Department of Public Works
Bureau of Environmental Services
Stormwater Management Division

Biological Assessment of the Cattail Creek, and Brighton Dam Watersheds, Howard County, Maryland

Spring 2005 Index Period

UT to Cattail Creek

Patuxent River

Cabin Branch

May, 2006
Final Report

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May, 2006
Final Report

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ACKNOWLEDGMENT

The principal authors of this report are Carolina Gallardo, Jessica Garrish, Colin Hill, and James B. Stribling, all from Tetra Tech. They were assisted by Erik W. Leppo and Michael J. Paul, also of Tetra Tech. This report presents results from the first year of round two sampling by the Howard County Biological Monitoring and Assessment Program.

The program's Technical Advisory Committee (TAC), assembled by Howard County to provide support and guidance, included: Howard Saltzman and Angela Morales, Stormwater Management Division (SWMD); Susan Overstreet, Department of Planning and Zoning (DPZ); Brenda Belensky, Department of Recreation and Parks (DRP); Ron Klauda, (MBSS/DNR); Wayne Davis (USEPA); and Keith Van Ness (Montgomery County Department of Environmental Protection).

Fieldwork was conducted by Tetra Tech staff including David Bressler, Colin Hill, and Adam Rettig. Other Tetra Tech staff (Carolina Gallardo, Jessica Garrish, Christopher Hines, Tara Kelly, John Roberts, Elizabeth Yarbrough, and Jennifer White) performed laboratory processing (sorting and subsampling) of the Cattail Creek/Brighton Dam watershed samples. Colin Hill completed quality assurance/quality control assessments on data entered into and retrieved from the Ecological Data Application System (EDAS). Benthic macroinvertebrates from this watershed were identified by Dr. Todd Askegaard, of Aquatic Resources Center (ARC; Nashville, Tennessee). Linda Shook, and Brenda Decker, both of Tetra Tech, assisted with budget tracking and clerical support. The appropriate citation for this report is:

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ABSTRACT

Stream biota rely on the quality of physical habitat, hydrology, and water chemistry for their survival and reproduction. Human activities, such as land cover alterations, can affect abiotic stream conditions, which, in turn, can influence biotic assemblages. Thus, many biological monitoring and assessment programs use composite biological indicators both as a measure of stream ecological response to land cover conversions, and as an overall descriptor of water resource integrity.

Several indicators (benthic macroinvertebrates, physical habitat quality, sediment particle size distribution, and channel dimensions) were sampled or measured at 30 stream locations in the Cattail Creek, and Upper and Lower Brighton Dam subwatersheds in Howard County, Maryland during late March and early April 2005. Sampling site locations were selected at random and were pre-stratified by subwatershed (Upper, Middle, and Lower) and stream order, so that 10 sites were selected in each subwatershed. Benthic macroinvertebrates were collected using Maryland Biological Stream Survey (MBSS) methods (multihabitat, 20-jab).

This report presents the sampling and assessment results for all three subwatersheds of the Cattail Creek/Brighton Dam watershed. Composite assessments are presented for watershed-scale biological and habitat assessments. The report also presents individual site-by-site assessments. Watershed comparisons are also made between the 2001 and 2005 results.
In the 2001 and 2002 reports, there was in error in the metric scores for percentage of collectors, which affected the B-IBI scores for some sites. The corrected results are included in this report and can be found in Appendices J and K.

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ACRONYMS

ARC	Aquatic Resources Center
B-IBI	Benthic Index of Biotic Integrity
BMP	Best Management Practice
BRF	Biological Research Facility
DQO	Data Quality Objectives
DNR	Department of Natural Resources
DPW	Department of Public Works
DPZ	Department of Planning and Zoning
DRP	Department of Recreation and Parks
EDAS	Ecological Data Application System
EPT	Ephemeroptera, Plecoptera, Trichoptera
FLD	Field
MBSS	Maryland Biological Stream Survey
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RBP	Rapid Biological Protocols
RPD	Relative Percent Difference
SD	Standard Deviation
SOP	Standard Operating Procedure
SWMD	Stormwater Management Division
TAC	Technical Advisory Committee
TCR	Taxonomic Certainty Rating
USEPA	United States Environmental Protection Agency
UT	Unnamed Tributary
WRD	Watershed Restoration Division

EXECUTIVE SUMMARY

In 2001, the Howard County Department of Public Works (DPW) Stormwater Management Division (SWMD) initiated biological monitoring for its streams and wadeable rivers on an annual, rotating basin cycle. The primary goal of this program is to assess the current status of the County's streams and watersheds and to establish a baseline for comparing future assessments. The program is designed to provide assessments at three geographic scales: stream-specific, watershed wide; and, after the multi-year sampling rotation is complete, county-wide. The Howard County biomonitoring program was designed to be comparable with the statewide Maryland Biological Stream Survey (MBSS). Comparability allows a greater density of sampling locations with consistent interpretation. Round one of the study was completed in 2003 and included the Little Patuxent River (2001), Cattail Creek (2001), Brighton Dam (2001), Middle Patuxent River (2002), Little Patuxent River (2003) and Patapsco River Tributaries and Branches (2003). This report presents results for year one of round two sampling performed in 2005 on the Cattail Creek and Brighton Dam watersheds. Sampling methods were identical to those used by the MBSS: benthic macroinvertebrates sampled using a D-frame net in multiple habitats (Best available 20-jab method), visual-based assessment of physical habitat quality, and selected field chemistry measurements. In addition to the MBSS protocols, substrate particle size distribution and stream channel cross sectional area were also evaluated. Biological condition scores were derived using the MBSS's Benthic Index of Biotic Integrity (B-IBI original and revised). The MBSS revised the B-IBI in 2005 to include parameters believed to better utilize the amount of data collected. Both the original (Stribling et.al.1998) and revised (Southerland et al. 2005) B-IBI scores are calculated and reported in the following report. The B-IBI was used to rate the biological condition of each site as good, fair, poor, or very poor. Assessment of physical habitat quality combined MBSS methods and USEPA's Rapid Bioassessment Protocols (RBP). A rating scale based on the latter was assigned to each stream, and used categories of: comparable, supporting, partially supporting, or non-supporting. MBSS measures were taken for additional information. Results of the study will be used for developing protection/restoration priorities. The public will be able to access the yearly report via the County website.

Lower and Upper Brighton Dam subwatersheds received "partially supporting" physical habitat ratings. Cattail Creek received a "non-supporting" habitat rating. All three of the subwatersheds, Cattail Creek, Lower and Upper Brighton Dam, received "good" biological ratings based on the original B-IBI scores.

I. PROGRAM OVERVIEW

INTRODUCTION

Background

The Howard County Stormwater Management Division (SWMD) began a multi-year, rotating basin sampling effort to assess the ecological condition of streams and watersheds across the county in 2001. That year, the Little Patuxent River (Upper, Middle, Lower), Cattail Creek, and Upper and Lower Brighton Dam subwatersheds were assessed. The next year (2002) the Middle Patuxent River (Upper, Middle, Lower) basin was assessed followed by the Little Patuxent River (Hammond Branch, Dorsey Run, and Rocky Gorge Dam subwatersheds) and Boundary Tributaries (South Branch Patapsco River Tributaries, Patapsco River Lower Branch A, and Patapsco River Lower Branch B subwatersheds) in 2003. The first three years completed round one of the study. Since all 15 subwatersheds were completed in three years, it was decided that monitoring of the watersheds would continue to find trends and note changes in stream condition. This report presents year one, round two of the sampling and assessment results from Cattail Creek, Lower Brighton Dam, and Upper Brighton Dam subwatersheds.

The Patapsco and Patuxent Rivers form the boundaries of Howard County. All streams within the county feed into these two larger rivers. To properly evaluate the stream conditions throughout Howard County, it is broken up into 15 subwatersheds. This allows data to be reported on a site-by-site basis and also extrapolated out to a watershed scale. This is important because habitat fragmentation caused by development or other stressors can be underestimated at smaller spatial scales (Robinson et al. 1992, Sutter 1993). Moreover, traditional regulatory approaches do not adequately address the effects of non-point source pollution, such as runoff or nutrient enrichment (USEPA 1996).

Advantages of using benthic macroinvertebrates as the basis of biological assessments include; they often occur in large numbers; they respond to cumulative effects of physical habitat alteration, point source pollution, non-point source contaminants, and periodic contaminant spills; they have a relative inability to quickly move away from such affected areas; and different aspects of the benthic assemblage change in response to stressed conditions (Barbour et al. 1999).

The primary goals of the County biomonitoring program are to assess the ecological status of Howard County streams and watersheds, and to establish a baseline for comparing future assessments. Results will also be related to potential programmatic activities, such as BMP sitting, installation, and evaluation (Stribling et al. 2001); stormwater discharge permits; contributing to restorations initiatives (such as DNR's Watershed Restoration Action Strategy [WRAS]; and guidelines for Low Impact Development [LID] (PG County 2000).

Purpose of Biological and Physical Habitat Assessment

Physical habitat quality was also visually assessed at each sampling location (Barbour et al. 1999), and reflects the potential of the stream to support a vigorous biota and to maintain normal hydrogeomorphic function. As land use/land cover conversions occur in a watershed, there are changes in stream and watershed hydrology that cause acceleration of stream channel erosion. Impacts on physical habitat through sustained farming operations, increased housing density, and

other urban-suburban developments (highways, schools, shopping centers) cause sedimentation, degradation of riparian vegetation, and bank instability, leading to reduced overall habitat quality (Richards et al. 1996).

Although habitat alteration can lead to a diminished capacity of a stream to support certain aquatic organisms, many other factors also affect the biological quality of any stream or watershed (Figure 1). Degraded habitat quality, interruption of natural hydrologic regimes, alterations in food/energy sources and water quality, and unnatural biological interactions cause the biological condition of a stream to worsen (Karr et al. 1986). Potential stressors that cause this type of degradation include nutrient enrichment, toxic spills, flood control engineering, temperature extremes due to depletion of riparian zones or effluent discharge, elevated levels of suspended sediment due to animals access, clearing of riparian areas, and/or construction runoff. Sources of these stressors exist throughout Howard County. However, although biological monitoring is a critical tool for detecting impairment, it can not identify specific causal relationships between stressors and stressor sources (USEPA 2000). This report reflects the current biological and physical habitat condition of the Cattail Creek and Brighton Dam watersheds, and provides potential reasons for those conditions.

Participating Agencies

Membership on the County's Technical Advisory Committee (TAC) included Howard County Government (Stormwater Management Division (SWMD), Department of Recreation and Parks (DRP), and Department of Planning and Zoning (DPZ)), the State of Maryland Department of Natural Resources Biological Stream Survey (MBSS), Montgomery County Department of Environmental Protection (DEP), and representatives from USEPA. Selected TAC members (Howard County SWMD, DPZ, DRP; MBSS) reviewed the first draft of this report, and provided comments that were integrated into the final report.

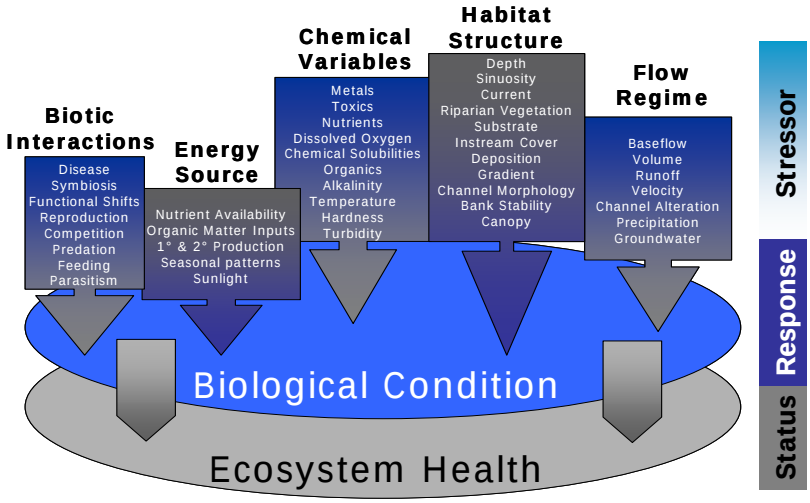

Figure 1. Five classes of environmental variables that affect water resource integrity and overall biological condition (modified from Karr et al. 1999).

METHODS

Network Design

Summary of Sampling Design

The measurement and data quality objectives (MQOs and DQOs) on which the Howard County biological monitoring program is based can be found in the *Quality Assurance Project Plan (QAPP) for Howard County Biological Monitoring and Assessment Program* (DPW 2001). The overall sampling design was developed to be directly comparable to the MBSS, and to allow the eventual sharing of data and assessments among agencies. The program is designed so that 10 sites in each of three subwatersheds are sampled per year (n = 30/year). A total of 15 subwatersheds will be sampled during a span of five years. Specific details of the sampling design can be found in *Design of the Biological Monitoring and Assessment Program for Howard County Maryland* (Pavlik et al. 2001). Spatial allocation of the sampling segments was based on random selection within Strahler (1957) stream orders. The number of sampling segments within each of the first through fourth order channel distances (m) was proportional to total stream length. Thus, final selection and placement of sampling segments was random, and stratified by subwatershed and stream order.

To address issues of measurement error (= systematic error), duplicate (repeated) biological samples were taken at 10% of the overall number of sites. Sites where this repeat sampling occurred were chosen at random, before the sampling event took place.

Site Selection

In 2005, year one of round two began and the Cattail Creek, Upper Brighton Dam, and Lower Brighton Dam subwatersheds were assessed using 10 new, randomly selected sites each. The full sampling schedule (2001-2005) is detailed in Table 1. Figure 2 graphically displays the watersheds sampled in 2005 that are covered in this report. Ten percent of the sites in each watershed were randomly selected as quality control (QC) sites. Only biology, chemistry, and habitat were collected at those QC sites.

In addition to the ten randomly selected primary sites selected for each subwatershed, ten alternate sites are also selected. In the event that a primary site is not able to be sampled (i.e., denied access, non-wadeable, impounded channel), the first alternate site of the same stream order is sampled in its place. This maintains the randomness of the design, while incorporating the flexibility necessary to account for unforeseen circumstances in the field.

Table 1. Howard County sampling schedule by watershed. WRD indicates that field sampling and laboratory processing of benthic samples was performed by DNR Watershed Restoration Division.

Year	Watershed Name or Surrogate	Subwatershed #	Primary Sampling Unit (PSU)
1 (2001)	Little Patuxent River	11	Upper Little Patuxent (10 sites, WRD)
		12	Mid Little Patuxent (10 sites, WRD)
		13	Lower Little Patuxent (10 sites, WRD)
	Brighton Dam	2	Upper Brighton Dam (10 sites)
		5	Lower Brighton Dam (10 sites)
	Cattail Creek	3	Cattail Creek (10 sites)
2 (2002)	Middle Patuxent River	6	Upper Middle Patuxent (10 sites)
		7	Mid Middle Patuxent (10 sites)
		8	Lower Middle Patuxent (10 sites)
3 (2003)	Boundary Tributaries	10	S Branch Patapsco R Tribs (10 sites)
		1	Patapsco River L Br A (10 sites)
		4	Patapsco River L Br B (10 sites)
	Little Patuxent River	14	Hammond Branch (10 sites)
		15	Dorsey Run (10 sites)
		9	Rocky Gorge Dam (10 sites)
4 (2005)	Brighton Dam	2	Upper Brighton Dam (10 sites)
		5	Lower Brighton Dam (10 sites)
	Cattail Creek	3	Cattail Creek (10 sites)

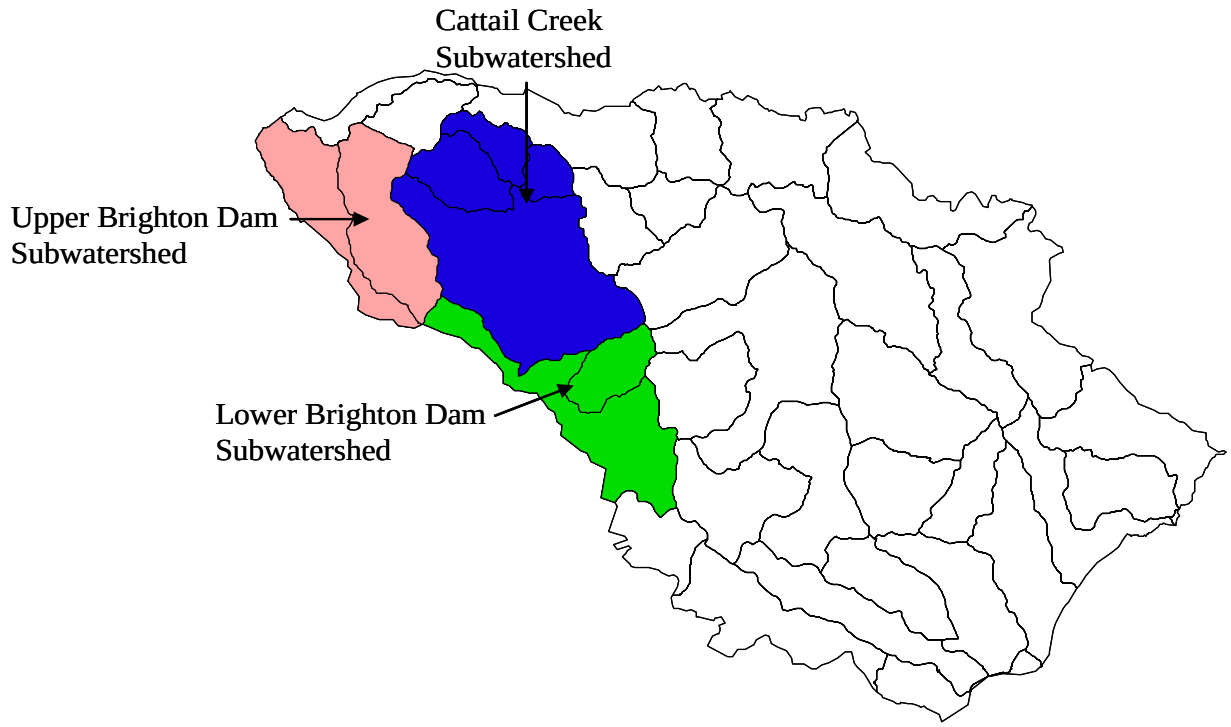

Figure 2. Subwatersheds sampled in 2005.

Field Sampling and Laboratory Processing

One two-person field team completed all sampling during the Spring 2005 Index Period. Benthic macroinvertebrate sampling and physical habitat assessments were conducted in accordance with the Standard Operating Procedures (SOP FLD003/09.07.00; FLD005/02.27.01) explained in the MBSS Sampling Manual (Kazyak 2000). Duplicate macroinvertebrate samples were taken at 10% of the sites (three in 2005) as per the data quality objectives listed in the QAPP. Field chemistry sampling, modified Wolman pebble count, and channel cross sections in the were conducted according to SOPs BRF050/07.07.97, FLD032/01.25.99, and FLD043/07.19.99, respectively.

Benthic Sampling and Processing

At each site, benthic macroinvertebrates were collected from a 75 m reach by sampling approximately 20 ft^2 of surface area with a D-frame net (595 µm mesh), in proportion to the frequency of habitat types (riffles, snags, vegetated banks, sandy bottom) found within the reach. All sampled material (including leaf litter, small woody debris, and sediment) was composited in a 595 µm sieve bucket, placed in one or more one-liter sample containers and preserved in 70 - 80% ethanol. Internal and external labels were completed for each container. Samples were tracked on chain-of-custody forms for each subwatershed.

All sorting of the samples was completed in Tetra Tech's Biological Research Facility (BRF) under the supervision of an experienced laboratory manager. The subsampling method involved using a 30-square Caton gridded screen, which allows isolation of physically defined amounts of sample material (leaf litter detritus, substrate particles) from the total sample, and the separation/removal of the organisms from that material. Gridded squares of material were removed and sorted until the target number of organisms (100 ± 20%) was reached, and samples were sent to an external laboratory (ARC) for identification to genus level (Howard County DPW/SWMD 2001, Boward and Friedman 2000).

Benthic Taxonomy

Benthic macroinvertebrates were primarily identified to the genus level. In some cases, e.g., when individuals were early instars or had damaged or missing diagnostic morphological features, identification was restricted to a higher taxonomic level, such as family. All identifications were performed by ARC, Nashville, Tennessee (Todd Askegaard, principal). Taxonomic data were received in Excel spreadsheets and loaded into the Ecological Data Application System, Version 3.0 (EDAS; Tetra Tech 1999). Functional feeding group, habit, and tolerance value designations were assigned to each taxon according to Merritt and Cummins (1996), Barbour et al. (1999), and Stribling et al. (1998). Tolerance of a taxon is based on its ability to survive short and long term exposure to physicochemical stressors that result from chemical pollution, hydrologic alteration, or habitat degradation (Stribling et al. 1998). Following Hilsenhoff's basic framework (1982), tolerance values were assigned to individual taxa on a scale of 0-10, with zero identifying those taxa with greatest sensitivity (least tolerance) to stressors, and 10 for taxa with the least sensitivity (greatest tolerance) to stressors.

Physical Habitat Rating (Methods for Calculation and Scoring)

As outlined in the QAPP (DPW 2001), 10 parameters describing physical habitat quality and stability were visually assessed at each site. These parameters were ranked as optimal, suboptimal, marginal, or poor based on a 20-point scale, with 20 being the best possible (optimal) conditions and zero representing the worst (poor) conditions. A reference database, and thus, a degraded/non-degraded threshold, has not been developed by the MBSS to allow direct comparison to physical habitat characteristics. Moreover, MBSS records any qualitative physical habitat measurements during the Summer Index Period, while sampling fish. Currently, Howard County does not support fish and habitat sampling during the summer season. For these reasons, the non-Coastal plain categories found in the Rapid Bioassessment Protocols (RBPs; Barbour et al. 1999) were used. However, since the RBPs were not used to rate reference sites, the values were summed and compared to the maximum possible score (200) for overall percent comparability for each site. The following 10 parameters were evaluated:

1. *Epifaunal substrate/available cover.* Includes the relative quantity and variety of natural structures in the stream, such as cobble (riffles), large rocks, fallen trees, logs and branches, and undercut banks, available as refuge, feeding, or sites for spawning and nursery functions of aquatic macrofauna.
2. *Embeddedness.* Refers to the extent to which rocks (gravel, cobble, and boulders) and snags are covered or sunken into the silt, or mud of the stream bottom.
3. *Velocity/depth regime.* The occurrence of flow patterns relates to the stream's ability to provide and maintain a stable aquatic environment.
4. *Sediment deposition.* Measures the amount of sediment that has accumulated in pools and the changes that have occurred to the stream bottom as a result of deposition.
5. *Channel flow status.* The degree to which a stream is filled with water.
6. *Channel alteration.* Measures large-scale (usually anthropogenic) changes in the shape of the stream channel.
7. *Frequency of riffles/bends.* Measures the heterogeneity occurring in a stream. Riffles are a source of high-quality habitat and diverse fauna. Therefore, increased frequency of occurrence greatly enhances the diversity of the stream community.
8. *Bank stability.* Measures whether the stream banks are eroded (or have potential for erosion).
9. *Vegetative protection.* Measures the amount of vegetative protection afforded to the stream bank and the near-stream portion of the riparian zone.
10. *Riparian vegetative zone width.* Measures the width of natural vegetation from the edge of the stream bank out through the riparian zone.

Parameters 8-10 evaluate each bank separately. The range of scores for each bank is 0 (poor) to 10 (optimal). Left and right banks were determined looking downstream. Example habitat forms can be found in the QAPP (SOP FLD005/02.27.01). Table 2 provides narrative ratings that correspond to physical habitat quality scores. These scores express the potential of a stream or watershed to support a healthy biological community. Percentages and their narrative ratings were adapted from Plafkin et al. (1989).

Table 2. Total habitat scores as a percentage of maximum possible and corresponding ratings.

% of Maximum	Narrative Habitat Rating	Definition
> 90.0	Comparable	Capable of maintaining biological conditions similar to reference streams
75.1 - 89.9	Supporting	Habitat of somewhat reduced condition, but often can support reference quality biology
60.1 - 75.0	Partially Supporting	Capable of supporting biological conditions of lower quality than reference conditions
< 60.0	Non-Supporting	Not able to maintain healthy biological conditions

Habitat forms developed by MBSS were also filled out at each site. These sheets evaluated land use/land cover designations, occurrence/severity of refuse, buffer breaks (storm drains, roads, pastures, etc.), and channelization. Information from these forms is described in the narrative watershed and site-by-site assessment sections of this report.

Water Quality

Conductivity, dissolved oxygen, pH, and temperature were measured at each site using a Hydrolab H2O (SOP BRF050/07.07.97). This instrument was calibrated for each parameter at the start of each sampling day, and the readings were recorded on a calibration log sheet. However, the dissolved oxygen probe had malfunctioned during the sampling period and was not able to be replaced on short notice. Therefore, dissolved oxygen data obtained during this sampling period was not reliable or accurate.

Modified Wolman Pebble Count

In addition to the qualitative habitat assessment, this physical habitat feature was measured for all stream sites during the sampling period. While not a part of the MBSS protocols, the County performed pebble counts to obtain more specific data on stream substrates and particle size distribution. Ten transects were proportionally distributed (approximately one every 7.5 m) through the assessment segment beginning on each bank at approximate bankfull level and spanning the width of the active channel. A total of 10 particles per transect were selected by hand (each particle is defined as a size of geologic substrate material within various classes: silt/clay, sand, gravel, cobble, boulder, and bedrock). Each particle was chosen, measured, and recorded at evenly spaced intervals across the channel. To reduce sampler bias, each particle was chosen without the sampler looking in the stream at what was being collected (DPW 2001, SOP FLD 032/01.25.99; Harrelson et al. 1994). Calipers and a sand card were used for particle measurement.

Channel Cross-Section

Although not measured by MBSS, the County includes this measurement to provide a coarse characterization of channel cross-sectional area and changes to channel dimensions over time. After a thorough visual assessment of the channel characteristics, a representative section was

selected for analysis as the cross-section area. A tape measure is drawn between temporary monuments (bank pins) that are set on each bank to record the location of each measurement. Height measurements are taken using a laser-level and survey rod. The measurements are taken across the entire width of the channel, as well as at transitional areas along the bank and streambed (e.g., bankfull and thalweg). This procedure is outlined in detail in SOP FLD043/07.19.99 (DPW 2001).

Inability to Sample Stream Sites

Ten primary sampling sites were randomly chosen for each subwatershed. In addition to the primary sites, ten secondary (alternate) sites were randomly chosen for each subwatershed to provide backup locations in the event that the primary sampling site was deemed unsampleable (i.e., landowner denied access, no channel remaining [filled in] or, channel too deep). Two primary sites in the Cattail Creek subwatershed were replaced with alternate sites because one channel no longer existed (i.e., filled with dirt, grass, etc.), and the landowner denied access to the other site. In addition, pebble count data was unable to be collected from one site in the watershed because the landowner asked the field team to leave. The other parameters were already collected, therefore that site was considered valid.

One site in the Lower Brighton Dam subwatershed was replaced with an alternate because several heavy rain events caused the reservoir to back up into the site, rendering it unsampleable.

Data Analysis

Data Structure

Benthic macroinvertebrate, physical habitat, and water quality data were entered into EDAS, Version 3.0 (Tetra Tech 1999). This relational database allows for the management of location and other metadata, taxonomic and count data, raw physical habitat scores, the calculation of metric values, physical habitat and water quality rankings, and B-IBI values (original and revised).

Biological Index Rating (Methods for Calculation and Scoring)

The biological indicator used in this project is based on the Index of Biological Integrity (IBI; Karr et al. 1986) and uses characteristics of the benthic macroinvertebrate assemblage structure and function to assess the overall water resource condition. Benthic IBIs were developed by the MBSS and calibrated for different geographic areas of Maryland (Stribling et al. 1998). As in previous reports (Pavlik and Stribling 2001, 2003, 2004, 2005), the original Maryland non-coastal plain B-IBI was calculated in this report, as well as a revised B-IBI calibrated for Maryland Eastern Piedmont streams (Southerland et al. 2005). The MBSS revised the B-IBI in 2005 to include parameters believed to better utilize the amount of data collected. Both the original (Stribling et.al.1998) and revised (Southerland et al. 2005) B-IBI scores are calculated and reported; however, to maintain consistency with earlier reports, the original B-IBI scores were used to report on the general biological conditions in the discussions of the subwatershed overview and site specific results.

Original B-IBI

The original benthic metrics used were those selected and calibrated by the MBSS (Stribling et al. 1998) for Maryland non-coastal plain streams. The nine metrics calculated for each of the benthic macroinvertebrate samples were:

1. *Total number of taxa.* The taxa richness of a community is commonly used as a qualitative measure of stream water and habitat quality. Stream degradation generally causes a decrease in the total number of taxa (Resh and Grodhaus 1983).
2. *Number of EPT taxa.* Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) are generally sensitive to degraded stream conditions. A low number of taxa representing these orders is indicative of stream degradation (Lenat 1988).
3. *Number of Ephemeroptera taxa.* Mayflies are generally sensitive to pollution and the number of mayfly genera represented by individuals in a sample can be an indicator of stream conditions, generally decreasing with increasing stress.
4. *Number of Diptera taxa.* As an order, Dipterans are relatively diverse, as well as variable in their tolerance to stress. Many taxa, especially Chironomidae, have wide distributions and may occur even in highly polluted streams. However, a high diversity of Diptera taxa generally suggests good water and habitat quality.
5. *Percent Ephemeroptera.* The degree to which mayflies dominate the community can indicate the relative success of these generally pollution intolerant individuals in sustaining reproduction. The presence of stresses will reduce the abundance of mayflies relative to other, more tolerant individuals; although, some mayfly groups, such as several genera of the family Baetidae, are known to increase in numbers in cases of nutrient enrichment.
6. *Percent Tanytarsini.* The tribe Tanytarsini is a relatively intolerant group of midges. A high percentage of Tanytarsini, proportional to the overall sample is taken to indicate lower levels of stress. This metric increases with high numbers of Tanytarsini and decreases with high numbers of non-Tanytarsini.
7. *Number of Intolerant Taxa.* Intolerant taxa are the first to be eliminated by perturbations. Often, intolerant taxa are specialists and perturbations can alter or eliminate specialized habitat or water quality requirements. Taxa with tolerance ratings from 0 - 3 were considered intolerant (Hilsenhoff 1987).
8. *Percent Tolerant.* As stressor intensity increases, tolerant individuals (tolerance values 7 - 10) tend to dominate samples. Values for this metric increase in cases of elevated stress. Intolerant individuals become less abundant as stress increases, leading to more opportunity for tolerant taxa to colonize a stream (Hilsenhoff 1987).
9. *Percent Collectors.* Abundance of detritivores, which feed on fine particulate organic matter in deposits, typically decreases with increased disturbance. This ecological response may be highly represented by intolerant taxa.

Each metric was scored on a 5, 3, 1 basis (5 being the best, 1 being the worst) according to stream health. Metric scoring criteria are listed in Table 3. Overall biological index scores are obtained by summing of the nine metric scores for each site, and dividing by the number of metrics (9). Using the format established by MBSS, the resulting value is then compared to the index scoring criteria for translation into narrative categories (Table 4; Stribling et al. 1998). Again, using the MBSS protocol, if the total number of organisms in a sample was less than 60,

metrics were not calculated (D. Boward, personal communication). Sites with < 60 organisms were rated as "very poor" unless there was evidence that this represented a natural condition (Stribling et al. 1999).

Table 3. Metric scoring criteria for the Original Benthic IBI (Stribling et al. 1998).

Benthic Macroinvertebrate Metrics	**Criteria**		
	5	**3**	**1**
Total number of taxa	>22	16 - 22	<16
Number of EPT taxa	>12	5 - 12	<5
Number of Ephemeroptera taxa	>4	2 - 4	<2
Number of Diptera taxa	>9	6 - 9	<6
% Ephemeroptera	>20.3	5.7 - 20.3	<5.7
% Tanytarsini	>4.8	0.0 - 4.8	0.0
Number of intolerant taxa	>8	3 - 8	<3
% tolerant	<11.8	11.8 - 48.0	>48.0
% collectors	>31.0	13.5 - 31.0	<13.5

Table 4. Benthic IBI score ranges and corresponding narrative ratings.

Benthic IBI Score Range	**Narrative Biological Rating**
4.0 - 5.0	Good
3.0 - 3.9	Fair
2.0 - 2.9	Poor
1.0 - 1.9	Very Poor

Revised B-IBI

The revised benthic metrics also calculated in this report for comparison purposes were those selected and calibrated by the MBSS (Southerland et al. 2005) for Maryland Eastern Piedmont streams. The six metrics calculated for each of the benthic macroinvertabrate samples were:

1. *Total number of taxa.* The taxa richness of a community is commonly used as a qualitative measure of stream water and habitat quality. Stream degradation generally causes a decrease in the total number of taxa (Resh and Grodhaus 1983).
2. *Number of EPT taxa.* Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) are generally sensitive to degraded stream conditions. A low number of taxa representing these orders is indicative of stream degradation (Lenat 1988).
3. *Number of Ephemeroptera.* Mayflies are generally sensitive to pollution and the number of mayfly genera represented by individuals in a sample can be an indicator of stream conditions, generally decreasing with increasing stress.

4. *Percent Intolerant to Urban.* This is the percentage of the benthic sample that is intolerant to urban stressors. This metric decreases with increased stream degradation.
5. *Percent Chironomidae.* This is the percentage of the benthic sample that are midge larvae and pupae. The percent of chironomids tends to increase with increasing perturbations.
6. *Percent Clingers.* This is the percentage of the benthic sample having fixed retreats or adaptations for attachment to surfaces in flowing water. Clingers tend to decrease with increasing stressors.

Like the original B-IBI, each metric was scored on a 5, 3, 1 basis according to stream health. Metric scoring criteria are listed in Table 5. The benthic IBI score ranges and corresponding narrative rating are the same as the original B-IBI (Stribling et al.1998).

Table 5. Metric scoring criteria for the Revised Benthic IBI (Southerland et al. 2005).

Benthic Macroinvertebrate Metrics	Criteria		
	5	**3**	**1**
Total number of taxa	≥25	15 - 24	<15
Number of EPT taxa	≥11	5-10	<5
Number of Ephemeroptera taxa	≥4	2-4	<2
Percent Intolerant to Urban	≥51	12-50	<12
% Chironomidae	≤24	25-63	>63
% Clingers	≥74	31-73	<31

Watershed Assessments

In this report, a narrative explanation of the biological condition and physical habitat quality scores are given for each site. Important features recorded during sampling, or found during subsampling, are used to further explain potential reasons for site ratings. Tolerance values (t.v.) are used in site descriptions to explain information about the organisms collected, and how their tolerance to pollution affects the overall metric score. For each watershed, the mean of the medians from each stream order (first, second, and third) and standard deviations for both benthic macroinvertebrate metrics and physical habitat scores were calculated in MS Excel. The "percent of maximum" values presented in the appendix were calculated by dividing the total habitat score by the total possible score represented on the habitat data sheets (200 maximum), rather than using a mean of field measurements or median from a set of reference sites.

QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance/Quality Control (QA/QC) activities are designed to ensure data quality and document data characteristics. To this end, Howard County has:

- documented standard operating procedures (SOPs) for field sampling, laboratory processing, and completing chain-of-custody forms

The SOPs and procedures for these QC activities are documented in the Howard County Biological Monitoring and Assessment Program Plan (DPW 2001). All SOPs are cited in the methods section of this report. Chain-of-custody and sample log sheets were maintained to track the inventory and processing status of all samples. Sample documentation forms are kept in Tetra Tech's Biological Research Facility (BRF).

- Repeated continual training and QC checks for sample sorting and subsampling

Each individual sorter had their work checked until a 90% sorting efficiency was achieved (internal QC). After this level of efficiency was obtained, one out of every 10 randomly selected samples was checked by the laboratory manager. During this sampling period, 20 samples were checked in total. Of those 20 samples, the six lab technicians achieved an overall internal sorting efficiency of 94.2%.

The number of organisms found in the pickate (pickate recoveries) from the initial sorting was used to calculate primary percent sorting efficiency (internal QC), SE1:

$$PSE_1 = \frac{A}{A + B_1}$$

where A is the number of individuals originally picked from the sample, and B_1 is the number of organisms found in the intra-laboratory recheck (internal QC).

The number of organisms recovered from the pickate during the secondary re-check (external QC) was used to calculate a secondary percent sorting efficiency, as follows (Hill et. al, 2005):

$$PSE_2 = \frac{A}{A + B_1 + B_2}$$

where B_2 is the number of organisms found during the secondary re-check (external QC).

After the initial sorting effort conducted by Tetra Tech's BRF, 10% of the sample pickates were randomly selected to be re-checked a second time by an independent laboratory, ARC, (external QC), resulting in four samples (Table 6). The four samples received an overall external sorting efficiency of 96.6%. *The laboratory sorting/subsampling measurement quality objective (MQO) for this project was to have <10% of the samples with sorting efficiency of <90%.*

Table 6. Percent sorting efficiencies per sample.

Station ID	# of orgs originally sorted	# of orgs found in QC	Total # of orgs	PSE_1
2-011	107	2	109	98.2
2-023	107	4	111	96.4
2-043	429	18	447	96.0
2-049	142	4	146	97.3
Mean PSE				**96.9**

- Subsample repeatability (Sample bias)

A side-by-side subsample comparison was performed to test the repeatability and representativeness of subsampling. The original subsample was obtained according to the methods described in the SOP (DPW 2001). After the first subsample was completed, the remaining unsorted sample remains were then re-spread over a 30-grid Caton tray. Grids were selected at random (minimum of four) and sorted to their entirety until a second 100 (± 20) organism subsample was obtained from the original sample (Table 7).

Table 7, Side-by-side subsample comparisons. The original subsample is denoted "a" while the second subsampled is denoted "b".

Sample ID	Grids sorted	Organisms Identified
2-004a	4	112
2-004b	4	116
2-005a	4	108
2-005b	4	106
2-007a	8	100
2-007b	4	100
2-038a	6	115
2-038b	6	111

Three of the four sample pairs resulted in different biological ratings based on the original B-IBI scores (Table 8). However, the individual metrics were much less variable than what the overall B-IBI scores would suggest. Table 9 shows various measures of precision, such as Root Mean Square Error (RMSE) Coefficient of Variability (CV), 90% Confidence Interval (CI) and median RPD, that were calculated on the sample pairs. None of the measures calculated deviated significantly from normal, acceptable levels of precision between duplicate sample pairs observed in a similar study (Hill et al. 2005). Differences in B-IBI scores can be explained primarily by the scoring criteria used to calculate the final B-IBI score. For example, while there was only one less taxon found in 2-004A compared to 2-004B, it received a score of three versus five for that metric because the value fell on the scoring threshold for that metric (Figure 3). For site 2-004, there were a total of three metrics where the subsample values deviated only slightly, but because they fell on either side of the scoring threshold they received different scores, which ultimately affect the overall B-IBI score. This appeared to be consistent in explaining why the other two sample pairs (2-007 and 2-038) also received different biological ratings. Furthermore, we found no difference in biological ratings between duplicate samples when applying the revised B-IBI (Table 10), suggesting that the data obtained from duplicate subsamples was, in fact, quite comparable even though the biological ratings obtained from the original B-IBI differed.

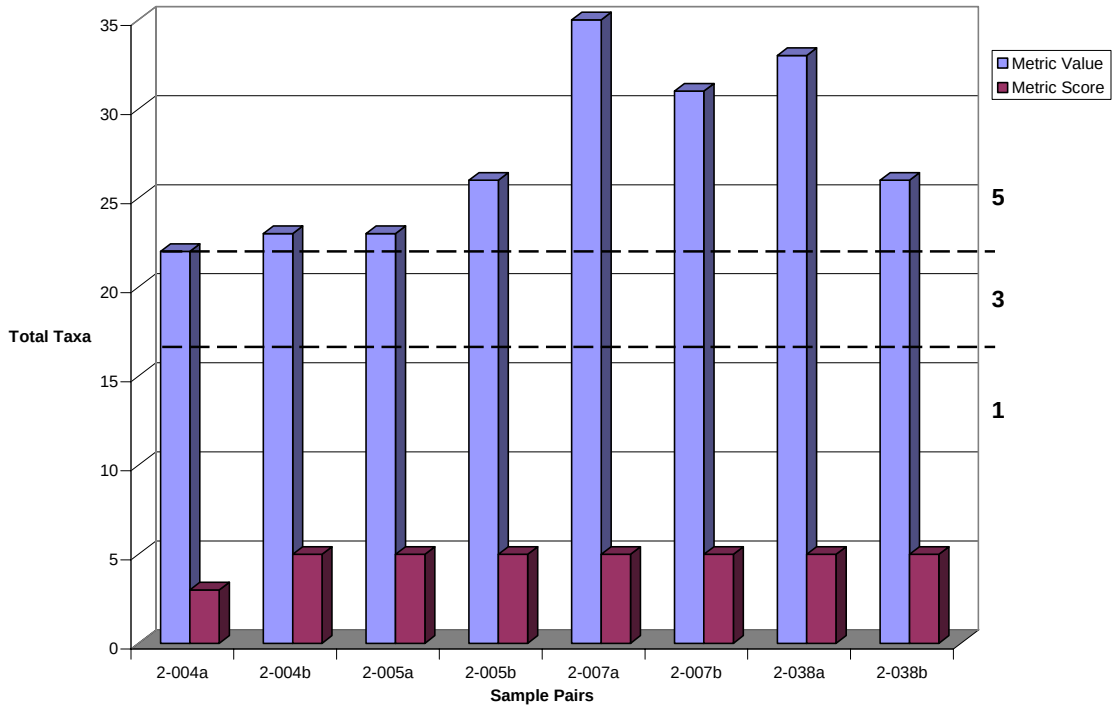

Figure 3. Metric values and scores for total taxa including metric scoring criteria. Sample 2-004 shows less variability between metric values than all other sample pairs, but because it falls on either side of the scoring threshold it received different scores.

Table 8. Metric values and scores using the original IBI for duplicate subsamples.

	Original IBI		Total Taxa		EPT Taxa		Ephemeroptera Taxa		Ephemeroptera Percent		Diptera Taxa		Tanytarsini Percent		Intolerant Taxa		Tolerant Percent		Collector Percent	
Sample	**Score**	**Rating**	**value**	**score**	**value**	**score**	**value**	**score**	**value**	**score**	**value**	**score**	**value**	**score**	**value**	**score**	**value**	**score**	**value**	**score**
2-004a	2.56	Poor	22	3	4	1	1	1	4	1	15	5	4	3	1	1	6	5	22	3
2-004b	3.22	Fair	23	5	4	1	0	1	0	1	13	5	3	3	3	3	4	5	31	5
2-005a	4.11	Good	23	5	6	3	3	3	56	5	11	5	1	3	4	3	7	5	68	5
2-005b	4.11	Good	26	5	7	3	2	3	40	5	16	5	5	3	6	3	4	5	53	5
2-007a	4.11	Good	35	5	10	3	4	3	10	3	19	5	17	5	6	3	6	5	36	5
2-007b	3.44	Fair	31	5	5	3	1	1	5	1	22	5	12	5	5	3	13	3	49	5
2-038a	4.33	Good	33	5	13	5	6	5	15	3	11	5	3	3	11	5	2	5	30	3
2-038b	3.22	Fair	26	5	12	3	3	3	8	3	9	3	0	1	8	3	1	5	24	3

Table 9. Various measures calculated to determine the precision of subsample repeatability including root mean square error (RMSE) coefficient of variability (CV), 90% confidence interval (CI) and median relative percent difference (mRPD).

Measure of Precision	Original IBI	Total Taxa	EPT Taxa	Ephemeroptera Taxa	Diptera Taxa	Ephemeroptera Percent	Tanytarsini Percent	Intolerant Taxa	Tolerant Percent	Collector Percent
RMSE	0.4	2.7	1.2	1.4	2.1	5.8	2.3	1.4	2.4	7.4
CV	11.9	9.7	16.2	56.6	14.6	33.7	42.3	25.7	43.7	18.9
90% CI	0.7	4.3	2.0	2.3	3.5	9.6	3.8	2.3	3.9	12.1
mRPD	20.4	12.2	11.7	93.3	17.3	46.7	84.3	24.9	64.4	27.6

Table 10. Metric values and scores using the revised IBI for duplicate subsamples.

	Revised IBI		Total Taxa		EPT Taxa		Ephemeroptera Taxa		Intolerant to Urban Percent		Chironomidae Percent		Clingers Percent	
Sample	**Score**	**Rating**	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**
2-004a	2.00	Poor	22	3	4	1	1	1	4	1	38	3	57	3
2-004b	2.00	Poor	23	3	4	1	0	1	9	1	34	3	63	3
2-005a	3.67	Fair	23	3	6	3	3	3	65	5	13	5	40	3
2-005b	3.33	Fair	26	5	7	3	2	3	46	3	25	3	39	3
2-007a	2.33	Poor	31	5	5	3	1	1	12	3	65	1	27	1
2-007b	2.33	Poor	31	5	5	3	1	1	12	3	65	1	27	1
2-038a	4.33	Good	33	5	13	5	6	5	32	3	17	5	67	3
2-038b	4.00	Good	26	5	12	5	3	3	27	3	8	5	74	3

- Consistent use of up-to-date technical taxonomic literature

The target level of taxonomic identification for benthic macroinvertebrates for this project was the genus level. State-of-the-science technical literature was used throughout and includes the references listed in Table 11.

Table 11. Taxonomic References used for organism identification

Burch, J. B. 1989. *North American Freshwater Snails*. Malacological Publ., Hamburg, Michigan. 365p.
Burch, J. B. 1982. *Freshwater Snails (Mollusca: Gastropoda) of North America*. EPA-600/3-82-026, USEPA, Cincinnati, Ohio. 294 p.
Edmunds, G. F., Jr., Jensen, S. K. and Berner, L. 1976. *The Mayflies of North and Central America*. Univ. Minn. Press, Minneapolis. 330 p.
Epler, J. H. 1995. *Identification Manual for the Larval Chironomidae (Diptera) of Florida.* rev. ed. Dept. Environ. Prot., Tallahassee, FL. 9 sections.
Epler, J. H. 1996. *Identification Manual for the Water beetles of Florida (Coleoptera: Dryopidae, Dytiscidae, Elmidae, Gyrinidae, Haliplidae, Hydraenidae, Hydrophilidae, Noteridae, Psephenidae, Ptilodactylidae, Scirtidae).* Dept. Environ. Prot., Tallahassee. 15 sections.
Kathman, R. D. and Brinkhurst, R. O. 1998. *Guide to the Freshwater Oligochaetes of North America.* Aquatic Resources Center, College Grove, TN. 264 p.
McAlpine, J. F., Peterson, B. V., Shewell, G. E., Teskey, H. J., Vockeroth, J. R. and Wood, D. M. (Coords.) 1981. *Manual of Nearctic Diptera.* Vol. 1, Monogr. 27. Can. Govt. Publ. Centre, Hull, Quebec. 674p.
Merritt, R. W. and Cummins, K. W. 1996. An Introduction to the Aquatic Insects of North America. 3rd, Edition. Kendall/Hunt Publ. Co., Dubuque, Iowa. 862p.
Needham, J. G. and Westfall, M. J., Jr. 1954. A Manual of the Dragonflies of North America (Anisoptera). Univ. Calif. Press, Berkeley. 615 p.
Oliver, D. R. and Dillon M. E. 1990. A Catalog of Nearctic Chironomidae. Research Branch, Agriculture Canada. Publ. 1857/B:1-89.
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Wiederholm, T. (ed.) 1983. Chironomidae of the Holarctic region. Keys and diagnoses. Part l. Larvae. Entomol. Scand. Suppl. 19. 457 p.
Wiederholm, T. (ed.) 1986. Chironomidae of the Holarctic region. Keys and diagnoses. Part 2. Pupae. Entomol. Scand. Suppl. 28. 482 p.
Wiggins, G.B. 1996. Larvae of North American Caddisfly Genera (Trichoptera), 2nd Ed. University of Toronto Press, Toronto. 457 p.

- Taxonomic Identification and Enumeration

Identifications were performed by an independent taxonomic laboratory (ARC) using the most appropriate and up-to-date technical literature. Taxonomy was performed to hierarchical levels, mostly to genus, some to species and others to higher levels (i.e., tribe, family, subfamily, order, or class) (Table 12). Approximately 10% of all project samples (four samples) were randomly chosen by Tetra Tech Inc., for re-identification. Once the primary identifications were completed for all four samples, the vials and slides containing specimens were shipped to an independent taxonomic lab, Freshwater Benthic Services (FBS), for re-identification. Samples were sent with site information only (i.e., without identifications), thus representing blind samples. Another aspect of sample processing that is related to taxonomic identification is

enumeration, or the direct counts of individuals in sample, both in total and separated by individual taxa.

Precision. Results from each lab were compared for an evaluation of enumeration and taxonomic precision. Presented below are the results of the analysis.

Enumeration: Final specimen counts for samples are dependent on the taxonomic identification, not the rough counts obtained during the initial sorting activity. Comparisons of counts were performed using Percent Difference in Enumeration (PDE; Stribling et al. 2003), calculated as:

$$PDE = \left(\frac{|Lab1 - Lab2|}{Lab1 + Lab2} \right) x100$$

where *Lab1* is the number of specimens counted by the first laboratory and *Lab 2* is the second laboratory's count. For all four samples, the total number of organisms was identical, resulting in PDEs of 0% (Figure 4).

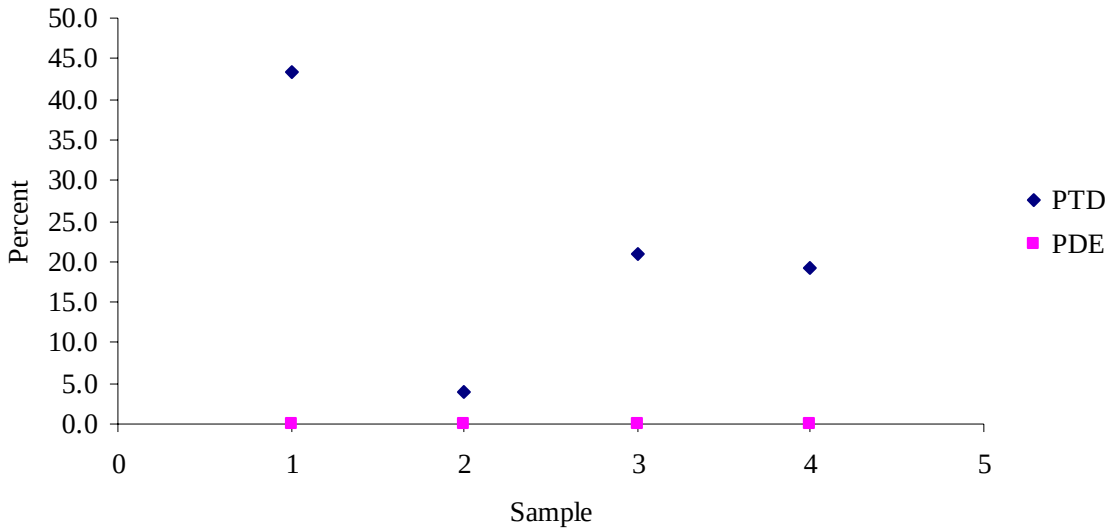

Figure 4. Percent difference in enumeration (PDE) and percent taxonomic disagreement (PTD) for four randomly selected samples. Program MQO for PDE = 5% and PTD = 15%.

Taxonomy: Precision of taxonomic identification was assessed by comparing genus-level taxonomic results from two independent taxonomists. A side-by-side comparison between the taxonomic results was performed for each re-identified sample. The process entailed examining both taxa lists for discrepancies between them, including straight disagreements (i.e., two different genus), hierarchical disagreements (i.e., family level identification vs. genus level), and numerical disagreements (i.e., different numbers of organisms listed under each taxon), and then determining the number of agreements

between each list. Using the number of agreements, Percent Taxonomic Disagreement, or PTD (Stribling et al. 2003) was calculated using the equation:

$$PTD = \left[1 - \left(\frac{Comp_{pos}}{N}\right)\right] \times 100$$

where $Comp_{pos}$ is the number of agreements, and N is the total number of organisms in the larger of the two counts. The lower the PTD value, the more similar are sample taxonomic results, and the greater is the overall taxonomic precision.

Table 12. Hierarchical targets for taxonomic identifications.

PHYLUM/Class	**Order/*Family***	**Taxonomic target**
PHYLUM ANNELIDA		
Class Branchiobdellida		Identify to genus
Class Hirudinea		Identify to genus
Class Oligochaeta		Identify to genus
Class Polychaeta		Identify to genus
PHYLUM ARTHROPODA		
Class Arachnoidea	*Acari*	Identify to genus
Class Insecta	Coleoptera	Identify to genus
	Diptera	*Identify all to genus except for the following taxa:*
	Chironomidae	Identify to genus (this may not be possible for some groups, which should be identified to at least tribe or subfamily)
	Dolichopodidae	Identify to family
	Phoridae	Identify to family
	Scathophagidae	Identify to family
	Syrphidae	Identify to family
	Ephemeroptera	Identify to genus
	Lepidoptera	Identify to genus
	Megaloptera	Identify to genus
	Odonata	Identify to genus
	Plecoptera	Identify to genus
	Trichoptera	Identify to genus
Class Malacostraca	Amphipoda	Identify to genus
	Decapoda	Identify to genus
	Isopoda	Identify to genus
	Mysidacea	Identify to genus
Class Ostracoda		Identify to genus
PHYLUM COELENTERATA		
PHYLUM MOLLUSCA		
Class Bivalvia		Identify to genus
Class Gastropoda		Identify to genus except in the following cases:
	Hydrobiidae	Identify to family
PHYLUM NEMERTEA		Identify to class
PLATYHELMINTHES PLANARIIDAE		Identify to genus

The PTD quantifies the precision with which the taxonomic database is developed. Upon review of the PTDs, a reconciliation call is held to resolve taxonomic differences between taxonomists wherever possible. This results in a revised PTD value, often much lower than the original. The original comparison resulted in a mean PTD of 21.9%, which did not meet the project MQO of <15% for the overall dataset. Upon examination of the lists, it revealed several areas of consistent disagreement:

- *Ephemerellidae* vs. *Ephemerella* (Insecta: Ephemeroptera) Hierarchical disagreement
- *Eukiefferiella* vs. *Tvetenia*; *Paraphaenocladius* vs. *Parametriocnemus*; *Trissocladius* vs. *Zavrelimyia*; *Prostoia* vs. *Nemoura*; *Cricotopus* vs. *Orthocladius* (Insecta: Diptera: Chironomidae) Straight disagreements
- *Stegopterna* vs. *Simulium* (Insecta: Diptera: Simuliidae) Straight disagreement
- *Ceratopsyche* vs. *Hydropsyche* (Insecta: Trichoptera: Hydropsychidae) Straight disagreement

Individual sample PTD ranged from 3.8-43.4% (see Table 13). Most of the disagreements were straight disagreements over midges (Insecta: Diptera: Chironomidae) and hierarchical disagreements over mayflies (Insecta: Ephemeroptera). For instance in sample 2-026, T1 identified 38 organisms to family level as *Ephemerellidae*, where T2 identified the same organisms to genus level as *Ephemerella*. If the organisms were brought to hierarchical agreement, PTD for that sample would only be 7.5% and would then pass the stated MQO; the same would also be the case for the other two samples that did not meet the MQO (Table 14). Overall, hierarchical disagreements between *Ephemerellidae* vs *Ephemerella* accounted for 76.2% of all disagreements among the four samples that were re-identified.

Table 13. Percent taxonomic disagreement for re-identified samples. PTD_{orig} reflects the original value before the reconciliation call and PTD_{rev} the revised value afterwards.

Sample	N	$Comp_{pos}$	PTD_{orig}	PTD_{rev}
2-026	106	60	44.3	43.4
2-027	104	100	15.4	3.8
2-044 QC	120	95	32.5	20.8
2-046	119	96	24.4	19.3

Table 14. PTD for re-identified samples with hierarchical disagreements removed.

Sample	N	$Comp_{pos}$	PTD
2-026	106	98	7.5
2-044 QC	120	116	4.2
2-046	119	114	4.2

- Created, maintained, and used reference collection and voucher samples

During the first sampling year, Howard County created a taxonomic reference collection for benthic macroinvertebrates collected within the County. One or more specimens from each taxon are kept as representatives of the taxonomist's concept of each particular taxon identified. Organisms collected during the spring 2005 index period that had not been previously collected were added to the reference collection. As sampling continues, the reference collection should be updated with any new example specimens. Specimens in the reference collection were

identified by ARC. Voucher samples (stored in ~ 75% ethanol) are kept from all Howard County samples for at least three years in the Tetra Tech BRF.

- Standardized data entry and management system

All biological, physical habitat, chemical, and ancillary data were entered directly from field data sheets or Excel spreadsheets into EDAS.

- Conducted independent QC checks of all data entry

One hundred percent of the data set, once entered, was checked by hand against the original, hand-written field sheets. If discrepancies were encountered, they were corrected in EDAS.

- Collected duplicate samples for estimating precision using Relative Percent Difference

Duplicate biological and physical habitat samples were taken at three sites (10% of the total sampled) in the Cattail Creek/Brighton Dam watershed. Comparison of the differences between duplicate samples provides estimates of the precision of biological assessments and the consistency of sampling activities. Relative percent difference (RPD) provides an estimate of the difference between sample pairs. Tables 15 and 16 illustrate RPDs calculated using the original and revised B-IBI scores, respectively.

The measurement performance criteria outlined in the QAPP (DPW 2001) calls for RPD agreement of the B-IBI scores to be $\leq 5\%$. Since the metric scores are based on a 1, 3, 5 scale (as opposed to a continuous scale), a change in only one metric category (i.e., one "point") is enough to alter the overall score above the acceptable limit. However, a very different performance criteria was found when calculating this measure using the revised B-IBI (Table 16). For example, sample pair 2-004/2-004 QC had an RPD of 23% using the original B- IBI versus 0% for the revised B-IBI. Table 17 compares RPD values between original and revised B-IBI scores. Figures 5 and 6 help further illustrate these comparisons.

Table 15. Relative Percent Difference (RPD) between duplicate samples, based on original B-IBI scores.

Station #	2-004	2-004 QC	2-022	2-022 QC	2-044	2-044 QC
Location	UT to Cattail Creek	UT to Cattail Creek	Patuxent River	Patuxent River	UT to Patuxent River	UT to Patuxent River
B-IBI Score	2.56	3.22	4.78	4.56	4.11	3.89
Narrative Rating	Poor	Fair	Good	Good	Good	Fair
Total Organisms	112	107	113	111	111	119
RPD	23%		5%		6%	

Table 16. Relative Percent Difference (RPD) between duplicate samples based on revised B-IBI scores.

Station #	2-004	2-004 QC	2-022	2-022 QC	2-044	2-044 QC
Location	UT to Cattail Creek	UT to Cattail Creek	Patuxent River	Patuxent River	UT to Patuxent River	UT to Patuxent River
B-IBI Score	2.00	2.00	4.67	4.67	4.33	3.33
Narrative Rating	Poor	Poor	Good	Good	Good	Fair
Total Organisms	112	107	113	111	111	119
RPD	0%		0%		26%	

Only one duplicate sample pair (2-022/2-022 QC) met the RPD criterion. However, the RPD score from site 2-004 (and QC) significantly exceeds the acceptable limit by 18%, while 2-044 (and QC) only slightly exceeds the acceptable limit by a scant one percent. Further review of the individual biological metrics revealed that between site 2-004 and QC, three metric categories (Total taxa, Ephemeroptera %, and intolerant taxa) varied enough to change the metric score, from either a three to five or a three to one. All three metric categories scored lower in the primary sample than in the duplicate sample. The total taxa metric had only two fewer taxa in the primary sample (22 vs. 24), and consequently was scored lower. There were four fewer organisms in the primary sample compared to the duplicate sample (five vs. nine) for percent Ephemeroptera metric, and thus, it received a lower score. Finally, the intolerant taxa metric in the primary sample had three fewer taxa than the duplicate sample (one vs. four), which caused it to receive a lower score.

Table 17. Direct RPD comparisons between original and revised IBI scores.

Station #	2-004	2-004 QC	2-022	2-022 QC	2-044	2-044 QC
Location	UT to Cattail Creek	UT to Cattail Creek	Patuxent River	Patuxent River	UT to Patuxent River	UT to Patuxent River
Original IBI Score	2.56	3.22	4.78	4.56	4.11	3.89
RPD	23%		5%		6%	
Revised IBI Score	2.00	2.00	4.67	4.67	4.33	3.33
RPD	0%		0%		26%	

Three metrics for sample pair 2-044/2-044 QC, (Ephemeroptera taxa, Ephemeroptera %, and intolerant taxa) varied enough to change each metric score from a three to a five. Two of those scored lower in the duplicate sample, while the third scored lower in the primary sample. The Ephemeroptera taxa metric had two fewer taxa in the duplicate sample (five vs. three) causing it to score lower. The duplicate sample had 23 fewer organisms than the primary sample for percent Ephemeroptera (47 vs. 24), which resulted in a lower score. The primary sample had only one less taxon than the duplicate sample for intolerant taxa, (eight vs. nine), but due to the scoring criteria it received a lower score (Table 15).

When evaluating RPD using the revised IBI, two sites, 2-004 and 2-022, received identical scores for both the sample and duplicate (Table 16). However, for the third sample, site 2-044, three metrics scored lower in the duplicate sample, resulting in an RPD of 26%. One of these metrics, total taxa, had only two fewer taxa but was scored in a lower category. The second metric, EPT taxa, had three fewer taxa, and thus received a lower score. The third and final metric, percent Chironomidae, scored lower due to a significant difference in abundance between samples (8.1% vs. 32.8%).

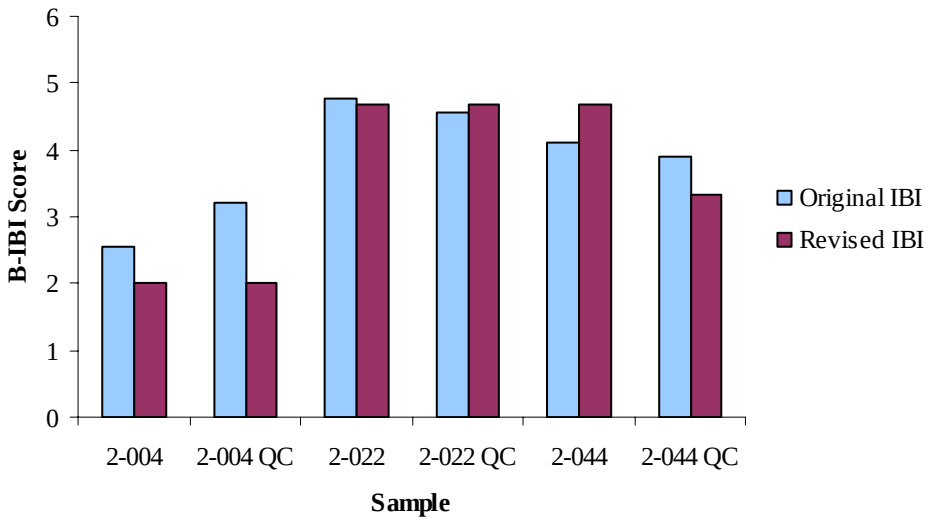

Figure 5. Comparison of Original and Revised B-IBI scores for duplicate field samples.

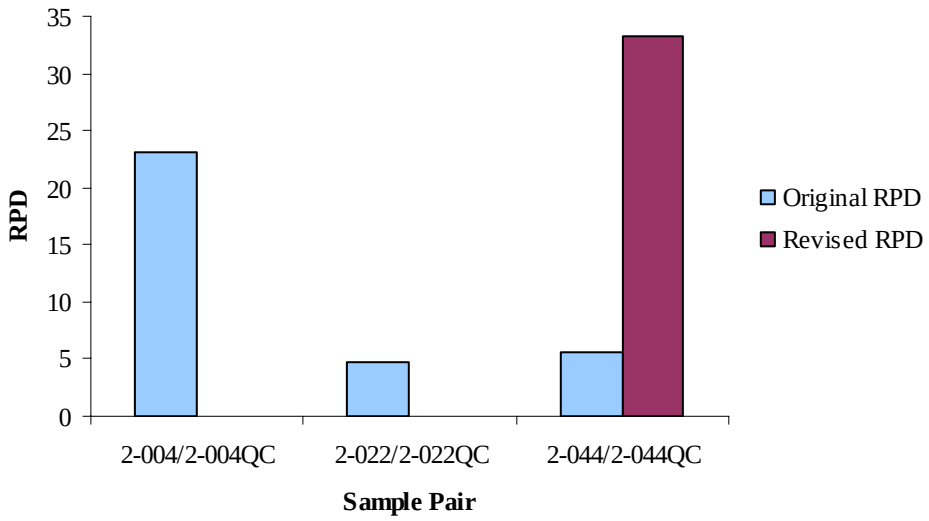

Figure 6. Comparison of RPD values for sample pairs using both Original and Revised B-IBI scores. RPD for sample pairs 2-004/2-004QC and 2-022/2-022QC using the Revised B-IBI were zero.

- Compared sample variation with design assumptions

The standard deviations from the three subwatersheds (following the year 2 biomonitoring schedule) were compared to the standard deviations (SD) associated with MBSS samples (reference and test) collected in general non-Coastal plain proximity and in Howard County. In the program sampling design (Pavlik et al. 2001); the MBSS values were used to assign a target

number (number of sites to sample) per subwatershed to meet specified data quality objectives (DQOs).

- Reference = 0.69
- MBSS Test = 0.83
- Spring 2005 Sampling = 0.54

Since the calculated SD from this dataset using the original B-IBI is 0.54, and is below the design criteria of 0.69 and 0.83, the DQO is met.

II. SUBWATERSHED SITE ASSESSMENT

Cattail Creek

The Cattail Creek watershed is in the northwestern part of Howard County, with crop and pasture agriculture as the major land uses. Other land uses include limited residential and forested areas. Residential areas are a mixture of older farm houses and planned communities, along with new developments that appear to be built on converted farm land.

Brighton Dam

The Upper and Lower Brighton Dam subwatersheds are similar to the Cattail Creek subwatershed. They are also in the northwestern portion of the County, and both border Montgomery County. The major land uses are agricultural (crops and pasture), residential, and forest. The forested areas are mainly concentrated around the Patuxent River State Park. Most of the newer (past 5-10 years) residential communities are on converted farm land. The Triadelphia reservoir is also located in the southern portion of the watershed. It is owned by the Washington Suburban Sanitary Commission (WSSC), and provides drinking water primarily to Montgomery and Prince George's Counties, and to a smaller extent, Howard County. The reservoir also provides limited recreational activities, such as fishing and canoeing.

Watershed Assessment

Table 18 provides an overview of mean index scores and narrative characterization for each subwatershed for both biological and physical habitat quality conditions. A graphic display of the subwatershed ratings can be found in Figure 7.

Table 18. Means of the biological and physical habitat scores for each subwatershed, with their corresponding narrative ratings. Confidence limits are represented by a single standard deviation.

	Narrative Rating	**Index Mean Score**
Cattail Creek		
Physical Habitat Quality	Non Supporting	$\bar{x}$ = 115.83 ± 4.07 (n = 10)
Original Biological Condition (B-IBI)	Good	$\bar{x}$ = 4.07 ± 0.23 (n = 10)
Revised Biological Condition (B-IBI)	Fair	$\bar{x}$ = 3.50 ± 0.17 (n = 10)
Lower Brighton Dam		
Physical Habitat Quality	Partially Supporting	$\bar{x}$ = 132.00 ± 17.78 (n = 10)
Original Biological Condition (B-IBI)	Good	$\bar{x}$ = 4.41 ± 0.13 (n = 10)
Revised Biological Condition (B-IBI)	Fair	$\bar{x}$ = 3.94 ± 0.67 (n = 10)
Upper Brighton Dam		
Physical Habitat Quality	Partially Supporting	$\bar{x}$ = 133.5 ± 19.11 (n = 10)
Original Biological Condition (B-IBI)	Good	$\bar{x}$ = 4.04 ± 0.34 (n = 10)
Revised Biological Condition (B-IBI)	Fair	$\bar{x}$ = 3.95 ± 0.09 (n = 10)

SUBWATERSHED RESULTS

This section presents the assessment results for each subwatershed as well as site specific results. It should be noted that biological condition ratings are based only on the original B-IBI scores. However, the revised B-IBI scores are also included in the tables for comparison purposes.

Cattail Creek

Data Overview

Two 3rd order, one 2nd order, and seven 1st order streams were sampled in this subwatershed. Of the ten sites sampled, seven were rated as "non-supporting" for physical habitat quality, two were rated as "partially supporting", and one was rated as "supporting". The mean rating for the subwatershed is "non-supporting" ($\bar{x}$ = 115.83 ± 4.07, n = 10). The mean biological condition for this subwatershed is "good" ($\bar{x}$ = 4.0 ± 0.23). Four sites received a "good" biological condition rating, five rated as "fair", and one received a "poor" rating.

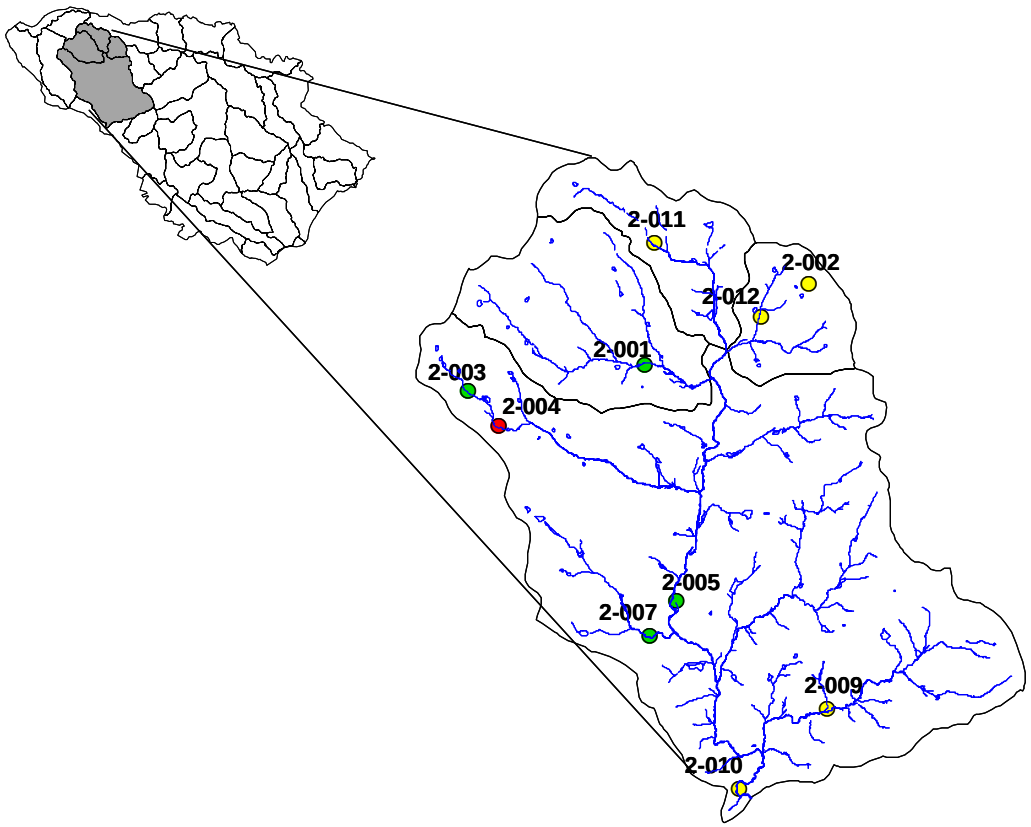

Figure 7. Color coded biological condition for the Cattail Creek subwatershed. Green = good, Yellow = fair, Red = poor. Biological condition ratings are based on scores obtained using the original benthic B-IBI.

'[**Table 19.** Summary of biological and habitat scores for each sampled site in the Cattail Creek subwatershed.

Site	Benthic IBI Score (ORIGINAL)	Biological Rating	Benthic IBI Score (REVISED)	Biological Rating	Habitat Score	Habitat Rating	Stream Order
2-001	4.33	Good	3.33	Fair	114	Non-Supporting	2
2-002	3.22	Fair	2.33	Poor	118	Non-Supporting	1
2-003	4.56	Good	4.67	Good	110	Non-Supporting	1
2-004	2.56	Poor	2.00	Poor	134	Partially Supporting	1
2-005	4.11	Good	3.67	Fair	140	Partially Supporting	3
2-007	4.11	Good	4.00	Good	156	Supporting	1
2-009	3.89	Fair	4.00	Good	106	Non-Supporting	1
2-010	3.89	Fair	3.33	Fair	101	Non-Supporting	3
2-011	3.89	Fair	3.67	Fair	108	Non-Supporting	1
2-012	3.44	Fair	3.33	Fair	113	Non Supporting	1

Site Specific Results

2-001

This site is located on a second-order stream behind a house on Cattail Meadows Drive (UT to Cattail Creek). The biological condition was rated as "good" (4.33). The subsample contained 110 total organisms and 44 total taxa, the latter being the highest total taxa for the Cattail Creek subwatershed. This sample was comprised of the highest number of Diptera taxa (24) as well.

Physical habitat was rated as "non-supporting" (57%). Marginal scores were given in the embeddedness, bank stability, vegetative protection, and riparian vegetative zone categories. The site was mostly surrounded by grass and shrubs.

2-002

Located in a forested area of Empty Pockets horse farm, this first-order stream (UT to Mid Patuxent) received a "fair" (3.22) biological condition rating. The subsample contained 111 organisms representing 27 total taxa. Forty-five percent of the sample was comprised of pollution tolerant organisms, the highest in the subwatershed. However, approximately 40% of the individual organisms in the sample were Tanytarsini, a midge that is relatively intolerant of pollution.

Physical habitat was rated "non-supporting" (59%). Marginal scores were given in the sediment deposition, channel flow status, and bank stability categories. While this site was located on the horse farm, there was no access to the stream for horses. Pebble count data revealed that 42% of the channel bottom contained sand of various sizes (very fine – very coarse), which has the potential to reduce interstitial space for biota.

2-003

This site is located on a first-order stream off a driveway on Woodbine Road (UT to Cattail Creek). This site received the highest biological condition rating of "good" (4.56), the highest in the subwatershed. In the subsample, there were 107 total organisms representing 29 different taxa. There were 12 EPT taxa in the subsample. The most common organism was *Oulimnius* (tolerance value [t.v.] = 2); (Coleoptera: Elmidae).

Physical habitat was rated "non-supporting (55%). The site received poor scores in the bank stability and vegetative protection categories. Several areas of floating green algae were observed, indicating possible nutrient enrichment at this site, which could also explain why the biological score was much better than would be expected with a "non-supporting" physical habitat condition.

2-004

Located on Larriland Farm, this first-order stream (UT to Cattail Creek) received the only "poor" (2.55) biological condition rating, the lowest in the subwatershed. There were 112 organisms in the subsample and 22 total taxa. Of the 22 taxa found, only one was an intolerant taxon. The most common organism was *Stenelmis* (Coleoptera: Elmidae) with t.v. = 6.

The physical habitat at this site was rated as "partially supporting" (67%). The site received suboptimal scores in the vegetative protection, channel alteration, embeddedness, and channel flow status categories. The pebble count revealed that 43% of the channel contained various sizes of gravel ranging from very fine to very coarse.

2-005

Located just west of McNeal Road, this section of Cattail Creek was third-order and was rated in "good" (4.11) biological condition. There were 108 organisms representing 23 total taxa in the subsample. This site had the highest percent Ephemeroptera value in the subwatershed, 56 %. The most common organisms found were in the Ephemerellidae family, which is relatively pollution sensitive (t.v. = 0-4).

Physical habitat was rated "partially supporting" (70%). The site received suboptimal scores in epifaunal substrate/available cover, embeddedness, velocity, sediment deposition, and channel flow status categories. The site was predominantly surrounded by forest, with a wide riparian zone. This stream also had the highest percent cobble substrate (27%) in the subwatershed.

2-007

This first-order stream is located just downstream of the Daisy Road crossing (UT to Cattail Creek). The site received a biological condition rating of "good" (4.11). The subsample contained 100 organisms comprised of 35 different taxa. There were 19 different Diptera taxa found, and 17 percent of the total sample were Tanytarsini, a relatively intolerant midge (fly larvae).

This site received the only "supporting" (78%) physical habitat rating in the subwatershed. All habitat parameters scored in the optimal and suboptimal range. The channel was full, unaltered, had good riffle/pool frequency, and a wide riparian zone. The channel bottom consisted of predominantly bedrock (63%), which was the only site in the subwatershed to contain bedrock.

2-009

This first-order stream is located immediately upstream of the confluence with Dorsey Branch (UT to Dorsey Branch). It received a "fair" (3.89) biological condition rating. The subsample contained 110 organisms comprised of 26 total taxa. The most common organisms found were

Diplectrona (Trichoptera: Hydropsychidae) and *Oulimnius* (Coleoptera: Elmidae), both with t.v. = 2.

Physical habitat was rated as "non-supporting" (53%). Marginal scores were given in the embeddedness, velocity/depth, sediment deposition, bank stability, and vegetative protection categories. The site was bordered on the right by a golf course giving the right bank a poor riparian vegetative zone score thus contributing negatively to the physical habitat quality of the stream. Furthermore, it is possible that nutrient runoff from the golf course could be causing elevated biological conditions, given the "non-supporting" physical habitat condition.

2-010

This third-order stream is located on Old Roxbury Road (Cattail Creek). It received a "fair" biological rating (3.89). The subsample consisted of 115 organisms representing 33 total taxa, six of which were intolerant taxa. On the other hand, 12% of the subsample was comprised of tolerant individuals.

This site received the lowest physical habitat score percentage (51) and was rated "non-supporting". The site received marginal scores in the embeddedness, sediment deposition, frequency of riffles, bank stability, and vegetative protection categories. The site was primarily one long run/pool with a sandy bottom; however, there was a small riffle area within the reach as well as another small area just outside the reach where benthic samples were collected.

2-011

This first-order stream is located just downstream of the Madison Road crossing (UT to Cattail Creek). This site received a "fair" (3.89) biological condition rating. The subsample contained 113 individual organisms from 22 total taxa. The most common organism found in the sample was *Amphinemura* (Plecoptera: Nemouridae; t.v. = 3).

Physical habitat was rated "non-supporting" (54%). Marginal scores were given in the sediment deposition, channel flow status, bank stability, vegetative protection, and riparian vegetative zone categories. The stream is surrounded by an agriculture field (row-crop), which noticeably reduced the width of the riparian vegetative zone.

2-012

This first-order stream is located behind a house on Frederick Road (UT to Cattail Creek). The site received a "fair" biological rating (3.44). The subsample contained 114 organisms from 28 total taxa. The most common organism found was *Stegopterna* (Diptera: Simuliidae), with t.v. = 7, which comprised approximately 25% of the subsample.

Physical habitat was rated "non-supporting" (57%). Marginal scores were given in the embeddedness, bank stability, and vegetative protection categories. Riparian vegetative zone received a poor habitat condition score. A fenced horse pasture ran along the right bank and an open field ran along the left bank. Pebble count was unable to be evaluated because the landowner kindly asked the field crew to leave before sampling was completed. While permission was granted to access the stream through the horse pasture, the landowner on the opposite side of the stream was not comfortable with the field crews working on his property.

Lower Brighton Dam

Data Overview

Three 3rd order, one 2nd order, and six 1st order streams were sampled in this subwatershed. Of the ten sites sampled, four were rated as "non-supporting" for physical habitat quality, four were rated as "partially supporting", and two were rated as "supporting". The mean rating for this subwatershed is "partially supporting" ($\bar{x}$ = 132.00 ± 17.78, n = 10). The mean biological condition for this subwatershed is "good" ($\bar{x}$ = 4.41 ± 0.13). Eight sites received a "good" biological condition rating and two were rated as "fair".

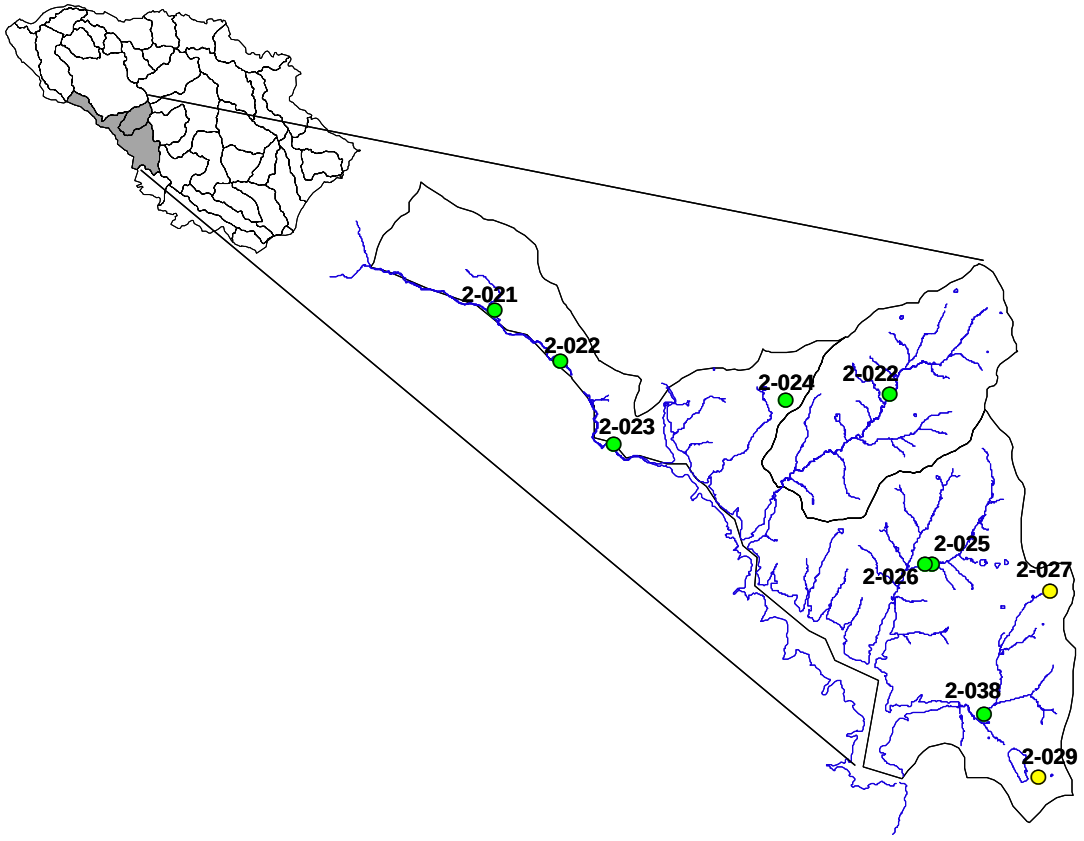

Figure 8. Color coded biological condition ratings for the Lower Brighton Dam subwatershed. Green = good, Yellow = fair, Red = poor. Biological condition ratings are based on scores obtained using the original benthic B-IBI

Table 20. Summary of biological and habitat scores in the Lower Brighton Dam subwatershed.

Site	Benthic IBI Score (ORIGINAL)	Biological Rating	Benthic IBI Score (REVISED)	Biological Rating	Habitat Score	Habitat Rating	Stream Order
2-021	4.56	Good	4.33	Good	154	Supporting	3
2-022	4.78	Good	4.67	Good	116	Non-Supporting	3
2-023	4.56	Good	4.33	Good	152	Supporting	3
2-024	4.78	Good	3.67	Fair	132	Partially Supporting	1
2-025	4.56	Good	4.33	Good	132	Partially Supporting	1
2-026	4.56	Good	4.33	Good	120	Non-Supporting	1
2-027	3.67	Fair	3.00	Fair	118	Non-Supporting	1
2-029	3.67	Fair	3.00	Fair	111	Non-Supporting	1
2-030	4.11	Good	2.67	Poor	143	Partially Supporting	1
2-038	4.33	Good	4.33	Good	118	Partially Supporting	2

Site Specific Results

2-021

This third-order stream (Patuxent River) is located within Patuxent River State Park approximately 950 meters west of Jennings Chapel Road. Biological condition was rated as "good" (4.56). The subsample contained 111 organisms from 34 total taxa. The most common family in the subsample is Ephemerellidae, which is relatively pollution sensitive (t.v. = 0-4). The most common organism was *Oulimnius* (Coleoptera: Elmidae), with a t.v. = 2.

This site received the highest physical habitat percentage (77%) in the subwatershed giving the site a "supporting" habitat rating. The site received optimal scores in the epifaunal substrate/available cover, embeddedness, velocity/depth, channel flow status, channel alteration, and riparian vegetative zone categories. The surrounding land cover was predominantly forest.

2-022

This third-order stream (Patuxent River) is located approximately 350 meters upstream of Howard Chapel Road within Patuxent River State Park. The site received a "good" (4.48) biological condition rating. The subsample contained 113 organisms representing 35 different taxa. Ephemerellidae was the most common family found in the subsample, with a t.v. ranging from 0 to 4.

Physical habitat was rated "non-supporting" (58%). The site received poor scores in the bank stability and vegetative protection categories. An old field was the dominant land use adjacent to the stream. It is likely that historical landuses (likely agriculture) contributed to the eroded, instable banks and lack of riparian vegetative cover at this location, which consequently reduced the physical habitat score.

2-023

This third-order stream (Patuxent River) is located approximately 250 meters upstream from a parking lot on Route 97 within Patuxent River State Park. The site received a "good" (4.56) biological condition rating. The subsample contained 116 organisms representing 37 total taxa, the latter being the highest in the subwatershed. The most common family in the subsample is Ephemerellidae, which is relatively pollution sensitive (t.v. = 0-4). The two most common

organisms found in the subsample were *Hydropsyche* (t.v. = 6) and *Cheumatopsyche* (t.v. = 5; both Trichoptera: Hydropsychidae).

Physical habitat was rated "supporting" (76%). The site received optimal scores in the embeddedness, velocity/depth, channel alteration, and riparian vegetative zone categories.

2-024

This first-order stream (UT to Triadelphia Reservoir) is located behind the house at 14888 Triadelphia Road. The site received the highest biological condition rating of "good" (4.78) in the subwatershed. The subsample consisted of 109 organisms and 36 total taxa. One of the most common organisms found was *Sympotthastia* (Diptera: Chironomidae; t.v. = 6).

Physical habitat was rated "partially supporting" (66%). The site received sub-optimal scores in the embeddedness, sediment deposition, channel flow status, vegetative protection, and riparian vegetative zone categories. The surroundings are predominantly residential. Refuse was present in moderate amounts around the site. The stream may also be impacted by the bridge running over the site.

2-025

Located in the middle of the property at 14050 Green Bridge Road behind a barn, this first-order stream (UT to Triadelphia Reservoir) received a "good" (4.56) biological condition rating. The subsample contained 119 organisms representing 31 total taxa. Out of the 31 taxa found, 15 were intolerant taxa, the highest in the subwatershed. Of the intolerant taxa, the most common was *Oulimnius* (Coleoptera: Elmidae), with a t.v. = 2.

Physical habitat was rated "partially supporting" (66%). The site received marginal scores in the bank stability and vegetative protection categories. Riparian vegetative zone scored high in the optimal category for the right bank, however, the left bank scored very low due to a large barn located within the riparian zone.

2-026

Located at 14050 Green Bridge Road, this site received a "good" (4.56) biological condition rating. The subsample contained 106 organisms representing 29 total taxa. Fourteen of the 29 taxa were EPT taxa. Furthermore, this site contained the highest percent of Ephemeroptera (42%) in the subwatershed.

Physical habitat was rated "partially supporting" (60%). This site received marginal scores in the channel alteration, vegetative protection, and velocity/depth categories and suboptimal scores in the embeddedness, frequency of riffles, and bank stability categories.

2-027

This site is located on a first-order stream (UT to Triadelphia Reservoir) behind the house at 14051 Highland Road, adjacent to a horse pasture. The site received a "fair" (3.67) biological condition rating, the lowest in the subwatershed along with site 2-029. The subsample contained 104 organisms representing 27 total taxa, the latter being the lowest in the subwatershed.

Physical habitat was rated "non-supporting" (59%). Marginal scores were given in the bank stability, vegetative protection, and riparian vegetative zone categories. The site is located partly within a horse pasture and partly within the woods. The horses have access to the stream and may have a negative impact on the site.

2-029

This first-order stream (UT to Triadelphia Reservoir) is located upstream from the driveway at 6656 Luster Drive. The site received a "fair" (3.67) biological condition rating. The subsample contained 110 organisms representing 34 total taxa. The two most common organisms found were *Thienemanniella* (t.v. = 6) and *Corynoneura* (t.v. = 7), both (Diptera: Chironomidae).

Physical habitat was rated "non-supporting" (55.5%), which was the lowest in the subwatershed. This site was very different from the other sites sampled in Howard County. Pebble count data indicated that bottom substrate composition was dominated by fine particulates such as silt/clay (32%) and sand (56%). The stream channel was very small and relatively straight and seemed as if it may have been altered many years ago.

2-030

This site is located on a first-order stream (Big Branch) next to the entrance of Big Branch Drive. The site received a "good" (4.11) biological condition rating. The subsample contained 110 organisms representing 32 taxa. An abundance of the organism *Hydrobaenus* (Diptera: Chironomidae) was found in the subsample (t.v. = 8).

Physical habitat at this site was rated "partially supporting" (72%). Sub-optimal scores were given for embeddedness, sediment deposition, channel flow status, vegetative protection, and riparian vegetative zone (left bank), while riparian vegetative zone (right bank) received an optimal score. The predominant land use adjacent to this site is residential.

2-038

This site is located on a second-order stream (UT to Triadelphia Reservoir) along Lakeside Drive, downstream from a pipeline clearing. The site received a "good" (4.33) biological condition rating. The subsample contained 115 organisms representing 33 total taxa, of which only 2% were tolerant taxa.

Physical habitat was rated "non-supporting" (59%), with the site receiving marginal scores for channel alteration, vegetative protection, and riparian vegetative zone (left bank) and a poor score for riparian vegetative zone (right bank). Furthermore, the stream runs adjacent to a gas pipeline clearing, and the predominant surrounding land use is residential.

Upper Brighton Dam

Data Overview

Two 3rd order, three 2nd order, and five 1st order streams were sampled in this subwatershed. Of the ten sites sampled, three were rated as "non-supporting" for physical habitat quality, six sites were rated as "partially supporting", and the remaining site was rated as "supporting". The mean rating for the subwatershed is "partially supporting" ($\bar{x}$ =133.5 ± 19.11, n = 10). The mean biological condition for this subwatershed is "good" ($\bar{x}$ = 4.04 ± 0.34). Seven sites received a "good" biological condition rating and three received a "fair" rating.

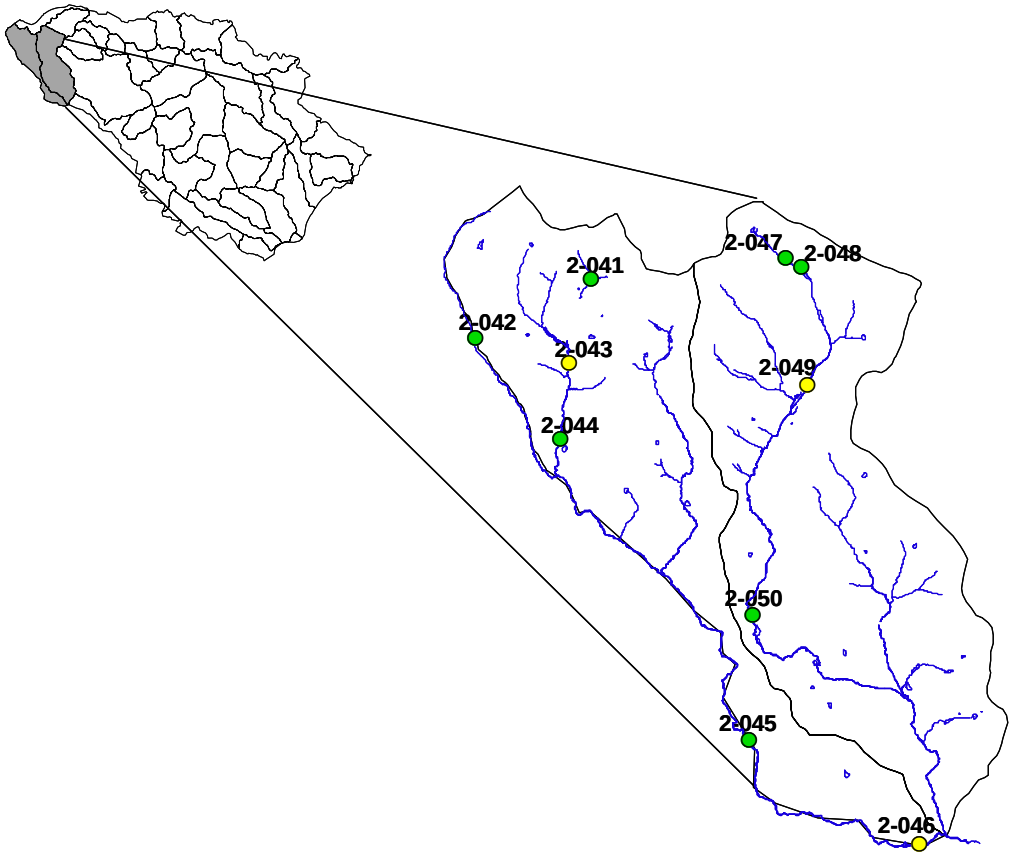

Figure 9. Color coded biological condition for the Upper Brighton Dam subwatershed. Green = good, Yellow = fair, Red = poor. Biological condition ratings are based on scores obtained using the original B-IBI.

Table 21. Summary of biological and habitat scores in the Upper Brighton Dam subwatershed.

Site	Benthic IBI Score (ORIGINAL)	Biological Rating	Benthic IBI Score (REVISED)	Biological Rating	Habitat Score	Habitat Rating	Stream Order
2-041	4.11	Good	4.00	Good	150	Partially Supporting	1
2-042	5.00	Good	4.33	Good	121	Partially Supporting	1
2-043	3.22	Fair	3.33	Fair	124	Partially Supporting	2
2-044	4.11	Good	4.67	Good	143	Partially Supporting	2
2-045	4.33	Good	4.00	Good	150	Partially Supporting	3
2-046	3.00	Fair	3.67	Fair	162	Supporting	3
2-047	4.33	Good	3.67	Fair	113	Non Supporting	1
2-048	4.33	Good	4.33	Good	122	Partially Supporting	1
2-049	3.89	Fair	3.67	Fair	109	Non Supporting	1
2-050	4.56	Good	4.33	Good	118	Non Supporting	2

Site Specific Results

2-041

This site on an unnamed tributary to Patuxent River, near the headwaters, was approximately 650 meters northwest of the barn behind Happy Hills Farm. The biological condition was rated as "good" (4.33). The subsample contained 112 organisms comprising 38 total taxa, which was the largest number of taxa found in the subwatershed. Of the 23 Diptera taxa found in the subsample, 11% were Tanytarsini, a relatively pollution intolerant midge. The most common organism found was *Amphinemura* (Plecoptera: Nemouridae, t.v. = 3).

Physical habitat was rated "partially-supporting" (75%). Suboptimal scores were given for embeddedness, sediment deposition, channel flow status, bank stability, and vegetative protection. The physical habitat score for this site fell just below the threshold between "partially-supporting" and "supporting" narrative rating categories.

2-042

Located on a first-order segment of the Patuxent River, this site was approximately 500 meters downstream of Windsor Forest Road. The biological condition was rated "good" (5.0) with the highest score in the Upper Brighton Dam subwatershed. Over the previous four-years of sampling (Rounds 1 and 2), this is the first site to receive a perfect score of 5.0. The subsample contained 113 organisms representing 33 total taxa. This site also had the highest number of intolerant taxa (12). The most common family found in the subsample was Ephemerellidae, which is relatively pollution sensitive (t.v. = 0-4).

This site received a "partially supporting" (60%) physical habitat rating. Marginal scores were given for bank stability, vegetative protective, and channel flow status category. However, the channel had a good cobble dominated substrate. There was also a large woody debris jam within the site that may have been accelerating bank erosion and adversely affecting the channel flow.

2-043

Located approximately 300 meters downstream of Windsor Forest Rd., this second-order stream (UT to Patuxent River) was rated "fair" (3.22) for biological condition. The subsample contained 111 organisms representing 21 total taxa. Forty-seven percent of the organisms found

in the subsample fall into the tolerant category, with *Prosimulium* (Diptera: Simuliidae) being the most common organism found (t.v. = 7).

Physical habitat was rated "partially supporting" (62%). Marginal scores were given in the vegetative protection, bank stability, and channel flow status categories. There was good cobble substrate observed in the riffles, but there was also a fairly large depositional bar located within the sampling reach.

2-044
This site is located on a second-order stream (UT to Patuxent River) in Patapsco State Park, near a pond in the woods. The site received a biological condition rating of "good" (4.11). The subsample contained 111 organisms representing 26 total taxa. The most common organisms found were *Prosimulium* (t.v. = 7) and *Amphinemura* (t.v. = 3).

Physical habitat was rated "partially supporting" (72%). Most of the habitat parameters received optimal to sub-optimal scores with exception to bank stability and vegetative protective, which received marginal scores. The channel substrate consisted primarily of gravel, with a mix of cobble and boulders.

2-045
This site is located on a third-order segment of the Patuxent River, just upstream from the Route 94 crossing in Patuxent River State Park. The site received a biological condition rating of "good" (4.33). The subsample consisted of 115 organisms representing 27 total taxa. This site contained the highest percent of Ephemeroptera (53%), a relatively sensitive order, in the subwatershed.

Physical habitat was rated "partially-supporting" (75%), which fell just below the threshold between "supporting" and "partially supporting". The majority of habitat parameters received high scores, except bank stability and vegetative protection which received marginal scores.

2-046
This site is located on the Patuxent River in Patuxent River State Park, in a section where the river is a third-order stream, approximately 650 meters downstream from the Hipsley Mill Road crossing. This site received the lowest biological condition rating, "fair" (3.0), in the subwatershed. The subsample contained 119 organisms representing the lowest diversity of taxa (22) in the subwatershed. Over 50% of the organisms found were of the genus *Prosimulium* (t.v. = 7).

This site received a "supporting" (80.5%) physical habitat rating, the highest in the Upper Brighton Dam subwatershed. All the habitat categories received optimal scores, with the exception of the bank stability and vegetative protection categories which received sub-optimal scores. The "supporting" habitat rating paired with a "fair" biological score could be an indication of water quality impairment at this site. However, further data would need to be collected before any inferences could be made about the water quality conditions.

2-047
This site is located on a first-order stream (UT to Cabin Branch) approximately 300 meters northwest of Shafferville Road, near a horse pasture. Biological condition was rated "good" (4.33). The subsample contained 104 organisms representing 29 total taxa. The most common organism found was *Amphinemura* (t.v. = 3), a sensitive taxon.

Physical habitat was rated "non-supporting" (57%). Sub-optimal scores were given for most habitat categories, however, bank stability, vegetative protection, and riparian vegetative zone (left bank) categories received marginal scores. There was an old fence crossing the stream, which was jammed with debris. Due to the proximity of the horse pasture, horses may have had access to the stream in the upper portion of the site.

2-048
This site is located on a first-order stream (UT to Cabin Branch) approximately 300 meters north of Shafferville Road, just east of a horse pasture. Biological condition was rated "good" (4.33). The subsample contained 117 organisms representing 31 total taxa. The most common organisms found [*Amphinemura* (t.v. = 3) and *Oulimnius* (Coleoptera: Elmidae; t.v. = 2)], both were pollution sensitive.

Physical habitat was rated "partially supporting" (61%). Marginal scores were given for bank stability and vegetative protection. Optimal scores were given for channel alteration and frequency of riffles. All remaining parameters received sub-optimal scores. The site had good sized cobble substrate in the riffles, however, an abundance of silt was observed in a few of the pools.

2-049
This site is located on a first-order segment of Cabin Branch, just upstream from the Florence Road crossing. Biological condition was rated "fair" (3.89). The subsample contained 116 organisms representing 30 total taxa. *Oulimnius* was the most common organism found in the subsample (t.v. = 2).

This site received the lowest physical habitat rating, "non-supporting" (55%), in the subwatershed. Bank stability and vegetative protection received marginal scores, while riparian vegetative zone received a poor score. An old field with recently planted saplings was adjacent to the stream.

2-050
This site is located on a second-order stream (Cabin Branch) behind the house at 17715 Quail Cove Court. Biological condition was rated "good" (4.56). The subsample contained 113 organisms representing 34 total taxa. The most common family found in the subsample was Ephemerellidae, which is relatively pollution sensitive (t.v. = 0-4).

Physical habitat was rated "non-supporting" (59%). Marginal scores were given for sediment deposition, bank stability, and vegetative protection. The predominant surrounding land use was forest.

WATERSHED COMPARISONS

To date, the Howard County biological monitoring and assessment program has sampled all 15 subwatersheds, and has begun year one of the second round of sampling, in which three of the 15 subwatershed were re-sampled (Cattail Creek, Upper Brighton Dam and Lower Brighton Dam). Of these three subwatersheds, Lower Brighton Dam had the highest mean original B-IBI score (4.41 ± 0.13), compared to Cattail Creek (4.07 ± 0.23) and Upper Brighton Dam (4.04 ± 0.34) subwatersheds.

The majority of the sites within the Cattail Creek and Brighton Dam subwatersheds, received "fair" or "good" biological ratings, paired with "partially" or "non-supporting" physical habitat ratings for both the original and revised B-IBI scores (Figures 10 and 11, respectively).

These watersheds received higher mean B-IBI scores when calculated with the original metrics than with the revised metrics (Figure 12). A Wilcoxon matched-pairs test was run to compare B-IBI scores between the two indices. Revised scores were significantly lower than original B-IBI scores for the same samples ($p = 0.0003$). The Wilcoxon matched-pairs test uses the sum of the ranks of the values associated with each of the two B-IBIs to determine the magnitude of difference between them.

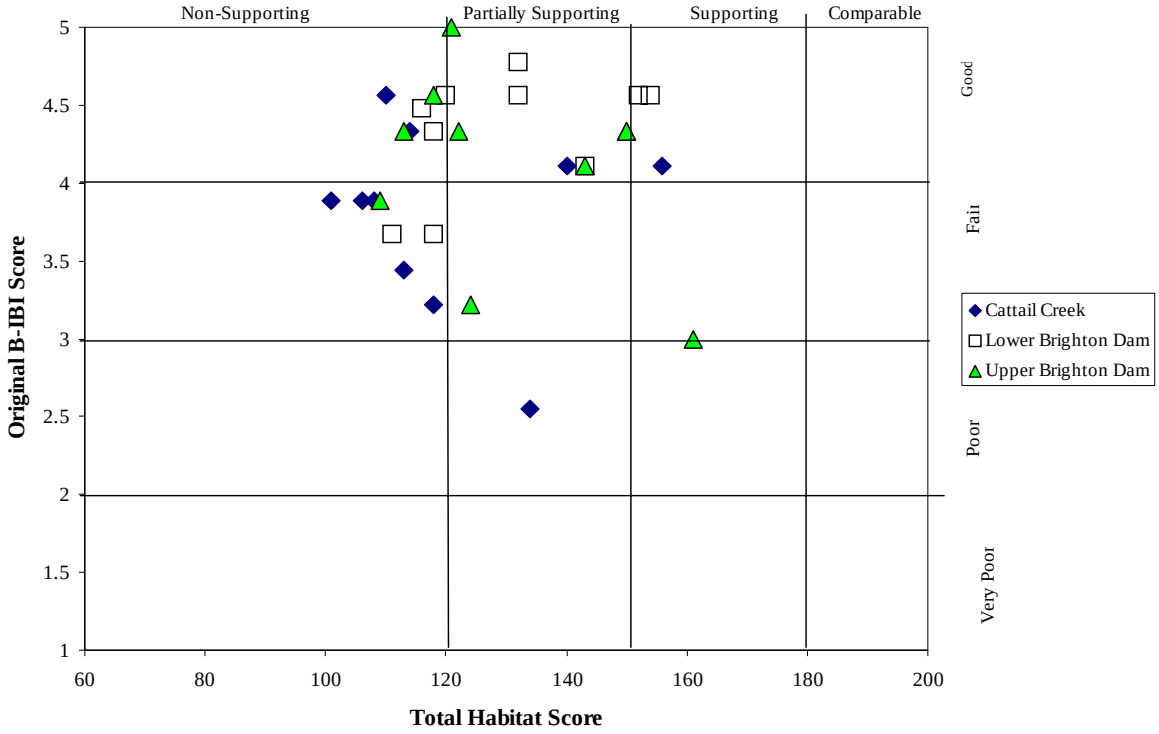

Figure 10. Original B-IBI scores and physical habitat rating for each site in the Cattail Creek/Brighton Dam watersheds.

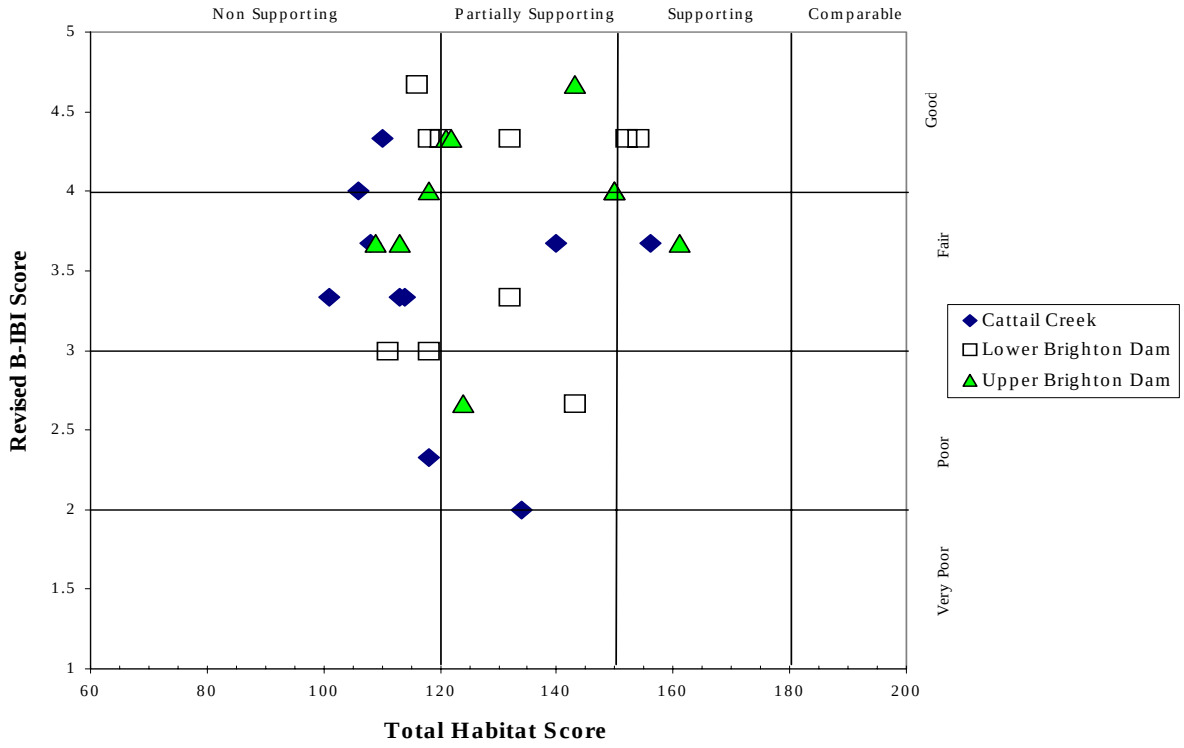

Figure 11. Revised B-IBI scores and physical habitat rating for each site in the Cattail Creek/Brighton Dam watersheds.

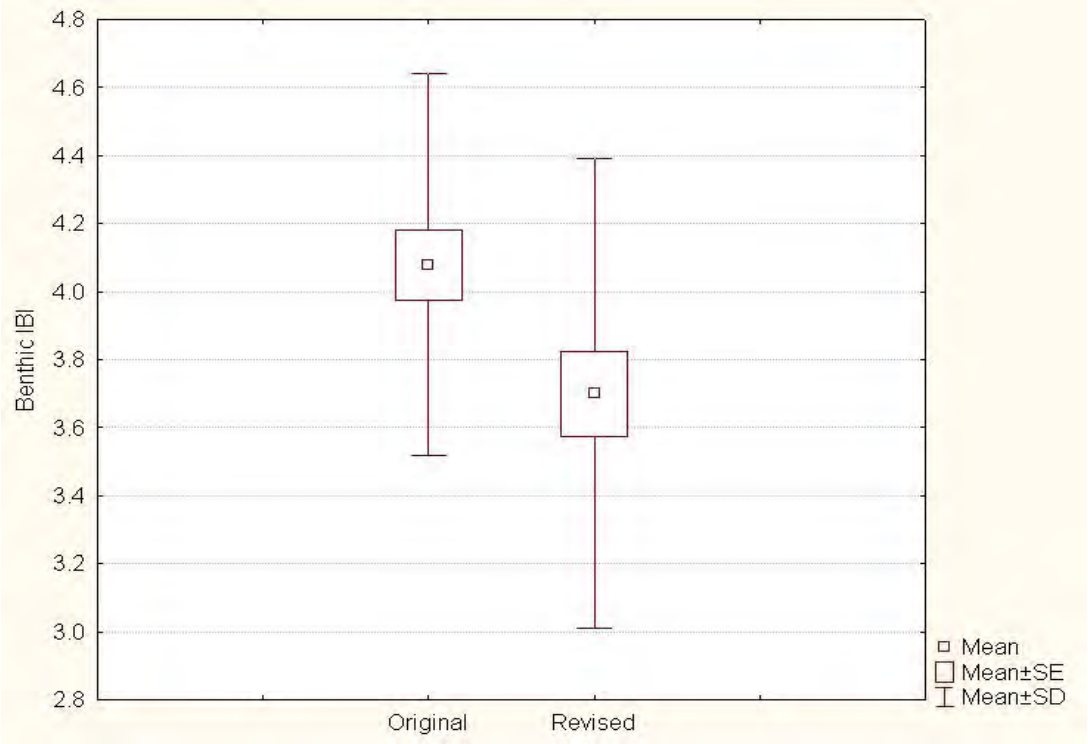

Figure 12. Original and revised B-IBI scores for 2005 Cattail Creek/Brighton Dam watersheds.

Comparisons of physical habitat and original B-IBI scores between 2001 and 2005 were also made for the Cattail Creek/Brighton Dam watersheds using a t-test, which assesses whether the means of two groups are statistically different from each other. There was no significant difference observed for B-IBI scores between 2001 and 2005 (Figures 13 and 14). On the other hand, a significant difference was observed for total habitat scores (Figures 13 and 15). The mean habitat score for 2001 was 113 while the mean habitat score for 2005 was 127, suggesting that physical habitat had improved from 2001 to 2005. This change could occur for a number of reasons. First, the physical habitat may, in fact, have improved over the four year period between sampling events. Secondly, the difference may be attributed to the interpretation of physical habitat conditions by the field crews, since different crews sampled the sites in 2001 than in 2005. Thirdly, it is possible that the sites sampled in 2005 simply had better physical habitat conditions than those visited in 2001 due to the fact that new sites were randomly selected in 2005. However, without having revisited any sites sampled previously in 2001, it is difficult to tease out possible sources of variability.

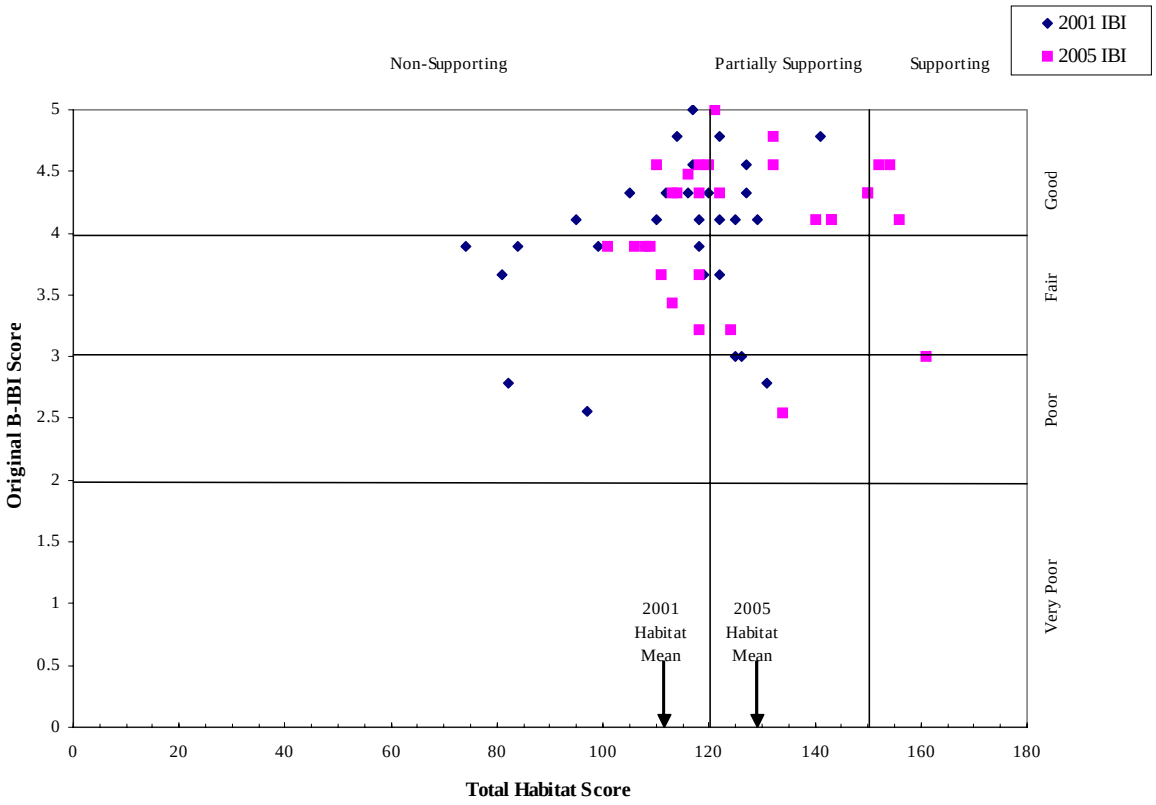

Figure 13. Original B-IBI scores and physical habitat ratings for each site in the Cattail Creek/Brighton Dam watersheds for both 2001 and 2005 sampling years.

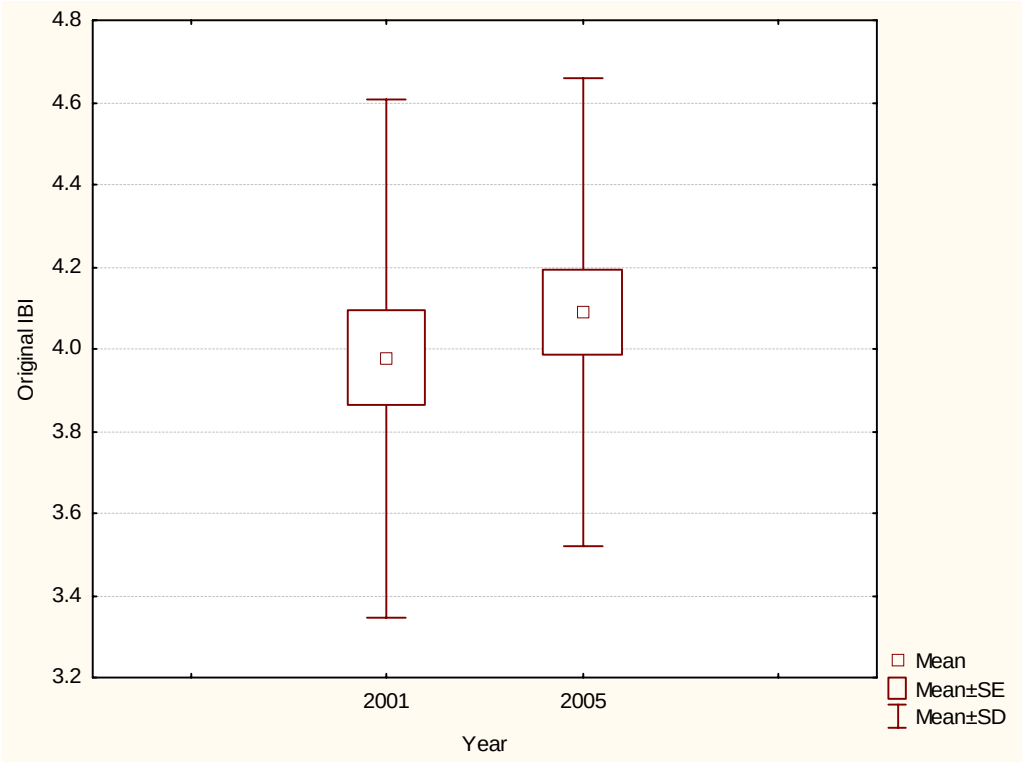

Figure 14. Comparison of B-IBI scores between 2001 and 2005 for the Cattail Creek/Brighton Dam watersheds.

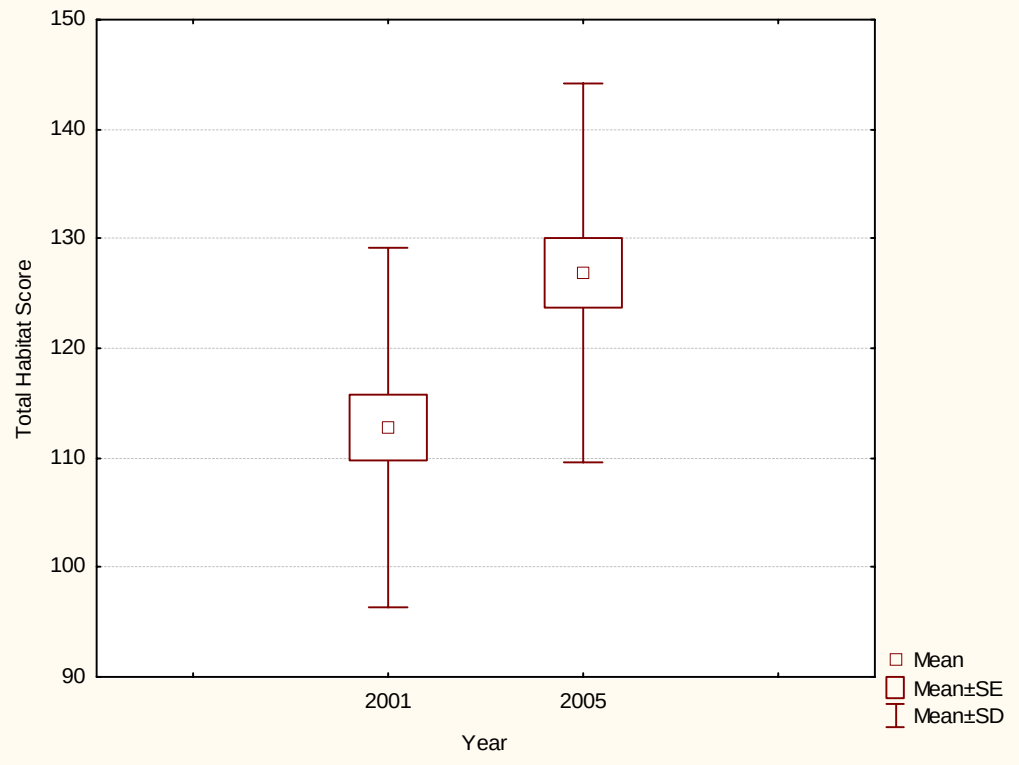

Figure 15. Comparison of mean physical habitat scores between 2001 and 2005 for the Cattail Creek/Brighton Dam watersheds.

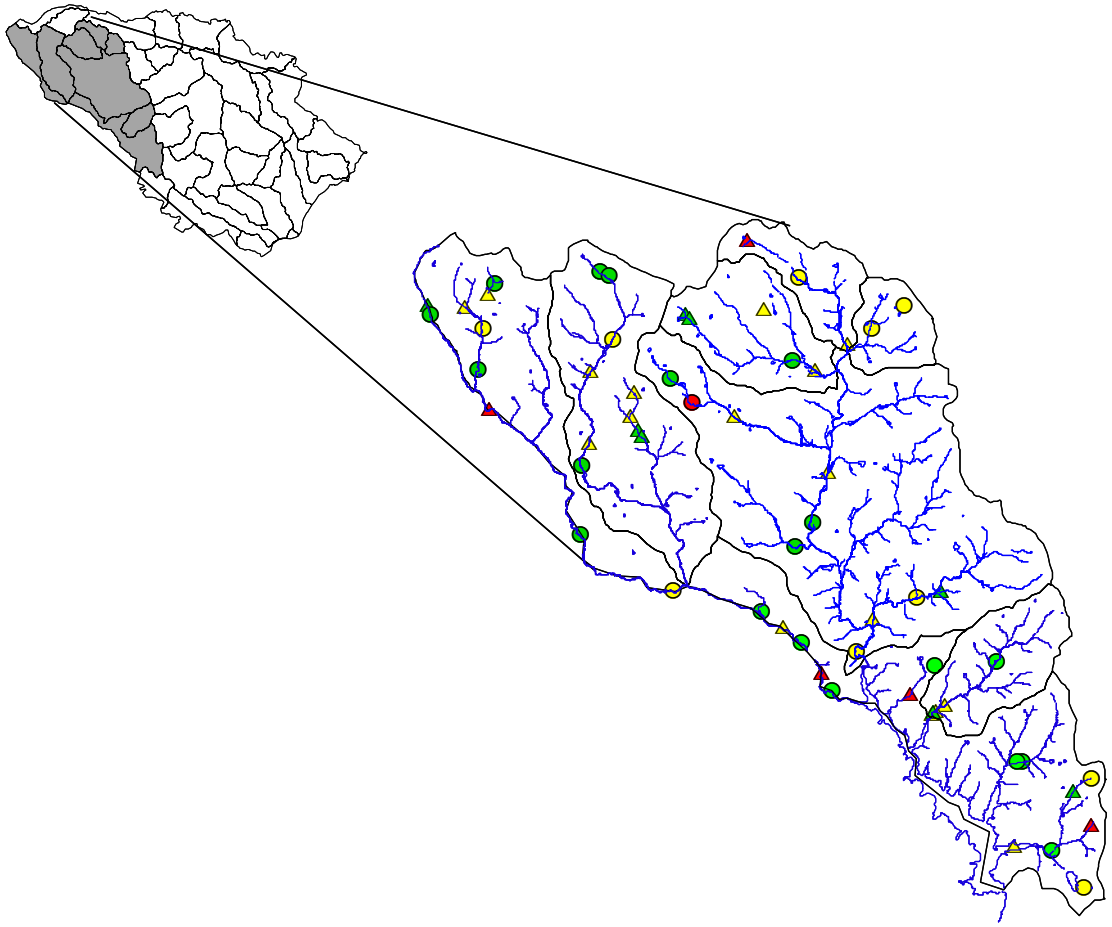

Figure 16. Color coded biological condition ratings from 2001 and 2005 for the Cattail Creek/Brighton Dam watersheds. Sites sampled in 2001 are represented by triangles, while those samples in 2005 are represented by circles. Green = good, Yellow = fair, Red = poor. Biological condition ratings are based on scores obtained using the original B-IBI.

III. CONCLUSIONS AND RECOMMENDATIONS

The results of these biological assessments lead to the following general recommendations:

- Re-evaluate the County's watershed-based sampling design to decide if this scale gives valuable information and whether or not the program should continue as is or if it should be refined to better suit County needs (Pavlik and Stribling 2005).

- Prioritize watersheds for protection and restoration activities.

The County has concentrated on 10 small watersheds (Centennial Lake, Wilde Lake, Lower Rocky Gorge Reservoir, North Laurel, Little Patuxent below Lake Elkhorn, Deep Run Tributaries, Elkridge, Rockburn Branch, Plumtree Branch, and Font Hill tributaries) to prioritize those that were most in need of protection or restoration. The prioritization is based on a number of factors, including: impervious cover, projected change in impervious cover at future build-out, projected change in subwatershed category, percentage of open space, and other community planning activities in the subwatersheds, such as Route 1 and Route 40 Corridor Studies. Whenever possible, the County should seek to utilize the biomonitoring results as a companion to the current watershed prioritizations. Biological monitoring results can also be used as a way to gauge restoration progress and success.

- Implement public outreach strategies

The final biological assessment reports from the first round of sampling are currently available through the County website. More reader friendly brochures or fact sheets with color graphics can be created for each subwatershed sampled or for the entire County that details the condition of streams and watersheds in a short summary, which would be easier for the public to understand. Handouts are just one way of developing community interest in County programs. A more interactive website with links that allow users to click on sites sampled and see results in the form of scores or taxa lists could help to peak interest in the biomonitoring program. The County also currently sponsors many volunteer activities, such as tree plantings and park/stream clean-ups and has recently implemented a volunteer stream monitoring program based on MBSS Stream Wader Protocols.

- Maintain comparability with State methods.

All field team leaders attend the yearly state-sponsored training offered by the Maryland Biological Stream Survey. The training serves both as a refresher of the state methods, as well as a way to keep informed of any updates the State might implement to their sampling protocols.

- Maintain and enhance quality assurance/quality control program (QA/QC), including documentation of performance characteristics.

Measurement quality objectives (MQOs) should be established for each step of the field-based assessments. While the current County QA/QC program covers field audits, checks of data entry and metric calculation, and relative percent difference (RPD) between QC sites, the program does not currently document each step. Developing a rigorous QA/QC program will improve the

County's ability to compare its biomonitoring program with the MBSS as well as other County programs.

- Initiate routine for assessing taxonomic precision and comparability with MBSS database

Generally, taxonomic precision is calculated using 10% of any sample set for re-identification by a third party. This will provide the County with documentation of the accuracy of its sample and reference collection of benthic macroinvertebrates. It will also establish a level of agreement between County and State taxonomists.

- Develop research studies that can be enhanced by the addition of biological data.

Howard County is unique in many ways. It is located primarily in the Piedmont physiographic region (a small portion [~5%] is Coastal Plain) and has a history of agricultural land use that is quickly developing between the Baltimore/Washington D.C. metro corridor. Biological data can be used in comparisons of taxa richness in developed vs. rural land, or Non-Coastal Plain developed areas vs. Coastal Plain developed areas. Other potential studies include the importance of a wide riparian coverage due to increased impervious surface, crop, or pasture land that has a negative affect on biology.

- Quantify the effects of nutrients on stream conditions (i.e., specifically biology).

Nutrient inputs from farmland occasionally have a positive short-term effect on local stream biology. However, extended periods of nutrient input can lead to over-enrichment and eutrophication. Protecting streams from this end result is a priority. Studies that include nutrient loading (especially nitrogen and phosphorus) could enhance the understanding of stream biological condition.

- Determine the critical point in which impervious surface imperils a stream or watershed.

According to the most recent report on population growth, from 2000-2003 the County had a greater than average population growth rate for the state of Maryland and was ranked 6th among all counties for the amount of increased residents (DPZ 2004). Along with increased population growth, increases in roadways, parking lots, houses, driveways, schools, and shopping centers are increasing the amount of impervious surface within the County. Analyses at the end of the second round of biomonitoring could be used to calculate watershed imperviousness levels and to evaluate relationships of these levels to benthic conditions.

- Target individual stream or subwatershed for diagnostic stressor identification

Using biological condition as an indicator, specific streams or watersheds can be chosen for more intensive study to determine the potential cause for degradation (stressor). Knowledge of specific stressors will allow the County to better plan and implement restoration activities that will target and correct the main problems affecting stream health.

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V. APPENDICES

APPENDIX A: Benthic Macroinvertebrate Taxa List

StationID	Class	Order	Family	Tribe	Genus	Final ID	Individuals
2-001	Clitellata	Haplotaxia	Tubificidae			Tubificinae	1
2-001	Oligochaeta	Tubificida	Enchytraeidae			Enchytraeidae	1
2-001	Oligochaeta	Tubificida	Lumbricidae			Lumbricidae	1
2-001	Oligochaeta	Tubificida	Naididae		Nais	Nais pardalis	1
2-001	Oligochaeta	Tubificida	Tubificidae		Limnodrilus	Limnodrilus claparedeianus	1
2-001	Oligochaeta	Tubificida	Tubificidae		Limnodrilus	Limnodrilus udekemianus	1
2-001	Insecta	Coleoptera	Dytiscidae		Helichus	Helichus	1
2-001	Insecta	Coleoptera	Elmidae		Dubiraphia	Dubiraphia	3
2-001	Insecta	Coleoptera	Elmidae		Macronychus	Macronychus	1
2-001	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	6
2-001	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	2
2-001	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	1
2-001	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-001	Insecta	Diptera	Chironomidae		Brillia	Brillia	4
2-001	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-001	Insecta	Diptera	Chironomidae		Natarsia	Natarsia	1
2-001	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-001	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	4
2-001	Insecta	Diptera	Chironomidae		Parakiefferiella	Parakiefferiella	2
2-001	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	3
2-001	Insecta	Diptera	Chironomidae		Phaenopsectra	Phaenopsectra	1
2-001	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	4
2-001	Insecta	Diptera	Chironomidae		Pseudosmittia	Pseudosmittia	1
2-001	Insecta	Diptera	Chironomidae		Smittia	Smittia	1
2-001	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	5
2-001	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	1
2-001	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	3
2-001	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	3
2-001	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	1
2-001	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	7
2-001	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-001	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2
2-001	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	1
2-001	Insecta	Diptera	Simuliidae		Simulium	Simulium	1
2-001	Insecta	Diptera	Tipulidae		Hexatoma	Hexatoma	3
2-001	Insecta	Diptera	Tipulidae		Ormosia	Ormosia	1
2-001	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	3
2-001	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	9
2-001	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	5
2-001	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	5
2-001	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	3

StationID	Class	Order	Family	Tribe	Genus	Final ID	Individuals
2-001	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	1
2-001	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	9
2-001	Insecta	Trichoptera	Limnephilidae		Pycnopsyche	Pycnopsyche	2
2-002	Arachnida	Trombidiformes	Sperchonidae			Sperchonidae	1
2-002	Oligochaeta	Lumbriculida	Lumbriculidae			Lumbriculidae	1
2-002	Oligochaeta	Tubificida	Enchytraeidae			Enchytraeidae	2
2-002	Oligochaeta	Tubificida	Tubificidae		Spirosperma	Spirosperma ferox	1
2-002	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	1
2-002	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	2
2-002	Insecta	Coleoptera	Sphaeriidae			Sphaeriidae	1
2-002	Insecta	Diptera	Ceratopogonidae		Ceratopogon	Ceratopogon	1
2-002	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-002	Insecta	Diptera	Chironomidae		Larsia	Larsia	2
2-002	Insecta	Diptera	Chironomidae		Natarsia	Natarsia	3
2-002	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	5
2-002	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	9
2-002	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-002	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	10
2-002	Insecta	Diptera	Chironomidae	Macropelopiini	Bethbilbeckia	Bethbilbeckia	2
2-002	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	2
2-002	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	39
2-002	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-002	Insecta	Diptera	Chironomidae	Tanytarsini	Zavrelia	Zavrelia	2
2-002	Insecta	Diptera	Tabanidae		Hybomitra	Hybomitra	1
2-002	Insecta	Diptera	Tipulidae		Dicranota	Dicranota	1
2-002	Insecta	Diptera	Tipulidae		Tipula	Tipula	1
2-002	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	3
2-002	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	16
2-002	Insecta	Trichoptera	Polycentropodidae		Polycentropus	Polycentropus	1
2-002	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-003	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	23
2-003	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-003	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	7
2-003	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	1
2-003	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	2
2-003	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-003	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	6
2-003	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	1
2-003	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	2
2-003	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	3
2-003	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2

StationID	Class	Order	Family	Tribe	Genus	Final ID	Individuals
2-003	Insecta	Diptera	Chironomidae	Tanytarsini	Zavrelia	Zavrelia	1
2-003	Insecta	Diptera	Simuliidae		Simulium	Simulium	2
2-003	Insecta	Diptera	Tipulidae		Dicranota	Dicranota	1
2-003	Insecta	Diptera	Tipulidae		Tipula	Tipula	1
2-003	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	1
2-003	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	15
2-003	Insecta	Ephemeroptera	Heptageniidae		Epeorus	Epeorus	1
2-003	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	2
2-003	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	5
2-003	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	4
2-003	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-003	Insecta	Plecoptera	Perlidae		Eccoptura	Eccoptura	1
2-003	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	1
2-003	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	4
2-003	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	5
2-003	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	4
2-003	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	2
2-003	Pelecypoda	Veneroida	Pisidiidae		Pisidium	Pisidium	7
2-004a	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	3
2-004a	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	39
2-004a	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	3
2-004a	Insecta	Diptera	Chironomidae		Brillia	Brillia	4
2-004a	Insecta	Diptera	Chironomidae		Chaetocladius	Chaetocladius	1
2-004a	Insecta	Diptera	Chironomidae		Cryptochironomus	Cryptochironomus	2
2-004a	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	2
2-004a	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-004a	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	13
2-004a	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	11
2-004a	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	2
2-004a	Insecta	Diptera	Chironomidae		Tanypodinae	Tanypodinae	1
2-004a	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-004a	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	8
2-004a	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	2
2-004a	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1
2-004a	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-004a	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	1
2-004a	Insecta	Ephemeroptera	Heptageniidae		Macaffertium	Macaffertium	5
2-004a	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	5
2-004a	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	2
2-004a	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	4
2-004 QC	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	4

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2-004 QC	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	40
2-004 QC	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	1
2-004 QC	Insecta	Diptera	Chironomidae		Chaetocladius	Chaetocladius	1
2-004 QC	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	1
2-004 QC	Insecta	Diptera	Chironomidae		Heterotrissocladius	Heterotrissocladius	1
2-004 QC	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-004 QC	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	1
2-004 QC	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	11
2-004 QC	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	3
2-004 QC	Insecta	Diptera	Chironomidae		Stenochironomus	Stenochironomus	1
2-004 QC	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	1
2-004 QC	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	4
2-004 QC	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	7
2-004 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	2
2-004 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-004 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	1
2-004 QC	Insecta	Diptera	Empididae		Chelifera	Chelifera	1
2-004 QC	Insecta	Diptera	Simuliidae		Simulium	Simulium	1
2-004 QC	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	9
2-004 QC	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	2
2-004 QC	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	11
2-004 QC	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	1
2-004 QC	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-004b	Oligochaeta	Tubificida	Naididae		Nais	Nais communis	2
2-004b	Insecta	Coleoptera	Elmidae		Macronychus	Macronychus	1
2-004b	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	4
2-004b	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	46
2-004b	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	5
2-004b	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-004b	Insecta	Diptera	Chironomidae		Brillia	Brillia	2
2-004b	Insecta	Diptera	Chironomidae		Chaetocladius	Chaetocladius	1
2-004b	Insecta	Diptera	Chironomidae		Cryptochironomus	Cryptochironomus	1
2-004b	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-004b	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	1
2-004b	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	12
2-004b	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	5
2-004b	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	2
2-004b	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	14
2-004b	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	1
2-004b	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	2
2-004b	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	1

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2-004b	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	3
2-004b	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	5
2-004b	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	1
2-004b	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	3
2-004b	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	2
2-005a	Insecta	Coleoptera	Dytiscidae		Helichus	Helichus	1
2-005a	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	4
2-005a	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	5
2-005a	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	1
2-005a	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	1
2-005a	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	2
2-005a	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-005a	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	4
2-005a	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	3
2-005a	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-005a	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	2
2-005a	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1
2-005a	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-005a	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	2
2-005a	Insecta	Diptera	Simuliidae		Simulium	Simulium	3
2-005a	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	10
2-005a	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	50
2-005a	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	1
2-005a	Insecta	Megaloptera	Corydalidae		Corydalus	Corydalus	2
2-005a	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-005a	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	2
2-005a	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	4
2-005a	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	6
2-005b	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	2
2-005b	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	4
2-005b	Insecta	Diptera	Ceratopogonidae		Dasyhelea	Dasyhelea	1
2-005b	Insecta	Diptera	Chironomidae		Brillia	Brillia	1
2-005b	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	1
2-005b	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	1
2-005b	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-005b	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	2
2-005b	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	10
2-005b	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	1
2-005b	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	3
2-005b	Insecta	Diptera	Chironomidae		Potthastia	Potthastia	1
2-005b	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1

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2-005b	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	2
2-005b	Insecta	Diptera	Chironomidae	Tanytarsini	Sublettea	Sublettea	1
2-005b	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	1
2-005b	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-005b	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	1
2-005b	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	4
2-005b	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	38
2-005b	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	4
2-005b	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	1
2-005b	Insecta	Plecoptera	Perlidae		Perlidae	Perlidae	1
2-005b	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	2
2-005b	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	8
2-005b	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	13
2-007a	Arachnida	Trombidiformes	Sperchonidae		Sperchon	Sperchon	4
2-007a	Insecta	Coleoptera	Curculionidae			Curculionidae	1
2-007a	Insecta	Coleoptera	Dytiscidae		Agabus	Agabus	1
2-007a	Insecta	Coleoptera	Elmidae		Macronychus	Macronychus	1
2-007a	Insecta	Coleoptera	Elmidae		Microcylloepus	Microcylloepus	4
2-007a	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	6
2-007a	Insecta	Diptera	Chironomidae		Brillia	Brillia	1
2-007a	Insecta	Diptera	Chironomidae		Chaetocladius	Chaetocladius	1
2-007a	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	1
2-007a	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus/Orthocladius	4
2-007a	Insecta	Diptera	Chironomidae		Diplocladius	Diplocladius	1
2-007a	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	3
2-007a	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-007a	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	14
2-007a	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	2
2-007a	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	6
2-007a	Insecta	Diptera	Chironomidae		Pseudosmittia	Pseudosmittia	1
2-007a	Insecta	Diptera	Chironomidae		Rheocricotopus	Rheocricotopus	1
2-007a	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	5
2-007a	Insecta	Diptera	Chironomidae	Tanytarsini	Cladotanytarsus	Cladotanytarsus	1
2-007a	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1
2-007a	Insecta	Diptera	Chironomidae	Tanytarsini	Paratanytarsus	Paratanytarsus	1
2-007a	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	14
2-007a	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-007a	Insecta	Diptera	Tipulidae		Antocha	Antocha	1
2-007a	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	2
2-007a	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	4
2-007a	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	2

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2-007a	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	2
2-007a	Insecta	Plecoptera	Capniidae/Leuctridae			Capniidae/Leuctridae	1
2-007a	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	4
2-007a	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	1
2-007a	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	4
2-007a	Insecta	Trichoptera	Limnephilidae		Pycnopsyche	Pycnopsyche	2
2-007a	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-007b	Insecta	Coleoptera	Elmidae		Microcylloepus	Microcylloepus	2
2-007b	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	2
2-007b	Insecta	Coleoptera	Sphaeriidae			Sphaeriidae	1
2-007b	Insecta	Diptera	Chironomidae		Chaetocladius	Chaetocladius	2
2-007b	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	1
2-007b	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-007b	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	9
2-007b	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	2
2-007b	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	26
2-007b	Insecta	Diptera	Chironomidae		Parakiefferiella	Parakiefferiella	1
2-007b	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	3
2-007b	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	3
2-007b	Insecta	Diptera	Chironomidae		Rheocricotopus	Rheocricotopus	1
2-007b	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	2
2-007b	Insecta	Diptera	Chironomidae		Tanypodinae	Tanypodinae	1
2-007b	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	9
2-007b	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	1
2-007b	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1
2-007b	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	7
2-007b	Insecta	Diptera	Chironomidae	Tanytarsini	Sublettea	Sublettea	1
2-007b	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsini	Tanytarsini	1
2-007b	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2
2-007b	Insecta	Diptera	Empididae		Clinocera	Clinocera	3
2-007b	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	1
2-007b	Insecta	Diptera	Tipulidae		Antocha	Antocha	1
2-007b	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	5
2-007b	Insecta	Odonata	Gomphidae			Gomphidae	1
2-007b	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	1
2-007b	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	6
2-007b	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-007b	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	2
2-009	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	1
2-009	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	20
2-009	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	6

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2-009	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	2
2-009	Insecta	Diptera	Ceratopogonidae		Dasyhelea	Dasyhelea	1
2-009	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	2
2-009	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus/Orthocladius	1
2-009	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	5
2-009	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-009	Insecta	Diptera	Chironomidae		Parakiefferiella	Parakiefferiella	1
2-009	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	4
2-009	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	7
2-009	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	2
2-009	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	2
2-009	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-009	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	1
2-009	Insecta	Diptera	Tipulidae		Pseudolimnophila	Pseudolimnophila	1
2-009	Insecta	Diptera	Tipulidae		Tipula	Tipula	3
2-009	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	5
2-009	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	11
2-009	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	1
2-009	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	5
2-009	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	1
2-009	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	7
2-009	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	14
2-009	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	5
2-010	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	6
2-010	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	7
2-010	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	9
2-010	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	1
2-010	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	3
2-010	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-010	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	9
2-010	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	5
2-010	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	8
2-010	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	1
2-010	Insecta	Diptera	Chironomidae		Rheocricotopus	Rheocricotopus	1
2-010	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	1
2-010	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-010	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	3
2-010	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	1
2-010	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-010	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	4
2-010	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	5

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2-010	Insecta	Diptera	Chironomidae	Tanytarsini	Sublettea	Sublettea	1
2-010	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsini	Tanytarsini	1
2-010	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-010	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	2
2-010	Insecta	Diptera	Tipulidae		Antocha	Antocha	4
2-010	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	14
2-010	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	3
2-010	Insecta	Megaloptera	Corydalidae		Corydalus	Corydalus	2
2-010	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-010	Insecta	Plecoptera	Perlidae		Acroneuria	Acroneuria	1
2-010	Insecta	Plecoptera	Perlidae		Perlidae	Perlidae	1
2-010	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	8
2-010	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	7
2-010	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-010	Insecta	Trichoptera	Polycentropodidae		Polycentropus	Polycentropus	1
2-011	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	1
2-011	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	24
2-011	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-011	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	1
2-011	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-011	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	1
2-011	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	2
2-011	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2
2-011	Insecta	Diptera	Empididae		Chelifera	Chelifera	1
2-011	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-011	Insecta	Diptera	Simuliidae		Simulium	Simulium	2
2-011	Insecta	Diptera	Tipulidae		Antocha	Antocha	3
2-011	Insecta	Ephemeroptera	Baetidae			Baetidae	3
2-011	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	2
2-011	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	9
2-011	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	33
2-011	Insecta	Plecoptera	Perlidae		Eccoptura	Eccoptura	1
2-011	Insecta	Plecoptera	Perlodidae		Cultus	Cultus	1
2-011	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	2
2-011	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	6
2-011	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	12
2-011	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	4
2-012	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	2
2-012	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	11
2-012	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	12
2-012	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1

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2-012	Insecta	Diptera	Chironomidae		Chironomini	Chironomini	1
2-012	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	2
2-012	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	1
2-012	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	2
2-012	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-012	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	6
2-012	Insecta	Diptera	Chironomidae		Stictochironomus	Stictochironomus	1
2-012	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-012	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-012	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	6
2-012	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-012	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	6
2-012	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	2
2-012	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	3
2-012	Insecta	Diptera	Simuliidae		Stegopterna	Stegopterna	29
2-012	Insecta	Diptera	Tipulidae		Hexatoma	Hexatoma	1
2-012	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	1
2-012	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	1
2-012	Insecta	Megaloptera	Corydalidae		Corydalus	Corydalus	3
2-012	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	1
2-012	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	12
2-012	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	3
2-012	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-012	Malacostraca	Amphipoda	Crangonyctidae		Crangonyx	Crangonyx	2
2-021	Arachnida	Trombidiformes	Lebertiidae		Lebertia	Lebertia	2
2-021	Insecta	Coleoptera	Elmidae		Dubiraphia	Dubiraphia	1
2-021	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	2
2-021	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	16
2-021	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	3
2-021	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	3
2-021	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-021	Insecta	Diptera	Chironomidae		Larsia	Larsia	1
2-021	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	2
2-021	Insecta	Diptera	Chironomidae		Stictochironomus	Stictochironomus	1
2-021	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-021	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	1
2-021	Insecta	Diptera	Chironomidae	Tanytarsini	Cladotanytarsus	Cladotanytarsus	1
2-021	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	5
2-021	Insecta	Diptera	Empididae		Clinocera	Clinocera	3
2-021	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	4
2-021	Insecta	Diptera	Tabanidae		Chrysops	Chrysops	1

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2-021	Insecta	Diptera	Tipulidae		Antocha	Antocha	5
2-021	Insecta	Diptera	Tipulidae		Tipula	Tipula	2
2-021	Insecta	Ephemeroptera	Baetidae		Baetis	Baetis	1
2-021	Insecta	Ephemeroptera	Ephemerellidae		Drunella	Drunella	3
2-021	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	2
2-021	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	23
2-021	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-021	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	2
2-021	Insecta	Plecoptera	Perlidae		Acroneuria	Acroneuria	1
2-021	Insecta	Trichoptera	Glossosomatidae			Glossosomatidae	2
2-021	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	9
2-021	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	5
2-021	Insecta	Trichoptera	Limnephilidae		Goera	Goera	1
2-021	Insecta	Trichoptera	Psychomyiidae		Psychomyia	Psychomyia	2
2-021	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	2
2-021	Malacostraca	Decapoda	Cambaridae		Orconectes	Orconectes	1
2-021	Gastropoda	Basommatophora	Ancylidae		Ferrissia	Ferrissia	1
2-022	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	4
2-022	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	8
2-022	Insecta	Coleoptera	Hydrophilidae			Hydrophilidae	1
2-022	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	4
2-022	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-022	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	2
2-022	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	4
2-022	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	2
2-022	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	1
2-022	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	2
2-022	Insecta	Diptera	Chironomidae	Tanytarsini	Cladotanytarsus	Cladotanytarsus	1
2-022	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-022	Insecta	Diptera	Empididae		Chelifera	Chelifera	1
2-022	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-022	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	2
2-022	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	3
2-022	Insecta	Diptera	Tipulidae		Antocha	Antocha	2
2-022	Insecta	Diptera	Tipulidae		Dicranota	Dicranota	1
2-022	Insecta	Ephemeroptera	Ephemerellidae		Drunella	Drunella	2
2-022	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	1
2-022	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	27
2-022	Insecta	Ephemeroptera	Ephemerellidae		Eurylophella	Eurylophella	1
2-022	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	4
2-022	Insecta	Ephemeroptera	Isonychiidae		Isonychia	Isonychia	2

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2-022	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	3
2-022	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	1
2-022	Insecta	Plecoptera	Nemouridae		Nemoura	Nemoura	2
2-022	Insecta	Plecoptera	Perlidae		Acroneuria	Acroneuria	3
2-022	Insecta	Plecoptera	Perlidae		Perlidae	Perlidae	1
2-022	Insecta	Trichoptera	Glossosomatidae			Glossosomatidae	6
2-022	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	6
2-022	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	9
2-022	Insecta	Trichoptera	Limnephilidae		Goera	Goera	1
2-022	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-022	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	2
2-022 QC	Arachnida	Trombidiformes	Hygrobatidae		Atractides	Atractides	1
2-022 QC	Arachnida	Trombidiformes	Lebertiidae		Lebertia	Lebertia	6
2-022 QC	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	2
2-022 QC	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	3
2-022 QC	Insecta	Diptera	Chironomidae		Brillia	Brillia	1
2-022 QC	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	1
2-022 QC	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	2
2-022 QC	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	3
2-022 QC	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	1
2-022 QC	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	1
2-022 QC	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-022 QC	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-022 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	4
2-022 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Stempellinella	Stempellinella	1
2-022 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	1
2-022 QC	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	2
2-022 QC	Insecta	Diptera	Tipulidae		Antocha	Antocha	4
2-022 QC	Insecta	Ephemeroptera	Ephemerellidae		Drunella	Drunella	4
2-022 QC	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	30
2-022 QC	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	5
2-022 QC	Insecta	Ephemeroptera	Heptageniidae		Macaffertium	Macaffertium	6
2-022 QC	Insecta	Ephemeroptera	Heptageniidae		Stenacron	Stenacron	1
2-022 QC	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-022 QC	Insecta	Megaloptera	Sialidae		Sialis	Sialis	1
2-022 QC	Insecta	Plecoptera	Nemouridae			Nemouridae	1
2-022 QC	Insecta	Plecoptera	Perlidae		Perlidae	Perlidae	5
2-022 QC	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	1
2-022 QC	Insecta	Trichoptera	Glossosomatidae			Glossosomatidae	7
2-022 QC	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	5
2-022 QC	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	8

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2-022 QC	Insecta	Trichoptera	Limnephilidae			Limnephilidae	1
2-023	Oligochaeta	Tubificida	Enchytraeidae			Enchytraeidae	1
2-023	Oligochaeta	Tubificida	Lumbricidae			Lumbricidae	1
2-023	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	2
2-023	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	8
2-023	Insecta	Diptera	Ceratopogonidae		Ceratopogon	Ceratopogon	1
2-023	Insecta	Diptera	Ceratopogonidae		Probezzia	Probezzia	1
2-023	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	4
2-023	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus/Orthocladius	1
2-023	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-023	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	3
2-023	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	4
2-023	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	1
2-023	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	6
2-023	Insecta	Diptera	Chironomidae		Rheocricotopus	Rheocricotopus	1
2-023	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	1
2-023	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-023	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2
2-023	Insecta	Diptera	Empididae		Clinocera	Clinocera	3
2-023	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	1
2-023	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	9
2-023	Insecta	Diptera	Tabanidae		Chrysops	Chrysops	1
2-023	Insecta	Diptera	Tipulidae		Antocha	Antocha	2
2-023	Insecta	Ephemeroptera	Ephemerellidae		Drunella	Drunella	1
2-023	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	1
2-023	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	19
2-023	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	1
2-023	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	1
2-023	Insecta	Ephemeroptera	Isonychiidae		Isonychia	Isonychia	1
2-023	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-023	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	4
2-023	Insecta	Plecoptera	Nemouridae		Shipsa	Shipsa	1
2-023	Insecta	Plecoptera	Perlidae		Acroneuria	Acroneuria	1
2-023	Insecta	Plecoptera	Pteronarcyidae		Pteronarcys	Pteronarcys	1
2-023	Insecta	Trichoptera	Glossosomatidae			Glossosomatidae	5
2-023	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	10
2-023	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	13
2-023	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-024	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	2
2-024	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	2
2-024	Insecta	Diptera	Ceratopogonidae		Ceratopogon	Ceratopogon	1

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2-024	Insecta	Diptera	Chironomidae		Brillia	Brillia	1
2-024	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	1
2-024	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	2
2-024	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-024	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-024	Insecta	Diptera	Chironomidae		Larsia	Larsia	4
2-024	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	2
2-024	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	18
2-024	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	5
2-024	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	11
2-024	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	2
2-024	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	13
2-024	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	2
2-024	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	5
2-024	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsini	Tanytarsini	1
2-024	Insecta	Diptera	Tipulidae		Molophilus	Molophilus	1
2-024	Insecta	Diptera	Tipulidae		Tipula	Tipula	1
2-024	Insecta	Ephemeroptera	Baetidae			Baetidae	1
2-024	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	1
2-024	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	1
2-024	Insecta	Ephemeroptera	Ephemerellidae		Eurylophella	Eurylophella	2
2-024	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	1
2-024	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	3
2-024	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	1
2-024	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-024	Insecta	Odonata	Cordulegastridae		Cordulegaster	Cordulegaster	1
2-024	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	2
2-024	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	1
2-024	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	7
2-024	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	3
2-024	Insecta	Trichoptera	Limnephilidae		Pycnopsyche	Pycnopsyche	3
2-024	Insecta	Trichoptera	Odontoceridae		Psilotreta	Psilotreta	4
2-024	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-025	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	19
2-025	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	1
2-025	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-025	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-025	Insecta	Diptera	Chironomidae		Heterotrissocladius	Heterotrissocladius	1
2-025	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-025	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	2
2-025	Insecta	Diptera	Chironomidae		Parakiefferiella	Parakiefferiella	1

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2-025	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	8
2-025	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	3
2-025	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-025	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	1
2-025	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-025	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-025	Insecta	Diptera	Tipulidae		Pseudolimnophila	Pseudolimnophila	1
2-025	Insecta	Diptera	Tipulidae		Tipula	Tipula	6
2-025	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	7
2-025	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	25
2-025	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	4
2-025	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-025	Insecta	Odonata	Gomphidae			Gomphidae	1
2-025	Insecta	Plecoptera	Chloroperlidae			Chloroperlidae	1
2-025	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	4
2-025	Insecta	Plecoptera	Nemouridae		Nemoura	Nemoura	1
2-025	Insecta	Plecoptera	Perlidae		Acroneuria	Acroneuria	1
2-025	Insecta	Plecoptera	Perlodidae		Isoperla	Isoperla	7
2-025	Insecta	Trichoptera	Glossosomatidae		Glossosoma	Glossosoma	1
2-025	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	10
2-025	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	1
2-025	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	4
2-025	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	2
2-026	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	1
2-026	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	12
2-026	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	1
2-026	Insecta	Diptera	Ceratopogonidae		Ceratopogon	Ceratopogon	2
2-026	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-026	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-026	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	2
2-026	Insecta	Diptera	Chironomidae		Tanypodinae	Tanypodinae	1
2-026	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	1
2-026	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	2
2-026	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	1
2-026	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-026	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	2
2-026	Insecta	Diptera	Tipulidae		Tipula	Tipula	3
2-026	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	5
2-026	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	38
2-026	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	2
2-026	Insecta	Odonata	Gomphidae		Stylogomphus	Stylogomphus	1

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2-026	Insecta	Plecoptera	Chloroperlidae			Chloroperlidae	1
2-026	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	2
2-026	Insecta	Plecoptera	Perlidae		Perlidae	Perlidae	1
2-026	Insecta	Plecoptera	Perlodidae		Isoperla	Isoperla	1
2-026	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	2
2-026	Insecta	Trichoptera	Glossosomatidae		Glossosoma	Glossosoma	1
2-026	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	7
2-026	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	1
2-026	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	6
2-026	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	6
2-026	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	1
2-027	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	1
2-027	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	1
2-027	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	12
2-027	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-027	Insecta	Diptera	Ceratopogonidae		Ceratopogon	Ceratopogon	3
2-027	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	1
2-027	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	5
2-027	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-027	Insecta	Diptera	Chironomidae		Heleniella	Heleniella	1
2-027	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-027	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	1
2-027	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	12
2-027	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	2
2-027	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-027	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	10
2-027	Insecta	Diptera	Chironomidae		Trissopelopia	Trissopelopia	1
2-027	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	3
2-027	Insecta	Diptera	Chironomidae		Zavrelimyia	Zavrelimyia	4
2-027	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	2
2-027	Insecta	Diptera	Simuliidae		Stegopterna	Stegopterna	5
2-027	Insecta	Diptera	Tipulidae		Pseudolimnophila	Pseudolimnophila	11
2-027	Insecta	Diptera	Tipulidae		Tipula	Tipula	1
2-027	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	3
2-027	Insecta	Ephemeroptera	Leptophlebiidae		Paraleptophlebia	Paraleptophlebia	5
2-027	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	7
2-027	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	8
2-027	Insecta	Trichoptera	Limnephilidae			Limnephilidae	1
2-029	Insecta	Coleoptera	Dytiscidae		Oreodytes	Oreodytes	1
2-029	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	2
2-029	Insecta	Coleoptera	Hydrophilidae		Hydrobius	Hydrobius	2

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2-029	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-029	Insecta	Diptera	Ceratopogonidae		Culicoides	Culicoides	2
2-029	Insecta	Diptera	Chironomidae		Chaetocladius	Chaetocladius	1
2-029	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-029	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	9
2-029	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	7
2-029	Insecta	Diptera	Chironomidae		Smittia	Smittia	1
2-029	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	12
2-029	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	9
2-029	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	3
2-029	Insecta	Diptera	Chironomidae		Zavrelimyia	Zavrelimyia	2
2-029	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	16
2-029	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-029	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-029	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsini	Tanytarsini	1
2-029	Insecta	Diptera	Simuliidae		Stegopterna	Stegopterna	9
2-029	Insecta	Diptera	Tipulidae		Molophilus	Molophilus	1
2-029	Insecta	Diptera	Tipulidae		Pseudolimnophila	Pseudolimnophila	1
2-029	Insecta	Diptera	Tipulidae		Tipula	Tipula	1
2-029	Insecta	Ephemeroptera	Ephemerellidae		Eurylophella	Eurylophella	1
2-029	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	1
2-029	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	1
2-029	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	2
2-029	Insecta	Plecoptera	Nemouridae		Nemoura	Nemoura	1
2-029	Insecta	Plecoptera	Perlidae		Perlidae	Perlidae	1
2-029	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	7
2-029	Insecta	Trichoptera	Molannidae		Molanna	Molanna	1
2-029	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	3
2-029	Gastropoda	Basommatophora	Lymnaeidae		Fossaria	Fossaria	1
2-029	Gastropoda	Basommatophora	Physidae		Physa	Physa	6
2-029	Pelecypoda	Veneroida	Pisidiidae		Pisidium	Pisidium	1
2-030	Clitellata	Haplotaxia	Tubificidae			Tubificinae	1
2-030	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	1
2-030	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	1
2-030	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	1
2-030	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	4
2-030	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	14
2-030	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-030	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	20
2-030	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	1
2-030	Insecta	Diptera	Chironomidae		Phaenopsectra	Phaenopsectra	1

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2-030	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	2
2-030	Insecta	Diptera	Chironomidae		Stictochironomus	Stictochironomus	3
2-030	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	22
2-030	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-030	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	3
2-030	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	3
2-030	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	2
2-030	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	2
2-030	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	3
2-030	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	2
2-030	Insecta	Diptera	Tipulidae		Pseudolimnophila	Pseudolimnophila	1
2-030	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	2
2-030	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	3
2-030	Insecta	Ephemeroptera	Ephemerellidae		Eurylophella	Eurylophella	1
2-030	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	3
2-030	Insecta	Ephemeroptera	Leptophlebiidae		Leptophlebia	Leptophlebia	2
2-030	Insecta	Odonata	Calopterygidae		Calopteryx	Calopteryx	1
2-030	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	3
2-030	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	1
2-030	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	3
2-030	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-030	Pelecypoda	Veneroida	Pisidiidae		Pisidium	Pisidium	1
2-038a	Arachnida	Trombidiformes	Hygrobatidae		Atractides	Atractides	1
2-038a	Insecta	Coleoptera	Elmidae		Macronychus	Macronychus	1
2-038a	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	10
2-038a	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	10
2-038a	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	9
2-038a	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	6
2-038a	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	7
2-038a	Insecta	Diptera	Chironomidae		Brillia	Brillia	1
2-038a	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	2
2-038a	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	5
2-038a	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	4
2-038a	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	1
2-038a	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	2
2-038a	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	3
2-038a	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsini	Tanytarsini	1
2-038a	Insecta	Diptera	Empididae		Chelifera	Chelifera	1
2-038a	Insecta	Diptera	Empididae		Clinocera	Clinocera	2
2-038a	Insecta	Diptera	Tipulidae		Antocha	Antocha	1
2-038a	Insecta	Ephemeroptera	Baetidae			Baetidae	2

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2-038a	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	2
2-038a	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	7
2-038a	Insecta	Ephemeroptera	Ephemeridae		Ephemera	Ephemera	1
2-038a	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	3
2-038a	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	2
2-038a	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-038a	Insecta	Odonata	Gomphidae			Gomphidae	1
2-038a	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	6
2-038a	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	2
2-038a	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	1
2-038a	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	14
2-038a	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	3
2-038a	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-038a	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	2
2-038b	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	9
2-038b	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	7
2-038b	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	2
2-038b	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	13
2-038b	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	6
2-038b	Insecta	Diptera	Chironomidae		Chaetocladius	Chaetocladius	1
2-038b	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	5
2-038b	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-038b	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	1
2-038b	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-038b	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	1
2-038b	Insecta	Diptera	Empididae		Chelifera	Chelifera	2
2-038b	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	1
2-038b	Insecta	Diptera	Tipulidae		Antocha	Antocha	5
2-038b	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	5
2-038b	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	2
2-038b	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	2
2-038b	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	5
2-038b	Insecta	Plecoptera	Perlidae		Eccoptura	Eccoptura	2
2-038b	Insecta	Plecoptera	Perlodidae		Isoperla	Isoperla	1
2-038b	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	1
2-038b	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	20
2-038b	Insecta	Trichoptera	Hydropsychidae			Hydropsychidae	4
2-038b	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	6
2-038b	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	2
2-038b	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	6
2-041	Arachnida	Trombidiformes	Sperchonidae		Sperchon	Sperchon	1

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2-041	Oligochaeta	Tubificida	Lumbricidae			Lumbricidae	1
2-041	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	6
2-041	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	1
2-041	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-041	Insecta	Diptera	Ceratopogonidae		Ceratopogon	Ceratopogon	3
2-041	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	1
2-041	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	1
2-041	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	2
2-041	Insecta	Diptera	Chironomidae		Larsia	Larsia	2
2-041	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-041	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	1
2-041	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	4
2-041	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	2
2-041	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	4
2-041	Insecta	Diptera	Chironomidae		Tanypodinae	Tanypodinae	1
2-041	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	2
2-041	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	2
2-041	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	1
2-041	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	8
2-041	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	3
2-041	Insecta	Diptera	Chironomidae	Tanytarsini	Zavrelia	Zavrelia	1
2-041	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	12
2-041	Insecta	Diptera	Simuliidae		Stegopterna	Stegopterna	1
2-041	Insecta	Diptera	Tabanidae		Chrysops	Chrysops	1
2-041	Insecta	Diptera	Tipulidae		Hexatoma	Hexatoma	1
2-041	Insecta	Diptera	Tipulidae		Tipula	Tipula	2
2-041	Insecta	Ephemeroptera	Ameletidae		Ameletus	Ameletus	2
2-041	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	6
2-041	Insecta	Ephemeroptera	Ephemerellidae		Eurylophella	Eurylophella	2
2-041	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	4
2-041	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	1
2-041	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	2
2-041	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	15
2-041	Insecta	Plecoptera	Perlodidae		Isoperla	Isoperla	1
2-041	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-041	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	2
2-041	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	10
2-042	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	7
2-042	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	10
2-042	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	3
2-042	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1

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2-042	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	1
2-042	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	2
2-042	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	2
2-042	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	3
2-042	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	1
2-042	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	2
2-042	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	9
2-042	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	3
2-042	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	2
2-042	Insecta	Diptera	Chironomidae	Tanytarsini	Stempellinella	Stempellinella	3
2-042	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2
2-042	Insecta	Diptera	Tipulidae		Tipula	Tipula	1
2-042	Insecta	Ephemeroptera	Ameletidae		Ameletus	Ameletus	1
2-042	Insecta	Ephemeroptera	Baetidae			Baetidae	3
2-042	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	2
2-042	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	30
2-042	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	2
2-042	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	1
2-042	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-042	Insecta	Odonata	Gomphidae			Gomphidae	2
2-042	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	3
2-042	Insecta	Plecoptera	Perlidae		Acroneuria	Acroneuria	4
2-042	Insecta	Plecoptera	Perlidae		Eccoptura	Eccoptura	1
2-042	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	2
2-042	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	3
2-042	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	2
2-042	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	2
2-042	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	1
2-042	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	1
2-043	Arachnida	Trombidiformes	Lebertiidae		Lebertia	Lebertia	1
2-043	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	1
2-043	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	1
2-043	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	3
2-043	Insecta	Diptera	Chironomidae		Diamesa	Diamesa	6
2-043	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	5
2-043	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	6
2-043	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	2
2-043	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	6
2-043	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-043	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	1
2-043	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	3

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2-043	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1
2-043	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2
2-043	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	43
2-043	Insecta	Diptera	Simuliidae		Stegopterna	Stegopterna	1
2-043	Insecta	Diptera	Tipulidae		Tipula	Tipula	1
2-043	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	9
2-043	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	3
2-043	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-043	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	14
2-044	Arachnida	Trombidiformes	Lebertiidae		Lebertia	Lebertia	1
2-044	Oligochaeta	Tubificida	Enchytraeidae			Enchytraeidae	1
2-044	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	2
2-044	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	2
2-044	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-044	Insecta	Diptera	Chironomidae		Brillia	Brillia	1
2-044	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-044	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	2
2-044	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	1
2-044	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	2
2-044	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-044	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	1
2-044	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	13
2-044	Insecta	Diptera	Simuliidae		Stegopterna	Stegopterna	1
2-044	Insecta	Diptera	Tipulidae		Tipula	Tipula	1
2-044	Insecta	Ephemeroptera	Baetidae			Baetidae	4
2-044	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	39
2-044	Insecta	Ephemeroptera	Heptageniidae		Epeorus	Epeorus	2
2-044	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	1
2-044	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	1
2-044	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	12
2-044	Insecta	Plecoptera	Nemouridae		Nemoura	Nemoura	3
2-044	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	2
2-044	Insecta	Trichoptera	Polycentropodidae		Polycentropus	Polycentropus	1
2-044	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-044	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	14
2-044 QC	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	8
2-044 QC	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	1
2-044 QC	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	5
2-044 QC	Insecta	Diptera	Ceratopogonidae		Ceratopogon	Ceratopogon	1
2-044 QC	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	6
2-044 QC	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	9

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2-044 QC	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-044 QC	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	1
2-044 QC	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	2
2-044 QC	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	15
2-044 QC	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-044 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	2
2-044 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-044 QC	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	1
2-044 QC	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	16
2-044 QC	Insecta	Diptera	Tipulidae		Limnophila	Limnophila	1
2-044 QC	Insecta	Ephemeroptera	Ameletidae		Ameletus	Ameletus	2
2-044 QC	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	21
2-044 QC	Insecta	Ephemeroptera	Ephemerellidae		Eurylophella	Eurylophella	1
2-044 QC	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	7
2-044 QC	Insecta	Plecoptera	Nemouridae		Nemoura	Nemoura	5
2-044 QC	Insecta	Plecoptera	Nemouridae		Shipsa	Shipsa	2
2-044 QC	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	1
2-044 QC	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	9
2-045	Arachnida	Trombidiformes	Sperchonidae		Sperchon	Sperchon	1
2-045	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	3
2-045	Insecta	Coleoptera	Psephenidae		Psephenus	Psephenus	1
2-045	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-045	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	2
2-045	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	1
2-045	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	2
2-045	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	1
2-045	Insecta	Diptera	Chironomidae		Stictochironomus	Stictochironomus	1
2-045	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-045	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1
2-045	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2
2-045	Insecta	Diptera	Empididae		Chelifera	Chelifera	1
2-045	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	1
2-045	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	10
2-045	Insecta	Diptera	Tipulidae		Antocha	Antocha	2
2-045	Insecta	Ephemeroptera	Ameletidae		Ameletus	Ameletus	1
2-045	Insecta	Ephemeroptera	Ephemerellidae		Drunella	Drunella	3
2-045	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	56
2-045	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	1
2-045	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-045	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	10
2-045	Insecta	Plecoptera	Nemouridae		Shipsa	Shipsa	1

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2-045	Insecta	Plecoptera	Perlidae		Perlidae	Perlidae	1
2-045	Insecta	Trichoptera	Glossosomatidae			Glossosomatidae	2
2-045	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	5
2-045	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	3
2-046	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	3
2-046	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	5
2-046	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	3
2-046	Insecta	Diptera	Chironomidae		Nanocladius	Nanocladius	1
2-046	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-046	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	2
2-046	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	1
2-046	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-046	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1
2-046	Insecta	Diptera	Empididae		Clinocera	Clinocera	1
2-046	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	55
2-046	Insecta	Diptera	Tipulidae		Antocha	Antocha	1
2-046	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	18
2-046	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	1
2-046	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	1
2-046	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	2
2-046	Insecta	Plecoptera	Perlidae		Perlidae	Perlidae	1
2-046	Insecta	Trichoptera	Glossosomatidae			Glossosomatidae	1
2-046	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	12
2-046	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	4
2-046	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	3
2-046	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-047	Arachnida	Trombidiformes	Lebertiidae		Lebertia	Lebertia	1
2-047	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	14
2-047	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	3
2-047	Insecta	Diptera	Ceratopogonidae		Ceratopogon	Ceratopogon	2
2-047	Insecta	Diptera	Chironomidae		Brillia	Brillia	1
2-047	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	1
2-047	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	3
2-047	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	17
2-047	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	2
2-047	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-047	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	4
2-047	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-047	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-047	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	5
2-047	Insecta	Diptera	Empididae		Hemerodromia	Hemerodromia	1

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2-047	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	5
2-047	Insecta	Diptera	Simuliidae		Simulium	Simulium	1
2-047	Insecta	Diptera	Simuliidae		Stegopterna	Stegopterna	1
2-047	Insecta	Diptera	Tipulidae		Hexatoma	Hexatoma	1
2-047	Insecta	Ephemeroptera	Baetidae			Baetidae	1
2-047	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	2
2-047	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	4
2-047	Insecta	Ephemeroptera	Ephemerellidae		Eurylophella	Eurylophella	1
2-047	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	7
2-047	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	18
2-047	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	3
2-047	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	1
2-047	Insecta	Trichoptera	Odontoceridae		Psilotreta	Psilotreta	1
2-047	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-048	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	3
2-048	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	15
2-048	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	1
2-048	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-048	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus/Orthocladius	1
2-048	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	6
2-048	Insecta	Diptera	Chironomidae		Orthocladiinae	Orthocladiinae	2
2-048	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	5
2-048	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	6
2-048	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	1
2-048	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-048	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	2
2-048	Insecta	Diptera	Chironomidae	Tanytarsini	Corynoneura	Corynoneura	4
2-048	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	6
2-048	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	1
2-048	Insecta	Diptera	Chironomidae	Tanytarsini	Stempellinella	Stempellinella	1
2-048	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	4
2-048	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	1
2-048	Insecta	Diptera	Simuliidae		Simulium	Simulium	1
2-048	Insecta	Diptera	Tipulidae		Antocha	Antocha	1
2-048	Insecta	Ephemeroptera	Ephemerellidae		Ephemerella	Ephemerella	4
2-048	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	9
2-048	Insecta	Ephemeroptera	Ephemerellidae		Eurylophella	Eurylophella	3
2-048	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	2
2-048	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	8
2-048	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	17
2-048	Insecta	Plecoptera	Perlodidae		Perlodidae	Perlodidae	2

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2-048	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	3
2-048	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	1
2-048	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	3
2-048	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	2
2-049	Arachnida	Trombidiformes	Sperchonidae		Sperchonopsis	Sperchonopsis	1
2-049	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	11
2-049	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	43
2-049	Insecta	Coleoptera	Elmidae		Stenelmis	Stenelmis	2
2-049	Insecta	Coleoptera	Ptilodactylidae		Anchytarsus	Anchytarsus	1
2-049	Insecta	Diptera	Ceratopogonidae		Bezzia/Palpomyia	Bezzia/Palpomyia	1
2-049	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus	2
2-049	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	1
2-049	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	2
2-049	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	5
2-049	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	5
2-049	Insecta	Diptera	Chironomidae		Phaenopsectra	Phaenopsectra	1
2-049	Insecta	Diptera	Chironomidae		Polypedilum	Polypedilum	3
2-049	Insecta	Diptera	Chironomidae		Sympotthastia	Sympotthastia	7
2-049	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	2
2-049	Insecta	Diptera	Chironomidae		Tvetenia	Tvetenia	2
2-049	Insecta	Diptera	Chironomidae	Tanytarsini	Microtendipes	Microtendipes	1
2-049	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	2
2-049	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	1
2-049	Insecta	Diptera	Simuliidae		Stegopterna	Stegopterna	1
2-049	Insecta	Diptera	Tipulidae		Tipula	Tipula	2
2-049	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	8
2-049	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	1
2-049	Insecta	Ephemeroptera	Leptophlebiidae			Leptophlebiidae	1
2-049	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	1
2-049	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	1
2-049	Insecta	Trichoptera	Hydropsychidae		Diplectrona	Diplectrona	1
2-049	Insecta	Trichoptera	Philopotamidae		Chimarra	Chimarra	3
2-049	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-049	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	3
2-050	Arachnida	Trombidiformes	Sperchonidae		Sperchon	Sperchon	1
2-050	Oligochaeta	Tubificida	Lumbricidae			Lumbricidae	1
2-050	Oligochaeta	Tubificida	Naididae		Nais	Nais behningi	2
2-050	Insecta	Coleoptera	Elmidae		Optioservus	Optioservus	1
2-050	Insecta	Coleoptera	Elmidae		Oulimnius	Oulimnius	1
2-050	Insecta	Diptera	Chironomidae		Cricotopus	Cricotopus/Orthocladius	1
2-050	Insecta	Diptera	Chironomidae		Cryptochironomus	Cryptochironomus	1

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2-050	Insecta	Diptera	Chironomidae		Eukiefferiella	Eukiefferiella	2
2-050	Insecta	Diptera	Chironomidae		Hydrobaenus	Hydrobaenus	1
2-050	Insecta	Diptera	Chironomidae		Orthocladius	Orthocladius	3
2-050	Insecta	Diptera	Chironomidae		Parametriocnemus	Parametriocnemus	1
2-050	Insecta	Diptera	Chironomidae		Stilocladius	Stilocladius	1
2-050	Insecta	Diptera	Chironomidae		Thienemanniella	Thienemanniella	1
2-050	Insecta	Diptera	Chironomidae		Thienemannimyia	Thienemannimyia gr.	3
2-050	Insecta	Diptera	Chironomidae	Tanytarsini	Cladotanytarsus	Cladotanytarsus	3
2-050	Insecta	Diptera	Chironomidae	Tanytarsini	Micropsectra	Micropsectra	1
2-050	Insecta	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	Rheotanytarsus	7
2-050	Insecta	Diptera	Chironomidae	Tanytarsini	Stempellinella	Stempellinella	1
2-050	Insecta	Diptera	Chironomidae	Tanytarsini	Tanytarsus	Tanytarsus	2
2-050	Insecta	Diptera	Empididae		Clinocera	Clinocera	4
2-050	Insecta	Diptera	Simuliidae		Prosimulium	Prosimulium	2
2-050	Insecta	Diptera	Tipulidae		Antocha	Antocha	2
2-050	Insecta	Diptera	Tipulidae		Dicranota	Dicranota	1
2-050	Insecta	Ephemeroptera	Ameletidae		Ameletus	Ameletus	1
2-050	Insecta	Ephemeroptera	Ephemerellidae		Drunella	Drunella	2
2-050	Insecta	Ephemeroptera	Ephemerellidae			Ephemerellidae	30
2-050	Insecta	Ephemeroptera	Heptageniidae			Heptageniidae	14
2-050	Insecta	Ephemeroptera	Heptageniidae		Maccaffertium	Maccaffertium	9
2-050	Insecta	Megaloptera	Corydalidae		Nigronia	Nigronia	2
2-050	Insecta	Plecoptera	Nemouridae		Amphinemura	Amphinemura	4
2-050	Insecta	Trichoptera	Hydropsychidae		Cheumatopsyche	Cheumatopsyche	2
2-050	Insecta	Trichoptera	Hydropsychidae		Hydropsyche	Hydropsyche	2
2-050	Insecta	Trichoptera	Rhyacophilidae		Rhyacophila	Rhyacophila	1
2-050	Insecta	Trichoptera	Uenoidae		Neophylax	Neophylax	3

Taxa	Tolerance Value	Functional Feeding Group	Habit
Acroneuria	0	Predator	Clinger
Agabus	5	Predator	Swimmer
Ameletus	0	Collector Gatherer	Swimmer
Amphinemura	3	Shredder	Sprawler
Anchytarsus	4	Shredder	Clinger
Antocha	5	Collector Gatherer	Clinger
Atractides		Predator	
Baetidae	4	Collector Gatherer	
Baetis	6	Collector Gatherer	Swimmer
Bethbilbeckia			
Bezzia/Palpomyia	6		Burrower
Brillia	5	Shredder	
Calopteryx	6	Predator	Climber
Capniidae/Leuctridae	1	Shredder	Sprawler
Ceratopogon	6	Predator	Burrower
Chaetocladius	6	Collector Gatherer	Sprawler
Chelifera	3	Collector Gatherer	
Cheumatopsyche	5	Filterer	Clinger
Chimarra	4	Filterer	Clinger
Chironomini	6	Collector Gatherer	
Chloroperlidae		Predator	Clinger
Chrysops	7	Collector Gatherer	Sprawler
Cladotanytarsus	7	Collector Gatherer	Climber
Clinocera	6	Predator	Clinger
Cordulegaster	3	Predator	Burrower
Corydalus	5	Predator	Clinger
Corynoneura	7	Collector Gatherer	Sprawler
Crangonyx	4	Collector Gatherer	
Cricotopus	7	Shredder	
Cricotopus/Orthocladius	6		Sprawler
Cryptochironomus	8	Predator	Sprawler
Culicoides	10	Predator	Burrower
Cultus		Predator	Clinger
Curculionidae		Shredder	Clinger
Dasyhelea		Collector Gatherer	Sprawler
Diamesa	5	Collector Gatherer	Sprawler
Dicranota	4	Predator	
Diplectrona	2	Filterer	Clinger
Diplocladius	7	Collector Gatherer	Sprawler
Drunella	1	Predator	Clinger
Dubiraphia	6	Collector Gatherer	Clinger
Eccoptura	3		Clinger
Enchytraeidae	10	Collector Gatherer	
Epeorus	0	Scraper	Clinger
Ephemera	3	Collector Gatherer	Burrower
Ephemerella	2	Collector Gatherer	Clinger
Ephemerellidae	2	Collector Gatherer	
Eukiefferiella	8	Collector Gatherer	Sprawler
Eurylophella	4	Scraper	Clinger
Ferrissia	7	Scraper	

Taxa	Tolerance Value	Functional Feeding Group	Habit
Glossosoma	0	Scraper	Clinger
Glossosomatidae	0	Scraper	Clinger
Goera		Scraper	Clinger
Gomphidae	1	Predator	Burrower
Heleniella		Collector Gatherer	Sprawler
Helichus	5	Scraper	Clinger
Hemerodromia	6	Predator	Sprawler
Heptageniidae	4	Scraper	
Heterotrissocladius	0	Collector Gatherer	Sprawler
Hexatoma	4	Predator	Burrower
Hybomitra		Predator	Sprawler
Hydrobaenus	8	Scraper	Sprawler
Hydrobius	5	Predator	Climber
Hydrophilidae		Predator	Swimmer
Hydropsyche	6	Filterer	Clinger
Hydropsychidae	4	Filterer	
Isonychia	2	Filterer	Swimmer
Isoperla	2	Predator	Clinger
Larsia	6	Predator	Sprawler
Lebertia		Predator	
Leptophlebia	4	Collector Gatherer	Swimmer
Leptophlebiidae	4	Collector Gatherer	
Limnephilidae	4	Shredder	
Limnodrilus claparedeianus	10	Collector Gatherer	
Limnodrilus udekemianus	10	Collector Gatherer	
Limnophila	4	Predator	Burrower
Lumbricidae	10	Collector Gatherer	
Lumbriculidae	10	Collector Gatherer	
Maccaffertium	4	Scraper	Clinger
Macronychus	4	Omnivore	Clinger
Microcylloepus	2	Collector Gatherer	Clinger
Micropsectra	7	Collector Gatherer	Climber
Microtendipes	6	Filterer	Clinger
Molanna	6	Scraper	Sprawler
Molophilus		Shredder	Burrower
Nais behningi	6	Collector Gatherer	
Nais communis	8	Collector Gatherer	
Nais pardalis	8	Collector Gatherer	
Nanocladius	3	Collector Gatherer	Sprawler
Natarsia	8	Predator	Sprawler
Nemoura	1	Shredder	Sprawler
Nemouridae	2	Shredder	
Neophylax	3	Scraper	Clinger
Nigronia	0	Predator	Clinger
Optioservus	4	Scraper	Clinger
Orconectes	6	Shredder; Collector Gatherer	
Oreodytes		Predator	Swimmer
Ormosia	3	Collector Gatherer	Burrower
Orthocladiinae	6	Collector Gatherer	Burrower
Orthocladius	6	Collector Gatherer	Sprawler

Taxa	Tolerance Value	Functional Feeding Group	Habit
Oulimnius	2	Collector Gatherer	Clinger
Pagastia	1	Collector Gatherer	
Parakiefferiella	4	Collector Gatherer	Sprawler
Paraleptophlebia	2	Collector Gatherer	Swimmer
Parametriocnemus	5	Collector Gatherer	Sprawler
Paratanytarsus	6	Collector Gatherer	Sprawler
Perlidae	1	Predator	
Perlodidae	2	Predator	Clinger
Phaenopsectra	7	Scraper	Clinger
Physa		Scraper	
Pisidium	8	Filterer	
Polycentropus	5	Predator	Clinger
Polypedilum	6	Shredder	Climber
Potthastia	2	Omnivore	Sprawler
Probezzia	6	Predator	Burrower
Prosimulium	7	Filterer	Clinger
Psephenus	4	Scraper	Clinger
Pseudolimnophila	2	Predator	Burrower
Pseudosmittia	6	Collector Gatherer	Sprawler
Psilotreta	0	Scraper	Sprawler
Psychomyia	2	Scraper	Clinger
Pteronarcys	2	Shredder	Clinger
Pycnopsyche	4	Shredder	Sprawler
Rheocricotopus	6	Collector Gatherer	Sprawler
Rheotanytarsus	6	Filterer	Clinger
Rhyacophila	1	Predator	Clinger
Shipsa	2	Shredder	Sprawler
Sialis	4	Predator	Burrower
Simulium	7	Filterer	Clinger
Smittia	6	Collector Gatherer	
Sperchon		Predator	
Sperchonidae		Predator	
Sperchonopsis		Predator	
Sphaeriidae	8	Filterer	
Spirosperma ferox	10	Collector Gatherer	
Stegopterna	7	Filterer	Clinger
Stempellinella	4	Collector Gatherer	Climber
Stenacron	4	Scraper	Clinger
Stenelmis	6	Scraper	Clinger
Stictochironomus	9	Omnivore	Burrower
Stilocladius		Collector Gatherer	Sprawler
Stylogomphus	0	Predator	Burrower
Sublettea		Filterer	
Sympotthastia	6	Collector Gatherer	Sprawler
Tanypodinae	6	Predator	Burrower
Tanytarsini	6	Filterer	
Tanytarsus	6	Filterer	Climber
Thienemanniella	6	Collector Gatherer	Sprawler
Thienemannimyia gr.	6	Predator	Sprawler
Tipula	4	Shredder	Burrower

Taxa	Tolerance Value	Functional Feeding Group	Habit
Trissopelopia	4	Predator	Sprawler
Tubificinae	10	Collector Gatherer	
Tvetenia	5	Collector Gatherer	Sprawler
Zavrelia	4	Collector Gatherer	Swimmer
Zavrelimyia	8	Predator	Sprawler

APPENDIX B: Taxonomic Comparison

Sample	Order	Family	Subfamily/Tribe	Final ID	T1	T2	Agreements
2-026	Ephemeroptera	Ephemerellidae		Ephemerella	5	43	5
2-026	Ephemeroptera	Ephemerellidae		Ephemerellidae	38	0	0
2-026	Ephemeroptera	Heptageniidae		Stenonema	0	2	0
2-026	Ephemeroptera	Heptageniidae		Heptageniidae	2	0	0
2-026	Odonata	Gomphidae		Stylogomphus	1	1	1
2-026	Plecoptera	Chloroperlidae		Haploperla	0	1	0
2-026	Plecoptera	Chloroperlidae		Chloroperlidae	1	0	0
2-026	Plecoptera	Nemouridae		Amphinemura	2	2	2
2-026	Plecoptera	Perlidae		Acroneuria	1	1	1
2-026	Plecoptera	Perlidae		Isoperla	1	1	1
2-026	Plecoptera	Perlodidae		Perlodid Unid.	0	2	2
2-026	Plecoptera	Perlodidae		Perlodidae	2	0	0
2-026	Plecoptera	Perlodidae		Glossosoma	1	1	1
2-026	Trichoptera	Glossosomatidae		Cheumatopsyche	7	7	7
2-026	Trichoptera	Hydropsychidae		Diplectrona	1	1	1
2-026	Trichoptera	Hydropsychidae		Hydropsyche	6	4	4
2-026	Trichoptera	Hydropsychidae		Hydropsychidae unid	0	2	0
2-026	Trichoptera	Philopotamidae		Chimarra	6	6	6
2-026	Trichoptera	Uenoidae		Neophylax	1	1	1
2-026	Coleoptera	Elmidae		Optioservus	1	2	1
2-026	Coleoptera	Elmidae		Oulimnius	12	11	11
2-026	Coleoptera	Psephenidae		Psephenus	1	1	1
2-026	Diptera	Ceratopogon		Ceratopogon	2	2	2
2-026	Diptera	Chironomidae	Diamesinae	Sympotthastia	2	3	2
2-026	Diptera	Chironomidae	Orthocladiinae	Corynoneura	1	1	1
2-026	Diptera	Chironomidae	Orthocladiinae	Eukiefferiella	1	1	1
2-026	Diptera	Chironomidae	Orthocladiinae	Orthocladiinae	1	0	0
2-026	Diptera	Chironomidae	Orthocladiinae	Tvetenia	0	1	0
2-026	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	2	2	2
2-026	Diptera	Chironomidae	Tanytarsini	Tanytarsus	1	1	1
2-026	Diptera	Chironomidae	Tanypodinae	Tanypodinae	1	0	0
2-026	Diptera	Empididae		Clinocera	1	1	1
2-026	Diptera	Simuliidae		Prosimulium	2	2	2
2-026	Diptera	Tipulidae		Tipula	3	3	3
				TOTAL NO.	106	106	60

Total Midges	9	9	7

% difference in enumeration (PDE)	0.0
% taxonomic disagreement_genus (PTD_g)	43.4
% taxonomic completeness (abs diff)	0.0
% difference in enumeration (PDE_m)	0.0
% taxonomic disagreement_midges (PTD_m)	22.2

Sample	Order	Family	Subfamily/Tribe	Final ID	T1	T2	Agreements
2-027	Ephemeroptera	Ephemerellidae		Ephemerella	3	3	3
2-027	Ephemeroptera	Leptophlebiidae		Paraleptophlebia	5	5	5
2-027	Plecoptera	Nemouridae		Amphinemura	7	7	7
2-027	Trichoptera	Hydropsychidae		Diplectrona	8	8	8
2-027	Trichoptera	Limnephilidae		Limnephilid Unid.	0	1	1
2-027	Trichoptera	Limnephilidae		Limnephilidae	1	0	0
2-027	Coleoptera	Elmidae		Oulimnius	1	1	1
2-027	Coleoptera	Elmidae		Stenelmis	1	1	1
2-027	Coleoptera	Ptylodactilidae		Anchytarsus	12	12	12
2-027	Diptera	Ceratopogonidae		Bezzia/Palpomyia	1	1	1
2-027	Diptera	Ceratopogonidae		Ceratopogon	3	3	3
2-027	Diptera	Chironomidae	Diamesinae	Diamesa	5	5	5
2-027	Diptera	Chironomidae	Orthocladiinae	Chaetocladius	1	1	1
2-027	Diptera	Chironomidae	Orthocladiinae	Corynoneura	2	2	2
2-027	Diptera	Chironomidae	Orthocladiinae	Cricotopus	1	0	0
2-027	Diptera	Chironomidae	Orthocladiinae	Eukiefferiella	1	4	1
2-027	Diptera	Chironomidae	Orthocladiinae	Heleniella	1	1	1
2-027	Diptera	Chironomidae	Orthocladiinae	Orthocladius	1	2	1
2-027	Diptera	Chironomidae	Orthocladiinae	Parametriocnemus	10	10	10
2-027	Diptera	Chironomidae	Orthocladiinae	Paraphaenocladius	2	2	2
2-027	Diptera	Chironomidae	Orthocladiinae	Stilocladius	2	2	2
2-027	Diptera	Chironomidae	Orthocladiinae	Thienemanniella	1	1	1
2-027	Diptera	Chironomidae	Orthocladiinae	Tvetenia	3	0	0
2-027	Diptera	Chironomidae	Tanypodinae	Natarsia	1	1	1
2-027	Diptera	Chironomidae	Tanypodinae	Trissopelopia	3	3	3
2-027	Diptera	Chironomidae	Tanypodinae	Zavrelimyia	1	1	1
2-027	Diptera	Chironomidae	Thienemannimyia genus grp.	Conchapelopia genus grp.	0	7	0
2-027	Diptera	Chironomidae	Thienemannimyia genus grp.	Meropelopia genus grp.	0	2	0
2-027	Diptera	Chironomidae	Thienemannimyia genus grp.	Thienemannimyia genus grp.	10	1	10
2-027	Diptera	Simuliidae		Stegopterna	5	5	5
2-027	Diptera	Tipulidae		Pseudolimnophila	11	11	11
2-027	Diptera	Tipulidae		Tipula	1	1	1
				TOTAL NO.	104	104	100
				Percent completeness			
				Total Midges	45	45	41

% difference in enumeration (PDE)	0.0
% taxonomic disagreement_genus (PTD_g)	3.8
% taxonomic completeness (abs diff)	0.0
% difference in enumeration (PDE_m)	0.0
% taxonomic disagreement_midges (PTD_m)	8.9

Sample	Order	Family	Subfamily/Tribe	Final ID	T1	T2	Agreements
2-044QC	Ephemeroptera	Ameletidae		Ameletus	2	2	2
2-044QC	Ephemeroptera	Ephemerellidae		Ephemerella	0	21	0
2-044QC	Ephemeroptera	Ephemerellidae		Eurylophella	1	1	1
2-044QC	Ephemeroptera	Ephemerellidae		Ephemerellidae	21	0	0
2-044QC	Odonata	Gomphidae		Gomphid Unid.	1	1	1
2-044QC	Plecoptera	Nemouridae		Amphinemura	7	7	7
2-044QC	Plecoptera	Nemouridae		Prostoia	5	5	5
2-044QC	Plecoptera	Perlodidae		Perlodid Unid.	0	1	1
2-044QC	Plecoptera	Perlodidae		Perlodidae	1	0	0
2-044QC	Plecoptera	Taeniopterygidae		Strophopteryx	2	2	2
2-044QC	Trichoptera	Uenoidae		Neophylax	9	9	9
2-044QC	Coleoptera	Elmidae		Oulimnius	8	8	8
2-044QC	Coleoptera	Psephenidae		Psephenus	1	1	1
2-044QC	Diptera	Ceratopogonidae		Bezzia/Palpomyia	5	6	5
2-044QC	Diptera	Ceratopogonidae		Ceratopogon	1	0	0
2-044QC	Diptera	Chironomidae	Chironomini	Polypedilum	2	2	2
2-044QC	Diptera	Chironomidae	Diamesinae	Sympotthastia	15	15	15
2-044QC	Diptera	Chironomidae	Orthocladiinae	Corynoneura	2	2	2
2-044QC	Diptera	Chironomidae	Orthocladiinae	Cricotopus	6	0	7
2-044QC	Diptera	Chironomidae	Orthocladiinae	Eukiefferiella	9	7	7
2-044QC	Diptera	Chironomidae	Orthocladiinae	Orthocladius	1	10	0
2-044QC	Diptera	Chironomidae	Orthocladiinae	Orthocladiinae	1	0	0
2-044QC	Diptera	Chironomidae	Tanytarsini	Rheotanytarsus	1	1	1
2-044QC	Diptera	Chironomidae	Tanytarsini	Tanytarsus	1	1	1
2-044QC	Diptera	Chironomidae	Thienemannimyia genus grp.	Conchapelopia genus grp.	0	1	0
2-044QC	Diptera	Chironomidae	Thienemannimyia group	Thienemannimyia group	1	0	1
2-044QC	Diptera	Simuliidae		Prosimulium	16	16	16
2-044QC	Diptera	Tipulidae		Limnophila	1	1	1
				TOTAL NO.	120	120	95
				Percent completeness			
				Total Midges	39	39	36

% difference in enumeration (PDE)	0.0
% taxonomic disagreement_genus (PTD_g)	20.8
% taxonomic completeness (abs diff)	0.0
% difference in enumeration (PDE_m)	0.0
% taxonomic disagreement_midges (PTD_m)	7.7

Sample	Order	Family	Subfamily/Tribe	Final ID	T1	T2	Agreements
2-046	Ephemeroptera	Ephemerellidae		Ephemerella	0	18	0
2-046	Ephemeroptera	Ephemerellidae		Ephemerellidae	18	0	0
2-046	Ephemeroptera	Heptageniidae		Epeorus	0	1	0
2-046	Ephemeroptera	Heptageniidae		Heptageniidae	1	0	0
2-046	Plecoptera	Nemouridae		Amphinemura	2	2	2
2-046	Plecoptera	Perlidae		Perlid Unid.	0	1	1
2-046	Plecoptera	Perlidae		Perlidae	1	0	0
2-046	Megaloptera	Corydalidae		Nigronia	1	1	1
2-046	Megaloptera	Glossosomatidae		Agapetus	1	1	1
2-046	Trichoptera	Hydropsychidae		Cheumatopsyche	12	12	12
2-046	Trichoptera	Hydropsychidae		Ceratopsyche	0	3	0
2-046	Trichoptera	Hydropsychidae		Hydropsyche	4	1	1
2-046	Trichoptera	Philopotamidae		Chimarra	3	3	3
2-046	Trichoptera	Rhyacophilidae		Rhyacophila	1	1	1
2-046	Coleoptera	Elmidae		Oulimnius	3	3	3
2-046	Diptera	Chironomidae	Tanytarsini	Micropsectra	1	1	1
2-046	Diptera	Chironomidae	Chironomini	Microtendipes	1	1	1
2-046	Diptera	Chironomidae	Orthocladiinae	Cricotopus	5	0	5
2-046	Diptera	Chironomidae	Orthocladiinae	Eukiefferiella	3	3	3
2-046	Diptera	Chironomidae	Orthocladiinae	Nanocladius	1	1	1
2-046	Diptera	Chironomidae	Orthocladiinae	Orthocladiinae	1	0	0
2-046	Diptera	Chironomidae	Orthocladiinae	Orthocladius	0	5	0
2-046	Diptera	Chironomidae	Orthocladiinae	Parachaetocladius	0	1	0
2-046	Diptera	Chironomidae	Orthocladiinae	Parametriocnemus	2	2	2
2-046	Diptera	Chironomidae	Tanypodinae	Thienemannimyia genus grp.	1	1	1
2-046	Diptera	Empididae		Clinocera	1	1	1
2-046	Diptera	Simuliidae		Prosimulium	55	55	55
2-046	Diptera	Tipulidae		Antocha	1	1	1
				TOTAL NO.	119	119	96

Percent completeness

Total Midges	15	15	14

% difference in enumeration (PDE)	0.0
% taxonomic disagreement_genus (PTD_g)	19.3
% taxonomic completeness (abs diff)	0.0
% difference in enumeration (PDE_m)	0.0
% taxonomic disagreement_midges (PTD_m)	6.7

APPENDIX C: Biological Metrics (Original B-IBI)

StationID	2-001	2-002	2-003	2-004a	2-004b	2-004 QC	2-005a	2-005b	2-007a	2-007b	2-009
Waterbody Name	UT to Cattail Creek	UT to Mid Pax	UT to Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	Cattail Creek	Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	UT to Dorsey Branch
Collection Date	03-30-2005	03-24-2005	03-24-2005	03-30-2005	03-30-2005	03-30-2005	03-31-2005	03-31-2005	03-28-2005	03-28-2005	03-31-2005
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	2	1	1	1	1	1	3	3	1	1	1
IBI-Spring-MBSS-NCP	4.33	3.22	4.56	2.56	3.22	3.22	4.11	4.11	4.11	3.44	3.89
Rating-Spring-MBSS-NCP	Good	Fair	Good	Poor	Fair	Fair	Good	Good	Good	Fair	Fair
Total Taxa	44	27	29	22	23	24	23	26	35	31	26
Total Taxa Score	5	5	5	3	5	5	5	5	5	5	5
EPT Taxa	8	3	12	4	4	4	6	7	10	5	8
EPT Taxa Score	3	1	3	1	1	1	3	3	3	3	3
Ephemeroptera Taxa	5	0	6	1	0	1	3	2	4	1	3
Ephemeroptera Taxa	5	1	5	1	1	1	3	3	3	1	3
Diptera Taxa	24	16	14	15	13	16	11	16	19	22	14
Diptera Taxa Score	5	5	5	5	5	5	5	5	5	5	5
Ephemeroptera Percent	22.73	0.00	26.17	4.46	0.00	8.41	56.48	39.62	10.00	5.00	15.45
Ephemeroptera Percent Score	5	1	5	1	1	3	5	5	3	1	3
Tanytarsini Percent	9.09	39.64	8.41	3.57	2.59	3.74	0.93	4.72	17.00	12.00	0.91
Tanytarsini Percent Score	5	5	5	3	3	3	3	3	5	5	3
Intolerant Taxa	5	4	9	1	4	3	4	6	6	5	7
Intolerant Taxa Score	3	3	5	1	3	3	3	3	3	3	3
Tolerant Percent	15.45	45.05	12.15	6.25	4.31	3.74	7.41	3.77	6.00	13.00	7.27
Tolererant Percent Score	3	3	3	5	5	5	5	5	5	3	5
Collector Percent	54.55	56.76	54.21	22.32	31.03	28.04	67.59	52.83	36.00	49.00	40.91
Collector Percent Score	5	5	5	3	5	3	5	5	5	5	5
Total Individuals	110	111	107	112	116	107	108	106	100	100	110
Mean Score	3.71										
Standard Deviation	0.55										

StationID	2-010	2-011	2-012	2-021	2-022	2-022 QC	2-023	2-024	2-025	2-026	2-027
Waterbody Name	Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	Patuxent River	Patuxent River	Patuxent River	Patuxent River	UT to Tridelphia Reservoir	UT to Tridelphia Reservoir	UT to Tridlephia Reservoir	UT to Tridlephia Reservoir
Collection Date	03-31-2005	03-28-2005	03-30-2005	04-01-2005	04-01-2005	04-01-2005	04-06-2005	03-24-2005	03-25-2005	03-25-2005	03-28-2005
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	3	1	1	3	3	3	3	1	1	1	1
IBI-Spring-MBSS-NCP	3.89	3.89	3.44	4.56	4.78	4.56	4.56	4.78	4.56	4.56	3.67
Rating-Spring-MBSS-NCP	Fair	Fair	Fair	Good	Good	Good	Good	Good	Good	Good	Fair
Total Taxa	33	22	28	34	35	31	37	36	31	29	27
Total Taxa Score	5	3	5	5	5	5	5	5	5	5	5
EPT Taxa	8	10	6	12	16	12	14	14	13	14	5
EPT Taxa Score	3	3	3	3	5	3	5	5	5	5	3
Ephemeroptera Taxa	2	3	2	4	6	5	6	7	3	3	2
Ephemeroptera Taxa	3	3	3	3	5	5	5	5	3	3	3
Diptera Taxa	19	10	17	15	15	13	18	18	14	11	19
Diptera Taxa Score	5	5	5	5	5	5	5	5	5	5	5
Ephemeroptera Percent	14.78	12.39	1.75	26.13	32.74	41.44	20.69	9.17	30.25	42.45	7.69
Ephemeroptera Percent Score	3	3	1	5	5	5	5	3	5	5	3
Tanytarsini Percent	10.43	4.42	7.89	5.41	1.77	5.41	3.45	7.34	0.84	3.77	1.92
Tanytarsini Percent Score	5	3	5	5	3	5	3	5	3	3	3
Intolerant Taxa	5	9	3	10	13	8	12	10	14	11	6
Intolerant Taxa Score	3	5	3	5	5	3	5	5	5	5	3
Tolerant Percent	12.17	2.65	33.33	9.91	10.62	4.50	16.38	9.17	1.68	3.77	13.46
Tolererant Percent Score	3	5	3	5	5	5	3	5	5	5	3
Collector Percent	38.26	39.82	20.18	51.35	43.36	39.64	37.93	49.54	57.14	56.60	35.58
Collector Percent Score	5	5	3	5	5	5	5	5	5	5	5
Total Individuals	115	113	114	111	113	111	116	109	119	106	104
Mean Score									4.28		
Standard Deviation									0.50		

StationID	2-029	2-030	2-038a	2-038b	2-041	2-042	2-043	2-044	2-044 QC	2-045	2-046
Waterbody Name	UT to Tridlephia Reservoir	Big Branch	UT to Tridlephia Reservoir	UT to Tridlephia Reservoir	UT to Patuxent River	Patuxent River	UT to Patuxent River	UT to Patuxent River	UT to Patuxent River	Patuxent River	Patuxent River
Collection Date	03-28-2005	03-28-2005	04-06-2005	04-06-2005	03-24-2005	03-22-2005	03-22-2005	03-22-2005	03-22-2005	04-01-2005	04-01-2005
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	1	1	2	2	1	1	2	2	2	3	3
IBI-Spring-MBSS-NCP	3.67	4.11	4.33	3.22	4.11	5.00	3.22	4.11	3.89	4.33	3.00
Rating-Spring-MBSS-NCP	Fair	Good	Good	Fair	Good	Good	Fair	Good	Fair	Good	Fair
Total Taxa	34	32	33	26	38	33	21	26	24	27	22
Total Taxa Score	5	5	5	5	5	5	3	5	5	5	3
EPT Taxa	9	9	13	12	10	15	4	11	8	10	9
EPT Taxa Score	3	3	5	3	3	5	1	3	3	3	3
Ephemeroptera Taxa	3	5	6	3	5	6	1	5	3	4	2
Ephemeroptera Taxa	3	5	5	3	5	5	1	5	3	3	3
Diptera Taxa	19	17	11	9	23	13	14	11	14	13	11
Diptera Taxa Score	5	5	5	3	5	5	5	5	5	5	5
Ephemeroptera Percent	2.73	10.00	14.78	8.10	13.39	34.51	8.12	42.34	20.17	53.04	15.97
Ephemeroptera Percent Score	1	3	3	3	3	5	3	5	3	5	3
Tanytarsini Percent	17.27	6.36	3.48	0.00	10.71	16.81	6.31	1.80	3.36	2.61	1.68
Tanytarsini Percent Score	5	5	3	1	5	5	5	3	3	3	3
Intolerant Taxa	6	5	11	8	8	12	5	8	9	10	8
Intolerant Taxa Score	3	3	5	3	3	5	3	3	5	5	3
Tolerant Percent	29.09	20.00	1.74	0.90	23.21	7.96	47.75	15.32	27.73	11.30	53.78
Tolererant Percent Score	3	3	5	5	3	5	3	3	3	5	1
Collector Percent	42.73	55.45	29.57	24.32	37.50	60.18	35.14	47.75	49.58	57.39	25.21
Collector Percent Score	5	5	3	3	5	5	5	5	5	5	3
Total Individuals	110	110	115	111	112	113	111	111	119	115	119
Mean Score					4.07						
Standard Deviation					0.57						

StationID	2-047	2-048	2-049	2-050
Waterbody Name	UT to Cabin Branch	UT to Cabin Branch	Cabin Branch	Cabin Branch
Collection Date	03-21-2005	03-21-2005	03-21-2005	03-28-2005
CP/NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring
Order	1	1	1	2
IBI-Spring-MBSS-NCP	4.33	4.33	3.89	4.56
Rating-Spring-MBSS-NCP	Good	Good	Fair	Good
Total Taxa	29	31	30	34
Total Taxa Score	5	5	5	5
EPT Taxa	10	11	9	10
EPT Taxa Score	3	3	3	3
Ephemeroptera Taxa	5	5	3	5
Ephemeroptera Taxa	5	5	3	5
Diptera Taxa	17	17	16	18
Diptera Taxa Score	5	5	5	5
Ephemeroptera Percent	14.42	22.22	8.62	49.56
Ephemeroptera Percent Score	3	5	3	5
Tanytarsini Percent	6.73	13.68	2.59	12.39
Tanytarsini Percent Score	5	5	3	5
Intolerant Taxa	8	7	6	8
Intolerant Taxa Score	3	3	3	3
Tolerant Percent	7.69	15.38	6.90	9.73
Tolererant Percent Score	5	3	5	5
Collector Percent	49.04	58.97	62.07	44.25
Collector Percent Score	5	5	5	5
Total Individuals	104	117	116	113
Mean Score				
Standard Deviation				

APPENDIX D: Biological Metrics (Revised B-IBI)

Station ID	2-001	2-002	2-003	2-004a	2-004b	2-004 QC	2-005a	2-005b	2-007a	2-007b	2-009
Waterbody Name	UT to Cattail Creek	UT to Mid Pax	UT to Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	Cattail Creek	Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	UT to Dorsey Branch
Collection Date	03-30-2005	03-24-2005	03-24-2005	03-30-2005	03-30-2005	03-30-2005	03-31-2005	03-31-2005	03-28-2005	03-28-2005	03-31-2005
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	2	1	1	1	1	1	3	3	1	1	1
IBI-Spring-MBSS-NCP	3.33	2.33	4.33	2.00	2.00	2.00	3.67	3.33	3.67	2.33	4.00
Rating-Spring-MBSS-NCP	Fair	Poor	Good	Poor	Poor	Poor	Fair	Fair	Fair	Poor	Good
Total Taxa	44	27	29	22	23	24	23	26	35	31	26
Total Taxa Score	5	5	5	3	3	3	3	5	5	5	5
EPT Taxa	8	3	12	4	4	4	6	7	10	5	8
EPT Taxa Score	3	1	5	1	1	1	3	3	3	3	3
Ephemeroptera Taxa	5	0	6	1	0	1	3	2	4	1	3
Ephemeroptera Taxa Score	5	1	5	1	1	1	3	3	5	1	3
Intolerant to Urban Percent	29.09	56.76	57.01	3.57	8.62	6.54	64.81	46.23	15.00	12	53.64
Intolerant to Urban Percent Score	3	5	5	1	1	1	5	3	3	3	5
Chironomidae Percent	41.82	69.37	25.23	44.64	36.21	33.64	13.89	24.53	58.00	74.00	23.64
Chironomidae Percent Score	3	1	3	3	3	3	5	3	3	1	5
Clingers Percent	30.91	8.11	49.53	57.14	62.93	66.36	39.81	38.68	37.00	27.00	58.18
Clingers Percent Score	1	1	3	3	3	3	3	3	3	1	3
Total Individuals	110	111	107	112	116	107	108	106	100	100	110
Mean Score							3.10				
Standard Deviation							0.80				

Station ID	2-010	2-011	2-012	2-021	2-022	2-022 QC	2-023	2-024	2-025	2-026	2-027
Waterbody Name	Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	Patuxent River	Patuxent River	Patuxent River	Patuxent River	UT to Tridelphia Reservoir	UT to Tridelphia Reservoir	UT to Tridlephia Reservoir	UT to Tridlephia Reservoir
Collection Date	03-31-2005	03-28-2005	03-30-2005	04-01-2005	04-01-2005	04-01-2005	04-06-2005	03-24-2005	03-25-2005	03-25-2005	03-28-2005
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	3	1	1	3	3	3	3	1	1	1	1
IBI-Spring-MBSS-NCP	3.33	3.67	3.33	4.33	4.67	4.67	4.33	3.33	4.33	4.33	3.00
Rating-Spring-MBSS-NCP	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good	Fair
Total Taxa	33	22	28	34	35	31	37	36	31	29	27
Total Taxa Score	5	3	5	5	5	5	5	5	5	5	5
EPT Taxa	8	10	6	12	16	12	14	14	13	14	5
EPT Taxa Score	3	3	3	5	5	5	5	5	5	5	3
Ephemeroptera Taxa	2	3	2	4	6	5	6	7	3	3	2
Ephemeroptera Taxa Score	3	3	3	5	5	5	5	5	3	3	3
Intolerant to Urban Percent	26.96	75.22	36.84	48.65	59.29	53.15	50	27.52	65.55	67.92	42.31
Intolerant to Urban Percent Score	3	5	3	3	5	5	3	3	5	5	3
Chironomidae Percent	40.00	7.08	27.19	17.12	15.93	15.32	21.55	63.30	16.81	8.49	43.27
Chironomidae Percent Score	3	5	3	5	5	5	5	1	5	5	3
Clingers Percent	50.43	53.98	73.68	54.05	46.90	41.44	50.86	21.10	47.90	47.17	28.85
Clingers Percent Score	3	3	3	3	3	3	3	1	3	3	1
Total Individuals	115	113	114	111	113	111	116	109	119	106	104
Mean Score									3.92		
Standard Deviation									0.71		

Station ID	2-029	2-030	2-038 a	2-038b	2-041	2-042	2-043	2-044	2-044 QC	2-045	2-046
Waterbody Name	UT to Tridlephia Reservoir	Big Branch	UT to Tridlephia Reservoir	UT to Tridlephia Reservoir	Patuxent River	Patuxent River	UT to Patuxent River	UT to Patuxent River	UT to Patuxent River	Patuxent River	Patuxent River
Collection Date	03-28-2005	03-28-2005	04-06-2005	04-06-2005	03-24-2005	03-22-2005	03-22-2005	03-22-2005	03-22-2005	04-01-2005	04-01-2005
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	1	1	2	2	1	1	2	2	2	3	3
IBI-Spring-MBSS-NCP	3.00	2.67	4.33	4.00	4.00	4.33	2.67	4.67	3.33	4.00	3.67
Rating-Spring-MBSS-NCP	Fair	Poor	Good	Good	Good	Good	Poor	Good	Fair	Good	Fair
Total Taxa	34	32	33	26	38	33	21	26	24	27	22
Total Taxa Score	5	5	5	5	5	5	3	5	3	5	3
EPT Taxa	9	9	13	12	10	15	4	11	8	10	9
EPT Taxa Score	3	3	5	5	3	5	1	5	3	3	3
Ephemeroptera Taxa	3	5	6	3	5	6	1	5	3	4	2
Ephemeroptera Taxa Score	3	5	5	3	5	5	1	5	3	5	3
Intolerant to Urban Percent	23.64	10.91	32.12	27.03	66.96	65.49	67.57	86.49	60.5	77.39	70.59
Intolerant to Urban Percent Score	3	1	3	3	5	5	5	5	5	5	5
Chironomidae Percent	58.18	74.55	16.52	9.01	32.14	26.56	29.73	8.11	32.77	9.57	12.61
Chironomidae Percent Score	3	1	5	5	3	3	3	5	3	5	5
Clingers Percent	20.91	21.82	66.96	73.87	33.93	38.94	55.86	35.14	31.09	26.96	69.75
Clingers Percent Score	1	1	3	3	3	3	3	3	3	1	3
Total Individuals	110	110	115	111	112	113	111	111	119	115	119
Mean Score					3.85						
Standard Deviation					0.54						

Station ID	2-047	2-048	2-049	2-050
Waterbody Name	UT to Cabin Branch	UT to Cabin Branch	Cabin Branch	Cabin Branch
Collection Date	03-21-2005	03-21-2005	03-21-2005	03-28-2005
CP/NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring
Order	1	1	1	2
IBI-Spring-MBSS-NCP	3.67	4.33	3.67	4.00
Rating-Spring-MBSS-NCP	Fair	Good	Fair	Good
Total Taxa	29	31	30	34
Total Taxa Score	5	5	5	5
EPT Taxa	10	11	9	10
EPT Taxa Score	3	5	3	3
Ephemeroptera Taxa	5	5	3	5
Ephemeroptera Taxa Score	5	5	3	5
Intolerant to Urban Percent	59.62	58.97	52.59	54.87
Intolerant to Urban Percent Score	5	5	5	5
Chironomidae Percent	34.62	34.19	28.45	24.78
Chironomidae Percent Score	3	3	3	3
Clingers Percent	28.85	35.04	62.07	33.63
Clingers Percent Score	1	3	3	3
Total Individuals	104	117	116	113
Mean Score				
Standard Deviation				

APPENDIX E: Physical Habitat Metrics

StationID	2-001	2-002	2-003	2-004	2-004 QC	2-005	2-007	2-009	2-010	2-011	2-012
Collection Date	03-30-2005	03-25-2005	03-21-2005	03-30-2005	03-30-2005	03-31-2005	03-28-2005	03-31-2005	03-31-2005	03-29-2005	03-30-2005
Total Habitat Score	114	118	110	134	136	140	156	106	101	108	113
Percent Compared to Maximum	57	59	55	67	68	70	78	53	50.5	54	56.5
Narrative Category	Non-Supporting	Non-Supporting	Non-Supporting	Partially Supporting	Partially Supporting	Partially Supporting	Supporting	Non-Supporting	Non-Supporting	Non-Supporting	Non-Supporting
Bank Stability (Left Bank)	3	5	2	5	7	4	8	5	4	4	5
Bank Stability (Right Bank)	3	5	2	7	5	7	8	5	4	4	4
Channel Alteration	18	20	16	15	16	18	18	16	14	15	13
Channel Flow Status	15	8	11	14	14	13	16	14	16	10	14
Embeddedness	10	11	11	12	13	13	15	8	8	13	10
Epifaunal Substrate/ Available Cover	12	12	11	13	15	13	13	11	7	12	13
Frequency of Riffles (or bends)	14	11	12	16	16	16	17	15	8	13	15
Riparian Vegetative Zone Width (Left Bank)	4	8	9	9	7	9	9	6	9	4	1
Riparian Vegetative Zone Width (Right Bank)	4	10	8	6	3	9	9	2	9	4	1
Sediment Deposition	11	9	11	10	11	13	15	8	6	10	15
Vegetative Protection (Left Bank)	3	6	2	7	7	4	7	4	4	4	5
Vegetative Protection (Right Bank)	3	6	2	7	7	7	7	4	4	4	4
Velocity/Depth Regime	14	7	13	13	15	14	14	8	8	11	13
Mean Habitat Score	122.3										
Mean % Compared to Maximum	0.61										
Standard Deviation	18.06										

StationID	2-021	2-022	2-022 QC	2-023	2-024	2-025	2-026	2-027	2-029	2-030	2-038
Collection Date	04-06-2005	04-01-2005	04-01-2005	04-06-2005	03-24-2005	03-25-2005	03-25-2005	03-29-2005	03-29-2005	03-25-2005	04-06-2005
Total Habitat Score	154	116	109	152	132	132	120	118	111	143	118
Percent Compared to Maximum	77	58	54.5	76	66	66	60	59	55.5	71.5	59
Narrative Category	Supporting	Non-Supporting	Non-Supporting	Supporting	Partially Supporting	Partially Supporting	Non-Supporting	Non-Supporting	Non-Supporting	Partially Supporting	Non-Supporting
Bank Stability (Left Bank)	4	2	2	5	5	4	8	5	8	6	6
Bank Stability (Right Bank)	6	2	2	5	5	5	8	5	8	4	6
Channel Alteration	19	15	13	20	18	11	8	15	15	20	10
Channel Flow Status	16	15	16	15	11	18	18	14	15	14	15
Embeddedness	16	13	13	16	13	14	14	11	6	15	13
Epifaunal Substrate/ Available Cover	16	13	11	15	15	14	14	13	8	15	14
Frequency of Riffles (or bends)	15	9	6	15	16	18	15	15	9	16	17
Riparian Vegetative Zone Width (Left Bank)	10	8	8	10	7	1	1	5	8	6	4
Riparian Vegetative Zone Width (Right Bank)	10	8	8	9	8	9	1	5	6	10	1
Sediment Deposition	15	12	12	15	13	17	16	11	6	11	13
Vegetative Protection (Left Bank)	5	2	2	5	6	5	4	5	7	6	5
Vegetative Protection (Right Bank)	6	2	2	6	6	5	4	5	7	6	4
Velocity/Depth Regime	16	15	14	16	9	11	9	9	8	14	10
Mean Habitat Score	128.7										
Mean % Compared to Maximum	0.64										
Standard Deviation	16.54										

StationID	2-041	2-042	2-043	2-044	2-044 QC	2-045	2-046	2-047	2-048	2-049	2-050
Collection Date	03-24-2005	03-22-2005	03-22-2005	03-22-2005	03-22-2005	04-01-2005	04-01-2005	03-21-2005	03-21-2005	03-21-2005	03-21-2005
Total Habitat Score	150	121	124	143	131	150	162	113	122	109	118
Percent Compared to Maximum	75	60.5	62	71.5	65.5	75	81	56.5	61	54.5	59
Narrative Category	Partially Supporting	Partially Supporting	Partially Supporting	Partially Supporting	Partially Supporting	Partially Supporting	Supporting	Non-Supporting	Partially Supporting	Non-Supporting	Non-Supporting
Bank Stability (Left Bank)	6	4	4	4	4	4	7	3	4	3	4
Bank Stability (Right Bank)	6	4	4	4	4	6	8	3	4	3	4
Channel Alteration	20	18	18	19	18	19	19	16	16	14	18
Channel Flow Status	14	10	10	13	10	12	14	13	8	15	14
Embeddedness	15	12	12	15	13	15	15	11	13	13	11
Epifaunal Substrate/ Available Cover	15	12	13	15	14	16	16	11	14	13	11
Frequency of Riffles (or bends)	18	13	13	17	14	16	16	15	17	15	11
Riparian Vegetative Zone Width (Left Bank)	10	9	9	10	10	10	10	5	6	1	9
Riparian Vegetative Zone Width (Right Bank)	10	9	9	10	10	10	10	8	7	1	9
Sediment Deposition	13	11	11	13	11	13	15	11	12	11	8
Vegetative Protection (Left Bank)	6	4	4	4	4	6	8	3	4	3	4
Vegetative Protection (Right Bank)	6	4	4	4	4	7	8	3	4	3	4
Velocity/Depth Regime	11	11	13	15	15	16	16	11	13	14	11
Mean Habitat Score	132.5										
Mean % Compared to Maximum	0.66										
Standard Deviation	17.77										

APPENDIX F: Station Locations

StationID	Waterbody Name	Location	Latitude	Longitude
2-001	UT to Cattail Creek	Approx. 200m Behind House at 1748 Cattail Meadows Dr.	39.31954	77.07132
2-002	UT to MID PAX	At Empty Pockets Horse Farm	39.33256	77.03645
2-003	UT to Cattaill Creek	Approx 150 m from driveway off Woodbine rd.	39.31491	77.10787
2-004	UT to Cattail Creek	At Larriland Farm	39.30927	77.10212
2-005	Cattail Creek	Approx 300m west of McNeal Rd.	39.2811	77.06489
2-007	UT to Cattial Creek	Approx 250m DS of Daisy Road xing	39.27467	77.07011
2-009	UT to Dorsey Branch	Immediately US of confluence with Dorsey Branch	39.26286	77.03244
2-010	Cattail Creek	Old Roxbury Road	39.24994	77.05117
2-011	UT Cattail	Approx 70m DS of Madison Rd Xing	39.33904	77.06899
2-012	UT to Cattail Creek	Approx 200m Behind House at 15200 Frederick Rd *NO Access	39.32706	77.04673
2-021	Patuxent River	Approx 950m W of Jennings Chapel Rd.	39.25957	77.08012
2-022	Patuxent River	Approx 350M US of Howard Chaple Rd crossing	39.25213	77.06809
2-023	Patuxent R.	Approx 250m US of parking lot off Rt. 97	39.24035	77.0586
2-024	UT to Tridelphia Res	Park at 14888 Tridelphi Rd.(get permission)	39.24654	77.02685
2-025	UT to Tridelphia Res	In the center behind barn at 14050 Green Bridge Rd	39.22364	77.0043
2-026	UT to Tribelphia Res	10m from driveway at 14050 Green Bridge Rd	39.22331	77.00141
2-027	UT to Tridelphia Res	Behind house at14051 Highland Rd	39.21965	76.97888
2-029	UT to Tridelphia Res	At end of Luster drive	39.19305	76.98008
2-030	Big Branch	park at entrance to Big Branch Dr.	39.24736	77.00804
2-038	UT to Tridelphia Res	Approx 100m DS of Lakeside Dr crossing	39.20201	76.9906
2-041	Pax River	Approx 650m NW of barn behind Happy Hills Farm	39.33781	77.16282
2-042	Patuxent	Approx 500m DS of Windor Forest Rd	39.33009	77.18224
2-043	UT to PAX	Approx 300m DS of Windsor Forest Rd	39.32697	77.16634
2-044	UT to Pax	Patasco State Park	39.31702	77.16804
2-045	Patuxent River	Approx 100m US off Rt. 94 xing	39.27779	77.1363
2-046	Patuxent R.	650m DS of Hipsley Mill Rd xing	39.26461	77.10758
2-047	UT to Cabin Branch	Approx 300m NW of Shafferville Rd.	39.3404	77.13011
2-048	UT to Cabin Branch	Approx 300m north Shafferville Rd.	39.33954	77.1278
2-049	Cabin Branch	Approx 50m US of Florence Rd.	39.32391	77.12633
2-050	Cabin Branch	Behind house at 17715 Quail Cove Ct.	39.2939	77.13569

APPENDIX G: Pebble Count

StationID	CollDate	%Silt/Clay	%Sand	%Gravel	%Cobble	%Boulder	%Bedrock
2-001	03-30-2005	17	52	30	1		
2-002	03-25-2005	25	42	28	5		
2-003	03-21-2005	27	22	35	10	6	
2-004	03-30-2005	21	18	43	12	6	
2-005	03-31-2005	12	18	30	27	13	
2-007	03-28-2005	1	21	9	4	2	63
2-009	03-31-2005	22	38	21	19		
2-010	03-31-2005	25	44	15	15	1	
2-011	03-29-2005	13	27	54	6		
2-021	04-06-2005	15	22	51	12		
2-022	04-01-2005	15	22	49	11	3	
2-023	04-06-2005	4	38	42	13	3	
2-024	03-24-2005	23	36	36	5		
2-025	03-25-2005	3	33	50	14		
2-026	03-25-2005	1	38	51	9	1	
2-027	03-29-2005	15	46	26	13		
2-029	03-29-2005	32	56	12			
2-030	03-25-2005	3	58	29	10		
2-038	04-06-2005	10	34	38	13	5	
2-041	03-24-2005	11	26	62	1		
2-042	03-22-2005	22	18	46	14		
2-043	03-22-2005	10	11	65	14		
2-044	03-22-2005	13	16	61	6	4	
2-045	04-01-2005	12	32	44	5	7	
2-046	04-01-2005	9	34	49	8		
2-047	03-21-2005	29	21	37	13		
2-048	03-21-2005	33	4	58	5		
2-049	03-21-2005	39	18	39	4		
2-050	03-21-2005	34	13	43	10		

APPENDIX H: Cross Sectional Data

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-001	3/30/2005	0.3	m	2.67	1/10 ft	Left Pin
2-001	3/30/2005	2	m	3.17	1/10 ft	
2-001	3/30/2005	3.5	m	3.08	1/10 ft	
2-001	3/30/2005	4.3	m	3.17	1/10 ft	Left Top of Bank
2-001	3/30/2005	5	m	4.08	1/10 ft	Left Bankfull
2-001	3/30/2005	5.3	m	5.42	1/10 ft	Left Edge of Water
2-001	3/30/2005	5.4	m	5.83	1/10 ft	
2-001	3/30/2005	5.7	m	6	1/10 ft	Thalweg
2-001	3/30/2005	6.3	m	6	1/10 ft	
2-001	3/30/2005	7	m	5.92	1/10 ft	
2-001	3/30/2005	7.6	m	5.92	1/10 ft	
2-001	3/30/2005	8.4	m	5.42	1/10 ft	Right Edge of Water
2-001	3/30/2005	8.9	m	4	1/10 ft	Right Bankfull
2-001	3/30/2005	9.3	m	2.58	1/10 ft	Right Top of Bank
2-001	3/30/2005	11	m	2.33	1/10 ft	Right Pin
2-002	3/24/2005	0.3	m	2.67	1/10 ft	
2-002	3/24/2005	2	m	3.25	1/10 ft	Left Bank
2-002	3/24/2005	2.6	m	3.5	1/10 ft	Left Bankfull
2-002	3/24/2005	3.2	m	4.17	1/10 ft	Left Top of Bank
2-002	3/24/2005	3.4	m	5.75	1/10 ft	Left Edge of Water
2-002	3/24/2005	3.6	m	6.17	1/10 ft	Thalweg
2-002	3/24/2005	4	m	5.92	1/10 ft	
2-002	3/24/2005	4.3	m	5.75	1/10 ft	Right Edge of Water
2-002	3/24/2005	4.7	m	5.67	1/10 ft	
2-002	3/24/2005	5.3	m	5.17	1/10 ft	Right Bankfull
2-002	3/24/2005	5.8	m	4.58	1/10 ft	Right Top of Bank
2-002	3/24/2005	7	m	4.17	1/10 ft	Right Bank
2-002	3/24/2005	8	m	3.5	1/10 ft	
2-002	3/24/2005	9.5	m	3.08	1/10 ft	Right Pin
2-003	3/21/2005	0.5	m	1.5	1/10 ft	Right Pin
2-003	3/21/2005	2	m	1.33	1/10 ft	Right Top of Bank
2-003	3/21/2005	3	m	3.75	1/10 ft	
2-003	3/21/2005	6	m	4.08	1/10 ft	
2-003	3/21/2005	6.5	m	4.75	1/10 ft	Right Bankfull
2-003	3/21/2005	7.1	m	5.5	1/10 ft	
2-003	3/21/2005	7.8	m	5.83	1/10 ft	Right Edge of Water
2-003	3/21/2005	8.4	m	6.17	1/10 ft	Thalweg
2-003	3/21/2005	8.7	m	5.92	1/10 ft	Left Edge of Water
2-003	3/21/2005	8.8	m	3	1/10 ft	Left Top of Bank
2-003	3/21/2005	9.5	m	2.5	1/10 ft	
2-003	3/21/2005	12	m	2.58	1/10 ft	Left Pin
2-004	3/30/2005	0.3	m	1.58	1/10 ft	Left Pin
2-004	3/30/2005	2	m	1.92	1/10 ft	
2-004	3/30/2005	3.4	m	2.92	1/10 ft	Left Top of Bank
2-004	3/30/2005	3.7	m	4.25	1/10 ft	Left Bankfull
2-004	3/30/2005	4.3	m	5.33	1/10 ft	Left Edge of Water
2-004	3/30/2005	5	m	5.67	1/10 ft	
2-004	3/30/2005	6	m	5.75	1/10 ft	
2-004	3/30/2005	7	m	5.75	1/10 ft	Thalweg
2-004	3/30/2005	7.3	m	5.58	1/10 ft	
2-004	3/30/2005	7.6	m	5.25	1/10 ft	Right Edge of Water

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-004	3/30/2005	8	m	4.83	1/10 ft	Right Bankfull
2-004	3/30/2005	8.6	m	4.5	1/10 ft	
2-004	3/30/2005	9.6	m	3.58	1/10 ft	Right Top of Bank
2-004	3/30/2005	11	m	3.5	1/10 ft	Right Pin
2-005	3/31/2005	0.3	m	0.5	1/10 ft	Right Pin
2-005	3/31/2005	2.7	m	0.92	1/10 ft	Right Top of Bank
2-005	3/31/2005	3.3	m	1.83	1/10 ft	
2-005	3/31/2005	4.2	m	3.58	1/10 ft	Right Bankfull
2-005	3/31/2005	5	m	4	1/10 ft	
2-005	3/31/2005	7.5	m	5.08	1/10 ft	
2-005	3/31/2005	9	m	4.92	1/10 ft	
2-005	3/31/2005	10	m	5.42	1/10 ft	
2-005	3/31/2005	11	m	6.25	1/10 ft	
2-005	3/31/2005	12.5	m	6.92	1/10 ft	
2-005	3/31/2005	13.5	m	7.17	1/10 ft	Right Edge of Water
2-005	3/31/2005	14	m	7.67	1/10 ft	
2-005	3/31/2005	15	m	7.83	1/10 ft	
2-005	3/31/2005	16	m	8.33	1/10 ft	
2-005	3/31/2005	17	m	9.33	1/10 ft	
2-005	3/31/2005	18	m	9.5	1/10 ft	Thalweg
2-005	3/31/2005	19	m	8.5	1/10 ft	
2-005	3/31/2005	19.5	m	8.42	1/10 ft	
2-005	3/31/2005	19.9	m	7.17	1/10 ft	Left Edge of Water
2-005	3/31/2005	20.4	m	2	1/10 ft	
2-005	3/31/2005	21	m	1.42	1/10 ft	Left Top of Bank
2-005	3/31/2005	24.5	m	1.42	1/10 ft	Left Pin
2-007	3/28/2005	0.3	m	3.17	1/10 ft	Left Pin
2-007	3/28/2005	1.5	m	3.5	1/10 ft	Left Top of Bank
2-007	3/28/2005	2	m	3.83	1/10 ft	Left Bankfull
2-007	3/28/2005	2.8	m	4.58	1/10 ft	
2-007	3/28/2005	3	m	4.92	1/10 ft	Left Edge of Water
2-007	3/28/2005	4	m	5.58	1/10 ft	
2-007	3/28/2005	5	m	5.5	1/10 ft	
2-007	3/28/2005	6	m	5.75	1/10 ft	
2-007	3/28/2005	7	m	5.5	1/10 ft	Thalweg
2-007	3/28/2005	7.5	m	5.67	1/10 ft	
2-007	3/28/2005	8	m	5.5	1/10 ft	
2-007	3/28/2005	8.6	m	5.33	1/10 ft	
2-007	3/28/2005	9	m	5	1/10 ft	Right Edge of Water
2-007	3/28/2005	9.4	m	4.58	1/10 ft	
2-007	3/28/2005	9.5	m	4.33	1/10 ft	
2-007	3/28/2005	10	m	3.83	1/10 ft	
2-007	3/28/2005	11	m	2.67	1/10 ft	
2-009	3/31/2005	0.3	m	3.83	1/10 ft	Left Pin
2-009	3/31/2005	1	m	3.83	1/10 ft	
2-009	3/31/2005	2	m	3.83	1/10 ft	Left Top of Bank
2-009	3/31/2005	2.5	m	4.33	1/10 ft	
2-009	3/31/2005	2.7	m	6	1/10 ft	Left Edge of Water
2-009	3/31/2005	2.9	m	6.25	1/10 ft	Thalweg
2-009	3/31/2005	3.3	m	6.33	1/10 ft	
2-009	3/31/2005	3.6	m	6.17	1/10 ft	

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-009	3/31/2005	4	m	6.17	1/10 ft	
2-009	3/31/2005	4.1	m	6	1/10 ft	Right Edge of Water
2-009	3/31/2005	4.3	m	5.58	1/10 ft	
2-009	3/31/2005	4.9	m	5.17	1/10 ft	Right Bankfull
2-009	3/31/2005	5.1	m	4.08	1/10 ft	
2-009	3/31/2005	5.5	m	3	1/10 ft	
2-009	3/31/2005	6	m	2.67	1/10 ft	Right Top of Bank
2-009	3/31/2005	8	m	2.5	1/10 ft	Right Pin
2-010	3/31/2005	0.3	m	1	1/10 ft	Right Pin
2-010	3/31/2005	1.3	m	1.25	1/10 ft	Right Top of Bank
2-010	3/31/2005	3.5	m	3.92	1/10 ft	
2-010	3/31/2005	4.5	m	4.17	1/10 ft	
2-010	3/31/2005	5	m	4	1/10 ft	
2-010	3/31/2005	6	m	3.17	1/10 ft	
2-010	3/31/2005	8	m	3	1/10 ft	
2-010	3/31/2005	9	m	3.08	1/10 ft	
2-010	3/31/2005	10.5	m	3.83	1/10 ft	Right Bankfull
2-010	3/31/2005	12.1	m	4.67	1/10 ft	
2-010	3/31/2005	12.7	m	5.92	1/10 ft	
2-010	3/31/2005	13.1	m	6.58	1/10 ft	Right Edge of Water
2-010	3/31/2005	14	m	7	1/10 ft	
2-010	3/31/2005	16	m	7.42	1/10 ft	
2-010	3/31/2005	18	m	7.75	1/10 ft	
2-010	3/31/2005	20	m	7.92	1/10 ft	
2-010	3/31/2005	21	m	7.67	1/10 ft	
2-010	3/31/2005	24	m	8.17	1/10 ft	
2-010	3/31/2005	26	m	8.42	1/10 ft	Thalweg
2-010	3/31/2005	27	m	7.92	1/10 ft	
2-010	3/31/2005	27.7	m	6.58	1/10 ft	Left Edge of Water
2-010	3/31/2005	28.4	m	4.83	1/10 ft	Left Bankfull
2-010	3/31/2005	28.6	m	0.92	1/10 ft	Left Top of Bank
2-010	3/31/2005	29.3	m	0.5	1/10 ft	
2-010	3/31/2005	30	m	0.5	1/10 ft	Left Pin
2-011	3/28/2005	0.3	m	1.58	1/10 ft	
2-011	3/28/2005	1.5	m	2.25	1/10 ft	
2-011	3/28/2005	2	m	1.58	1/10 ft	
2-011	3/28/2005	2.4	m	3.17	1/10 ft	Right Top of Bank
2-011	3/28/2005	3	m	5	1/10 ft	Right Bankfull
2-011	3/28/2005	3.6	m	5.58	1/10 ft	
2-011	3/28/2005	3.7	m	6.25	1/10 ft	Right Edge of Water
2-011	3/28/2005	3.8	m	6.75	1/10 ft	
2-011	3/28/2005	4	m	6.92	1/10 ft	Thalweg
2-011	3/28/2005	4.5	m	6.67	1/10 ft	
2-011	3/28/2005	5	m	6.58	1/10 ft	
2-011	3/28/2005	5.6	m	6.33	1/10 ft	Left Edge of Water
2-011	3/28/2005	5.8	m	6	1/10 ft	
2-011	3/28/2005	5.9	m	4.5	1/10 ft	
2-011	3/28/2005	6.4	m	3.58	1/10 ft	Left Top of Bank
2-011	3/28/2005	8	m	3.33	1/10 ft	Left Pin
2-012	3/30/2005	0.3	m	2.42	1/10 ft	Right Pin
2-012	3/30/2005	1.5	m	3.08	1/10 ft	

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-012	3/30/2005	2.3	m	3.33	1/10 ft	Right Top of Bank
2-012	3/30/2005	2.5	m	5.58	1/10 ft	Right Edge of Water
2-012	3/30/2005	2.6	m	6	1/10 ft	Thalweg
2-012	3/30/2005	3	m	5.92	1/10 ft	
2-012	3/30/2005	4	m	5.75	1/10 ft	
2-012	3/30/2005	5	m	5.75	1/10 ft	
2-012	3/30/2005	5.2	m	5.58	1/10 ft	Left Edge of Water
2-012	3/30/2005	5.5	m	5	1/10 ft	Left Bankfull
2-012	3/30/2005	5.8	m	3.83	1/10 ft	Left Top of Bank
2-012	3/30/2005	7	m	3	1/10 ft	Left Pin
2-021	4/6/2005	0.3	m	1.33	1/10 ft	Left Pin
2-021	4/6/2005	2	m	1.58	1/10 ft	Left Top of Bank
2-021	4/6/2005	2.8	m	2.67	1/10 ft	Left Bankfull
2-021	4/6/2005	3.3	m	4.33	1/10 ft	
2-021	4/6/2005	3.7	m	4.83	1/10 ft	
2-021	4/6/2005	3.8	m	5.75	1/10 ft	Left Edge of Water
2-021	4/6/2005	3.9	m	6.17	1/10 ft	
2-021	4/6/2005	5	m	7.08	1/10 ft	
2-021	4/6/2005	6	m	7.08	1/10 ft	
2-021	4/6/2005	7	m	7.33	1/10 ft	
2-021	4/6/2005	8	m	7.67	1/10 ft	Thalweg
2-021	4/6/2005	9	m	7.33	1/10 ft	
2-021	4/6/2005	11	m	7.33	1/10 ft	
2-021	4/6/2005	13	m	7.08	1/10 ft	
2-021	4/6/2005	13.5	m	6.42	1/10 ft	
2-021	4/6/2005	13.8	m	5.67	1/10 ft	Right Edge of Water
2-021	4/6/2005	14.2	m	5.17	1/10 ft	
2-021	4/6/2005	15.2	m	3.75	1/10 ft	Right Bankfull
2-021	4/6/2005	16.6	m	1.83	1/10 ft	Right Top of Bank
2-021	4/6/2005	17	m	1.42	1/10 ft	Right Pin
2-022	4/1/2005	0.3	m	2.75	1/10 ft	Right Edge of Water
2-022	4/1/2005	2	m	2.75	1/10 ft	Right Top of Bank
2-022	4/1/2005	4.2	m	3.08	1/10 ft	
2-022	4/1/2005	4.4	m	5.33	1/10 ft	
2-022	4/1/2005	4.8	m	5.92	1/10 ft	
2-022	4/1/2005	5.3	m	6.33	1/10 ft	Right Edge of Water
2-022	4/1/2005	5.4	m	6.75	1/10 ft	
2-022	4/1/2005	6	m	7.08	1/10 ft	
2-022	4/1/2005	7	m	7.5	1/10 ft	
2-022	4/1/2005	8	m	7.75	1/10 ft	Thalweg
2-022	4/1/2005	10	m	7.58	1/10 ft	
2-022	4/1/2005	11	m	7.5	1/10 ft	
2-022	4/1/2005	13	m	7.17	1/10 ft	
2-022	4/1/2005	14.2	m	7.67	1/10 ft	
2-022	4/1/2005	14.9	m	6.58	1/10 ft	Left Edge of Water
2-022	4/1/2005	15.8	m	5	1/10 ft	Left Bankfull
2-022	4/1/2005	16.4	m	1.92	1/10 ft	Left Top of Bank
2-022	4/1/2005	18	m	1.92	1/10 ft	
2-023	4/6/2005	0.3	m	2	1/10 ft	Left Pin
2-023	4/6/2005	2.7	m	2.33	1/10 ft	Left Top of Bank
2-023	4/6/2005	5	m	2.92	1/10 ft	

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-023	4/6/2005	7.3	m	3	1/10 ft	
2-023	4/6/2005	8.4	m	3.17	1/10 ft	Left Bankfull
2-023	4/6/2005	10.2	m	6	1/10 ft	
2-023	4/6/2005	11.1	m	6.17	1/10 ft	Left Edge of Water
2-023	4/6/2005	12.7	m	6.83	1/10 ft	
2-023	4/6/2005	14.6	m	7.83	1/10 ft	
2-023	4/6/2005	16.5	m	9.25	1/10 ft	Thalweg
2-023	4/6/2005	18	m	8.08	1/10 ft	
2-023	4/6/2005	19.4	m	8.17	1/10 ft	
2-023	4/6/2005	20.2	m	8.58	1/10 ft	
2-023	4/6/2005	22.2	m	6.17	1/10 ft	Right Edge of Water
2-023	4/6/2005	23.2	m	4.92	1/10 ft	
2-023	4/6/2005	24.4	m	1.25	1/10 ft	Right Top of Bank
2-023	4/6/2005	25.5	m	1.08	1/10 ft	Right Pin
2-024	3/24/2005	0.6	m	1.08	1/10 ft	Left Pin
2-024	3/24/2005	2	m	1.92	1/10 ft	
2-024	3/24/2005	2.5	m	2.17	1/10 ft	Left Top of Bank
2-024	3/24/2005	3.1	m	3.83	1/10 ft	Left Bankfull
2-024	3/24/2005	3.7	m	4.67	1/10 ft	Left Bank
2-024	3/24/2005	4.4	m	5.17	1/10 ft	Left Edge of Water
2-024	3/24/2005	4.9	m	5.33	1/10 ft	
2-024	3/24/2005	5.1	m	5.5	1/10 ft	Thalweg
2-024	3/24/2005	5.3	m	5.42	1/10 ft	
2-024	3/24/2005	5.4	m	5.17	1/10 ft	Right Edge of Water
2-024	3/24/2005	5.7	m	5	1/10 ft	
2-024	3/24/2005	5.9	m	4.17	1/10 ft	Right Bankfull
2-024	3/24/2005	6	m	3.17	1/10 ft	Right Top of Bank
2-024	3/24/2005	6.8	m	2.67	1/10 ft	
2-024	3/24/2005	7.7	m	2	1/10 ft	
2-024	3/24/2005	9	m	0.75	1/10 ft	Right Pin
2-025	3/25/2005	0.3	m	0.75	1/10 ft	
2-025	3/25/2005	2	m	2	1/10 ft	
2-025	3/25/2005	3.4	m	3.83	1/10 ft	Left Top of Bank
2-025	3/25/2005	4	m	4.08	1/10 ft	
2-025	3/25/2005	4.6	m	5.67	1/10 ft	Left Bankfull
2-025	3/25/2005	4.8	m	6.58	1/10 ft	
2-025	3/25/2005	5.2	m	7.33	1/10 ft	Left Edge of Water
2-025	3/25/2005	6	m	7.5	1/10 ft	
2-025	3/25/2005	7	m	7.67	1/10 ft	
2-025	3/25/2005	7.5	m	7.75	1/10 ft	
2-025	3/25/2005	7.8	m	7.83	1/10 ft	Thalweg
2-025	3/25/2005	8.3	m	7.83	1/10 ft	
2-025	3/25/2005	8.4	m	7.58	1/10 ft	Right Edge of Water
2-025	3/25/2005	8.6	m	6.75	1/10 ft	
2-025	3/25/2005	9.1	m	6.67	1/10 ft	
2-025	3/25/2005	10	m	5.92	1/10 ft	Right Bankfull
2-025	3/25/2005	11.5	m	3.17	1/10 ft	
2-025	3/25/2005	12.8	m	1.75	1/10 ft	
2-026	3/25/2005	0.3	m	0.92	1/10 ft	
2-026	3/25/2005	1.9	m	1.5	1/10 ft	Left Top of Bank
2-026	3/25/2005	2.7	m	2.25	1/10 ft	

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-026	3/25/2005	3.5	m	3.33	1/10 ft	
2-026	3/25/2005	4	m	4.08	1/10 ft	Left Bankfull
2-026	3/25/2005	4.1	m	4.5	1/10 ft	
2-026	3/25/2005	4.7	m	5.17	1/10 ft	Left Edge of Water
2-026	3/25/2005	5.1	m	5.58	1/10 ft	
2-026	3/25/2005	5.7	m	5.67	1/10 ft	Thalweg
2-026	3/25/2005	6.1	m	5.67	1/10 ft	
2-026	3/25/2005	6.7	m	5.5	1/10 ft	
2-026	3/25/2005	6.8	m	5.92	1/10 ft	Right Edge of Water
2-026	3/25/2005	7	m	4.33	1/10 ft	Right Bankfull
2-026	3/25/2005	7.3	m	3.58	1/10 ft	
2-026	3/25/2005	8	m	3	1/10 ft	
2-026	3/25/2005	10	m	2.08	1/10 ft	
2-026	3/25/2005	13	m	0.92	1/10 ft	
2-027	3/28/2005	0.3	m	1.58	1/10 ft	
2-027	3/28/2005	1	m	2.42	1/10 ft	
2-027	3/28/2005	2.4	m	4.08	1/10 ft	Left Top of Bank
2-027	3/28/2005	2.8	m	4.67	1/10 ft	
2-027	3/28/2005	4	m	5.25	1/10 ft	Left Bankfull
2-027	3/28/2005	5	m	5.42	1/10 ft	
2-027	3/28/2005	5.4	m	6	1/10 ft	Left Edge of Water
2-027	3/28/2005	5.5	m	6.17	1/10 ft	
2-027	3/28/2005	5.8	m	6.25	1/10 ft	Thalweg
2-027	3/28/2005	6	m	6	1/10 ft	Right Edge of Water
2-027	3/28/2005	6.6	m	2.75	1/10 ft	
2-027	3/28/2005	7	m	2.5	1/10 ft	Right Top of Bank
2-027	3/28/2005	8	m	2.42	1/10 ft	
2-029	3/28/2005	0.3	m	2.33	1/10 ft	Left Pin
2-029	3/28/2005	1	m	2.58	1/10 ft	
2-029	3/28/2005	2.1	m	3.25	1/10 ft	Left Top of Bank
2-029	3/28/2005	2.2	m	3.33	1/10 ft	Left Bankfull
2-029	3/28/2005	2.6	m	3.83	1/10 ft	Left Edge of Water
2-029	3/28/2005	2.9	m	4.08	1/10 ft	Thalweg
2-029	3/28/2005	3	m	4	1/10 ft	
2-029	3/28/2005	3.1	m	3.83	1/10 ft	Right Edge of Water
2-029	3/28/2005	3.7	m	3.42	1/10 ft	Right Bankfull
2-029	3/28/2005	4	m	3.33	1/10 ft	Right Top of Bank
2-029	3/28/2005	6	m	3.5	1/10 ft	Right Pin
2-030	3/25/2005	0.3	m	0.83	1/10 ft	Right Pin
2-030	3/25/2005	1	m	1.33	1/10 ft	Right Top of Bank
2-030	3/25/2005	2.2	m	3.42	1/10 ft	Right Bankfull
2-030	3/25/2005	3	m	4	1/10 ft	
2-030	3/25/2005	3.7	m	5.08	1/10 ft	
2-030	3/25/2005	4.9	m	6	1/10 ft	
2-030	3/25/2005	5.1	m	5.5	1/10 ft	
2-030	3/25/2005	5.5	m	6.75	1/10 ft	Right Edge of Water
2-030	3/25/2005	6.1	m	7	1/10 ft	
2-030	3/25/2005	6.5	m	7.25	1/10 ft	
2-030	3/25/2005	7.1	m	7.08	1/10 ft	Thalweg
2-030	3/25/2005	7.6	m	7.17	1/10 ft	
2-030	3/25/2005	8	m	6.92	1/10 ft	

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-030	3/25/2005	8.3	m	6.75	1/10 ft	Left Edge of Water
2-030	3/25/2005	8.7	m	6.42	1/10 ft	
2-030	3/25/2005	9.3	m	5.33	1/10 ft	
2-030	3/25/2005	10.3	m	5.08	1/10 ft	Left Bankfull
2-030	3/25/2005	11	m	4.42	1/10 ft	
2-030	3/25/2005	12	m	3.92	1/10 ft	
2-030	3/25/2005	13.5	m	2.58	1/10 ft	Left Top of Bank
2-030	3/25/2005	14	m	2.5	1/10 ft	
2-038	4/6/2005	0.3	m	4	1/10 ft	Right Pin
2-038	4/6/2005	1.5	m	3.67	1/10 ft	
2-038	4/6/2005	3.4	m	3.25	1/10 ft	Right Top of Bank
2-038	4/6/2005	3.6	m	5.33	1/10 ft	Right Bankfull
2-038	4/6/2005	4.1	m	6.42	1/10 ft	
2-038	4/6/2005	4.4	m	6.75	1/10 ft	Right Edge of Water
2-038	4/6/2005	5	m	7	1/10 ft	
2-038	4/6/2005	6.1	m	7.25	1/10 ft	Thalweg
2-038	4/6/2005	6.4	m	7.17	1/10 ft	
2-038	4/6/2005	6.5	m	6.67	1/10 ft	
2-038	4/6/2005	7	m	4.08	1/10 ft	
2-038	4/6/2005	7.3	m	2.33	1/10 ft	Left Top of Bank
2-038	4/6/2005	9	m	1.5	1/10 ft	
2-038	4/6/2005	10	m	1.92	1/10 ft	Left Pin
2-041	3/24/2005	0.8	m	3.17	1/10 ft	Left Pin
2-041	3/24/2005	2	m	3.42	1/10 ft	
2-041	3/24/2005	2.6	m	3.42	1/10 ft	Left Top of Bank
2-041	3/24/2005	2.9	m	4.08	1/10 ft	Left Bankfull
2-041	3/24/2005	3.4	m	4.75	1/10 ft	
2-041	3/24/2005	3.5	m	5.33	1/10 ft	Left Edge of Water
2-041	3/24/2005	3.6	m	5.83	1/10 ft	
2-041	3/24/2005	4	m	6	1/10 ft	
2-041	3/24/2005	4.5	m	6	1/10 ft	Thalweg
2-041	3/24/2005	5.3	m	6	1/10 ft	
2-041	3/24/2005	6	m	5.83	1/10 ft	
2-041	3/24/2005	6.1	m	5.5	1/10 ft	Right Edge of Water
2-041	3/24/2005	6.4	m	4.67	1/10 ft	Right Bankfull
2-041	3/24/2005	6.5	m	3.75	1/10 ft	Right Top of Bank
2-041	3/24/2005	8	m	3.42	1/10 ft	
2-041	3/24/2005	12	m	3.25	1/10 ft	
2-042	3/22/2005	0.6	m	2.83	1/10 ft	Left Pin
2-042	3/22/2005	2.2	m	3.17	1/10 ft	
2-042	3/22/2005	3	m	3.58	1/10 ft	Left Top of Bank
2-042	3/22/2005	3.2	m	6	1/10 ft	
2-042	3/22/2005	4	m	6.17	1/10 ft	
2-042	3/22/2005	4.7	m	6	1/10 ft	
2-042	3/22/2005	5.3	m	6.08	1/10 ft	Left Edge of Water
2-042	3/22/2005	6	m	6.42	1/10 ft	
2-042	3/22/2005	6.8	m	6.58	1/10 ft	Thalweg
2-042	3/22/2005	7.8	m	6.33	1/10 ft	
2-042	3/22/2005	8	m	6.08	1/10 ft	Right Edge of Water
2-042	3/22/2005	8.2	m	5.17	1/10 ft	Right Bankfull
2-042	3/22/2005	8.8	m	4.42	1/10 ft	

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-042	3/22/2005	9.5	m	3.25	1/10 ft	Right Top of Bank
2-042	3/22/2005	11	m	2.92	1/10 ft	Right Pin
2-043	3/22/2005	0.3	m	3.42	1/10 ft	Right Pin
2-043	3/22/2005	2.3	m	3.75	1/10 ft	Right Top of Bank
2-043	3/22/2005	3.1	m	4.92	1/10 ft	Right Bankfull
2-043	3/22/2005	3.7	m	5.83	1/10 ft	
2-043	3/22/2005	4.2	m	6.08	1/10 ft	Right Edge of Water
2-043	3/22/2005	5	m	6.17	1/10 ft	
2-043	3/22/2005	6	m	6.5	1/10 ft	Thalweg
2-043	3/22/2005	7	m	6.5	1/10 ft	
2-043	3/22/2005	7.6	m	6.33	1/10 ft	
2-043	3/22/2005	8	m	6.42	1/10 ft	
2-043	3/22/2005	8.1	m	6	1/10 ft	Left Edge of Water
2-043	3/22/2005	8.2	m	4.08	1/10 ft	Left Top of Bank
2-043	3/22/2005	8.7	m	3.5	1/10 ft	
2-043	3/22/2005	10.2	m	4	1/10 ft	Left Pin
2-044	3/22/2005	0.3	m	2.5	1/10 ft	Right Pin
2-044	3/22/2005	2	m	2.5	1/10 ft	
2-044	3/22/2005	3.5	m	2.92	1/10 ft	Right Top of Bank
2-044	3/22/2005	3.6	m	5.17	1/10 ft	
2-044	3/22/2005	4	m	5.58	1/10 ft	Right Edge of Water
2-044	3/22/2005	4.8	m	5.92	1/10 ft	Thalweg
2-044	3/22/2005	5.8	m	5.67	1/10 ft	
2-044	3/22/2005	6.3	m	5.75	1/10 ft	
2-044	3/22/2005	6.7	m	5.92	1/10 ft	
2-044	3/22/2005	7.8	m	5.58	1/10 ft	Left Edge of Water
2-044	3/22/2005	8.2	m	5	1/10 ft	
2-044	3/22/2005	9	m	4.42	1/10 ft	
2-044	3/22/2005	10	m	4.17	1/10 ft	Left Bankfull
2-044	3/22/2005	12	m	2.83	1/10 ft	Left Top of Bank
2-044	3/22/2005	14	m	2.33	1/10 ft	Left Pin
2-045	4/1/2005	0.3	m	0.75	1/10 ft	Left Pin
2-045	4/1/2005	2.3	m	0.92	1/10 ft	Left Top of Bank
2-045	4/1/2005	2.5	m	3.83	1/10 ft	Left Bankfull
2-045	4/1/2005	3	m	4.75	1/10 ft	Left Edge of Water
2-045	4/1/2005	3.1	m	5.58	1/10 ft	
2-045	4/1/2005	3.6	m	6.08	1/10 ft	
2-045	4/1/2005	4.3	m	6.5	1/10 ft	
2-045	4/1/2005	6	m	6.67	1/10 ft	Thalweg
2-045	4/1/2005	7	m	6.33	1/10 ft	
2-045	4/1/2005	8	m	6	1/10 ft	
2-045	4/1/2005	10	m	5.5	1/10 ft	
2-045	4/1/2005	11	m	5.42	1/10 ft	
2-045	4/1/2005	12	m	5.42	1/10 ft	
2-045	4/1/2005	12.6	m	4.75	1/10 ft	Right Edge of Water
2-045	4/1/2005	13.3	m	3.67	1/10 ft	
2-045	4/1/2005	14.6	m	2.25	1/10 ft	Right Bankfull
2-045	4/1/2005	16	m	2	1/10 ft	
2-046	4/1/2005	0.3	m	1.58	1/10 ft	Right Pin
2-046	4/1/2005	2	m	1.67	1/10 ft	Right Top of Bank

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-046	4/1/2005	3.5	m	2	1/10 ft	
2-046	4/1/2005	4	m	2.42	1/10 ft	
2-046	4/1/2005	4.7	m	2.75	1/10 ft	
2-046	4/1/2005	5.7	m	2.08	1/10 ft	
2-046	4/1/2005	7	m	2.5	1/10 ft	
2-046	4/1/2005	8	m	3	1/10 ft	
2-046	4/1/2005	9	m	3.17	1/10 ft	
2-046	4/1/2005	11	m	3.92	1/10 ft	
2-046	4/1/2005	11.5	m	4.25	1/10 ft	Right Edge of Water
2-046	4/1/2005	13	m	4.92	1/10 ft	
2-046	4/1/2005	15	m	5.58	1/10 ft	
2-046	4/1/2005	16	m	6.33	1/10 ft	
2-046	4/1/2005	17	m	6.42	1/10 ft	
2-046	4/1/2005	17.5	m	6.42	1/10 ft	Thalweg
2-046	4/1/2005	18	m	6.33	1/10 ft	
2-046	4/1/2005	18.3	m	6.25	1/10 ft	
2-046	4/1/2005	18.35	m	4.25	1/10 ft	Left Edge of Water
2-046	4/1/2005	18.6	m	3	1/10 ft	
2-046	4/1/2005	19	m	2.75	1/10 ft	Left Bankfull
2-046	4/1/2005	20	m	1.42	1/10 ft	
2-046	4/1/2005	21	m	1.75	1/10 ft	Left Pin
2-047	3/21/2005	0.5	m	3.08	1/10 ft	Left Pin
2-047	3/21/2005	2	m	3.17	1/10 ft	
2-047	3/21/2005	3.5	m	4	1/10 ft	Left Top of Bank
2-047	3/21/2005	4	m	4.75	1/10 ft	Left Bankfull
2-047	3/21/2005	4.2	m	5.25	1/10 ft	
2-047	3/21/2005	4.9	m	5.25	1/10 ft	Left Edge of Water
2-047	3/21/2005	6.4	m	5.67	1/10 ft	Thalweg
2-047	3/21/2005	7.9	m	5.25	1/10 ft	Right Edge of Water
2-047	3/21/2005	8	m	3.5	1/10 ft	Right Top of Bank
2-047	3/21/2005	9	m	3.08	1/10 ft	Right Pin
2-048	3/21/2005	0.6	m	3.25	1/10 ft	Left Pin
2-048	3/21/2005	2	m	3.67	1/10 ft	Left Top of Bank
2-048	3/21/2005	2.5	m	4.5	1/10 ft	Left Bankfull
2-048	3/21/2005	5	m	4.67	1/10 ft	
2-048	3/21/2005	7	m	5.08	1/10 ft	
2-048	3/21/2005	7.6	m	5.25	1/10 ft	
2-048	3/21/2005	8	m	5.83	1/10 ft	
2-048	3/21/2005	8.6	m	6.17	1/10 ft	Left Edge of Water
2-048	3/21/2005	9.8	M	6.5	1/10 ft	Thalweg
2-048	3/21/2005	10.1	m	6.08	1/10 ft	Right Edge of Water
2-048	3/21/2005	10.3	m	3.25	1/10 ft	Right Top of Bank
2-048	3/21/2005	11	m	2.83	1/10 ft	
2-048	3/21/2005	14.3	m	3.33	1/10 ft	Right Pin
2-049	3/21/2005	0.5	m	3.25	1/10 ft	Left Pin
2-049	3/21/2005	3.2	m	3.33	1/10 ft	Left Top of Bank
2-049	3/21/2005	3.4	m	5.17	1/10 ft	Left Bankfull
2-049	3/21/2005	3.9	m	5.83	1/10 ft	Left Edge of Water
2-049	3/21/2005	5	m	6.25	1/10 ft	Thalweg
2-049	3/21/2005	5.6	m	5.83	1/10 ft	Right Edge of Water
2-049	3/21/2005	5.7	m	5	1/10 ft	Right Bankfull

Station ID	Collection Date	DistanceFromLeft	Unit	Elev/Depth	Unit	XS Remark Code
2-049	3/21/2005	6.3	m	4.92	1/10 ft	
2-049	3/21/2005	6.6	m	4.25	1/10 ft	Right Top of Bank
2-049	3/21/2005	9	m	4.25	1/10 ft	
2-049	3/21/2005	11	m	3.58	1/10 ft	Right Pin
2-050	3/22/2005	0.3	m	3.17	1/10 ft	Left Pin
2-050	3/22/2005	1	m	3.42	1/10 ft	
2-050	3/22/2005	2	m	3.92	1/10 ft	
2-050	3/22/2005	3	m	4.08	1/10 ft	
2-050	3/22/2005	4.8	m	4.17	1/10 ft	Left Top of Bank
2-050	3/22/2005	5.7	m	5.25	1/10 ft	Left Bankfull
2-050	3/22/2005	6.4	m	6.33	1/10 ft	
2-050	3/22/2005	7	m	6.67	1/10 ft	Left Edge of Water
2-050	3/22/2005	9	m	7.17	1/10 ft	
2-050	3/22/2005	10	m	7.42	1/10 ft	
2-050	3/22/2005	10.9	m	7.67	1/10 ft	Thalweg
2-050	3/22/2005	12	m	7.33	1/10 ft	
2-050	3/22/2005	12.4	m	6.67	1/10 ft	Right Edge of Water
2-050	3/22/2005	12.9	m	5.42	1/10 ft	Right Bankfull
2-050	3/22/2005	14	m	3	1/10 ft	Right Top of Bank
2-050	3/22/2005	15	m	2.75	1/10 ft	
2-050	3/22/2005	18	m	3	1/10 ft	Right Pin

APPENDIX I: Field Water Chemistry

StationID	CollDate	Conductivity (µmho/cm)	Dissolved Oxygen (mg/l)	pH (SU)	Water Temperature (°C)
2-001	3/30/2005	188	6.7	7.11	13.42
2-002	3/25/2005	373	6.39	7.18	10.86
2-003	3/21/2005	62.6	6.7	7.7	8.71
2-004	3/30/2005	124.6	5.83	7.14	9.33
2-004QC	3/30/2005	123.8	6.06	7.09	9.58
2-005	3/31/2005	174	10.28	7.1	8.51
2-007	3/28/2005	107.7	6	7.57	8.13
2-009	3/31/2005	134.4	5.53	7.12	7.7
2-010	3/31/2005	164	6.47	7.12	8.96
2-011	3/29/2005	492	6.31	6.87	9.74
2-012	3/30/2005	357	6.28	6.9	11.09
2-021	4/6/2005	116.8	6.71	7.32	10.02
2-022	4/1/2005	121	7.09	7.13	11.54
2-022 QC	4/1/2005	123.3	7.37	6.9	12.24
2-023	4/6/2005	110.9	5.82	6.98	9.2
2-024	3/24/2005	263	6.98	7.56	8.64
2-025	3/25/2005	96.8	6.89	7.58	7.27
2-026	3/25/2005	96.5	6.8	7.52	6.92
2-027	3/29/2005	144.9	5.82	6.93	10.21
2-029	3/29/2005	267	6.69	6.76	12.19
2-030	3/25/2005	154	7.05	7.61	6.35
2-038	4/6/2005	201	7.16	7.5	15.97
2-041	3/24/2005	74.8	7.62	7.63	5.23
2-042	3/22/2005	128.7	7.71	7.46	10.9
2-043	3/22/2005	78	7.69	7.68	9.12
2-044	3/22/2005	63.7	7.47	8.02	5.52
2-044QC	3/22/2005	63.8	7.45	8	5.56
2-045	4/1/2005	122.3	6.44	7.16	8.48
2-046	4/1/2005	121.8	6.71	7.15	9.31
2-047	3/21/2005	136.8	5.78	7.56	7.76
2-048	3/21/2005	121.4	5.7	7.54	7.13
2-049	3/21/2005	101.4	5.66	7.9	8.36
2-050	3/21/2005	72.6	8.08	8.29	3.85

APPENDIX J: Corrected Biological Metrics 2001

StationID	002	003	004	006	007	007-QC	009	010	012	013	014
Waterbody Name	UT to Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	UT to Cattail Creek	Cattail Creek	Cattail Creek	Dorsey Branch	East Branch	UT to Cattail Creek	UT to Cattail Creek	UT to Cattail Creek
Collection Date	03-20-2001	03-13-2001	03-13-2001	03-09-2001	03-09-2001	03-09-2001	03-07-2001	03-08-2001	03-13-2001	03-19-2001	04-09-2001
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	1	1	3	1	3	3	1	2	1	1	1
IBI-Spring-MBSS-NCP	3.67	4.56	3.89	4.11	3.89	3.67	4.78	3.89	2.78	3.89	5.00
Rating-Spring-MBSS-NCP	Fair	Good	Fair	Good	Fair	Fair	Good	Fair	Poor	Fair	Good
Total Taxa	38	43	27	33	30	34	44	46	20	33	38
Total Taxa Score	5	5	5	5	5	5	5	5	3	5	5
EPT Taxa	9	17	8	10	10	10	15	12	4	8	18
EPT Taxa Score	3	5	3	3	3	3	5	3	1	3	5
Ephemeroptera Taxa	4	5	4	4	4	3	6	3	1	3	8
Ephemeroptera Taxa Score	3	5	3	3	3	3	5	3	1	3	5
Diptera Taxa	19	24	16	18	17	20	23	24	14	23	19
Diptera Taxa Score	5	5	5	5	5	5	5	5	5	5	5
Ephemeroptera Percent	5.23	17.76	12.50	9.82	30.56	19.17	26.17	11.93	0.88	14.91	30.91
Ephemeroptera Percent Score	1	3	3	3	5	3	5	3	1	3	5
Tanytarsini Percent	23.68	9.35	17.31	10.71	4.63	3.33	8.41	10.09	4.39	15.79	12.73
Tanytarsini Percent Score	5	5	5	5	3	3	5	5	3	5	5
Intolerant Taxa	7	9	4	11	6	6	10	8	2	6	10
Intolerant Taxa Score	3	5	3	5	3	3	5	3	1	3	5
Tolerant Percent	24.56	17.76	18.27	27.68	15.74	20.86	14.02	12.84	6.14	25.44	4.55
Tolererant Percent Score	3	3	3	3	3	3	3	3	5	3	5
Collector Percent	35.96	35.51	61.54	44.64	62.96	48.33	54.21	41.28	66.67	35.09	39.09
Collector Percent Score	5	5	5	5	5	5	5	5	5	5	5
Total Individuals	114	107	104	112	108	120	107	109	114	114	110
Mean Score	4.01										
Standard Deviation	0.61										

StationID	022	022-QC	023	024	025	028	029	030	032	72948	77679
Waterbody Name	Patuxent River	Patuxent River	UT to Patuxent River	UT to Patuxent River	UT to Patuxent River	UT to Patuxent River	UT to Patuxent River	UT to Patuxent River	Patuxent River	UT to Patuxent River	UT to Patuxent River
Collection Date	03-08-2001	03-08-2001	03-14-2001	03-14-2001	03-14-2001	03-12-2001	03-12-2001	03-12-2001	03-19-2001	03-12-2001	03-14-2001
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	3	3	1	1	1	1	1	2	3	1	1
IBI-Spring-MBSS-NCP	4.33	4.11	4.33	4.11	4.11	2.56	4.33	3.89	3.00	2.78	4.78
Rating-Spring-MBSS-NCP	Good	Good	Good	Good	Good	Poor	Good	Fair	Fair	Poor	Good
Total Taxa	29	27	39	33	30	29	41	30	22	26	30
Total Taxa Score	5	5	5	5	5	5	5	5	3	5	5
EPT Taxa	9	11	15	13	5	1	13	9	11	4	13
EPT Taxa Score	3	3	5	5	3	1	5	3	3	1	5
Ephemeroptera Taxa	5	3	6	5	5	0	4	6	4	0	6
Ephemeroptera Taxa Score	5	3	5	5	5	1	3	5	3	1	5
Diptera Taxa	14	13	23	15	19	20	22	10	10	14	13
Diptera Taxa Score	5	5	5	5	5	5	5	5	5	5	5
Ephemeroptera Percent	22.02	25.69	18.10	20.56	44.64	0.00	21.36	19.82	13.59	0.00	52.94
Ephemeroptera Percent Score	5	5	3	5	5	1	5	3	3	1	5
Tanytarsini Percent	4.59	0.92	15.24	2.80	3.57	0.93	7.77	3.60	0.00	2.75	9.80
Tanytarsini Percent Score	3	3	5	3	3	3	5	3	1	3	5
Intolerant Taxa	7	7	7	8	3	5	11	4	5	4	6
Intolerant Taxa Score	3	3	3	3	3	3	5	3	3	3	3
Tolerant Percent	4.59	4.59	14.29	14.95	19.64	21.30	22.33	19.82	21.36	59.63	5.88
Tolererant Percent Score	5	5	3	3	3	3	3	3	3	1	5
Collector Percent	36.70	42.20	44.76	23.36	65.18	12.04	30.10	68.47	13.59	68.81	56.86
Collector Percent Score	5	5	5	3	5	1	3	5	3	5	5
Total Individuals	109	109	105	107	112	108	103	11	103	109	102
Mean Score	3.85										
Standard Deviation	0.73										

StationID	041	042	043	044	045	046	047	049	050	061	062
Waterbody Name	Little Patuxent River	Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	Little Patuxent River	Little Patuxent River	UT to Little Patuxent River
Collection Date	03-12-2001	03-12-2001	03-12-2001	03-15-2001	03-15-2001	03-13-2001	03-16-2001	03-15-2001	03-16-2001	03-19-2001	03-19-2001
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	3	3	1	1	1	3	1	1	4	3	2
IBI-Spring-MBSS-NCP	2.33	3.22	2.11	1.67	2.56	2.56	2.56	1.67	3.44	3.22	3.44
Rating-Spring-MBSS-NCP	Poor	Fair	Poor	Very Poor	Poor	Poor	Poor	Very Poor	Fair	Fair	Fair
Total Taxa	13	19	15	11	18	18	21	13	26	21	22
Total Taxa Score	1	3	1	1	3	3	3	1	5	3	3
EPT Taxa	2	6	3	2	2	3	3	2	8	5	8
EPT Taxa Score	1	3	1	1	1	1	1	1	3	3	3
Ephemeroptera Taxa	0	2	1	0	0	0	0	0	2	2	3
Ephemeroptera Taxa Score	1	3	1	1	1	1	1	1	3	3	3
Diptera Taxa	10	11	10	6	13	11	13	8	15	10	11
Diptera Taxa Score	5	5	5	3	5	5	5	3	5	5	5
Ephemeroptera Percent	0.00	1.72	0.90	0.00	0.00	0.00	0.00	0.00	3.01	4.29	17.76
Ephemeroptera Percent Score	1	1	1	1	1	1	1	1	1	1	3
Tanytarsini Percent	3.85	5.17	0.00	0.00	8.82	1.72	2.06	0.00	9.02	10.71	1.87
Tanytarsini Percent Score	3	5	1	1	5	3	3	1	5	5	3
Intolerant Taxa	1	2	1	0	1	1	2	0	2	2	3
Intolerant Taxa Score	1	1	1	1	1	1	1	1	1	1	3
Tolerant Percent	46.15	27.59	23.42	14.43	51.96	32.76	34.02	16.16	34.59	18.57	12.15
Tolererant Percent Score	3	3	3	3	1	3	3	3	3	3	3
Collector Percent	50.96	42.24	73.87	17.53	39.22	68.10	36.08	25.25	53.38	73.57	67.29
Collector Percent Score	5	5	5	3	5	5	5	3	5	5	5
Total Individuals	104	116	111	97	102	116	97	99	133	140	107
Mean Score	2.46										
Standard Deviation	0.61										

StationID	062 QC	063	064	065	065 QC	066	066 QC	067	068	069
Waterbody Name	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River
Collection Date	03-19-2001	03-20-2001	03-16-2001	03-19-2001	03-19-2001	03-19-2001	03-19-2001	03-12-2001	03-12-2001	03-26-2001
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	2	1	1	1	1	1	1	1	1	1
IBI-Spring-MBSS-NCP	3.44	3.00	1.44	0.00	2.11	2.33	2.11	2.56	2.33	2.11
Rating-Spring-MBSS-NCP	Fair	Fair	Very Poor	Very Poor	Poor	Poor	Poor	Poor	Poor	Poor
Total Taxa	21	20	13	22	15	9	11	19	14	8
Total Taxa Score	3	3	1	3	1	1	1	3	1	1
EPT Taxa	8	7	1	2	2	1	1	3	2	0
EPT Taxa Score	3	3	1	1	1	1	1	1	1	1
Ephemeroptera Taxa	3	2	0	0	0	0	1	0	0	0
Ephemeroptera Taxa Score	3	3	1	1	1	1	1	1	1	1
Diptera Taxa	9	9	8	13	9	7	9	13	10	6
Diptera Taxa Score	3	3	3	5	3	3	3	5	5	3
Ephemeroptera Percent	22.00	7.83	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00
Ephemeroptera Percent Score	5	3	1	1	1	1	1	1	1	1
Tanytarsini Percent	1.00	4.35	2.97	10.91	10.89	0.98	0.00	3.33	1.02	0.92
Tanytarsini Percent Score	3	3	3	5	5	3	1	3	3	3
Intolerant Taxa	4	3	1	0	0	1	1	2	0	0
Intolerant Taxa Score	3	3	1	1	1	1	1	1	1	1
Tolerant Percent	15.00	18.26	81.19	40.00	53.47	8.82	11.57	13.33	42.86	40.37
Tolererant Percent Score	3	3	1	3	1	5	5	3	3	3
Collector Percent	44.00	30.43	3.96	61.82	79.21	95.10	90.08	80.00	58.16	88.07
Collector Percent Score	5	3	1	5	5	5	5	5	5	5
Total Individuals	100	115	101	55	101	102	121	120	98	109
Mean Score	2.31									
Standard Deviation	0.93									

StationID	075	081	082	084	085	086	087	087-QC	088	089	090
Waterbody Name	UT to Little Patuxent River	UT to Patuxent River	UT to Patuxent River	UT to Patuxent River	UT to Cabin Branch	UT to Cabin Branch	UT to Cabin Branch	UT to Cabin Branch	UT to Cabin Branch	Cabin Branch	Cabin Branch
Collection Date	03-29-2001	03-20-2001	03-15-2001	03-16-2001	03-16-2001	03-16-2001	03-15-2001	03-15-2001	03-15-2001	03-19-2001	03-19-2001
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	1	1	1	3	1	1	1	1	1	2	2
IBI-Spring-MBSS-NCP	1.89	3.67	4.11	3.00	4.33	4.33	4.78	4.56	4.56	3.67	4.11
Rating-Spring-MBSS-NCP	Very Poor	Fair	Good	Fair	Good	Good	Good	Good	Good	Fair	Good
Total Taxa	12	28	36	31	37	33	51	40	36	34	38
Total Taxa Score	1	5	5	5	5	5	5	5	5	5	5
EPT Taxa	2	8	17	10	9	10	20	13	14	13	16
EPT Taxa Score	1	3	5	3	3	3	5	5	5	5	5
Ephemeroptera Taxa	0	3	5	2	5	5	8	6	5	4	6
Ephemeroptera Taxa Score	1	3	5	3	5	5	5	5	5	3	5
Diptera Taxa	7	17	16	17	26	22	20	21	14	18	14
Diptera Taxa Score	3	5	5	5	5	5	5	5	5	5	5
Ephemeroptera Percent	0.00	8.65	9.35	4.27	14.55	22.55	31.93	32.14	24.77	19.66	18.87
Ephemeroptera Percent Score	1	3	3	1	3	5	5	5	5	3	3
Tanytarsini Percent	0.00	12.50	6.54	4.27	22.73	19.61	8.40	8.04	11.01	10.26	4.72
Tanytarsini Percent Score	1	5	5	3	5	5	5	5	5	5	3
Intolerant Taxa	0	9	11	6	5	7	17	6	11	7	12
Intolerant Taxa Score	1	5	5	3	3	3	5	3	5	3	5
Tolerant Percent	26.36	49.04	43.93	64.10	6.36	24.51	18.49	19.64	22.94	30.77	22.64
Tolererant Percent Score	3	1	3	1	5	3	3	3	3	3	3
Collector Percent	64.55	23.08	11.21	18.80	50.91	34.31	40.34	32.14	24.77	12.82	29.25
Collector Percent Score	5	3	1	3	5	5	5	5	3	1	3
Total Individuals	110	104	107	117	110	102	119	112	109	117	106
Mean Score		4.11									
Standard Deviation		0.51									

StationID	091	101	102	103	103 QC	104	105	106	108	109	110
Waterbody Name	UT to Patuxent River	Little Patuxent River	Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	UT to Little Patuxent River	Little Patuxent River	UT to Little Patuxent River	Little Patuxent River	Hill Branch	Hill Branch
Collection Date	03-20-2001	03-20-2001	03-20-2001	03-15-2001	03-15-2001	03-15-2001	03-15-2001	03-13-2001	03-14-2001	03-20-2001	03-20-2001
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	1	1	1	1	1	1	2	1	2	1	1
IBI-Spring-MBSS-NCP	4.11	3.67	3.89	3.89	4.11	2.11	3.22	3.22	3.44	2.78	3.22
Rating-Spring-MBSS-NCP	Good	Fair	Fair	Fair	Good	Poor	Fair	Fair	Fair	Poor	Fair
Total Taxa	38	25	20	30	27	13	24	21	23	23	26
Total Taxa Score	5	5	3	5	5	1	5	3	5	5	5
EPT Taxa	14	8	7	11	11	0	6	6	6	8	4
EPT Taxa Score	5	3	3	3	3	1	3	3	3	3	1
Ephemeroptera Taxa	3	3	2	4	5	0	1	3	3	3	1
Ephemeroptera Taxa Score	3	3	3	3	5	1	1	3	3	3	1
Diptera Taxa	23	14	10	17	11	9	14	13	15	9	16
Diptera Taxa Score	5	5	5	5	5	3	5	5	5	3	5
Ephemeroptera Percent	5.94	18.31	28.46	16.82	26.36	0.00	1.72	3.85	2.75	3.96	1.06
Ephemeroptera Percent Score	3	3	5	3	5	1	1	1	1	1	1
Tanytarsini Percent	5.94	2.82	0.77	9.35	2.33	3.64	9.48	1.92	19.27	3.96	6.38
Tanytarsini Percent Score	5	3	3	5	3	3	5	3	5	3	5
Intolerant Taxa	12	7	4	6	6	0	2	3	2	2	3
Intolerant Taxa Score	5	3	3	3	3	1	1	3	1	1	3
Tolerant Percent	42.57	6.34	10.00	19.63	17.05	29.09	20.69	37.50	34.86	51.49	34.04
Tolererant Percent Score	3	5	5	3	3	3	3	3	3	1	3
Collector Percent	26.73	30.28	41.54	34.58	36.43	80.00	43.97	50.00	65.14	48.51	48.94
Collector Percent Score	3	3	5	5	5	5	5	5	5	5	5
Total Individuals	101	142	130	107	129	110	116	104	109	101	94
Mean Score		3.17									
Standard Deviation		0.63									

StationID	115	115 QC	117
Waterbody Name	Plumtree Branch	Plumtree Branch	UT to Little Patuxent
Collection Date	03-26-2001	03-26-2001	03-26-2001
CP/NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring
Order	1	1	1
IBI-Spring-MBSS-NCP	2.56	2.33	2.78
Rating-Spring-MBSS-NCP	Poor	Poor	Poor
Total Taxa	14	11	16
Total Taxa Score	1	1	3
EPT Taxa	1	1	4
EPT Taxa Score	1	1	1
Ephemeroptera Taxa	0	0	2
Ephemeroptera Taxa Score	1	1	3
Diptera Taxa	10	8	8
Diptera Taxa Score	5	3	3
Ephemeroptera Percent	0.00	0.00	1.68
Ephemeroptera Percent Score	1	1	1
Tanytarsini Percent	7.48	6.67	0.00
Tanytarsini Percent Score	5	5	1
Intolerant Taxa	1	1	3
Intolerant Taxa Score	1	1	3
Tolerant Percent	19.63	19.05	3.36
Tolererant Percent Score	3	3	5
Collector Percent	56.07	47.62	78.15
Collector Percent Score	5	5	5
Total Individuals	107	105	119
Mean Score			
Standard Deviation			

APPENDIX K: Corrected Biological Metrics 2002

StationID	121	122	123	124	125	125 QC	126	127	128	129	130
WaterbodyName	Middle Patuxent	UT to Middle Patuxent	Middle Patuxent	UT to Middle Patuxent	UT to Middle Patuxent	UT to Middle Patuxent	Middle Patuxent	UT to Middle Patuxent	UT to Middle Patuxent	Middle Patuxent	UT to Middle Patuxent
Collection Date	03-25-2002	03-25-2002	03-14-2002	03-19-2002	03-15-2002	03-15-2002	03-19-2002	03-15-2002	03-18-2002	03-25-2002	03-11-2002
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	4	1	3	3	1	1	4	2	1	4	1
IBI-Spring-MBSS-NCP	3.89	2.56	3.89	4.78	3.00	3.44	3.44	3.89	3.67	3.44	3.44
Rating-Spring-MBSS-NCP	Fair	Poor	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair
Total Taxa	36	22	42	36	28	35	31	40	38	36	30
Total Taxa Score	5	3	5	5	5	5	5	5	5	5	5
EPT Taxa	11	0	9	15	5	6	10	6	6	10	9
EPT Taxa Score	3	1	3	5	3	3	3	3	3	3	3
Ephemeroptera Taxa	3	0	4	7	1	1	3	2	2	3	2
Ephemeroptera Taxa Score	3	1	3	5	1	1	3	3	3	3	3
Diptera Taxa	21	16	24	18	20	23	15	26	25	19	18
Diptera Taxa Score	5	5	5	5	5	5	5	5	5	5	5
Ephemeroptera Percent	13.04	0.00	10.48	22.77	2.56	2.91	6.38	12.87	2.78	6.48	5.66
Ephemeroptera Percent Score	3	1	3	5	1	1	3	3	1	3	1
Tanytarsini Percent	6.96	1.00	7.62	4.95	4.27	12.62	3.19	13.86	17.59	4.63	4.72
Tanytarsini Percent Score	5	3	5	5	3	5	3	5	5	3	3
Intolerant Taxa	8	0	3	6	6	8	5	6	8	7	8
Intolerant Taxa Score	3	1	3	3	3	3	3	3	3	3	3
Tolerant Percent	15.65	13.00	16.19	6.93	26.50	21.36	15.96	15.84	20.37	13.89	25.47
Tolerant Percent Score	3	3	3	5	3	3	3	3	3	3	3
Collector Percent	33.04	79.00	46.67	42.57	28.21	54.37	27.66	60.40	55.56	27.78	48.11
Collector Percent Score	5	5	5	5	3	5	3	5	5	3	5
Total Individuals	115	100	105	101	117	103	94	101	108	108	106
Mean Score	3.59										
Standard Deviation	0.56										

StationID	141	142	143	144	145	146	146 QC	147	148	149	150
WaterbodyName	UT to Middle Patuxent	UT to Middle Patuxent	Middle Patuxent	Middle Patuxent	Middle Patuxent	Ut to Middle Patuxent	Ut to Middle Patuxent	UT to Middle Patuxent	UT to Middle Patuxent	UT to Middle Patuxent	UT to Middle Patuxent
Collection Date	03-12-2002	03-12-2002	03-08-2002	03-08-2002	03-08-2002	03-07-2002	03-07-2002	03-07-2002	03-18-2002	03-18-2002	03-14-2002
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	1	1	3	3	3	1	1	1	2	2	1
IBI-Spring-MBSS-NCP	4.11	4.33	4.11	3.89	4.56	3.89	4.11	3.67	3.89	3.89	3.67
Rating-Spring-MBSS-NCP	Good	Good	Good	Fair	Good	Fair	Good	Fair	Fair	Fair	Fair
Total Taxa	26	45	29	23	38	29	34	28	28	43	43
Total Taxa Score	5	5	5	5	5	5	5	5	5	5	5
EPT Taxa	6	11	12	11	13	10	12	7	6	5	5
EPT Taxa Score	3	3	3	3	5	3	3	3	3	3	3
Ephemeroptera Taxa	3	3	4	3	3	3	4	3	3	3	2
Ephemeroptera Taxa Score	3	3	3	3	3	3	3	3	3	3	3
Diptera Taxa	14	25	11	8	20	13	17	19	15	27	32
Diptera Taxa Score	5	5	5	3	5	5	5	5	5	5	5
Ephemeroptera Percent	51.92	16.26	20.39	37.50	17.00	8.65	16.67	4.21	17.14	5.71	3.54
Ephemeroptera Percent Score	5	3	5	5	3	3	3	1	3	3	1
Tanytarsini Percent	1.92	11.38	2.91	0.96	5.00	6.73	7.41	11.58	2.86	11.43	15.93
Tanytarsini Percent Score	3	5	3	3	5	5	5	5	3	5	5
Intolerant Taxa	6	12	7	6	9	7	10	6	8	6	4
Intolerant Taxa Score	3	5	3	3	5	3	5	3	3	3	3
Tolerant Percent	7.69	9.76	0.97	0.00	10.00	5.77	15.74	45.26	4.76	31.43	21.24
Tolerant Percent Score	5	5	5	5	5	5	3	3	5	3	3
Collector Percent	70.19	49.59	33.98	54.81	43.00	26.92	43.52	34.74	49.52	59.05	50.44
Collector Percent Score	5	5	5	5	5	3	5	5	5	5	5
Total Individuals	104	123	103	104	100	104	108	95	105	105	113
Mean Score	4.01										
Standard Deviation	0.27										

StationID	161	163	164	167	168	168 QC	169	170	171
WaterbodyName	UT to Middle Patuxent	UT to Middle Patuxent	UT to Middle Patuxent	UT to Middle Paxtuent	Terrapin Branch	Terrapin Branch	Middle Patuxent	Middle Patuxent	Ut to Middle Patuxent
Collection Date	03-06-2002	03-06-2002	03-13-2002	03-13-2002	03-12-2002	03-12-2002	03-11-2002	03-08-2002	03-14-2002
CP/NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
Index	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Order	1	2	1	1	1	1	3	3	1
IBI-Spring-MBSS-NCP	2.78	3.89	3.44	3.44	4.56	4.33	4.11	4.11	3.22
Rating-Spring-MBSS-NCP	Poor	Fair	Fair	Fair	Good	Good	Good	Good	Fair
Total Taxa	29	25	41	37	29	28	24	32	27
Total Taxa Score	5	5	5	5	5	5	5	5	5
EPT Taxa	1	7	10	7	13	7	9	10	4
EPT Taxa Score	1	3	3	3	5	3	3	3	1
Ephemeroptera Taxa	0	2	2	0	3	4	4	3	0
Ephemeroptera Taxa Score	1	3	3	1	3	3	3	3	1
Diptera Taxa	18	13	25	23	12	18	12	17	20
Diptera Taxa Score	5	5	5	5	5	5	5	5	5
Ephemeroptera Percent	0.00	11.11	1.75	0.00	29.29	26.79	39.64	16.38	0.00
Ephemeroptera Percent Score	1	3	1	1	5	5	5	3	1
Tanytarsini Percent	8.57	7.07	5.26	0.87	6.06	18.75	3.60	6.90	5.05
Tanytarsini Percent Score	5	5	5	3	5	5	3	5	5
Intolerant Taxa	2	4	8	10	8	5	5	8	5
Intolerant Taxa Score	1	3	3	5	3	3	3	3	3
Tolerant Percent	46.67	5.05	21.93	8.70	4.04	8.04	2.70	0.86	14.14
Tolerant Percent Score	3	5	3	5	5	5	5	5	3
Collector Percent	21.90	29.29	29.82	26.09	70.71	66.07	63.06	42.24	59.60
Collector Percent Score	3	3	3	3	5	5	5	5	5
Total Individuals	105	99	114	115	99	112	111	116	99
Mean Score	3.77								
Standard Deviation	0.58								