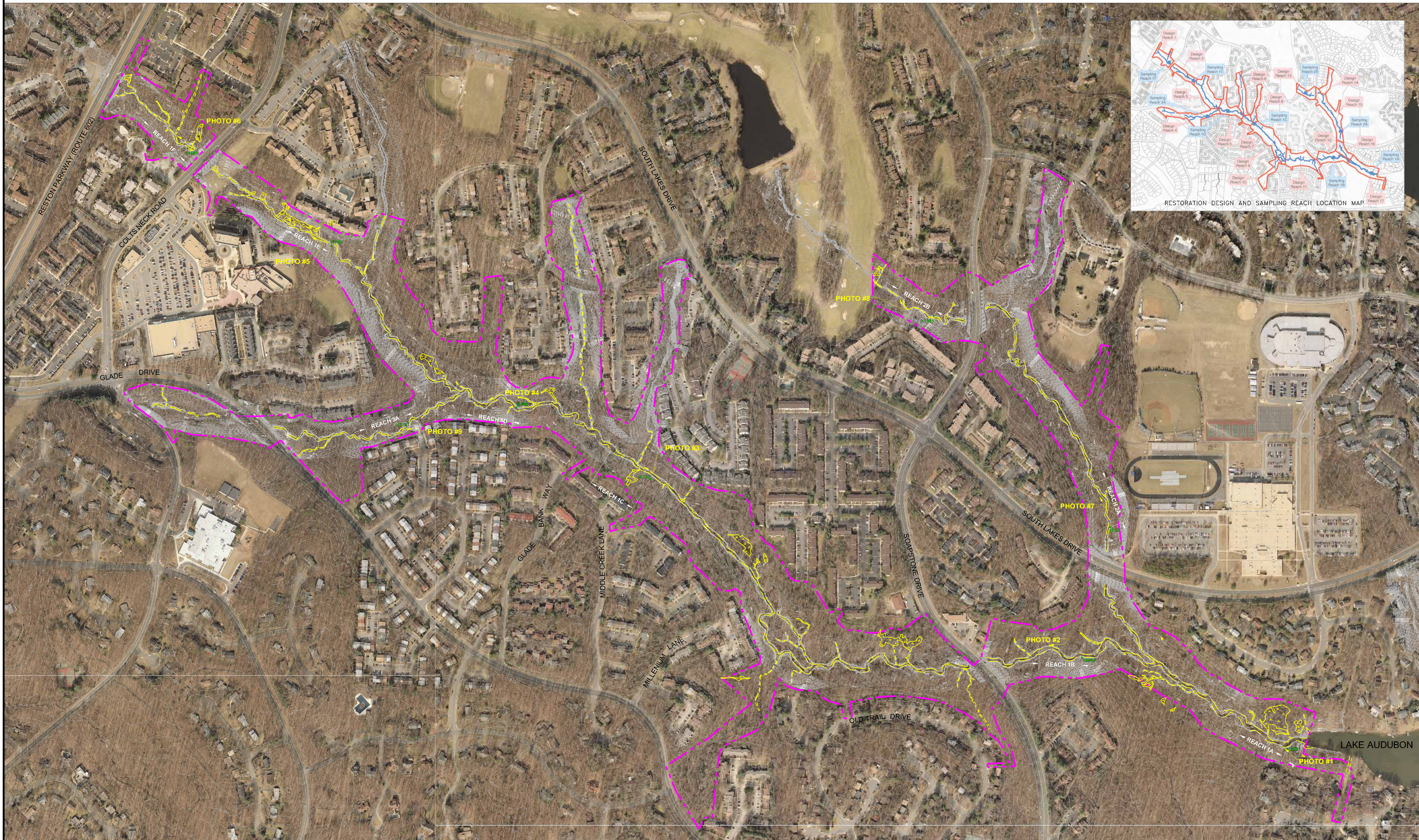
1. Wetland Studies and Solutions, Inc. (WSSI) performed biological stream monitoring on the Snakeden Branch Watershed portion of the Northern Virginia Stream Restoration Bank (NVSRB) in 2007 and 2008. This monitoring was conducted pursuant to the maintenance and monitoring requirements defined in the Northern Virginia Stream Restoration Bank (NVSRB) Banking Instrument. This second pre-construction monitoring report characterizes the 2008 baseline conditions against which future biological monitoring in the study area will be compared.
2. Biological stream monitoring was conducted along nine permanent biological monitoring reaches using benthic macroinvertebrate and habitat data. Benthic macroinvertebrate data was used to calculate a Stream Condition Index for Virginia Non-coastal Streams (VA-SCI) and habitat data was used to calculate the percentage of best possible habitat for each reach. Pre-construction biological monitoring fieldwork was conducted on February 12 and 14, 2008 by Sean D. Sipple, CT, PWS and Taylor S. Sprengle, WPIT.
3. Baseline habitat results indicate that habitat of the streams within the Snakeden Branch Watershed portion of the NVSRB in 2008 is "Poor" to "Fair", with habitat assessment scores of 142 (out of 200) or less. The low habitat assessment scores are due to the lack of epifaunal substrate/available cover for stream macrofauna, highly embedded epifaunal substrate, overwidened stream channels, bank instability, and lack of vegetation protection along the stream banks.
4. Baseline benthic macroinvertebrate results indicate that streams within the Snakeden Branch watershed portion of the NVSRB are in "Severe Stress" in 2008, with VA-SCI scores below 35 (out of 100) for all streams assessed. The low VA-SCI scores are likely due to several confounding abiotic factors, including highly impervious land cover within the watershed, high nutrient, toxicant and sediment input from adjacent land use, channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, and lack of epifaunal substrate/available cover.
5. Topographic information provided by Fairfax County Digital Data and Air Survey Corp., boundary information provided by WSSI, and a February 23, 2004 natural color image provided by Air Survey Corp. were used as a base for this attachment.
6. The boundaries of jurisdictional wetlands and other waters of the U.S. located within the limits of the Snakeden Branch portion of the NVSRB were delineated and survey-located by WSSI as described in the Snakeden Branch Reach 1 and Snakeden Branch Reach 2 delineation reports, dated February 14, 2005 and May 18, 2005, respectively. The U.S. Army Corps of Engineers verified the Snakeden Branch Reach 1 and Snakeden Branch Reach 2 delineations, with jurisdictional determinations (JD) dated May 17, 2006 (JD #05-R0601 and JD #05-R1495, respectively). Note that for logistical purposes, Snakeden Branch Reach 1 and Snakeden Branch Reach 2 have been further divided into 17 manageable restoration reaches, as depicted on the NVSRB - Snakeden Branch plan sets, dated May, August, October, November, and December 2007. The biological monitoring reaches for this report are located within a portion of these 17 reaches. The locations of the biological monitoring reaches relative to these 17 reaches are as follows: Reach 1-F corresponds with Reach 1 of the May 2007 plan set; Reach 1-E corresponds with Reach 2 of the August 2007 plan set; Reach 3-A corresponds with Reach 4 of the October 2007 plan set; Reaches 1-D and 1-C correspond with Reaches 5 and 7, respectively of the November 2007 plan set; Reaches 2-A and 2-B correspond with Reaches 13 and 15, respectively of the July 2, 2008 plan set; and Reaches 1-A and 1-B correspond with Reaches 12 and 17, respectively of the July 10, 2008 plan set.
7. The locations of each of the nine stream reaches were approximated on this exhibit using survey-located trees, which were noted during the biological monitoring field work.

Snakeden Branch Watershed Biotic Metric Scores								
Reach	Total Taxa	Total EPT Taxa	Percent Ephemeroptera	Percent Plecoptera + Trichoptera (Excluding Hydropsychidae)	Percent Scrapers	Percent Chironomidae	Percent Top Two Dominant	HBI
1-A	9	1	0.00	0.00	0.00	64.63	78.05	4.67
1-B	12	0	0.00	0.00	14.94	56.62	71.26	5.79
1-C	4	1	0.00	0.00	0.00	56.14	94.74	3.96
1-D	9	0	0.00	0.00	6.30	19.00	72.00	3.32
1-E	11	2	0.00	1.89	3.39	35.59	74.58	3.81
1-F	7	0	0.00	0.00	0.00	4.81	78.85	2.00
2-A	8	0	0.00	0.00	4.00	12.00	56.00	4.80
2-B	6	0	0.00	0.00	3.92	97.25	92.15	5.93
3-A	5	0	0.00	0.00	0.92	3.67	85.32	5.91

LEGEND

- STUDY AREA BOUNDARY
- PERENNIAL STREAM (PER FAIRFAX COUNTY RPA MAP)
- NON-PERENNIAL STREAM (PER FAIRFAX COUNTY RPA MAP)
- JURISDICTIONAL WETLAND AREAS
- UPLAND
- SURVEY-LOCATED TREE (NOTE 7)

Snakeden Branch Watershed Total Habitat Assessment Scores			
REACH	Habitat Assessment Score	Percent Best Possible Score	Narrative Rating
1-A	113	57	Poor
1-B	103	52	Poor
1-C	109	55	Poor
1-D	106	53	Poor
1-E	142	71	Fair
1-F	101	51	Poor
2-A	104	52	Poor
2-B	121	61	Fair
3-A	101	51	Poor
Average	111	56	Poor



NORTHERN VIRGINIA STREAM RESTORATION BANK - SNAKEDEN BRANCH WATERSHED
 2008 PRE-CONSTRUCTION MONITORING
 Fairfax County, Virginia
 EXHIBIT 3: BIOLOGICAL STREAM MONITORING MAP

REVISIONS		Res. By	App. By
No.	Date	Description	

Horizontal Datum: NAD 83
 Vertical Datum: NGVD 29
 Boundary and Topo Source: Fairfax County Digital Data, Air Survey Corp.
 Date: OCTOBER 2008
 Scale: 1"=200'

Computer File Name: L:\2008\05\200803\CADD\05-ENVR\Biomonitoring\Pre-con Year 2\BIOassessment\map.dwg
 sheet [] of []

EXHIBIT 4
BIOLOGICAL STREAM ASSESSMENT PHOTOGRAPHS
PHOTOGRAPHS TAKEN ON FEBRUARY 12 AND 14, 2008
SNAKEDEN BRANCH WATERSHED
WSSI #20003



1. Looking northwest (upstream) at Reach 1-A of Snakeden Branch on the eastern portion of the study area.



2. Looking west (upstream) at Reach 1-B of Snakeden Branch on the eastern portion of the study area.

**EXHIBIT 4
BIOLOGICAL STREAM ASSESSMENT PHOTOGRAPHS
PHOTOGRAPHS TAKEN ON FEBRUARY 12 AND 14, 2008
SNAKEDEN BRANCH WATERSHED
WSSI #20003**



3. **Looking northwest (upstream) at Reach 1-C of Snakeden Branch on the central portion of the study area.**



4. **Looking southwest (upstream) at Reach 1-D of Snakeden Branch on the central portion of the study area.**

**EXHIBIT 4
BIOLOGICAL STREAM ASSESSMENT PHOTOGRAPHS
PHOTOGRAPHS TAKEN ON FEBRUARY 12 AND 14, 2008
SNAKEDEN BRANCH WATERSHED
WSSI #20003**



5. **Looking northwest (upstream) at Reach 1-E of Snakeden Branch on the western portion of the study area.**



6. **Looking northwest (upstream) at Reach 1-F of Snakeden Branch on the western portion of the study area.**

EXHIBIT 4
BIOLOGICAL STREAM ASSESSMENT PHOTOGRAPHS
PHOTOGRAPHS TAKEN ON FEBRUARY 12 AND 14, 2008
SNAKEDEN BRANCH WATERSHED
WSSI #20003



7. **Looking northwest (upstream) at Reach 2-A of an unnamed tributary of Snakeden Branch on the eastern portion of the study area.**



8. **Looking northwest (upstream) at Reach 2-B of an unnamed tributary of Snakeden Branch on the eastern portion of the study area.**

EXHIBIT 4
BIOLOGICAL STREAM ASSESSMENT PHOTOGRAPHS
PHOTOGRAPHS TAKEN ON FEBRUARY 12 AND 14, 2008
SNAKEDEN BRANCH WATERSHED
WSSI #20003



9. **Looking west (upstream) at Reach 3-A, an unnamed tributary of Snakeden Branch on the western portion of the study area.**



EXHIBIT 5: HABITAT ASSESSMENT FIELD DATA SHEET - SUMMARY WORKSHEET

Project Name and WSSI Number: Northern Virginia Stream Restoration Bank: Snakeden Branch (WSSI # 20003)

Stream ID: Snakeden Branch and Unnamed Tributaries to Snakeden Branch **Date:** 2/12/08, 2/14/08

Evaluators: TSS/SDS **HUC:** 02070008

Assessment Period: Prerestoration

Assessment Reach Name	Condition Category										TOTAL SCORE	Percent of Best Possible Score***	Reach Length	Stream Type	
	Substrate	Embedded-ness	Velocity	Sediment Deposition	Flow Status	Channel Alteration	Frequency of Riffles	Bank Stability*	Vegetation Protection*	Riparian Zone*					
Stream 1	1-A	Marginal	Marginal	Optimal	Marginal	Marginal	Optimal	Poor	Poor	Optimal	Optimal	113	57	300	R3
	1-B	Marginal	Marginal	Optimal	Marginal	Marginal	Optimal	Poor	Poor	Optimal	Optimal	103	52	300	R3
	1-C	Marginal	Marginal	Optimal	Marginal	Suboptimal	Optimal	Poor	Poor	Optimal	Optimal	109	55	300	R3
	1-D	Marginal	Marginal	Optimal	Marginal	Suboptimal	Optimal	Poor	Poor	Optimal	Optimal	106	53	300	R3
	1-E	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	142	71	300	R3
Stream 2	1-F	Marginal	Suboptimal	Suboptimal	Marginal	Marginal	Optimal	Marginal	Marginal	Optimal	Optimal	101	51	300	R4/RE**
	2-A	Marginal	Marginal	Optimal	Marginal	Marginal	Optimal	Poor	Poor	Optimal	Optimal	104	52	300	R3
Stream 3	2-B	Suboptimal	Marginal	Optimal	Marginal	Marginal	Suboptimal	Marginal	Marginal	Suboptimal	Suboptimal	121	61	300	R3
	3-A	Marginal	Suboptimal	Optimal	Marginal	Marginal	Optimal	Poor	Poor	Optimal	Optimal	101	51	300	R3
Total											101		2,700		

* The score for Bank Stability, Vegetation Protection and Riparian Zone combines the left and right bank scores.

** The stream is characterized as non-perennial by Fairfax County and is thus either intermittent or ephemeral.

*** Percentage of Best Possible Score= (Total Habitat Score)/(200)*100

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/12/2008	10:00AM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-A		863	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	7
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	4
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	12
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
Total Score					39

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/12/2008	10:00AM
Investigators		HUC	Potomac	Locality	
TSS SDS DW		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-A		863	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstructions is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
	<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
Total Score					113

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/12/2008	12:00AM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-B		540	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	4
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	4
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	4
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
<i>Total Score</i>					31

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/12/2008	12:00AM
Investigators		HUC	Potomac	Locality	
TSS SDS DW		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-B		540	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	16
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	17
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	2
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	2
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					103



WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/14/2008	9:30AM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-C		386	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	9
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	9
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
Total Score					38



WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/14/2008	9:30AM
Investigators		HUC	Potomac	Locality	
		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-C		386	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	18
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	14
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					109
<i>General Comments: Easement in reach.</i>					

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/14/2008	10:30AM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-D		291	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
Total Score					39

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/14/2008	10:30AM
Investigators		HUC	Potomac	Locality	
		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-D		291	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	20
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	12
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	6
Total Score					106

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/14/2008	1:15PM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-E		77	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	15
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	13
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	13
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	15
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	15
<i>Total Score</i>					71

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3	Potomac	2/14/2008	1:15PM
Investigators		HUC		Locality	
		02070008	Fairfax County		
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-E		77	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	16
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	7
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	7
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
Total Score					142
General Comments: Restored reach.					

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R4		2/14/2008	2:15PM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-F		55	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Total Score					30

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R4		2/14/2008	2:15PM
Investigators		HUC	Potomac	Locality	
		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-F		55	300	3	
Latitude	Longitude		Stream Name		
38°55'58"	77°21'01"		Snakeden Branch		
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	17
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	12
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	3
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	3
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
Total Score					101

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/12/2008	1:30PM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
2-A		256	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Unnamed Tributary to Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
	<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Total Score					32

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/12/2008	1:30PM
Investigators		HUC	Potomac	Locality	
TSS SDS DW		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
2-A		256	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Unnamed Tributary to Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	19
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	16
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-80% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
Total Score					104

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/12/2008	2:00PM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
2-B		169	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Unnamed Tributary to Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	9
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	4
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	14
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	10
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	10
Total Score					47



WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/12/2008	2:00PM
Investigators		HUC	Potomac	Locality	
TSS SDS DW		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
2-B		169	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Unnamed Tributary to Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	16
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	19
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	2
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	2
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	8
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Total Score</i>					121

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/14/2008	11:30AM
Investigators		HUC	Potomac	Locality	
TSS/SDS		02070008		Fairfax County	
Reach		D.A. (Acres)	Reach Length (LF)	Order	
3-A		75	300	1	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Unnamed Tributary to Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble, or other stable habitat and at stage to allow full colonization potential (i.e. snags/logs that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization.	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	5
Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast shallow)(slow is <0.3m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low)	Dominated by 1 velocity/depth regime (usually slow-deep).	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	9
4. Sediment Deposition	Little or no enlargement of islands or point bars and <5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand, or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
Total Score					32

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS					
Project #	Site	Cowardin	River Basin	Date	Time
20003	NOVA Stream Bank	R3		2/14/2008	11:30AM
Investigators		HUC	Potomac	Locality	
		02070008		Fairfax County	
Reach	D.A. (Acres)	Reach Length (LF)	Order		
3-A	75	300	1		
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Unnamed Tributary to Snakeden Branch			
Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	Score
6. Channel Alteration	Channelization or dredging absent or minimal; stream width normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e. dredging, may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	18
7. Frequency of Riffles	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distances between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
<i>Score</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	14
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	1
9. Vegetation Protection (score each bank) Note: Determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetation disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	9
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.	
<i>Score Left Bank</i>	10 9	8 7 6	5 4 3	2 1 0	7
<i>Score Right Bank</i>	10 9	8 7 6	5 4 3	2 1 0	10
<i>Total Score</i>					101
<i>General Comments: Easement in reach.</i>					



WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET					
Project #	Site	Cowardin	River Basin	Date	Time
20003	Snakeden	R3	Potomac	2/12/2008	10:00AM
Investigators		HUC	Locality		
TSS/SDS		2070008	Fairfax County		
Reach		D.A. (Acres)	Reach Length (LF)	Order	
1-A		863	300	3	
Latitude	Longitude	Stream Name			
38°55'58"	77°21'01"	Snakeden Branch			
Habitat Types (Indicate Percentage of Each Habitat Present)					
Cobble	30	Sand	80	Rootwads	5
Large Woody Debris			5	Undercut Banks	5
				Vegetated Banks	0
				Leaf Packs	5
Sample Collection					
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat	
<i>D-Frame</i>	x	<i>Wading</i>	x		
<i>Kick-Net</i>		<i>From Bank</i>		<i>Cobble</i>	10
<i>Other</i>		<i>From Boat</i>		<i>Undercut Banks</i>	4
				<i>Sand</i>	0
				<i>Submerged Macro-phytes</i>	0
				<i>Rootwads</i>	2
				<i>Leaf Packs</i>	2
				<i>Vegetated Banks</i>	0
				<i>Large Woody Debris</i>	2
General Comments					
Qualitative Listing of Aquatic Biota					
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant					
Periphyton	3	Slimes			0
Filamentous Algae	0	Macroinvertebrates			1
Macrophytes	0	Fish			1

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET								
Project #	Site	Cowardin	River Basin	Date	Time			
20003	Snakeden	R3	Potomac	2/12/2008	9:51 AM			
Investigators		HUC	Locality					
TSS/SDS		2070008	Fairfax County					
Reach		D.A. (Acres)	Reach Length (LF)	Order				
1-B		540	300	3				
Latitude	Longitude	Stream Name						
38°55'58"	77°21'01"	Snakeden Branch						
Habitat Types (Indicate Percentage of Each Habitat Present)								
Cobble	20	Sand	85	Rootwads	5	Vegetated Banks	0	
Large Woody Debris		0	Undercut Banks	5	Leaf Packs	5		
Sample Collection								
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat				
D-Frame	x	Wading	x					
Kick-Net		From Bank		Cobble	10	Undercut Banks	6	
Other		From Boat		Sand	0	Submerged Macro-phytes	0	
				Rootwads	1	Leaf Packs	3	
				Vegetated Banks	0	Large Woody Debris	0	
General Comments								
Caught one green frog in net.								
Qualitative Listing of Aquatic Biota								
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant								
Periphyton		3	Slimes		0			
Filamentous Algae		0	Macroinvertebrates		1			
Macrophytes		0	Fish		1			
Page 1 of 1								



WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20003	Snakeden	R3	Potomac	2/14/2008	9:30AM		
Investigators		HUC	Locality				
TSS/SDS		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
1-C		386	300	3			
Latitude	Longitude	Stream Name					
38°55'58"	77°21'01"	Snakeden Branch					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	40	Sand	70	Rootwads	1	Vegetated Banks	0
Submerged Macrophytes		0	Undercut Banks		1		
Large Woody Debris		2	Leaf Packs		5	Other (bedrocks)	5
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
D-Frame	x	Wading		x			
Kick-Net		From Bank		Cobble	14	Undercut Banks	0
Other		From Boat		Sand	0	Submerged Macrophytes	0
				Rootwads	0	Leaf Packs	5
				Vegetated Banks	0	Large Woody Debris	1
General Comments							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton		3	Slimes		0		
Filamentous Algae		0	Macroinvertebrates		1		
Macrophytes		0	Fish		1		
Page 1 of 1							



WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET								
Project #	Site	Cowardin	River Basin	Date	Time			
20003	Snakeden	R3	Potomac	2/14/2008	10:30AM			
Investigators		HUC	Locality					
TSS/SDS		2070008	Fairfax County					
Reach		D.A. (Acres)	Reach Length (LF)	Order				
1-D		291	300	3				
Latitude	Longitude	Stream Name						
38°55'58"	77°21'01"	Snakeden Branch						
Habitat Types (Indicate Percentage of Each Habitat Present)								
Cobble	30	Sand	85	Rootwads	1	Vegetated Banks	0	
Submerged Macrophytes		0	Undercut Banks		10			
Large Woody Debris		1	Leaf Packs		3	Other (bedrocks)	5	
Sample Collection								
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat				
D-Frame	x	Wading		x				
Kick-Net		From Bank		Cobble	10	Undercut Banks	7	
Other		From Boat		Sand	0	Submerged Macro-phytes	0	
				Rootwads	0	Leaf Packs	2	
				Vegetated Banks	0	Large Woody Debris	1	
General Comments								
Caught one salamander in net.								
Qualitative Listing of Aquatic Biota								
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant								
Periphyton	3	Slimes	0					
Filamentous Algae	1	Macroinvertebrates	1					
Macrophytes	0	Fish	2					
Page 1 of 1								



WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20003	Snakeden	R3	Potomac	2/14/2008	1:15PM		
Investigators		HUC	Locality				
TSS/SDS		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
1-E		77	300	3			
Latitude	Longitude	Stream Name					
38°55'58"	77°21'01"	Snakeden Branch					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	40	Sand	70	Rootwads	1	Vegetated Banks	5
Submerged Macrophytes		0	Undercut Banks		0		
Large Woody Debris		2	Leaf Packs		5	Other (bedrocks)	0
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
<i>D-Frame</i>	x	<i>Wading</i>		<i>x</i>			
<i>Kick-Net</i>		<i>From Bank</i>		<i>Cobble</i>	14	<i>Undercut Banks</i>	0
<i>Other</i>		<i>From Boat</i>		<i>Sand</i>	0	<i>Submerged Macro-phytes</i>	0
				<i>Rootwads</i>	0	<i>Leaf Packs</i>	3
				<i>Vegetated Banks</i>	3	<i>Large Woody Debris</i>	0
General Comments							
Caught 2 salamanders in net.							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton		3	Slimes		0		
Filamentous Algae		0	Macroinvertebrates		1		
Macrophytes		0	Fish		2		
Page 1 of 1							



WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20003	Snakeden	R3	Potomac	2/14/2008	2:15PM		
Investigators		HUC	Locality				
TSS/SDS		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
1-F		55	300	3			
Latitude	Longitude	Stream Name					
38°55'58"	77°21'01"	Snakeden Branch					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	20	Sand	90	Rootwads	0	Vegetated Banks	0
Submerged Macrophytes		0	Undercut Banks		2		
Large Woody Debris		0	Leaf Packs		15	Other (bedrocks)	5
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
<i>D-Frame</i>	x	<i>Wading</i>		<i>x</i>			
<i>Kick-Net</i>		<i>From Bank</i>		<i>Cobble</i>	9	<i>Undercut Banks</i>	2
<i>Other</i>		<i>From Boat</i>		<i>Sand</i>	0	<i>Submerged Macro-phytes</i>	0
				<i>Rootwads</i>	0	<i>Leaf Packs</i>	9
				<i>Vegetated Banks</i>	0	<i>Large Woody Debris</i>	0
General Comments							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton		3	Slimes				0
Filamentous Algae		2	Macroinvertebrates				1
Macrophytes		0	Fish				0
Page 1 of 1							



WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20003	Snakeden	R3	Potomac	2/12/2008	12:50 PM		
Investigators		HUC	Locality				
TSS/SDS		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
2-A		256	300	3			
Latitude	Longitude	Stream Name					
38°55'58"	77°21'01"	Snakeden Branch					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	20	Sand	90	Rootwads	1	Vegetated Banks	0
Large Woody Debris		1	Undercut Banks	3	Leaf Packs	5	
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
<i>D-Frame</i>	x	<i>Wading</i>	x				
<i>Kick-Net</i>		<i>From Bank</i>		<i>Cobble</i>	11	<i>Undercut Banks</i>	3
<i>Other</i>		<i>From Boat</i>		<i>Sand</i>	0	<i>Submerged Macro-phytes</i>	0
				<i>Rootwads</i>	1	<i>Leaf Packs</i>	4
				<i>Vegetated Banks</i>	0	<i>Large Woody Debris</i>	1
General Comments							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton	3	Slimes	0				
Filamentous Algae	0	Macroinvertebrates	1				
Macrophytes	0	Fish	0				



WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20003	Snakeden	R3	Potomac	2/12/2008	2:00 PM		
Investigators		HUC	Locality				
TSS/SDS		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
2-B		169	300	3			
Latitude	Longitude	Stream Name					
38°55'58"	77°21'01"	Snakeden Branch					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	35	Sand	80	Rootwads	1	Vegetated Banks	0
Large Woody Debris		1	Undercut Banks	3	Leaf Packs		15
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
<i>D-Frame</i>	x	<i>Wading</i>	x				
<i>Kick-Net</i>		<i>From Bank</i>		<i>Cobble</i>	12	<i>Undercut Banks</i>	0
<i>Other</i>		<i>From Boat</i>		<i>Sand</i>	0	<i>Submerged Macrophytes</i>	0
				<i>Rootwads</i>		<i>Leaf Packs</i>	8
				<i>Vegetated Banks</i>	0	<i>Large Woody Debris</i>	0
General Comments							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton		3	Slimes		0		
Filamentous Algae		0	Macroinvertebrates		1		
Macrophytes		0	Fish		0		
Page 1 of 1							



WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET							
Project #	Site	Cowardin	River Basin	Date	Time		
20003	Snakeden	R3	Potomac	2/14/2008	11:30AM		
Investigators		HUC	Locality				
TSS/SDS		2070008	Fairfax County				
Reach		D.A. (Acres)	Reach Length (LF)	Order			
3-A		75	300	1			
Latitude	Longitude	Stream Name					
38°55'58"	77°21'01"	Snakeden Branch					
Habitat Types (Indicate Percentage of Each Habitat Present)							
Cobble	20	Sand	90	Rootwads	0	Vegetated Banks	0
Submerged Macrophytes		0	Undercut Banks		1		
Large Woody Debris		0	Leaf Packs		3	Other (bedrocks)	2
Sample Collection							
Gear Used		How Were Samples Collected?		Number of Jabs/Kicks Taken from Each Habitat			
D-Frame	x	Wading		x			
Kick-Net		From Bank		Cobble	17	Undercut Banks	1
Other		From Boat		Sand	0	Submerged Macrophytes	0
				Rootwads	0	Leaf Packs	2
				Vegetated Banks	0	Large Woody Debris	0
General Comments							
Qualitative Listing of Aquatic Biota							
Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant							
Periphyton	3	Slimes				0	
Filamentous Algae	1	Macroinvertebrates				1	
Macrophytes	0	Fish				0	
Page 1 of 1							

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-A	SDS/TSS	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/25/2008	8/18/2008	SDS	SDS	65	82
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE		Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.	4	Sphaeromyia sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chabonus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	53	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicyptochironomus sp.		Guttipolopia sp.	
CURCULIONIDAE		Dicotendipes sp.		Krenopolopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Maropolopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Copelotomus sp.		Nitohauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopolopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopsectra sp.		Thienemannimyia sp.	
Optoservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopolopia sp.	
Promoesia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelletia sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropsectra sp.		Mansonia	
Gyrinus		Micropsectra/Tanytarsus complex		Orthopodomyia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dbx sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	1
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Symphosthia sp.		EPHYDRIDAE	1
PSEPHENIDAE		Orthocladinae		PELCO RHYNCHIDAE	
Psephenus sp.		Brilia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchytarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE	5	Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissociocladus sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEOMONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladus sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametrioconemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies	1	Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrichoeladius sp.		TIPULIDAE	2
Atherix sp.		Paratrissociocladus sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGNIDAE		Pailometrioconemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pausedolmnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladus sp.		Limnophila sp.	
Dasyhelea sp.		Symphosicladus sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-A	SDS/TSS	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/25/2008	8/18/2008	SDS	SDS	65	82
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostola sp.	
Pilaria sp.		HOPLOMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERA - Caddisflies		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanaera sp.		TAENIOPTERIGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centropilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeschna sp.		HYDROPSYCHIDAE	3
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		CORDULEGASTRIDAE		Dipterona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Argomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocuta sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Caraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE	1	LIMNIPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isorychnia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONURIDAE		OLIGOCHAETA - Oligochaete Worms	11	MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE		PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormakia sp.	
HYDROBIIDAE		AECLOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aeclosoma sp.		Phlostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acronuria sp.		Phylocentropus sp.	
PHYSIDAE		Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Eccoptura sp.		Lype sp.	
PLANORBIDAE		Neoptera sp.		Psychomyia sp.	
Menetus sp.		Perlesta sp.		RHYACOPHILIDAE	
Gyraulus sp.		<i>Perlina</i> sp.		Ryacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Cloperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Pelloperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-B	SDS/TSS	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/5/2008	8/1/2008	SDS	SDS	58	87
BIVALVIA - Clams		Forcipomya sp.		Synorthocladus sp.	
SPHAERIDAE	6	Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	51	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrolandipes sp.		Krenopelopia sp.	
DRYOPIDAE		Ehrlfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larzia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nilothauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccosis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracaladepelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopspectra sp.		Thienemannimyia sp.	
Oplioservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Microspectra sp.		Mansonia	
Gyrinus		Microspectra/Tanytarsus complex		Orthopodomysia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodytia sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Halophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Cheiffera sp.	
Hydrochus sp.		Pagaalia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthoclaadiinae		PELCOHRHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchytarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissociadius sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthoclaadiinae A		Eristalis sp.	
PALAEOMONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE	1	Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrithocladus sp.		TIPULIDAE	2
Atherix sp.		Paratrissocladius sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psilometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladus sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladius sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-B	SDS/TSS	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/5/2008	8/1/2008	SDS	SDS	58	87
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostola sp.	
Ptilaria sp.		HOPLOMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Swetsha sp.	
EPHEMEROPTERA - Mayflies		Archanaera sp.		TAENIOPTERIGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ametetus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centroptilum sp.		Nigronia sp.		Heteroplectron sp.	
Diphelot sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms	1	Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeschna sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		CORDULEGASTRIDAE		Dipterona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIDAE		Arigomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocufa sp.		Hagenius sp.		Leucotrichia sp.	
Stonacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trianaodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Caraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE	1	LIMNIPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatnia sp.	
Isocybia sp.		COENAGRIONIDAE	1	Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONEURIDAE		OLIGOCHAETA - Oligochaete Worms	7	MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAEIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE	2	PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormakia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aelosoma sp.		Phlostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acroneuria sp.		Polycentropus sp.	
PHYSIDAE	11	Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Ecoptura sp.		Lype sp.	
PLANORBIDAE	2	Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlenta sp.		RHYACOPHILIDAE	
Gyraulus sp.		Pertinella sp.		Ryacophila sp.	
PLEUROCIERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Clioptera sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	1
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE		NEMERTEA - Ribbon Worms	1
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Alicapnia sp.			
MESVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-D	SDS/TSS	1	122
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/15/2008	8/15/2008	SDS	SDS	18	100
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE	5	Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	19	Tanypodinae	
UNIONIDAE		Chironominae		Abiabeomyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Aloatanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Copilotomus sp.		Nilothauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcytloopus sp.		Phaenopsectra sp.		Thienemannimyia sp.	
Optioservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoesia sp.		Sticlochironomus sp.		Zavelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zaveliella sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropsectra sp.		Mansonia	
Gyrinus		Micropsectra/Tanyarsus complex		Orthopodomyia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyla sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthocladinae		PELCOCORHYNCHIDAE	
Psaphenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE	1	Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissocladius sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametrioconemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thauma/ea sp.	
ATHERICIDAE		Paratrissocladius sp.		TIPULIDAE	1
Atherix sp.		Paratrissocladius sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Haxatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGNIDAE		Pelometrioconemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladius sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladius sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-D	SDS/TSS	1	122
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/15/2008	8/15/2008	SDS	SDS	18	100
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostelia sp.	
Plecia sp.		HOPLOMERETEA - Ribbon Worms		Shipsa sp.	
Eroptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERA		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archana sp.		TAenioPTERIGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centroptilum sp.		Nigronia sp.		Heteroplectron sp.	
Diphetera sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Baetis sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Euryophella sp.		CORDULEGASTRIDAE		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemeris sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIDAE		Argomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocota sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trisnoides sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclia sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Ocellis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNIPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		COENAGRIONIDAE		Hydatophytax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONURIDAE		OLIGOCHAETA - Oligochaete Worms	53	MOLANNIDAE	
Siphonurus sp.		FAMILY #1	1	Molanna sp.	
TRICORYTHIDAE		ENCHYTRAIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails	1	TUBIFICIDAE	13	PHILOPOTAMIDAE	
ANCYLIDAE	1	LUMBRICULIDAE		Chimarra sp.	
Ferisa sp.		POLYCHAETA - Polychaete Worms		Wormalia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aelosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acronuria sp.		Polycentropus sp.	
PHYSIDAE	4	Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Ecoptura sp.		Lype sp.	
PLANORBIDAE	1	Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlenta sp.		RHYACOPHILIDAE	
Gyraulus sp.		<i>Perinella sp.</i>		Ryacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Cloperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-E	SDS/TSS	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
7/22/2008	7/21/2008	SDS	SDS	29	118
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostia sp.	
Ptilaria sp.		HOPLONERMETERA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archana sp.		TAenioPTERIGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centroptilum sp.		Nigronia sp.		Heteroplectron sp.	
Diphetera sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Halicosyche sp.	
Drunella sp.		Basiaeschna sp.		HYDROPSYCHIDAE	8
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurytrophella sp.		CORDULEGASTRIDAE		Dipterona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIIDAE		Argomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocuta sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trianaodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oecetis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE	1	LIMNephILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatia sp.	
Isonychia sp.		COENAGRIONIDAE	4	Hydatophylax sp.	
POLYMITARCIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONEURIDAE		OLIGOCHAETA - Oligochaete Worms	46	MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAEDIAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE	7	PHILOPOTAMIDAE	2
ANCYLIDAE	4	LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormakia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aelosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acroneuria sp.		Polycentropus sp.	
PHYSIDAE		Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Ecoptura sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlenta sp.		RHYACOPHILIDAE	
Gyraulus sp.		<i>Perlinella</i> sp.		Ryacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Cloperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE		NEMERTEA - Ribbon Worms	1
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocarca sp.			
VELIIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-F	SDS/TSS	1	125
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/25/2008	8/13/2008	JDF/SDS	JDF/SDS	66	104
BIVALVIA - Clams		Forcipomya sp.		Synorthocladus sp.	
SPHAERIDAE		Probezzia sp.		Thienemannella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	5	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Aspectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microlandipes sp.		Paramerina sp.	
Coptotomus sp.		Nitthauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccosis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopsectra sp.		Thienemannimyia sp.	
Optoservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoesia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubiraphia sp.		Zavrelieilla sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanyarsus complex		Orthopodomyia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE	1	Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Subiettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	1
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Doichocephala sp.	
Laccobius sp.		Symptothastia sp.		EPHYDRIDAE	3
PSEPHENIDAE		Orthocladinae		PELCO RHYNCHIDAE	
Paephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissociadius sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limniphyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEOMONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies	1	Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrachocladus sp.		TIPULIDAE	14
Atherix sp.		Paratrisociadius sp.		Antocha sp.	
BLEPHARICERIDAE		Paetrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Pallometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rhaecricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Paedolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilicladus sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladius sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	1-F	SDS/TSS	1	125
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/25/2008	8/13/2008	JDF/SDS	JDF/SDS	66	104
Pedicia sp.		Microvelia sp.			Paranemoura sp.
Limonia sp.		HIRUDINEA - Leeches			Prostola sp.
Ptania sp.		HOPLOMERTEA - Ribbon Worms			Shipsa sp.
Erioptera sp.		TETRASTEMMATIDAE			CHLOROPERLIDAE
Rhabdomastix sp.		Prostoma sp.			Alloperla sp.
TRICHOPTERA		LEPIDOPTERA - Moth Larvae			Haploperla sp.
Trichocera sp.		NOCTUIDAE			Sweltia sp.
EPHEMEROPTERA - Mayflies		Arohanara sp.			TAENIOPTERIGIDAE
AMELETIDAE		Bellura sp.			Strophopteryx sp.
Ameletus sp.		PYRALIDAE			Taeniopteryx sp.
BAETIDAE		MEGALOPTERA - Dobsonflies			TRICHOPTERA - Caddisflies
Acentrella sp.		CORYDALIDAE			BRACHYCENTRIDAE
Acerpenna sp.		Chauliodes sp.			Brachycentrus sp.
Baetis sp.		Corydalus sp.			CALAMOCERATIDAE
Centroptilum sp.		Nigronia sp.			Heteroplectron sp.
Diphetero sp.		SIALIDAE			DIPSEUDOPSIDAE
BAETISCIDAE		Stalis sp.			Phylocentropus sp.
Baetisca sp.		NEMATODA - Roundworms			GLOSSOSOMATIDAE
CAENIDAE		NEMATOMORPHA - Horsehair Worms			Glossosoma sp.
Caenis sp.		ODONATA (Anisoptera - Dragonflies)			Agapetus sp.
EPHEMERELLIDAE		AESHNIDAE			HELICOPSYCHIDAE
Dannella sp.		Anax sp.			Helicopsyche sp.
Drunella sp.		Basiaeschna sp.			HYDROPSYCHIDAE
Ephemerella sp.		Boyeria sp.			Cheumatopsyche sp.
Eurylophella sp.		CORDULEGASTRIDAE			Diplectrona sp.
Serratella sp.		Cordulagaster sp.			Hydropsyche sp.
EPHEMERIDAE		CORDULIDAE			Parapsyche sp.
Ephemera sp.		GOMPHIDAE			Potamyia sp.
HEPTAGENIIDAE		Argomphus sp.			HYDROPTILIDAE
Epeorus sp.		Gomphus sp.			Hydroptila sp.
Leucrocota sp.		Hagenius sp.			Leucotrichia sp.
Stenacron sp.		Lanthus sp.			Ochrotrichia sp.
Stenonema sp.		Stylogomphus sp.			LEPIDOSTOMATIDAE
LEPTOPHLEBIIDAE		LIBELLULIDAE			Lepidostoma sp.
Leptophlebia sp.		MACROMIDAE			LEPTOCERIDAE
Habrophlebia sp.		Macromia sp.			Trienodes sp.
Habrophlebiodes sp.		PETALURIDAE			Ceraclea sp.
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies			Oacelis sp.
NEOEPHEMERIDAE		CALOPTERYGIDAE			LIMNephilidae
OLIGONEURIDAE		Calopteryx sp.			Apatina sp.
Isorychia sp.		COENAGRIONIDAE			Hydatophylax sp.
POLYMATRACIDAE		Argia sp.			Ironoquia sp.
POTAMANTHIDAE		LESTIDAE			Pycnopsyche sp.
SIPHONURIDAE		OLIGOCHAETA - Oligochaete Worms	68		MOLLANIDAE
Siphonurus sp.		LUMBRICINA			Molanna sp.
TRICORYTHIDAE		ENCHYTRAIDAE			ODONTOCERIDAE
Tricorythodes sp.		NAIDIDAE			Psilotreta sp.
GASTROPODA - Snails		TUBIFICIDAE	11		PHILOPOTAMIDAE
ANCYLIDAE		LUMBRICULIDAE			Chimarra sp.
Ferissa sp.		POLYCHAETA - Polychaete Worms			Wormakia sp.
HYDROBIIDAE		AELOSOMATIDAE			PHRYGANEIDAE
LYMNAEIDAE		Aelosoma sp.			Philostomis sp.
Fossaria sp.		PLECOPTERA - Stonefly Larvae			POLYCENTROPIDAE
Stagnicola sp.		PERLIDAE			Cymellus sp.
Pseudosuccinea sp.		Acroneria sp.			Polycentropus sp.
PHYSIDAE		Beloneuria sp.			PSYCHOMYIDAE
Physella sp.		Eccoptera sp.			Lype sp.
PLANORBIDAE		Neoperla sp.			Psychomyia sp.
Menetus sp.		Perlesta sp.			RHYACOPHILIDAE
Gyraulus sp.		<i>Perinella sp.</i>			Ryacophila sp.
PLEUROCERIDAE		PERLODIDAE			UENOIDAE
VIVIPARIDAE		Cloperla sp.			Neophylax sp.
Viviparus sp.		Diploperla sp.			TUBELLARIA - Flatworms
HAPLOSCLERIDA		Isoperla sp.			PLANARIIDAE
SPONGILLIDAE		Cultus sp.			DENDROCOELIDAE
HEMIPTERA - True Bugs		PTERONARCYCIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Pelloperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	2-A	SDS/TSS	1	36
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/13/2008	8/13/2008	SDS	SDS	102	25
BIVALVIA - Clams		Forcipomya sp.		Synorthocladus sp.	
SPHAERIDAE	7	Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Placidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	3	Tanypodinae	
UNIONIDAE		Chironominae		Abiabetesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicortendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coplotomus sp.		Nilothauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccosis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracladopelma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcylopus sp.		Phaenopsectra sp.		Thienemannimyia sp.	
Optiosenus sp.		Polypedium sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trisopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubirapha sp.		Zaveliella sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Ciadotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropsectra sp.		Mansonella	
Gyrinus		Micropsectra/Tanyarsarsus complex		Orthopodommyia	
HALIPIDAE	1	Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyla sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Halochares sp.		Zavelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthocladinae		PELCOORHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Paricoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda - Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE	1	Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissocladus sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda - Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrithocladus sp.		TIPULIDAE	2
Atherix sp.		Paratrisocladus sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psalmetriocnemus sp.		Molophilus sp.	
Aliaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladus sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladius sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	2-A	SDS/TSS	1	36
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/13/2008	8/13/2008	SDS	SDS	102	25
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostola sp.	
Pilaria sp.		HOPLOMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Swetla sp.	
EPHEMEROPTERA - Mayflies		Archana sp.		TAENIOPTERIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ametetus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centroptilum sp.		Nigronia sp.		Heteropteron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phyllocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaesha sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Euryophella sp.		CORDULEGASTRIDAE		Dipterona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE	1	Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIDAE		Arigomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocota sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trienodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oacelis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNEPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatna sp.	
Isonychia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONEURIDAE		OLIGOCHAETA - Oligochaete Worms	7	MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molana sp.	
TRICORYTHIDAE		ENCHYTRAEIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Paiotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE	2	PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormadia sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aeolosoma sp.		Phlostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acronuria sp.		Polycentropus sp.	
PHYSIDAE	1	Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Ecoptura sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlesta sp.		RHYACOPHILIDAE	
Gyraulus sp.		Perinella sp.		Ryacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Clioperla sp.		Neophylax sp.	
Vivparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealuctra sp.			
Trepobates sp.		Paraluctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	2-B	SDS/TSS	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/12/2008	8/12/2008	SDS	SDS	30	102
BIVALVIA - Clams		Forcipomyia sp.		Synorthocladus sp.	
SPHAERIDAE	5	Probezzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Placidium sp.		Stilobezzia sp.		Urniella sp.	
Musculium sp.		CHAOBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	89	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicyptochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Coptotomus sp.		Nilothauma sp.		Pantaneura sp.	
Oreodytes sp.		Pagastella sp.		Procladius sp.	
Laccornis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paraclopedima sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcyloepus sp.		Phaenopspectra sp.		Thienemannimyia sp.	
Optioservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubirapha sp.		Zavreliella sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Ouilimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonia	
Gyrinus		Micropectra/Tanytarsus complex		Orthopodomyia	
HALIPIDAE		Paratanytarsus sp.		Peorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropisternus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichocephala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthocladinae		PELCOHRYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchyrtarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Smulium sp.	
CRUSTACEA (Amphiboda- Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Stygonectes sp.		Heleniella sp.		Twina sp.	
Crangonyx sp.		Heterotrissocladius sp.		Stegopterna sp.	
Synurella sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopecladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decopoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIDAE		Orthocladinae A		Eristalis sp.	
PALAEMONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda- Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrachocladius sp.		TIPULIDAE	
Atherix sp.		Paratrissocladius sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psilometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladius sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladius sp.		Ormosia sp.	

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	2-B	SDS/TSS	1	121
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
8/12/2008	8/12/2008	SDS	SDS	30	102
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoma sp.	
Ptilaria sp.		HOPLOMEREMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERA		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanaera sp.		TAENIOPTERIGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydatus sp.		CALAMOCERATIDAE	
Centroptilum sp.		Nigronia sp.		Heteroplectron sp.	
Diphelot sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Sialis sp.		Phyllocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms	3	Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeschna sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		CORDULEGASTRIDAE		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIDAE		Argomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocota sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stenonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Trienodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Ocellis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNephilidae	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isorychnia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHONEURIDAE		OLIGOCHAETA - Oligochaete Worms	1	MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAEIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE		PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormatida sp.	
HYDROBIIDAE		AELOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aeolosoma sp.		Philostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acroneuria sp.		Polycentropus sp.	
PHYSIDAE	3	Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Eccoptera sp.		Lype sp.	
PLANORBIDAE	1	Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlesta sp.		RHYACOPHILIDAE	
Gyraulus sp.		Perinella sp.		Ryacophila sp.	
PLEUROCIERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Cloperla sp.		Neophylax sp.	
Viviparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zaenaeuctra sp.			
Trepobates sp.		Paraleuctra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET*

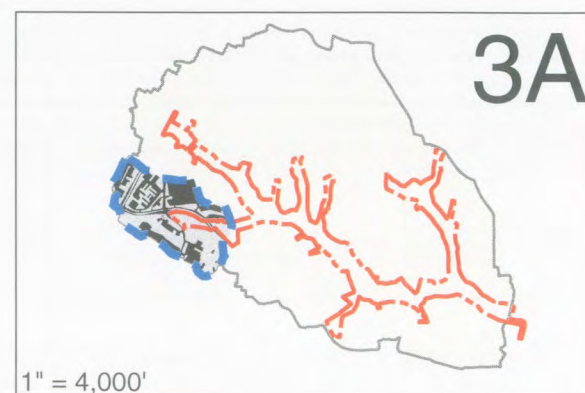
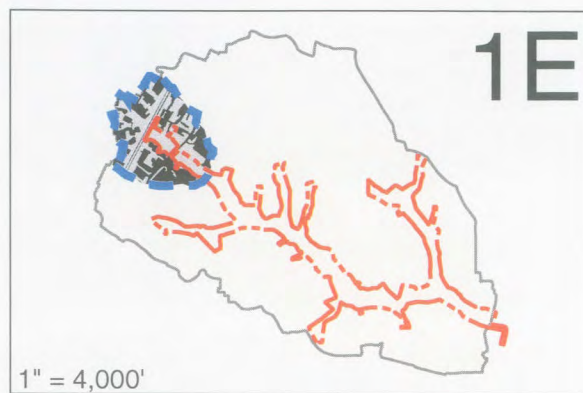
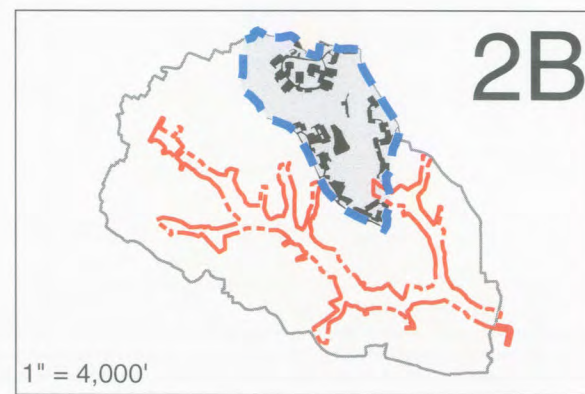
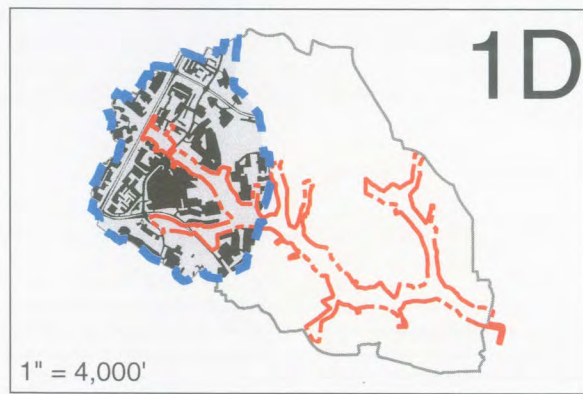
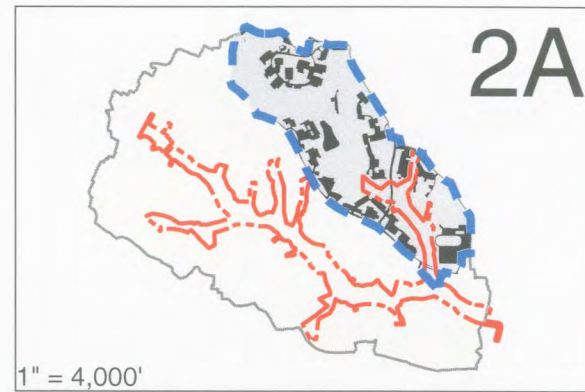
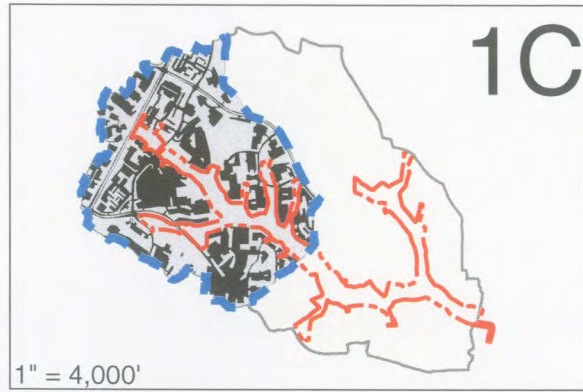
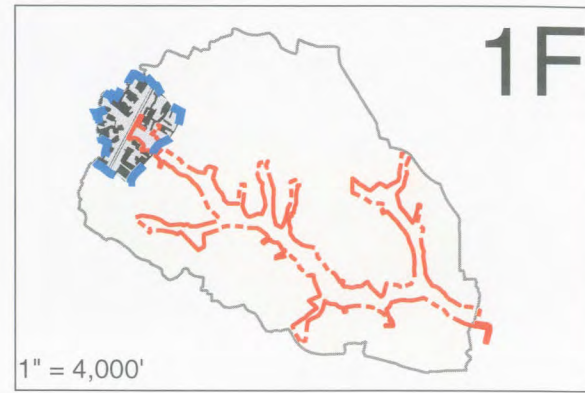
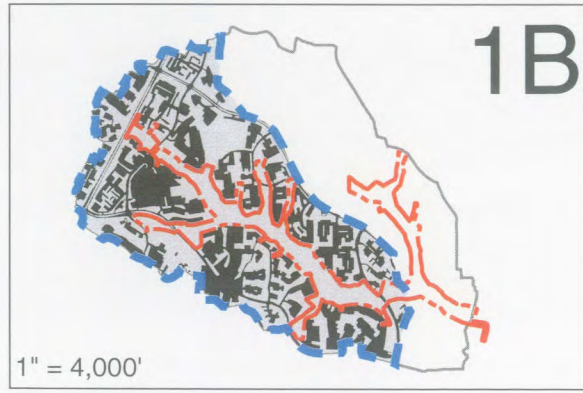
Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	3-A	SDS/TSS	1	120
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
7/23/2008	7/22/2008	SDS	SDS	35	109
BIVALVIA - Clams		Forcipomya sp.		Synorthocladus sp.	
SPHAERIDAE	64	Probazzia sp.		Thienemanniella sp.	
Sphaerium sp.		Sphaeromias sp.		Tvetenia sp.	
Pisidium sp.		Stilobezzia sp.		Unniella sp.	
Musculium sp.		CHAEBORIDAE		Xylotopus sp.	
CORBICULIDAE		Chaborus sp.		Zalutschia sp.	
Corbicula fluminea sp.		CHIRONOMIDAE	4	Tanypodinae	
UNIONIDAE		Chironominae		Ablabesmyia sp.	
BRANCHIOBELLELLIDA		Chironomini		Alotanypus sp.	
BRANCHIOBELLELLIDAE		Chironomus sp.		Apsectrotanypus sp.	
TETRASTEMMATIDAE		Cryptochironomus sp.		Clinotanypus sp.	
COLEOPTERA - Beetles		Cryptotendipes sp.		Conchapelopia sp.	
CANTHERIDAE		Demicrochironomus sp.		Guttipelopia sp.	
CURCULIONIDAE		Dicrotendipes sp.		Krenopelopia sp.	
DRYOPIDAE		Einfeldia sp.		Labrundinia sp.	
Helichus sp.		Endochironomus sp.		Larsia sp.	
DYTISCIDAE		Glyptotendipes sp.		Macropelopia sp.	
Agabus sp.		Kiefferulus sp.		Meropelopia sp.	
Hydroporus sp.		Microtendipes sp.		Paramerina sp.	
Copelotomus sp.		Nilothauma sp.		Pentaneura sp.	
Oreodytes sp.		Pagastelia sp.		Procladius sp.	
Laccosis sp.		Parachironomus sp.		Psectrotanypus sp.	
Dytiscus sp.		Paracaladopolma sp.		Rheopelopia sp.	
ELMIDAE		Paratendipes sp.		Tanypus sp.	
Microcylopus sp.		Phaenopsectra sp.		Thienemannimyia sp.	
Optioservus sp.		Polypedilum sp.		Thienemannimyia sp.	
Stenelmis sp.		Stenochironomus sp.		Trissopelopia sp.	
Promoresia sp.		Stictochironomus sp.		Zavrelimyia sp.	
Macronychus sp.		Tribelos sp.		CULICIDAE	
Dubirapha sp.		Zavrelia sp.		Aedes	
Ancyronyx sp.		Tanytarsini		Anopheles	
Oulimnius sp.		Cladotanytarsus sp.		Culex	
GYRINIDAE		Constempellina sp.		Culiseta	
Dineutus		Micropectra sp.		Mansonella	
Gyrinus		Micropectra/Tanyarsus complex		Orthopodomysia	
HALIPIDAE		Paratanytarsus sp.		Psorophora	
Halipus sp.		Rheotanytarsus sp.		Toxorhynchites	
HYDROPHILIDAE		Stempellina sp.		Uranotaenia	
Cymbiodyta sp.		Stempellinella sp.		Wyeomyia	
Berosus sp.		Sublettea sp.		DIXIDAE	
Derallus sp.		Tanytarsus sp.		Dixa sp.	
Helochares sp.		Zavrelia sp.		DOLICHOPODIDAE	
Helophorus sp.		Diamesinae		EMPIDIDAE	
Hydrophilus sp.		Diamesa sp.		Chelifera sp.	
Hydrochus sp.		Pagastia sp.		Clinocera sp.	
Tropistamus sp.		Pothastia sp.		Hemerodromia sp.	
Hydrobius sp.		Prodiamesa sp.		Dolichoccephala sp.	
Laccobius sp.		Sympothastia sp.		EPHYDRIDAE	
PSEPHENIDAE		Orthocladinae		PELCOHORHYNCHIDAE	
Psephenus sp.		Brillia sp.		Glutops sp.	
Ectopria sp.		Cardiocladius sp.		PSYCHODIDAE	
Dicranopselaphus sp.		Chaetocladius sp.		Pericoma sp.	
PTILODACTYLIDAE		Corynoneura sp.		Psychoda sp.	
Anchytarsus sp.		Cricotopus sp.		SIMULIDAE	
COPEPODA		Cricotopus/Orthocladus sp.		Simulium sp.	
CRUSTACEA (Amphipoda- Scuds)		Diplocladius sp.		Prosimulium sp.	
CRANYONYCTIDAE		Eukiefferiella sp.		Cnephia sp.	
Sygonectes sp.		Halenella sp.		Twinia sp.	
Crangonyx sp.		Heterotrissociadius sp.		Stegopterna sp.	
Synuralla sp.		Hydrobaenus sp.		Ectemnia sp.	
GAMMARIDAE		Limnophyes sp.		STRATIOMYIDAE	
Gammarus sp.		Lopescladius sp.		Oxycera sp.	
HYALELLIDAE		Mesocricotopus sp.		Odontomyia sp.	
Hyalella sp.		Mesosmittia sp.		SYRPHIDAE	
CRUSTACEA (Decapoda - Crayfish)		Nanocladius sp.		Chrysogaster sp.	
CAMBARIIDAE		Orthocladinae A		Eristalis sp.	
PALAEONIDAE		Orthocladus sp.		TABANIDAE	
CRUSTACEA (Isopoda- Sowbugs)		Parachaetocladius sp.		Chrysops sp.	
ASELIDAE		Parakiefferiella sp.		Tabanus sp.	
Caecidotea sp.		Parametricnemus sp.		TANYDERIDAE	
Lirceus sp.		Paraphaenocladus sp.		THAUMALEIDAE	
DIPTERA - True Flies		Parasmittia sp.		Thaumalea sp.	
ATHERICIDAE		Paratrachocladius sp.		TIPULIDAE	
Atherix sp.		Paratrisociadius sp.		Antocha sp.	
BLEPHARICERIDAE		Psectrocladius sp.		Hexatoma sp.	
CECIDOMYIIDAE		Pseudorthocladus sp.		Leptotarsus sp.	
CERATOPOGONIDAE		Psilometricnemus sp.		Molophilus sp.	
Alluaudomyia sp.		Rheocricotopus sp.		Tipula sp.	
Bezzia sp.		Rheosmittia sp.		Pseudolimnophila sp.	
Ceratopogon sp.		Smittia sp.		Dicranota sp.	
Culicoides sp.		Stilocladus sp.		Limnophila sp.	
Dasyhelea sp.		Symposiocladus sp.		Ormosia sp.	



WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Snakeden Branch - Pre Con. Year 2	20003	3-A	SDS/TSS	1	120
Date ID'd	Date Sorted	Taxonomist	Sorter	# Grids in Subsample	Total No. Organisms ID'd
7/23/2008	7/22/2008	SDS	SDS	35	109
Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostola sp.	
Pilaria sp.		HOPLOMEREMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		TETRASTEMMATIDAE		CHLOROPERLIDAE	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOPTERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		NOCTUIDAE		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanaera sp.		TAENIOPTERIGIDAE	
AMELETIDAE		Bellura sp.		Strophopteryx sp.	
Ameletus sp.		PYRALIDAE		Taeniopteryx sp.	
BAETIDAE		MEGALOPTERA - Dobsonflies		TRICHOPTERA - Caddisflies	
Acentrella sp.		CORYDALIDAE		BRACHYCENTRIDAE	
Acerpenna sp.		Chauliodes sp.		Brachycentrus sp.	
Baetis sp.		Corydalus sp.		CALAMOCERATIDAE	
Centroptilum sp.		Nigronia sp.		Heteroplectron sp.	
Dipheter sp.		SIALIDAE		DIPSEUDOPSIDAE	
BAETISCIDAE		Stalis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		GLOSSOSOMATIDAE	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisoptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		AESHNIDAE		HELICOPSYCHIDAE	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeschna sp.		HYDROPSYCHIDAE	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		CORDULEGASTRIDAE		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		CORDULIDAE		Parapsyche sp.	
Ephemera sp.		GOMPHIDAE		Potamyia sp.	
HEPTAGENIDAE		Arigomphus sp.		HYDROPTILIDAE	
Epeorus sp.		Gomphus sp.		Hydroptila sp.	
Leucrocota sp.		Hagenius sp.		Leucotrichia sp.	
Stenacron sp.		Lanthus sp.		Ochrotrichia sp.	
Stonema sp.		Stylogomphus sp.		LEPIDOSTOMATIDAE	
LEPTOPHLEBIIDAE		LIBELLULIDAE		Lepidostoma sp.	
Leptophlebia sp.		MACROMIIDAE		LEPTOCERIDAE	
Habrophlebia sp.		Macromia sp.		Triacnodes sp.	
Habrophlebiodes sp.		PETALURIDAE		Caraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies		Oacelis sp.	
NEOEPHEMERIDAE		CALOPTERYGIDAE		LIMNIPHILIDAE	
OLIGONEURIDAE		Calopteryx sp.		Apatnia sp.	
Isocybia sp.		COENAGRIONIDAE		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		LESTIDAE		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	29	MOLANNIDAE	
Siphonurus sp.		LUMBRICINA		Molanna sp.	
TRICORYTHIDAE		ENCHYTRAEIDAE		ODONTOCERIDAE	
Tricorythodes sp.		NAIDIDAE		Psilotreta sp.	
GASTROPODA - Snails		TUBIFICIDAE	10	PHILOPOTAMIDAE	
ANCYLIDAE		LUMBRICULIDAE		Chimarra sp.	
Ferissa sp.		POLYCHAETA - Polychaete Worms		Wormadia sp.	
HYDROBIIDAE		AEOLOSOMATIDAE		PHRYGANEIDAE	
LYMNAEIDAE		Aeolosoma sp.		Ptilostomis sp.	
Fossaria sp.		PLECOPTERA - Stonefly Larvae		POLYCENTROPIDAE	
Stagnicola sp.		PERLIDAE		Cymellus sp.	
Pseudosuccinea sp.		Acronuria sp.		Polycentropus sp.	
PHYSIDAE	1	Beloneuria sp.		PSYCHOMYIDAE	
Physella sp.		Ecoptura sp.		Lype sp.	
PLANORBIDAE		Neoperla sp.		Psychomyia sp.	
Menetus sp.		Perlenta sp.		RHYACOPHILIDAE	
Gyraulus sp.		Perlinella sp.		Ryacophila sp.	
PLEUROCERIDAE		PERLODIDAE		UENOIDAE	
VIVIPARIDAE		Clioperla sp.		Neophylax sp.	
Vivparus sp.		Diploperla sp.		TUBELLARIA - Flatworms	1
HAPLOSCLERIDA		Isoperla sp.		PLANARIIDAE	
SPONGILLIDAE		Cultus sp.		DENDROCOELIDAE	
HEMIPTERA - True Bugs		PTERONARCYIDAE			
BELOSTOMATIDAE		Pteronarcys sp.			
Belostoma sp.		PELTOPERLIDAE			
Lethocerus sp.		Peltoperla sp.			
CORIXIDAE		LEUCTRIDAE			
GELASTOCORIDAE		Leuctra sp.			
GERRIDAE		Zealectra sp.			
Trepobates sp.		Paralectra sp.			
HEBRIDAE		CAPNIDAE			
HYDROMETRIDAE		Allocapnia sp.			
MESOVELIDAE		Paracapnia sp.			
NEPIDAE		NEMOURIDAE			
Nepa sp.		Amphinemura sp.			
Ranatra sp.		Ostrocerca sp.			
VELIDAE		Nemoura sp.			

* Taxa in grey are higher-level taxa (i.e., phylum, class, subclass order). Taxa in bold are either family or subfamily-level taxa.



Land Cover Map
Snakeden Branch
Scale as Noted

Stream ID	Impervious Percent	Total Acres
1A	38%	863
1B	45%	540
1C	46%	386
1D	45%	291
1E	50%	77
1F	47%	55
2A	26%	256
2B	25%	169
3A	49%	75

- SITE
- DRAINAGE BOUNDARIES
- IMPERVIOUS AREAS
- PERVIOUS AREAS



Appendix A - List of Impaired (Category 5) Waters in 2006*

Assessment Unit ID	Waterbody Name	City / County	Assessment Unit Description
Potomac and Shenandoah River Basins			
TMDL Watershed Name: Shenandoah River, South Fork			
TMDL Group ID: 00403			
VAV-B35R_SSF01A00	South Fork Shenandoah River	ROCKINGHAM CO	South Fork Shenandoah River from its confluence with Big Run downstream to its confluence with Naked Creek.
VA Overall AU Category: 5A	15.17 MILES	2002	Impairment Specific Comments and/or Impairment Specific VA Category
Recreation	Fecal Coliform	00403	2010
Sources: Source Unknown			
VAV-B37R_SSF01A00	S.F. Shenandoah River	PAGE CO ROCKINGHAM CO	South Fork Shenandoah River from its confluence with Naked Creek downstream to its confluence with Stoney Run just above the Route 340 bridge at Alma.
VA Overall AU Category: 5A	18.28 MILES	2002	Impairment Specific Comments and/or Impairment Specific VA Category
Recreation	Fecal Coliform	00403	2010
Sources: Source Unknown			
VAV-B38R_SSF01A00	South Fork Shenandoah River	PAGE CO	South Fork Shenandoah River from its confluence with Stoney Run just above the Route 340 bridge at Alma downstream to its confluence with Hawksbill Creek.
VA Overall AU Category: 5A	16.09 MILES	2002	Impairment Specific Comments and/or Impairment Specific VA Category
Recreation	Fecal Coliform	00403	2010
Sources: Source Unknown Wildlife Other than Waterfowl			
Snakeden Branch			
TMDL Watershed Name: Snakeden Branch			
TMDL Group ID: 60019			
VAN-A11R_SNA01A02	Snakeden Branch	FAIRFAX CO	Segment begins at the confluence with an unnamed tributary to Snakeden Branch, approximately 0.4 rivermile downstream from the Twin Branches Road bridge, and continues downstream until the confluence with Difficult Run.
VA Overall AU Category: 5A	0.79 MILES	2006	Impairment Specific Comments and/or Impairment Specific VA Category
Recreation	Escherichia coli	60019	2018
Sources: Source Unknown			