Wetland
Studies and Solutions, Inc.

BIOLOGICAL MONITORING REPORT #2

Pre-construction Monitoring

NORTHERN VIRGINIA STREAM RESTORATION BANK

Colvin Run Watershed
(±31,000 LINEAR FEET)

FAIRFAX COUNTY, VIRGINIA

Prepared For:

Northern Virginia Stream Restoration, L.C.
c/o Wetland Studies and Solutions, Inc.
5300 Wellington Branch Drive, Suite 100
Gainesville, Virginia 20155

WSSI Project #20010 – Task D

December 8, 2008

5300 Wellington Branch Drive • Suite 100 • Gainesville, VA 20155 • Phone 703.679.5600 • Fax 703.679.5601 • www.wetlandstudies.com

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I. Executive Summary

As set forth in the "Northern Virginia Stream Restoration Bank Banking Instrument" (Banking Instrument), approximately 31,000 linear feet of streams and drainage features within the Colvin Run 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 Colvin Run Watershed portion of the Northern Virginia Stream Restoration Bank (NVSRB) 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 in addition to prior pre-construction monitoring is to determine the baseline conditions of the streams within the Colvin Run Watershed Portion of the NVSRB in 2008, 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 ten 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.

Our baseline habitat results indicate that habitat of the streams within the Colvin Run Watershed portion of the NVSRB in 2008 is in a range from "Poor" to "Fair", with habitat assessment scores of 139 (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 preconstruction monitoring.

Baseline benthic macroinvertebrate results indicate that the benthic macroinvertebrate community of the streams within the Colvin Run watershed portion of the NVSRB in 2008 is in the category of "Stress" to "Severe Stress", with VA-SCI scores below 49 (out of 100) for all stream reaches 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. 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 are known to have 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 the town of 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 and the first pre-construction monitoring report characterize the baseline conditions of the streams within the Colvin Run 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 Colvin Run Watershed portion of the NVSRB[1], 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 31,000 linear feet of stream along Colvin Run and several unnamed tributaries of Colvin Run, as well as the adjacent riparian corridor. The study area is located between the Dulles Access Road (Route 267) and Harry Bird Highway (Route 7) to the west of Lake Fairfax Park, in Northern 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. Colvin Run flows in a northeasterly direction through the southern portion of the study area. The study area is gently to steeply 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 a report entitled "Waters of the U.S. Delineation, Northern Virginia Stream Restoration Bank, A Portion of the Colvin Run Watershed (± 116 acres)". WSSI has received a confirmation letter (# 2007-2482) from the U.S. Army Corps of Engineers (COE) dated May 31, 2007, confirming the delineation.

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 2,000 linear feet of stream restoration along samplable streams at the NVSRB. Once established, these reaches

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[1] *Note that monitoring reports for Snakeden Branch and The Glade watershed portions of the NVSRB will be provided under separate cover.*

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)[2].

- 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)[3].

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 ten permanent sampling reaches that were selected in Biological Monitoring Report #1 (Reaches 1-A, 2-A, 2-B, 3-A, 4-A, 5-A, 6-A, 7-A, 8-A[4], and 9-A). The location of these ten sampling reaches relative to the reaches created for restoration design purposes is depicted in Figure 1, below[5]. 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 was conducted by WSSI environmental scientists Sean D. Sipple, CT, PWS[6], Lynn Straughan, PWS, Jennifer Van Houten, PWS, PWD, and Beth Clements between March 10 and 12, 2008.

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2 *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, Colvin Run Watershed", dated November 6, 2008.*

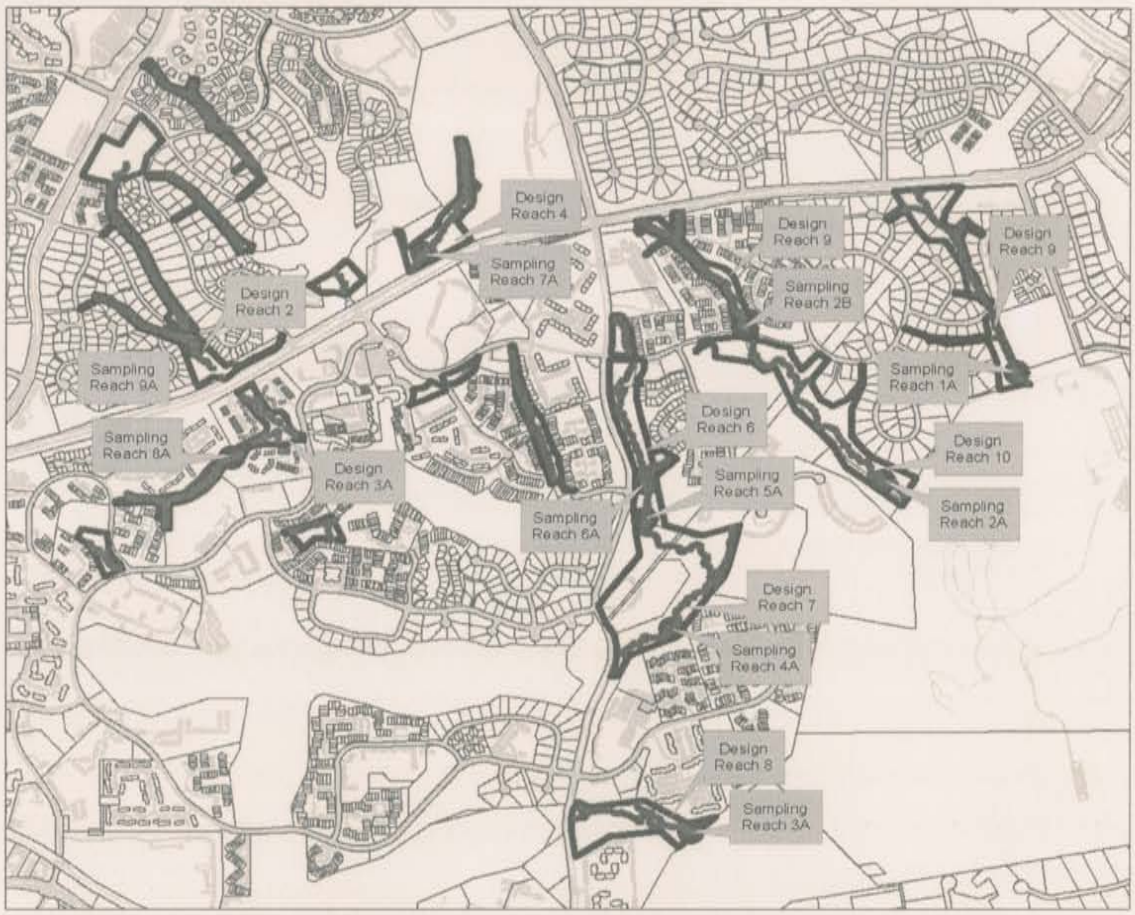
3 *This method is to be used in all monitoring years and is accompanied by a habitat assessment, following guidance established by Virginia Department of Environmental Quality's (DEQ) standard operating procedures for stream habitat assessment (SOPs; DEQ 2006b) and the EPA's RBP for habitat (Barbour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

4 *Note that during the 2008 sampling, Stream Reach 8-a was shifted approximately 200 feet downstream due to lack of flowing water in the original reach.*

5 *Note that for design purposes, Colvin Run has been divided into 16 manageable restoration reaches. Monitoring stream reach labels 1-A, 2-A, 2-B, 3-A, 4-A, 5-A, 6-A, 7-A, 8-A, and 9-A correspond with construction design reach labels 12, 10, 9, 8, 7, 6, 6, 4, 3A, and 2 respectively.*

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).*

Figure 1. Restoration Design and Sampling Reach Location Map



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 the best possible score[7], 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:

Percentage of Best Possible Score = (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.

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[7] *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.*

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 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 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 a VA-SCI range of 0-100. The weighting is as follows:

    - Total Taxa: Score = 100 x (X/22), where X = Metric Value
    - EPT Taxa: Score = 100 x (X/11), where X = Metric Value
    - Percent Ephemeroptera: Score = 100 x (X/61.3), where X = Metric Value
    - Percent Plecoptera + Trichoptera less Hydropsychidae: Score = 100 x (X/35.6), where X = Metric Value
    - Percent Scrapers: Score = 100 x (X/51.6), where X = Metric Value
    - Percent Chironomidae: Score = 100 x [(100-X) (100-0)], where X = Metric Value
    - Percent Top 2 Dominant: Score = 100 x [(100-X) (100-30.8)], where X = Metric Value
    - Hilsenhoff Biotic Index: Score = 100 x [(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.

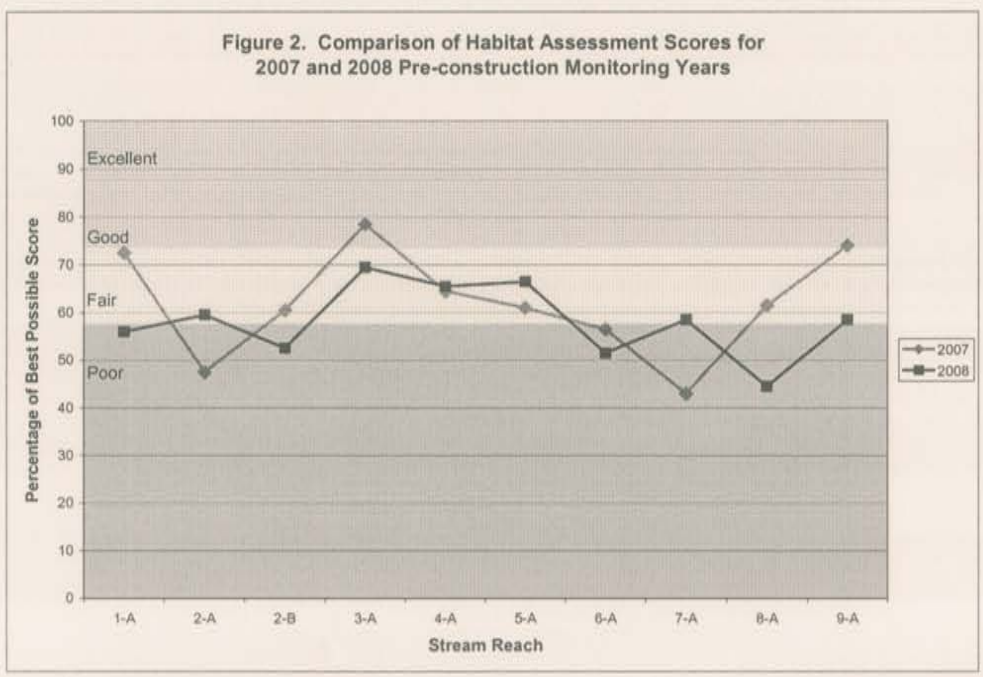
Biological Stream Monitoring Results and Discussion. Habitat results for 2008 show that all ten stream reaches (Reaches 1-A, 2-A, 2-B, 3-A, 4-A, 5-A, 6-A, 7-A, 8-A, and 9-A) have either "Poor" or "Fair" habitat conditions (Table 1, below; Exhibit 5). Reaches 3-A and 5-A have the best habitat scores, with habitat assessment scores of 139 out of 200 ("Fair") and 133 out of 200 ("Fair"), respectively. Reach 8-A has the worst habitat score, having a habitat assessment score of 89 out of 200 ("Poor"). All reaches have low habitat assessment scores 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

Colvin Run Watershed portion of the NVSRB in 2008 is 117, which is 59 percent of the best possible score ("Poor").

Table 1. 2008 Colvin Run Watershed Total Habitat Assessment Scores

REACH	Habitat Assessment Score	Percent Best Possible Score	Narrative Rating
1-A	112	56	Poor
2-A	119	60	Fair
2-B	105	53	Poor
3-A	139	70	Fair
4-A	131	66	Fair
5-A	133	67	Fair
6-A	103	52	Poor
7-A	117	59	Poor
8-A	89	45	Poor
9-A	117	59	Poor
Average	**117**	**59**	**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 Colvin Run Watershed portion of the NVSRB in 2007 was 124, which is 62 percent of the best possible score ("Fair").



Benthic macroinvertebrate results show that individuals from 33 taxa[8] were collected from all ten reaches collectively (Table 2, below; Exhibit 7) during the 2008 pre-construction benthic macroinvertebrate monitoring. These 33 taxa include physid, hydrobiid, lymnaid snails, and unknown snails (Families Physidae, Hydrobiidae, Lymnaeidae, and Order Gastropoda, respectively); fingernail clams (Family Sphaeriidae); oligochaete, ribbon, and flat worms (Family Tubificidae and Class Oligochaeta, Phylum Nemertea, and Family Planariidae, respectively); mites (Family Hydrachnida); springtails (Family Isotomidae); aquatic moth larvae (Family Noctuidae); broad shoulder water striders (Family Veliidae); scuds (Family Crangonyctidae); aquatic sowbugs (Family Asellidae); crayfish (Family Cambaridae); non-biting midge, crane, aquatic longlegged, moth, phorid, dixid, and unknown fly larvae (Families Chironomidae, Tipulidae, Dolichopodidae, Psychididae, Phoridae, Dixidae, Diptera Family #1, and Order Diptera respectively); common net-spinning, northern casemaker, and fingernet caddisfly larvae (Families Hydropsychidae, Limnephilidae, and Philipotamidae, respectively); broadwinged and narrowwinged damselfly larvae (Families Calopterygidae and Coenagrionidae, respectively); green-eyed skimmer, darner, and clubtail, dragonfly larvae (Families Corduliidae, Aeshnidae, and Gomphidae, respectively); and weevils, predaceous diving beetles, and riffle beetles (Families Curculionidae, Dytiscidae, and Elmidae, respectively). Of all 33 taxa collected, non-biting midge larvae and oligochaete worms comprised the majority of individuals in each reach (Table 2, below).

The data collected for each reach (Table 2) 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. The results of our data analysis indicate that the benthic macroinvertebrate community at nine of the stream reaches (Reaches 1-A, 2-A, 2-B, 3-A, 4-A, 5-A, 7-A, 8-A, and 9-A) are in "Severe Stress" and stream reach (6-A) is in "Stress" in 2008 prior to stream restoration activities, based on their VA-SCI scores (Table 4). The highest VA-SCI score was observed at Reach 6-A (48.52) and the lowest VA-SCI score was observed at Reach 8-A (14.65). The average VA-SCI numerical score for all streams assessed within the Colvin Run Watershed portion of the NVSRB in 2008 is 31.36 ("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 3).

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[8] *Although 36 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.*

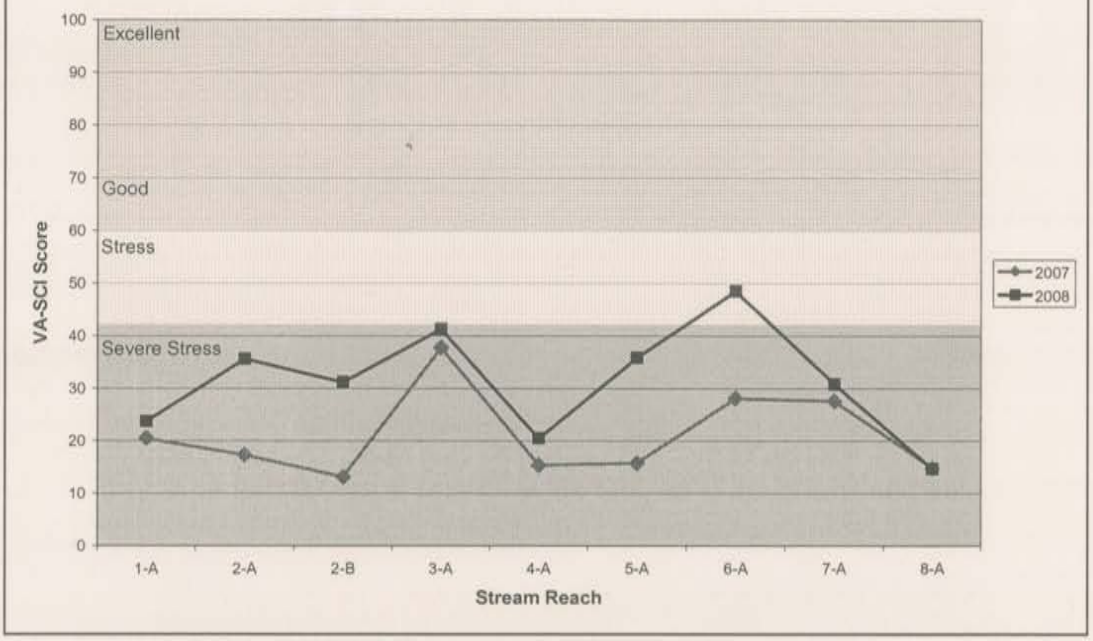
Table 2. Colvin Run Watershed Raw Data											
TAXA	REACH										
	1-A	2-A	2-B	3-A	4-A	5-A	6-A	7-A	8-A	9-A	TOTAL
Aeshnidae	-	-	-	2	-	-	-	-	-	-	2
Asellidae	-	-	-	-	-	-	-	-	-	1	1
Calopterygidae	-	-	-	2	1	-	-	-	-	-	3
Cambaridae	-	-	-	-	-	-	-	-	2	2	4
Chironomidae	71	18	18	39	60	32	18	4	97	42	399
Coenagrionidae	-	-	-	8	-	-	-	-	-	-	8
Corbiculidae	1	-	-	-	-	-	-	-	-	-	1
Corduliidae	-	1	-	-	-	-	-	-	-	-	1
Crangonyctidae	-	4	-	35	-	9	15	6	1	-	70
Curculionidae	-	-	-	-	1	-	-	-	-	-	1
Diptera	-	-	-	-	-	1	-	5	-	-	6
Diptera Family #1	-	-	-	-	-	1	-	-	-	-	1
Dixidae	-	-	-	-	-	-	3	-	-	-	3
Dolichopodidae	-	-	-	-	-	1	-	-	1	3	5
Dytiscidae	-	1	-	-	-	-	-	7	-	-	8
Elmidae	-	-	-	11	-	-	-	-	-	-	11
Gastropoda	-	-	2	-	-	-	1	-	-	-	3
Gomphidae	-	-	-	2	-	-	-	-	-	-	2
Hydrachnida	-	-	-	-	-	1	-	-	-	-	1
Hydrobiidae	-	-	-	-	-	1	80	-	-	-	81
Hydropsychidae	-	-	2	8	5	-	-	-	-	-	15
Isotomidae	-	3	-	-	-	2	3	-	-	2	10
Limnephilidae	-	-	-	-	-	-	-	-	-	1	1
Lymnaeidae	6	-	-	-	-	-	-	-	-	-	6
Nemertea	1	-	-	-	-	-	-	-	-	-	1
Noctuidae	-	-	-	-	-	1	-	-	-	-	1
Oligochaeta	14	54	75	-	2	25	3	18	2	28	221
Philopotamidae	-	-	-	9	-	-	-	-		-	9
Phoridae	2	3	-	-	-	1	3	3	1	6	19
Physidae	1	3	-	3	4	3	-	-	-	-	14
Planariidae	-	1	-	-	-	1	-	26	-	-	28
Psychodidae	-	-	-	-	-	2	1	-	-	-	3
Sphaeridae	8	-	-	-	1	-	7	3	-	3	22
Tipulidae	2	4	1	2	1	3	9	2	2	1	27
Tubificidae	5	2	-	1	-	2	2	43	4	2	61
Veliidae	-	-	-	-	5	-	-	-	-	-	5
Total	**111**	**94**	**98**	**122**	**80**	**86**	**145**	**117**	**110**	**91**	**1054**

Table 3. 2008 Colvin Run 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	0	0.00	0.00	6.31	63.96	76.58	5.44
2-A	10	0	0.00	0.00	3.19	19.15	76.60	1.95
2-B	5	1	0.00	0.00	0.00	18.37	94.90	1.23
3-A	12	2	0.00	7.38	11.48	31.97	60.66	3.89
4-A	9	1	0.00	0.00	5.00	75.00	87.50	5.85
5-A	14	0	0.00	0.00	4.65	37.21	66.28	3.03
6-A	10	0	0.00	0.00	55.17	12.41	67.59	3.11
7-A	8	0	0.00	0.00	0.00	3.42	58.97	6.27
8-A	7	0	0.00	0.00	0.00	88.18	91.82	5.80
9-A	10	1	0.00	1.10	0.00	46.15	76.92	3.53

Table 4. 2008 Colvin Run Watershed Biotic Metric and Index Weighting and VA-SCI										
METRIC	REACH									
	1-A	2-A	2-B	3-A	4-A	5-A	6-A	7-A	8-A	9-A
Total Taxa	40.91	45.45	22.73	54.55	40.91	63.64	45.45	36.36	31.82	45.45
EPT Taxa	0.00	0.00	9.09	18.18	9.09	0.00	0.00	0.00	0.00	9.09
Percent Ephemeroptera	0.00	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	20.72	0.00	0.00	0.00	0.00	0.00	3.09
Percent Scrapers	12.22	6.19	0.00	22.24	9.69	9.01	106.92	0.00	0.00	0.00
Percent Chironomidae	36.04	80.85	81.63	68.03	25.00	62.79	87.59	96.58	11.82	53.85
Percent Top Two Dominant	33.85	33.82	7.37	56.86	18.06	48.73	46.84	59.29	11.82	33.35
HBI	67.04	118.43	128.90	89.80	61.03	102.43	101.32	54.80	61.76	95.18
VA-SCI Numerical Score	**23.76**	**35.59**	**31.22**	**41.30**	**20.47**	**35.82**	**48.52**	**30.88**	**14.65**	**30.00**
Average VA-SCI Numerical Score	**31.36**									
Average VA-SCI Narrative Score	**Severe Stress**									

These results are similar to the 2007 monitoring, except for Reach 6-A, which went from "Severe Stress" in 2007 to "Stress" in 2008 (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 are known to have occurred within the study area prior to the 2008 monitoring.

Figure 3. Comparison of VA-SCI Scores for 2007 and 2008 Pre-construction Monitoring Years



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), except for Reach 7-A, as depicted in the Land Cover Map (Exhibit 8), and Table 5, below. 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).

Table 5. Impervious Land Cover and VA-SCI for Each Reach

REACH	Watershed Acres	Percent Impervious	VA-SCI
1-A	156	22	23.76
2-A	176	24	35.59
2-B	100	26	31.22
3-A	704	43	41.30
4-A	245	25	20.47
5-A	75	28	35.82
6-A	5.7	23	48.52
7-A	44	1.3	30.88
8-A	48	29	14.65
9-A	67	22	30.00
Total	**1620.7**	**-**	**-**

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, waterfowl and faulty sewer lines. 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.

VI. 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 primarily in "Severe Stress". The low VA-SCI and habitat scores are likely due to several confounding abiotic factors, including channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, lack of epifaunal substrate/available cover, highly impervious land cover, and high nutrient, toxicant and sediment input from adjacent land use.

VII. 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.

Jennifer VanHorn for

Beth Clements
Environmental Technician

Sean D. Sipple, CT, PWS, PWD
Environmental Scientist

VIII. Literature Cited

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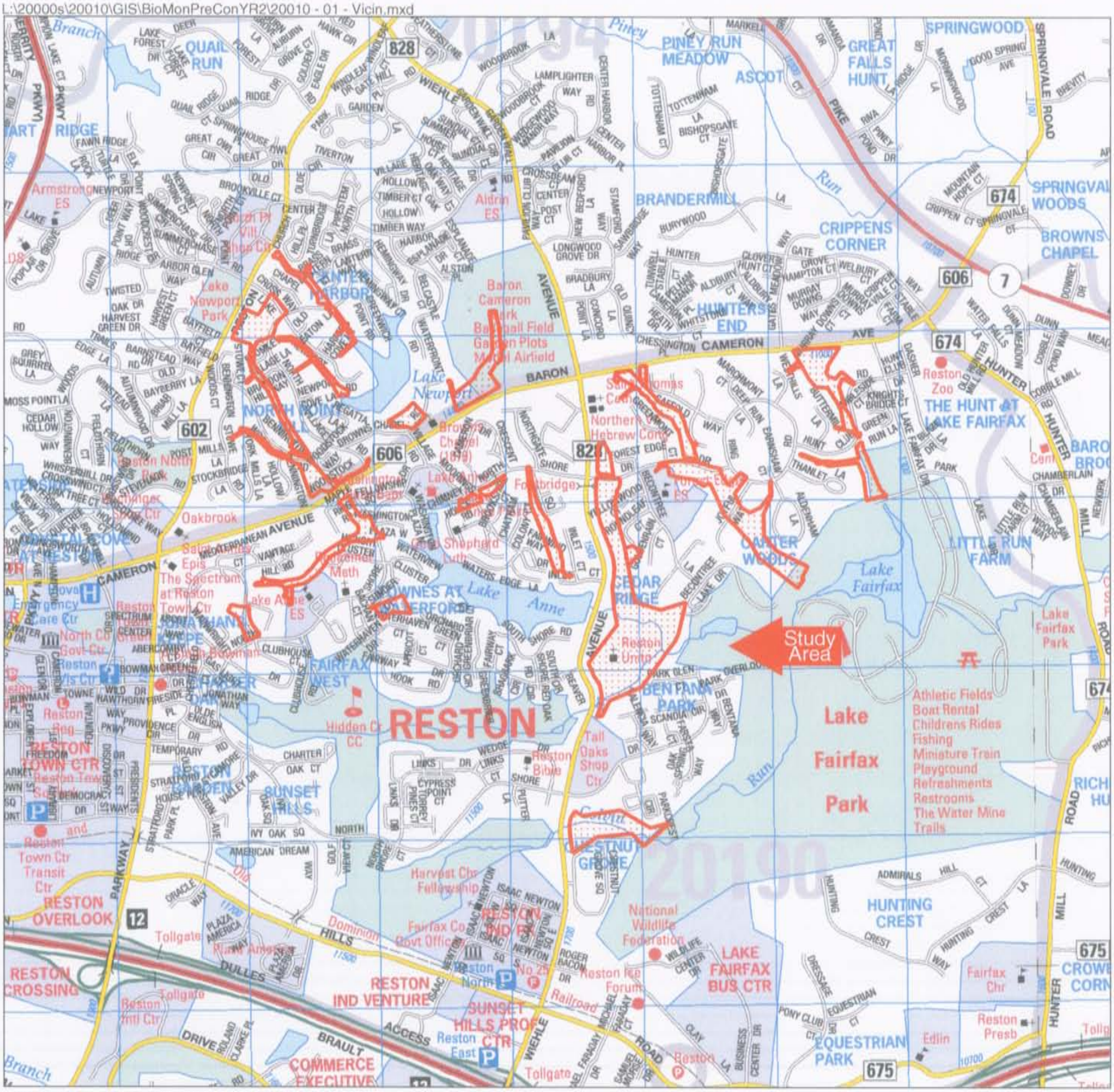

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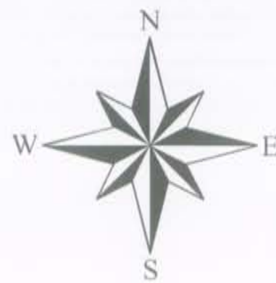
Vicinity Map
Colvin Run
WSSI #20010
Scale: 1" = 2000'



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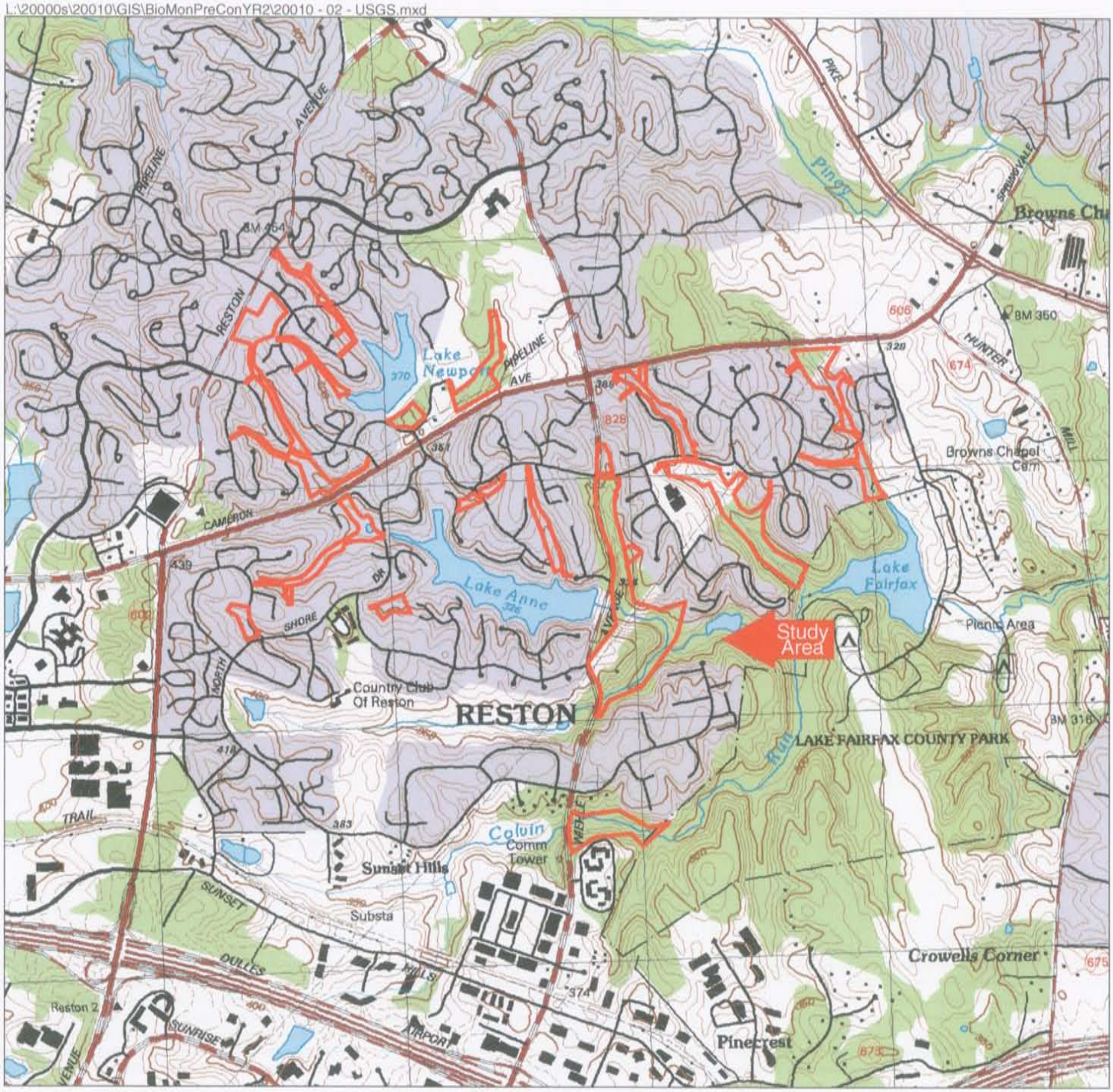

USGS Quad Map
Vienna, VA-MD 1994
Colvin Run
WSSI #20010
Scale: 1" = 2000'

N
W E
S

Latitude: 38°58'00" N
Longitude: 77°20'06" W
Hydrologic Unit Code (HUC): 020700081004
Stream Class: III
Name of Watershed:Colvin Run

BIOLOGICAL STREAM MONITORING NOTES:

1. Wetland Studies and Solutions, Inc. (WSSI) performed biological stream monitoring on the Colvin Run watershed portion of the Northern Virginia Stream Restoration Bank (NVSRB). This assessment was conducted pursuant to the maintenance and monitoring requirements defined in the NVSRB Banking Instrument. This second pre-construction monitoring report and first pre-construction monitoring report characterize the baseline conditions against which future biological monitoring in the study area can be compared.

2. Biological stream monitoring was conducted along ten permanent biological monitoring reaches to collect 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. This second round of pre-construction biological monitoring fieldwork was conducted between March 10 and 12, 2008 by Sean D. Sipple, CT, PWS, PWD, Lynn Straughan, PWS, PWD, Jennifer Van Houten, PWS, PWD and Beth Clements.

3. Baseline habitat results indicate that habitat of the streams within the Colvin Run Watershed portion of the NVSRB in 2008 is in a range from "Poor" to "Fair", with habitat assessment scores of 139 (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 Colvin Run watershed portion of the NVSRB are in "Severe Stress" in 2008, with VA-SCI scores below 49 (out of 100) for all streams assessed. The low VA-SCI scores are likely due to several confounding abiotic factors, including channel alteration, high sediment deposition, bank instability, lack of vegetative protection along the stream banks, lack of epifaunal substrate/available cover, highly impervious land cover within the watershed, and high nutrient, toxicant and sediment input from adjacent land use .

5. Topographic information provided by Fairfax County Digital Data and Air Survey Corp., boundary information provided by WSSI, and a WSSI Spring 2004 color infrared image 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 Colvin Run portion of the NVSRB were delineated and survey-located by WSSI as described in the NVSRB, a Portion of the Colvin Run Watershed delineation report, dated August 25, 2006. The U.S. Army Corps of Engineers issued a wetland confirmation for this site, dated May 31, 2007 (JD #2007-2482).

7. Note that during the 2008 sampling, Stream Reach 8-A was shifted approximately 200 feet downstream due to lack of flowing water in the original reach.

Colvin Run Watershed Biotic Metric and Index Weighting and VA-SCI

METRIC	REACH									
	1-A	2-A	2-B	3-A	4-A	5-A	6-A	7-A	8-A	9-A
Total Taxa	40.91	45.45	22.73	54.55	40.91	63.64	45.45	36.36	31.82	45.45
EPT Taxa	0.00	0.00	9.09	18.18	9.09	0.00	0.00	0.00	0.00	9.09
Percent Ephemeroptera	0.00	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	20.72	0.00	0.00	0.00	0.00	0.00	3.09
Percent Scrapers	12.22	6.19	0.00	22.24	9.69	9.01	106.92	0.00	0.00	0.00
Percent Chironomidae	36.04	80.85	81.63	68.03	25.00	62.79	87.59	96.58	11.82	53.85
Percent Top Two Dominant	33.85	33.82	7.37	56.86	18.06	48.73	46.84	59.29	11.82	33.35
HBI	67.04	118.43	128.90	89.80	61.03	102.43	101.32	54.80	61.76	95.18
VA-SCI Numerical Score	23.78	35.59	31.22	41.30	20.47	35.82	48.52	30.88	14.65	30.00
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	31.36									
Average VA-SCI Narrative Score	Severe Stress									

Colvin Run 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	0	0.00	0.00	6.31	63.96	76.58	5.44
2-A	10	0	0.00	0.00	3.19	19.15	76.60	1.95
2-B	5	1	0.00	0.00	0.00	18.37	94.90	1.23
3-A	12	2	0.00	7.38	11.48	31.97	60.66	3.89
4-A	9	1	0.00	0.00	5.00	75.00	87.50	5.85
5-A	14	0	0.00	0.00	4.65	37.21	66.28	3.03
6-A	10	0	0.00	0.00	55.17	12.41	67.59	3.11
7-A	8	0	0.00	0.00	0.00	3.42	58.97	6.27
8-A	7	0	0.00	0.00	0.00	88.18	91.82	5.80
9-A	10	1	0.00	1.10	0.00	46.15	76.92	3.53

Colvin Run Watershed Total Habitat Assessment Scores

REACH	Habitat Assessment	Percent Best	Narrative Rating
1-A	112	56	Poor
2-A	119	60	Fair
2-B	105	53	Poor
3-A	139	70	Fair
4-A	131	66	Fair
5-A	133	67	Fair
6-A	103	52	Poor
7-A	117	59	Poor
8-A	89	45	Poor
9-A	117	59	Poor
Average	117	59	Poor

Wetland Studies and Solutions, Inc.
5300 Wellington Branch Drive, Suite 100 • Gainesville, VA 20155
Phone 703 679 5600 • Fax 703 679 5601
www.wetlandstudies.com

NORTHERN VIRGINIA STREAM RESTORATION BANK-COLVIN RUN WATERSHED
2008 PRE-CONSTRUCTION MONITORING
Fairfax County, Virginia

EXHIBIT 3: BIOLOGICAL STREAM MONITORING MAP

REVISIONS

No.	Date	Description	Rev. By	App. By

DATE: DECEMBER 2008
SCALE: 1" = 300'

Horizontal Datum: VCS NAD83
Vertical Datum: NGVD29
Boundary and Topo Source: Fairfax County Air Survey

Computer File Name: Colvin_BioMonitoring.dwg
Design: BAC | Drawn: BAC | Approved: SDS/MSK
sheet # 1 of 1

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EXHIBIT 4
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010

1. **Looking north-northwest (upstream) at Reach 1-A of an unnamed tributary of Lake Fairfax in the eastern portion of the study area.**

2. **Looking southeast (downstream) at Reach 2-A of an unnamed tributary of Lake Fairfax in the eastern portion of the study area.**

EXHIBIT 4
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010

3. Looking west (upstream) at Reach 3-A, Colvin Run, in the southern portion of the study area.

4. Looking southwest (downstream) at Reach 4-A of an unnamed tributary of Colvin Run in the central portion of the study area.

EXHIBIT 4
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010

5. **Looking north (upstream) at Reach 5-A of an unnamed tributary of Colvin Run in the central portion of the study area.**

6. **Looking northeast (upstream) at Reach 6-A of an unnamed tributary of Colvin Run in the central portion of the study area.**

EXHIBIT 4
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010

7. Looking south-southeast (downstream) at Reach 2-B of an unnamed tributary of Colvin Run in the eastern portion of the study area.

8. Looking northeast (upstream) at Reach 7-A of an unnamed tributary of Lake Anne in the northwestern portion of the study area.

EXHIBIT 4
BIOLOGICAL STREAM MONITORING PHOTOGRAPHS
NORTHERN VIRGINIA STREAM RESTORATION BANK
COLVIN RUN WATERSHED
WSSI #20010

9. **Looking southwest (upstream) at Reach 8-A, an unnamed tributary of Lake Anne in the western portion of the study area.**

10. **Looking west-southwest (upstream) at Reach 9-A, an unnamed tributary of Lake Anne in the western portion of the study area.**

Wetland Studies and Solutions, Inc.

EXHIBIT 5: HABITAT ASSESSMENT FIELD DATA SHEET - SUMMARY WORKSHEET

Project Name and WSSI Number: Northern Virginia Stream Restoration Bank: Colvin Run (WSSI # 20010)

Stream ID: Colvin Run and Unnamed Tributaries to Colvin Run

Date: 2/10/08-2/10/08

Evaluators: SDS/LS/JVH/BC

HUC: 02070008

Assessment Period: **Prerestoration** Postrestoration

Assessment Reach Name		Condition Category										TOTAL SCORE	Narrative Rating	Percent of Best Possible Score	Reach Length	Stream Type
		Substrate	*Embedded-ness*	*Velocity*	*Sediment Depostion*	*Flow Status*	*Channel Alteration*	*Frequency of Riffles*	*Bank Stability**	*Vegetation Protection**	*Riparian Zone**					
Stream 1	1-A	Marginal	Marginal	Suboptimal	Poor	Suboptimal	Optimal	Marginal	Suboptimal	Marginal	Suboptimal	112	Poor	56	300	R3
Stream 2	2-A	Suboptimal	Suboptimal	Optimal	Marginal	Marginal	Optimal	Suboptimal	Marginal	Marginal	Optimal	119	Fair	60	300	R3
	2-B	Marginal	Suboptimal	Marginal	Marginal	Marginal	Marginal	Poor	Suboptimal	Optimal	Suboptimal	105	Poor	53	300	R3
Stream 3	3-A	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Marginal	Optimal	Optimal	Marginal	Optimal	Optimal	139	Fair	70	300	R3
Stream 4	4-A	Marginal	Suboptimal	Suboptimal	Suboptimal	Marginal	Optimal	Suboptimal	Poor	Optimal	Optimal	131	Fair	66	300	R3
Stream 5	5-A	Marginal	Suboptimal	Suboptimal	Marginal	Marginal	Optimal	Optimal	Marginal	Optimal	Optimal	133	Fair	67	300	R3
Stream 6	6-A	Marginal	Marginal	Marginal	Marginal	Marginal	Optimal	Poor	Poor	Suboptimal	Optimal	103	Poor	52	300	R4
Stream 7	7-A	Poor	Marginal	Suboptimal	Marginal	Suboptimal	Optimal	Suboptimal	Marginal	Marginal	Optimal	117	Poor	59	300	R3
Stream 8	8-A	Poor	Suboptimal	Marginal	Suboptimal	Marginal	Poor	Marginal	Suboptimal	Marginal	Optimal	89	Poor	45	300	R4
Stream 9	9-A	Suboptimal	Suboptimal	Suboptimal	Marginal	Marginal	Optimal	Suboptimal	Marginal	Marginal	Optimal	117	Poor	59	300	R4
												Total			3,000	

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

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/12/2008	12:04PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
1-A		156	300	1	
Latitude	**Longitude**	**Stream Name**			
38°59'9"	77°19'11"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	10
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	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	7
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).	
Score	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.	
Score	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 availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
			Total Score		45

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/12/2008	12:04PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
1-A		156	300	1	
Latitude	**Longitude**	**Stream Name**			
38°59'9"	77°19'11"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	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 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	7
Score Right Bank	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	5
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	5
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	5
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					112

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/11/2008	3:00PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
2-A		174	300	1	
Latitude	**Longitude**	**Stream Name**			
38°57'58"	77°19'27"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	13
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	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	12
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).	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	16
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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	7
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
			Total Score		56

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/11/2008	3:00PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
2-A		174	300	1	
Latitude	**Longitude**	**Stream Name**			
38°57'58"	77°19'27"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	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.	
Score	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	3
Score Right Bank	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 allo	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	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	3
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	3
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	9
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					119

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		3/12/2008	10:40AM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
2-B		100	300	1	
Latitude	**Longitude**	**Stream Name**			
38°58'14"	77°19'44"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	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	
Score	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).	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	7
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.	
Score	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 availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	9
			Total Score		42

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WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		3/12/2008	10:40AM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
2-B		100	300	1	
Latitude	**Longitude**	**Stream Name**			
38°58'14"	77°19'44"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	5
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	8
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	8
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	9
Score Right Bank	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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	8
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	8
			Total Score		105

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/10/2008	2:00PM
Investigators		**HUC**	Potomac	**Locality**	
SDS/LS/BC		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
3-A		703	300	2	
Latitude	**Longitude**	**Stream Name**			
38°57'23"	77°19'51"	Colvin Run			

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 maintainance 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	13
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	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
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).	
Score	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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
			Total Score		57

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/10/2008	2:00PM
Investigators		**HUC**	Potomac	**Locality**	
SDS/LS/BC		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
3-A		703	300	2	
Latitude	**Longitude**	**Stream Name**			
38°57'23"	77°19'51"	Colvin Run			

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.	Channeliztion 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.	
Score	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.	
Score	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	3
Score Right Bank	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
			Total Score		139

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/10/2008	3:41PM
Investigators		**HUC**	Potomac	**Locality**	
SDS/LS/BC		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
4-A		245	300	1	
Latitude	**Longitude**	**Stream Name**			
38°57'43"	77°19'53"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	10
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	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
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).	
Score	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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
			Total Score		52

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/10/2008	3:41PM
Investigators		**HUC**	Potomac	**Locality**	
SDS/LS/BC		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
4-A		245	300	1	
Latitude	**Longitude**	**Stream Name**			
38°57'43"	77°19'53"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	15
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	2
Score Right Bank	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					131

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/11/2008	10:30AM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
5-A		75	300	2	
Latitude	**Longitude**	**Stream Name**			
38°57'55"	77°19'56"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	10
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	
Score	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).	
Score	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.	
Score	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 availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
			Total Score		51

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/11/2008	10:30AM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
5-A		75	300	2	
Latitude	**Longitude**	**Stream Name**			
38°57'55"	77°19'56"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	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.	
Score	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	3
Score Right Bank	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
			Total Score		133

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		3/11/2008	1:15PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
6-A		6	300	1	
Latitude	**Longitude**	**Stream Name**			
38°57'58"	77°19'55"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	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	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	9
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).	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	10
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.	
Score	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 availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
			Total Score		42

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		3/11/2008	1:15PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
6-A		6	300	1	
Latitude	**Longitude**	**Stream Name**			
38°57'58"	77°19'55"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	5
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	1
Score Right Bank	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	6
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	9
Total Score					103

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3		3/12/2008	2:45PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
7-A		44	300	1	
Latitude	**Longitude**	**Stream Name**			
38°58'22"	77°20'21"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	5
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	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
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).	
Score	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.	
Score	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 availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	14
			Total Score		50

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R3	Potomac	3/11/2008	2:45PM
Investigators		**HUC**		**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
7-A		44	300	1	
Latitude	**Longitude**	**Stream Name**			
38°58'22"	77°20'21"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	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.	
Score	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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	4
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	4
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	5
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	5
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	8
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
			Total Score		117

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		3/12/2008	4:07PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
8-A		48	300	2	
Latitude	**Longitude**	**Stream Name**			
38°58'1"	77°20'44"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	5
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	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	12
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).	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	11
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	7
			Total Score		41

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WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		3/12/2008	4:07PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
8-A		48	300	2	
Latitude	**Longitude**	**Stream Name**			
38°58'1"	77°20'44"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	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 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	6
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	7
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	5
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	5
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	5
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	10
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					89

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		3/12/2008	5:06PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
9-A		67	300	1	
Latitude	**Longitude**	**Stream Name**			
38°58'13"	77°20'49"	Unnamed Tributary to Colvin Run			

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 maintainance 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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	13
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	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	12
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).	
Score	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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	7
5. Channel Flow status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the availible channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the availible channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	8
			Total Score		54

Wetland Studies and Solutions, Inc.

WSSI HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS

Project #	Site	Cowardin	River Basin	Date	Time
20010	NOVA Stream Bank	R4		3/12/2008	5:06PM
Investigators		**HUC**	Potomac	**Locality**	
LS/BC/JVH		02070008		Fairfax County	
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
9-A		67	300	1	
Latitude	**Longitude**	**Stream Name**			
38°58'13"	77°20'49"	Unnamed Tributary to Colvin Run			

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.	Channeliztion 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.	
Score	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.	
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	13
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	4
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	4
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.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	3
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	3
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 riperian zone <6 meters; little or no riparian vegetation due to human activities.	
Score Left Bank	10 9	8 7 6	5 4 3	2 1 0	8
Score Right Bank	10 9	8 7 6	5 4 3	2 1 0	10
Total Score					117

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WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R3	Potomac	3/12/2008	12:04 PM

Investigators	HUC	Locality	
LS/BC/JVH	2070008	Fairfax County	
Reach	**D.A. (Acres)**	**Reach Length (LF)**	**Order**
1-A	156	300	1

Latitude	Longitude	Stream Name
38°58'09"	77°19'11"	Unnamed Tributary to Colvin Run

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	40	**Sand**	95	**Rootwads**	0	**Vegetated Banks**	0	
Large Woody Debris		15	**Undercut Banks**		15	**Leaf Packs**		50

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*	6	*Undercut Banks*	3
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	0
				Rootwads	0	*Leaf Packs*	8
				Vegetated Banks	0	*Large Woody Debris*	3

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	1
Filamentous Algae	2	Macroinvertebrates	1
Macrophytes	0	Fish	1

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WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R3	Potomac	3/11/2008	11:00 AM

Investigators	HUC	Locality	
LS/BC/JVH	2070008	Fairfax County	
Reach	**D.A. (Acres)**	**Reach Length (LF)**	**Order**
2-A	174	300	1

Latitude	Longitude	Stream Name
38°57'58"	77°19'27"	Unnamed Tributary to Colvin Run

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	75	**Sand**	98	**Rootwads**	0	**Vegetated Banks**	0	
Large Woody Debris	5	**Undercut Banks**	45	**Leaf Packs**	15			

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

Qualitative Listing of Aquatic Biota

Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant

Periphyton	1	Slimes	0
Filamentous Algae	0	Macroinvertebrates	2
Macrophytes	0	Fish	0

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R3	Potomac	3/12/2008	10:40 AM

Investigators	HUC	Locality
LS/BC/JVH	2070008	Fairfax County

Reach	D.A. (Acres)	Reach Length (LF)	Order
2-B	100	300	1

Latitude	Longitude	Stream Name
38°58'14"	77°19'44"	Unnamed Tributary to Colvin Run

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	80	Sand	90	Rootwads	0	Vegetated Banks	85
Submerged Macrophytes	2	Undercut Banks	0	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*	18	*Undercut Banks*	0
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	1
				Rootwads	0	*Leaf Packs*	1
				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	2	Slimes	0
Filamentous Algae	0	Macroinvertebrates	1
Macrophytes	1	Fish	0

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R3	Potomac	3/10/2008	2:00 PM
Investigators		**HUC**	**Locality**		
SS/LS/BC		2070008	Fairfax County		
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
3-A		703	300	2	
Latitude	**Longitude**	**Stream Name**			
38°57'23"	77°21'01"	Colvin Run			

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	70	**Sand**	95	**Rootwads**	15	**Vegetated Banks**	0		
Submerged Macrophytes		0	**Undercut Banks**		15				
Large Woody Debris		5	**Leaf Packs**		5	**Other (bedrocks)**		0	

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*	3
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	0
				Rootwads	5	*Leaf Packs*	1
				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	2
Macrophytes	0	Fish	1

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R3	Potomac	3/10/2008	3:41 PM

Investigators	HUC	Locality
SS/LS/BC	2070008	Fairfax County

Reach	D.A. (Acres)	Reach Length (LF)	Order
4-A	245	300	1

Latitude	Longitude	Stream Name
38°57'43"	77°19'53"	Unnamed Tributary to Colvin Run

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	45	Sand	65	Rootwads	3	Vegetated Banks	0		
Submerged Macrophytes	0			Undercut Banks	3				
Large Woody Debris	0			Leaf Packs	10	Other (bedrocks)	10		

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*	11	*Undercut Banks*	3
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	0
				Rootwads	1	*Leaf Packs*	2
				Vegetated Banks	0	*Bedrocks*	3

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	2

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R3	Potomac	3/11/2008	10:30 AM

Investigators	HUC	Locality	
LS/BC/JVH	2070008	Fairfax County	
Reach	**D.A. (Acres)**	**Reach Length (LF)**	**Order**
5-A	75	300	2

Latitude	Longitude	Stream Name
38°57'55"	77°19'56"	Unnamed Tributary to Colvin Run

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	70	**Sand**	95	**Rootwads**	5	**Vegetated Banks**	0	
Submerged Macrophytes	0	**Undercut Banks**	5					
Large Woody Debris	2	**Leaf Packs**	15	**Other (bedrocks)**	0			

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*	1
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	0
				Rootwads	1	*Leaf Packs*	3
				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	1	Slimes	0
Filamentous Algae	0	Macroinvertebrates	1
Macrophytes	0	Fish	0

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R4	Potomac	3/11/2008	1:15 PM

Investigators	HUC	Locality
LS/BC/JVH	2070008	Fairfax County

Reach	D.A. (Acres)	Reach Length (LF)	Order
6-A	6	300	1

Latitude	Longitude	Stream Name
38°57'58"	77°19'55"	Unnamed Tributary to Colvin Run

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	60	Sand	95	Rootwads	0	Vegetated Banks	0		
Submerged Macrophytes	0			Undercut Banks	2				
Large Woody Debris	2			Leaf Packs	40	Other (bedrocks)	0		

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*	11	*Undercut Banks*	1
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	0
				Rootwads	0	*Leaf Packs*	7
				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	2	Slimes	0
Filamentous Algae	0	Macroinvertebrates	2
Macrophytes	0	Fish	0

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R3	Potomac	3/12/2008	2:45 PM

Investigators	HUC	Locality
LS/BC/JVH	2070008	Fairfax County

Reach	D.A. (Acres)	Reach Length (LF)	Order
7-A	44	300	1

Latitude	Longitude	Stream Name
38°58'22"	77°20'21"	Unnamed Tributary to Colvin Run

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	30	Sand	95	Rootwads	3	Vegetated Banks	0		
Submerged Macrophytes	0			Undercut Banks	0				
Large Woody Debris	5			Leaf Packs	45	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*	5	*Undercut Banks*	0
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	0
				Rootwads	1	*Leaf Packs*	12
				Vegetated Banks	0	*Large Woody Debris*	2

General Comments

Qualitative Listing of Aquatic Biota

Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant

Periphyton	1	Slimes	0
Filamentous Algae	0	Macroinvertebrates	1
Macrophytes	0	Fish	0

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R4	Potomac	3/12/2008	4:07 PM

Investigators	HUC	Locality	
LS/BC/JVH	2070008	Fairfax County	
Reach	**D.A. (Acres)**	**Reach Length (LF)**	**Order**
8-A	55	300	2

Latitude	Longitude	Stream Name
38°58'01"	77°20'44"	Unnamed Tributary to Colvin Run

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	85	**Sand**	87	**Rootwads**	0	**Vegetated Banks**	0	
Submerged Macrophytes		0	**Undercut Banks**		0			
Large Woody Debris		0	**Leaf Packs**		15	**Other (bedrocks)**		13

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*	0
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	0
				Rootwads	0	*Leaf Packs*	3
				Vegetated Banks	0	*Bedrocks*	0

General Comments

Qualitative Listing of Aquatic Biota

Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant

Periphyton	2	Slimes	2
Filamentous Algae	1	Macroinvertebrates	1
Macrophytes	0	Fish	1

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

Project #	Site	Cowardin	River Basin	Date	Time
20010	Colvin	R4	Potomac	3/12/2008	5:06 PM
Investigators		**HUC**	**Locality**		
LS/BC/JVH		2070008	Fairfax County		
Reach		**D.A. (Acres)**	**Reach Length (LF)**	**Order**	
9-A		67	300	1	
Latitude	**Longitude**				
38°58'13"	77°20'49"	Unnamed Tributary to Colvin Run			

Habitat Types (Indicate Percentage of Each Habitat Present)

Cobble	85	**Sand**	95	**Rootwads**	5	**Vegetated Banks**	0	
Submerged Macrophytes		0	**Undercut Banks**		20			
Large Woody Debris		0	**Leaf Packs**		25	**Other (bedrocks)**		15

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*	12	*Undercut Banks*	3
Other		*From Boat*		*Sand*	0	*Submerged Macro-phytes*	0
				Rootwads	1	*Leaf Packs*	4
				Vegetated Banks	0	*Bedrocks*	0

General Comments

Qualitative Listing of Aquatic Biota

Indicate Estimated Abundance: 0=Absent/Not Observed, 1=Rare, 2=Common, 3=Abundant, 4=Dominant

Periphyton	1	Slimes	0
Filamentous Algae	1	Macroinvertebrates	1
Macrophytes	0	Fish	0

Wetland Studies and Solutions, Inc.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	1-A	SDS/LS/JVH/BC	1	122
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	BC	BC	101	111

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACARINA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE	8	Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	71	**Tanypodinae**	
CORBICULIDAE	1	**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE		Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccomis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	
Derallus sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp		Dolichocephala sp.	
Tropisternus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	2
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE		Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANYONYCTIDAE		Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE		Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	2
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies		Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	1-A	SDS/LS/JVH/BC	1	122
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	BC	BC	101	111

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor sp.		**SIALIDAE**		**DIPSEUDOPSIDAE**	
BAETISCIDAE		Sialis sp.		Phylocentropus sp.	
Baetisca sp.		NEMATODA - Roundworms		**GLOSSOSOMATIDAE**	
CAENIDAE		NEMATOMORPHA - Horsehair Worms		Glossosoma sp.	
Caenis sp.		ODONATA (Anisptera - Dragonflies)		Agapetus sp.	
EPHEMERELLIDAE		**AESHNIDAE**		**HELICOPSYCHIDAE**	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeshna sp.		**HYDROPSYCHIDAE**	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**		**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	14	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails		**NEMERTEA**	1	**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**	5	Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE	6	**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE	1	Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Clioperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealuectra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

Wetland Studies and Solutions, Inc.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	2-A	SDS/LS/JVH/BC	1	106
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
8/30/2008	8/29/2008	JVH	JVH	19	94

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE		Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	18	**Tanypodinae**	
CORBICULIDAE		**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE	1	Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccornis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	
Derallus sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp.		Dolichocephala sp.	
Tropistemus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	3
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE	3	Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANGONYCTIDAE	4	Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladiinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE		Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	4
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies		Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	2-A	SDS/LS/JVH/BC	1	106
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
8/30/2008	8/29/2008	JVH	JVH	19	94

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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.		Basiaeshna sp.		**HYDROPSYCHIDAE**	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**	1	Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**		**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	54	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails		**NEMERTEA**		**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**	2	Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE	3	Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Clioperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	1
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.		NEMERTEA - Ribbon Worms	
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	2-B	SDS/LS/JVH/BC	1	137
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
3/14/2008	3/13/2008	BC	BC	24	98

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE		Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	18	**Tanypodinae**	
CORBICULIDAE		**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE		Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccornis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	
Derallus sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp.		Dolichocephala sp.	
Tropisternus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE		Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANYONYCTIDAE		Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE		Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	1
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies		Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

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WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	2-B	SDS/LS/JVH/BC	1	137
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
3/14/2008	3/13/2008	BC	BC	24	98

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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.		Basiaeshna sp.		**HYDROPSYCHIDAE**	2
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**		**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	75	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails	2	**NEMERTEA**		**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**		Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cyrnellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE		Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Clioperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	3-A	SDS/LS/JVH/BC	1	131
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	BC	LS	19	122

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE		Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	39	**Tanypodinae**	
CORBICULIDAE		**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE		Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccomis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE	11	Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	
Derallus sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp.		Dolichocephala sp.	
Tropisternus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE		Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANGONYCTIDAE	35	Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE		Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	2
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies		Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

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WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	3-A	SDS/LS/JVH/BC	1	131
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	BC	LS	19	122

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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**	2	**HELICOPSYCHIDAE**	
Dannella sp.		Anax sp.		Helicopsyche sp.	
Drunella sp.		Basiaeshna sp.		**HYDROPSYCHIDAE**	8
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**	2	Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**	2	**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**	8	Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms		**MOLANNIDAE**	
Siphlonurus sp.		**FAMILY #1**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails		**NEMERTEA**		**PHILOPOTAMIDAE**	9
ANCYLIDAE		**TUBIFICIDAE**	1	Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE	3	Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Cliloperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	4-A	SDS/LS/JVH/BC	1	131
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
7/29/2008	3/14/2008	BC	LS	51	80

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE	1	Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	60	**Tanypodinae**	
CORBICULIDAE		**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE	1	Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE		Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccornis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	
Derallus sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp		Dolichocephala sp.	
Tropisternus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE		Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANYONYCTIDAE		Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE		Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	1
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies		Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

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WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con, Year 2	20010	4-A	SDS/LS/JVH/BC	1	131
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
7/29/2008	3/14/2008	BC	LS	51	80

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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.		Basiaeshna sp.		**HYDROPSYCHIDAE**	5
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**	1	**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	2	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails		**NEMERTEA**		**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**		Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE	4	Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Cloperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.		NEMERTEA - Ribbon Worms	
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE	5	Ostrocerca sp			
		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.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	5-A	SDS/LS/JVH/BC	1	97
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	BC	BC	101	86

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA	1	Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE		Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	32	**Tanypodinae**	
CORBICULIDAE		**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE		Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccornis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	1
Derallus sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp		Dolichocephala sp.	
Tropisternus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	1
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	2
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE	2	Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANGONYCTIDAE	9	Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE		Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	3
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies	1	Pseudorthocladius sp.		Hexatoma sp.	
DIPTERA FAMILY #1	1	Psilometriocnemus sp.		Leptotarsus sp.	
ATHERICIDAE		Rheocricotopus sp.		Molophilus sp.	
Atherix sp.		Rheosmittia sp.		Tipula sp.	
BLEPHARICERIDAE		Smittia sp.		Psuedolimnophila sp.	
CECIDOMYIIDAE		Stilocladius sp.		Dicranota sp.	
CERATOPOGNIDAE		Symposiocladius sp.		Limnophila sp.	
Alluaudomyia sp.				Ormosia sp.	
Bezzia sp.					
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

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WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	5-A	SDS/LS/JVH/BC	1	97
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	BC	BC	101	86

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**	1	Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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.		Basiaeshna sp.		**HYDROPSYCHIDAE**	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**		**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	25	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails		**NEMERTEA**		**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**	2	Chimarra sp.	
Fertissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE	1	POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cyrnellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE	3	Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Clioperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	1
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	6-A	SDS/LS/JVH/BC	1	131
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/4/2008	BC/LS	BC/LS	21	145

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE	7	Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	18	**Tanypodinae**	
CORBICULIDAE		**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE		Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccornis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	3
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	
Derallus sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp.		Dolichocephala sp.	
Tropistemus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	3
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	1
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE	3	Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANGONYCTIDAE	15	Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE		Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	9
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies		Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

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Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	6-A	SDS/LS/JVH/BC	1	131
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/4/2008	BC/LS	BC/LS	21	145

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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.		Basiaeshna sp.		**HYDROPSYCHIDAE**	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**		**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	3	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails	1	**NEMERTEA**		**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**	2	Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE	80	POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE		Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Clioperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	7-A	SDS/LS/JVH/BC	1	127
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	7/31/2008	BC	BC	36	117

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE	3	Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		CHAOBORIDAE		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		CHIRONOMIDAE	4	Tanypodinae	
CORBICULIDAE		Chironominae		Ablabesmyia sp.	
Corbicula fluminea sp.		Chironomini		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE	7	Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccornis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		CULICIDAE	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		Tanytarsini		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		DIXIDAE	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		DOLICHOPODIDAE	
Derallus sp.		Diamesinae		EMPIDIDAE	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp		Dolichocephala sp.	
Tropisternus sp.		Sympotthastia sp.		EPHYDRIDAE	
Hydrobius sp.		Orthocladiinae		PELCORHYNCHIDAE	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		PHORIDAE	3
Psephenus sp.		Chaetocladius sp.		PSYCHODIDAE	
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		SIMULIDAE	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE		Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANGONYCTIDAE	6	Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		STRATIOMYIDAE	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		SYRPHIDAE	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		TABANIDAE	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE		Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		TANYDERIDAE	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		THAUMALEIDAE	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		TIPULIDAE	2
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies	5	Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

Wetland Studies and Solutions, Inc.

WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	7-A	SDS/LS/JVH/BC	1	127
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	7/31/2008	BC	BC	36	117

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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.		Basiaeshna sp.		**HYDROPSYCHIDAE**	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**		**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	18	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails		**NEMERTEA**		**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**	43	Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE		Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Clioperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	26
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

Wetland Studies and Solutions, Inc.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con.Year 2	20010	8-A	SDS/LS/JVH/BC	1	125
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	LS	LS	101	110

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE		Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	97	**Tanypodinae**	
CORBICULIDAE		**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE		Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccomis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	1
Derallus sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp		Dolichocephala sp.	
Tropistemus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	1
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE		Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANGONYCTIDAE	1	Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE	2	Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE		Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	2
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies		Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

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Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con.Year 2	20010	8-A	SDS/LS/JVH/BC	1	125
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	LS	LS	101	110

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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.		Basiaeshna sp.		**HYDROPSYCHIDAE**	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**		**LIMNEPHILIDAE**	
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	2	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails		**NEMERTEA**		**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**	4	Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE		Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Clioperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

Wetland Studies and Solutions, Inc.

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

Site	WSSI #	Reach	Collectors	# Jars in Sample	Total No. Organisms Sorted
Colvin Run - Pre Con. Year 2	20010	9-A	SDS/LS/JVH/BC	1	105
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	LS	BC	101	91

ACARIFORMES		Forcipomyia sp.		Synorthocladius sp.	
HYDRACHNIDA		Probezzia sp.		Thienemanniella sp.	
BIVALVIA - Clams		Sphaeromias sp.		Tvetenia sp.	
SPHAERIDAE	3	Stilobezzia sp.		Unniella sp.	
Sphaerium sp.		**CHAOBORIDAE**		Xylotopus sp.	
Pisidium sp.		Chaborus sp.		Zalutschia sp.	
Musculium sp.		**CHIRONOMIDAE**	42	**Tanypodinae**	
CORBICULIDAE		**Chironominae**		Ablabesmyia sp.	
Corbicula fluminea sp.		**Chironomini**		Alotanypus sp.	
UNIONIDAE		Chironomus sp.		Apsectrotanypus sp.	
BRANCHIOBDELLIDA		Cryptochironomus sp.		Clinotanypus sp.	
BRANCHIOBDELLIDAE		Cryptotendipes sp.		Conchapelopia sp.	
TETRASTEMMATIDAE		Demicryptochironomus sp.		Guttipelopia sp.	
COLEOPTERA - Beetles		Dicrotendipes sp.		Krenopelopia sp.	
CANTHERIDAE		Einfeldia sp.		Labrundinia sp.	
CURCULIONIDAE		Endochironomus sp.		Larsia sp.	
DRYOPIDAE		Glyptotendipes sp.		Macropelopia sp.	
Helichus sp.		Kiefferulus sp.		Meropelopia sp.	
DYTISCIDAE		Microtendipes sp.		Paramerina sp.	
Agabus sp.		Nilothauma sp.		Pentaneura sp.	
Hydroporous sp.		Pagastiella sp.		Procladius sp.	
Coptotomus sp.		Parachironomus sp.		Psectrotanypus sp.	
Oreodytes sp.		Paracladopelma sp.		Rheopelopia sp.	
Laccomis sp.		Paratendipes sp.		Tanypus sp.	
Dytiscus sp.		Phaenopsectra sp.		Thienemannimyia gp.	
ELMIDAE		Polypedilum sp.		Thienemannimyia sp.	
Microcylloepus sp.		Stenochironomus sp.		Trissopelopia sp.	
Optioservus sp.		Stictochironomus sp.		Zavrelimyia sp.	
Stenelmis sp.		Tribelos sp.		**CULICIDAE**	
Promoresia sp.		Zavreliella sp.		Aedes	
Macronychus sp.		**Tanytarsini**		Anopheles	
Dubiraphia sp.		Cladotanytarsus sp.		Culex	
Ancyronyx sp.		Constempellina sp.		Culiseta	
Oulimnius sp.		Micropsectra sp.		Mansonia	
GYRINIDAE		Micropsectra/Tanysarsus complex		Orthopodomyia	
Dineutus		Paratanytarsus sp.		Psorophora	
Gyrinus		Rheotanytarsus sp.		Toxorhynchites	
HALIPIDAE		Stempellina sp.		Uranotaenia	
Haliplus sp.		Stempellinella sp.		Wyeomyia	
HYDROPHILIDAE		Sublettea sp.		**DIXIDAE**	
Cymbiodyta sp.		Tanytarsus sp.		Dixa sp.	
Berosus sp.		Zavrelia sp.		**DOLICHOPODIDAE**	3
Peratlius sp.		**Diamesinae**		**EMPIDIDAE**	
Helochares sp.		Diamesa sp.		Chelifera sp.	
Helophorus sp.		Pagastia sp.		Clinocera sp.	
Hydrophilus sp.		Potthastia sp.		Hemerodromia sp.	
Hydrochus sp.		Prodiamesa sp.		Dolichocephala sp.	
Tropistemus sp.		Sympotthastia sp.		**EPHYDRIDAE**	
Hydrobius sp.		**Orthocladiinae**		**PELCORHYNCHIDAE**	
Laccobius sp.		Brillia sp.		Glutops sp.	
PSEPHENIDAE		Cardiocladius sp.		**PHORIDAE**	6
Psephenus sp.		Chaetocladius sp.		**PSYCHODIDAE**	
Ectopria sp.		Corynoneura sp.		Pericoma sp.	
Dicranopselaphus sp.		Cricotopus sp.		Psycoda sp.	
PTILODACTYLIDAE		Cricotopus/Orthocladius sp.		**SIMULIDAE**	
Anchytarsus sp.		Diplocladius sp.		Simulium sp.	
COLLEMBOLA		Eukiefferiella sp.		Prosimulium sp.	
ISOTOMIDAE	2	Heleniella sp.		Cnephia sp.	
COPEPODA		Heterotrissocladius sp.		Twinia sp.	
CRUSTACEA (Amphipoda- Scuds)		Hydrobaenus sp.		Stegopterna sp.	
CRANGONYCTIDAE		Limnophyes sp.		Ectemnia sp.	
Stygonectes sp.		Lopescladius sp.		**STRATIOMYIDAE**	
Crangonyx sp.		Mesocricotopus sp.		Oxycera sp.	
Synurella sp.		Mesosmittia sp.		Odontomyia sp.	
GAMMARIDAE		Nanocladius sp.		**SYRPHIDAE**	
Gammarus sp.		Orthocladinae A		Chrysogaster sp.	
HYALELLIDAE		Orthocladius sp.		Eristalis sp.	
Hyalella sp.		Parachaetocladius sp.		**TABANIDAE**	
CRUSTACEA (Decopoda - Crayfish)		Parakiefferiella sp.		Chrysops sp.	
CAMBARIDAE	2	Parametriocnemus sp.		Tabanus sp.	
PALAEMONIDAE		Paraphaenocladius sp.		**TANYDERIDAE**	
CRUSTACEA (Isopoda- Sowbugs)		Parasmittia sp.		**THAUMALEIDAE**	
ASELIDAE	1	Paratrichocladius sp.		Thaumalea sp.	
Caecidotea sp.		Paratrissocladius sp.		**TIPULIDAE**	1
Lirceus sp.		Psectrocladius sp.		Antocha sp.	
DIPTERA - True Flies		Pseudorthocladius sp.		Hexatoma sp.	
ATHERICIDAE		Psilometriocnemus sp.		Leptotarsus sp.	
Atherix sp.		Rheocricotopus sp.		Molophilus sp.	
BLEPHARICERIDAE		Rheosmittia sp.		Tipula sp.	
CECIDOMYIIDAE		Smittia sp.		Psuedolimnophila sp.	
CERATOPOGNIDAE		Stilocladius sp.		Dicranota sp.	
Alluaudomyia sp.		Symposiocladius sp.		Limnophila sp.	
Bezzia sp.				Ormosia sp.	
Ceratopogon sp.					
Culicoides sp.					
Dasyhelea sp.					

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WSSI BENTHIC MACROINVERTEBRATE I.D. AND ENUMERATION BENCH SHEET

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Colvin Run - Pre Con.Year 2	20010	9-A	SDS/LS/JVH/BC	1	105
Date ID'd	**Date Sorted**	**Taxonomist**	**Sorter**	**# Grids in Subsample**	**Total No. Organisms ID'd**
9/20/2008	9/9/2008	LS	BC	101	91

Pedicia sp.		Microvelia sp.		Paranemoura sp.	
Limonia sp.		HIRUDINEA - Leeches		Prostoia sp.	
Pilaria sp.		HOPLONEMERTEA - Ribbon Worms		Shipsa sp.	
Erioptera sp.		**TETRASTEMMATIDAE**		**CHLOROPERLIDAE**	
Rhabdomastix sp.		Prostoma sp.		Alloperla sp.	
TRICHOCERIDAE		LEPIDOPTERA - Moth Larvae		Haploperla sp.	
Trichocera sp.		**NOCTUIDAE**		Sweltsa sp.	
EPHEMEROPTERA - Mayflies		Archanara sp.		**TAENIOPTERGIDAE**	
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.	
Diphetor 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.		Basiaeshna sp.		**HYDROPSYCHIDAE**	
Ephemerella sp.		Boyeria sp.		Cheumatopsyche sp.	
Eurylophella sp.		**CORDULEGASTRIDAE**		Diplectrona sp.	
Serratella sp.		Cordulegaster sp.		Hydropsyche sp.	
EPHEMERIDAE		**CORDULIIDAE**		Parapsyche sp.	
Ephemera sp.		**GOMPHIDAE**		Potamyia sp.	
HEPTAGENIIDAE		Arigomphus 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.		**MACROMIIDAE**		**LEPTOCERIDAE**	
Habrophlebia sp.		Macromia sp.		Triaenodes sp.	
Habrophlebiodes sp.		**PETALURIDAE**		Ceraclea sp.	
Paraleptophlebia sp.		ODONATA Zygoptera - Damselflies)		Oecetis sp.	
NEOEPHEMERIDAE		**CALOPTERYGIDAE**		**LIMNEPHILIDAE**	1
OLIGONEURIDAE		Calopteryx sp.		Apatina sp.	
Isonychia sp.		**COENAGRIONIDAE**		Hydatophylax sp.	
POLYMITARCYIDAE		Argia sp.		Ironoquia sp.	
POTAMANTHIDAE		**LESTIDAE**		Pycnopsyche sp.	
SIPHLONEURIDAE		OLIGOCHAETA - Oligochaete Worms	28	**MOLANNIDAE**	
Siphlonurus sp.		**LUMBRICINA**		Molanna sp.	
TRICORYTHIDAE		**ENCHYTRAEIDAE**		**ODONTOCERIDAE**	
Tricorythodes sp.		**NAIDIDAE**		Psilotreta sp.	
GASTROPODA - Snails		**NEMERTEA**		**PHILOPOTAMIDAE**	
ANCYLIDAE		**TUBIFICIDAE**	2	Chimarra sp.	
Ferissa sp.		**LUMBRICULIDAE**		Wormaldia sp.	
HYDROBIIDAE		POLYCHAETA - Polychaete Worms		**PHRYGANEIDAE**	
LYMNAEIDAE		**AEOLOSOMATIDAE**		Ptilostomis sp.	
Fossaria sp.		Aeolosoma sp.		**POLYCENTROPIDAE**	
Stagnicola sp.		PLECOPTERA - Stonefly Larvae		Cymellus sp.	
Pseudosuccinea sp.		**PERLIDAE**		Polycentropus sp.	
PHYSIDAE		Acroneuria sp.		**PSYCHOMYIDAE**	
Physella sp.		Beloneuria sp.		Lype sp.	
PLANORBIDAE		Eccoptura sp.		Psychomyia sp.	
Menetus sp.		Neoperla sp.		**RHYACOPHILIDAE**	
Gyraulus sp.		Perlesta sp.		Ryacophila sp.	
PLEUROCERIDAE		*Perlinella sp.*		**UENOIDAE**	
VIVIPARIDAE		**PERLODIDAE**		Neophylax sp.	
Viviparus sp.		Clioperla sp.		TURBELLARIA - Flatworms	
HAPLOSCLERIDA		Diploperla sp.		**PLANARIIDAE**	
SPONGILLIDAE		Isoperla sp.		**DENDROCOELIDAE**	
HEMIPTERA - True Bugs		Cultus sp.			
BELOSTOMATIDAE		**PTERONARCYIDAE**			
Belostoma sp.		Pteronarcys sp.			
Lethocerus sp.		**PELTOPERLIDAE**			
CORIXIDAE		Peltoperla sp.			
GELASTOCORIDAE		**LEUCTRIDAE**			
GERRIDAE		Leuctra sp.			
Trepobates sp.		Zealeuctra sp.			
HEBRIDAE		Paraleuctra sp.			
HYDROMETRIDAE		**CAPNIDAE**			
MESOVELIIDAE		Allocapnia sp.			
NEPIDAE		Paracapnia sp.			
Nepa sp.		**NEMOURIDAE**			
Ranatra sp.		Amphinemura sp.			
VELIIDAE		Ostrocerca sp			
		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.

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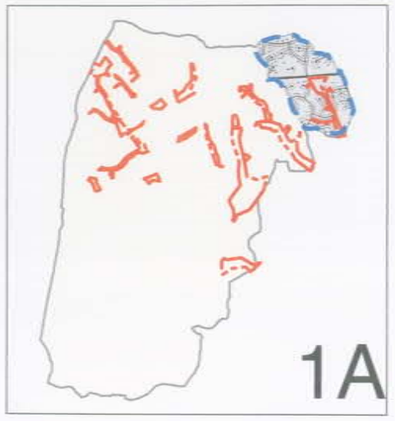

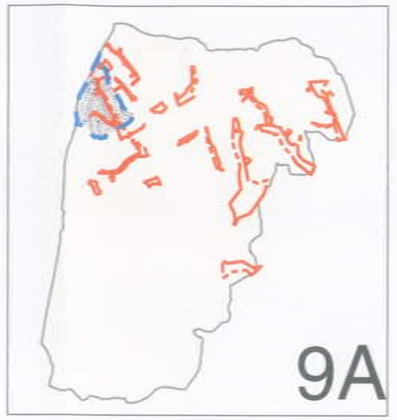

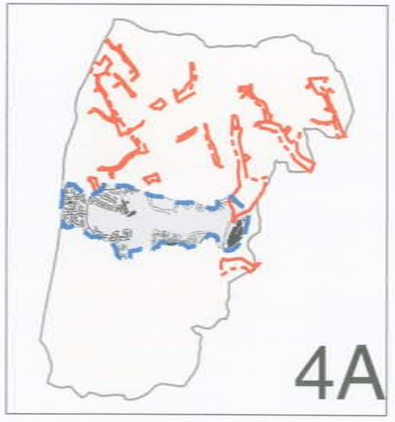

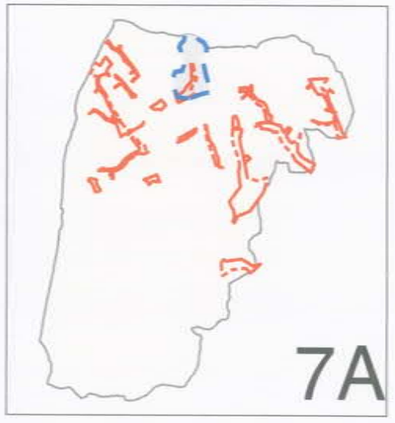

Land Cover Map

Colvin Run

Scale: 1" = 1 mile

Stream ID	Impervious Percent	Total Acres	VA-SCI
1A	22	156	23.76
2A	24	176	35.39
2B	26	100	31.22
3A	43	704	41.30
4A	25	245	20.47
5A	28	75	35.82
6A	23	5.7	48.52
7A	1.3	44	30.88
8A	29	48	14.65
9A	22	67	30.00

SITE

DRAINAGE BOUNDARIES

IMPERVIOUS AREAS

PERVIOUS AREAS