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Rapid Bioassessment Methods for Assessing Stream Macroinvertebrate Community on the Savannah River Site

by

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RAPID BIOASSESSMENT METHODS FOR ASSESSING STREAM MACROINVERTEBRATE COMMUNITIES ON THE SAVANNAH RIVER SITE

by

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EXECUTIVE SUMMARY

Macroinvertebrate sampling was performed at 16 locations in SRS streams using Hester-Dendy multiplate samplers and EPA Rapid Bioassessment Protocols (RBP). Some of the sampling locations were unimpacted, while other locations had been subject to various forms of perturbation by SRS activities. In general, the data from the Hester-Dendy multiplate samplers were more sensitive at detecting impacts than were the RBP data. We developed a Biotic Index for the Hester-Dendy data which incorporated eight community structure, function, and balance parameters. When tested using a data set that was unrelated to the data set that was used in developing the Biotic Index, the index was very successful at detecting impact .

We also evaluated the sensitivity of the RBP methods in detecting impact in coastal plain streams. Of the eight metrics used, only one was statistically significant in detecting differences between impacted and unimpacted streams. However, the eight metrics combined were able to detect some degree of impact at most impacted stations, but often detected impact at locations that were not impacted by SRS activities. We evaluated six additional metrics for possible incorporation into the RBP index. Two of the metrics did not detect differences between impacted and unimpacted locations, while the remaining four were as sensitive as most of the RBP metrics in detecting impacts.

1.0 INTRODUCTION

One of the problems that is inherent to assessing the health of an aquatic community is that although many parameters may be measured, there is no one perfect measure of community health. While the values for some parameters may suggest perturbation, the values for others may suggest little or no perturbation. Thus judging the overall health of an ecosystem can be very subjective, and largely based on best scientific judgment. There have been many attempts made to develop indices that combine many different parameters to yield one number that can then be used to quantify the degree to which a stream may be impacted.

In 1989, the U.S. Environmental Protection Agency published rapid bioassessment protocols for fish and aquatic macroinvertebrates (Plafkin et al., 1989). These protocols were designed to provide cost-effective screening methods for collecting fish and macroinvertebrate data from lotic systems that could be used for assessing stream quality. These rapid bioassessment protocols provide a means of integrated assessment by comparing habitat features (physical structure, flow regime, etc.) and biological measures with empirically defined reference conditions. The primary advantage of this integrated approach is that since biological communities reflect the overall ecological integrity of an ecosystem, the cumulative effects of both physical and chemical stressors can be evaluated, thus providing a holistic measure of their aggregate impact over time.

The general approach that is used in all of the EPA rapid bioassessment protocols is to have a scientist who is familiar with the local faunal group of interest (fish or (macroinvertebrates) perform the stream surveys. Similar surveys are conducted at one or more unimpacted reference sites as well as at potentially impacted sites.

Specific metrics are evaluated at each site, and the results are compared to the values obtained from the reference site. Based on the overall similarity of the metrics of the potentially impacted sites to those of the reference site, a site is categorized as non-impaired, moderately impaired, or severely impaired.

Although these methods were developed primarily for use in the riffle-run areas of rocky-bottomed streams, Plafkin et al. (1989) state that "the final rapid bioassessment guidance should be generally applicable to all ecoregions of the United States, although specific elements and evaluation criteria may require modification for particular ecoregions".

Based on macroinvertebrate data collected from SRS coastal plain streams over the past twelve years, we believed that modifications of EPA's rapid bioassessment protocols would be necessary to customize them for use in our streams.
The shifting sand substrates present in southeastern coastal plain streams provide poor habitat for most species of macroinvertebrates. Instead, many species rely on structure provided by leafpacks, snags, aquatic vegetation, and root mats (Benke et al., 1984; Smock et al., 1985). Chironomids are also much more abundant in southeastern streams than in more northern rocky-bottomed streams, while stoneflies and mayflies are often less abundant. In many instances, chironomids are numerically the most abundant order of macroinvertebrates collected in our streams. Although the EPA rapid bioassessment protocols do not discriminate among subfamilies or tribes of chironomids, the sensitivities among these groups to perturbation are well documented. In general Tanytarsini chironomids are generally considered to be intolerant of stream enrichment and heavy metals (Heliovaara and Vaisanen, 1993), while Chironomini and Tanypodinae are generally recognized to be much more tolerant of most forms of perturbation. Most Orthocladiinae are generally considered to be intolerant of organic enrichment, but several species are reported to dominate in streams with elevated levels of heavy metals (Surber, 1959, Winner, et al, 1980).

With respect to functional feeding groups, southeastern coastal plain streams also differ from northern streams in that shredders are often found in extremely low numbers, even in headwater streams, while collector gatherers and collector-filterers are generally more abundant than in northern streams.

We investigated the use of aquatic macroinvertebrate data to evaluate environmental impacts to streams on and near the Savannah River Site (SRS), a U.S. Department of Energy (DOE) facility located in the sandhills/upper coastal plain region of west-central South Carolina, that was formerly used for the production of nuclear weapons materials. Some streams on the SRS have experienced various types of long-term chemical and/or physical degradation, including exposure to temperatures in excess of 70 °C. Although some streams are in various stages of recovery, others continue to receive effluent discharges and/or physical perturbations.

In order to identify and remediate perturbed streams, techniques are needed that rapidly and accurately assess their state of health in a cost-effective manner. The purpose of this study is to evaluate the utility of the existing EPA Rapid Bioassessment protocols in assessing aquatic macroinvertebrate communities in southeastern coastal plain streams that have been subjected to different kinds of stress, and if necessary, to develop modifications to the protocols to adapt them for use in these streams.

To accomplish these objectives, we compared macroinvertebrate data that were collected using conventional multiplate samplers with data collected using the EPA's Rapid Bioassessment Protocols II and III. The data were then analyzed to develop biotic indices for multiplate sampler data and Rapid Bioassessment Protocol data that would allow for a rapid assessment of stream health in southeastern coastal plain streams.

2.0 DESCRIPTION OF STUDY SITES

The SRS includes six stream systems within a 780 km^2 area located in the sandhills ecoregion on the upper coastal plain of South Carolina: Upper Three Runs, Beaver Dam Creek, Fourmile Branch, Pen Branch, Steel Creek, and Lower Three Runs. The streams in the sand hill and coastal plain ecoregions are characterized by low gradients, sandy bottoms, and lack of well defined pool-riffle-run habitats (Paller, 1994). Snags and other woody debris constitute the principal instream structure, together with rooted aquatic vegetation, root mats, undercut banks, overhanging shoreline vegetation, and leafpacks. Many coastal plain streams, including those on the SRS, are blackwater streams, with relatively low pH (4.5 to 6.9), specific conductance (11 to 104 µS/cm), and hardness (5 to 25 mg/l as $CaCO_3$), and relatively high concentrations of humic and fulvic acids, which give the streams their characteristic tea-colored water.

Streams on and near the SRS range in size from first through fourth order (Strahler 1957), are approximately 2-15 m wide and 0.6-2.5 m/km in average gradient. These streams support diverse macroinvertebrate communities, dominated by species in the orders Diptera, Ephemeroptera, Plecoptera, Trichoptera, and Coleoptera. Of the Diptera, the Tanytarsini chironomids are generally most abundant in unperturbed streams.

Because of its large size, restricted access, and former industrial activities, the Savannah River Site contains streams that range from virtually pristine to severely impacted. Impacts include:

Thermal and post-thermal: Several streams formerly received large volumes of hot (70 °C) secondary cooling water discharged from nuclear reactors, which resulted in near total elimination of aquatic biota and extensive scouring/channel erosion. After thermal discharges were eliminated between 1985 and 1988, the streams were rapidly recolonized by aquatic macroinvertebrates (Enwright, 1989a, 1989b, 1989c; Lauritsen and Starkel, 1989), but continued to suffer degraded instream habitat.

Impoundment related: Stream reaches below reactor cooling water reservoirs experienced alterations in discharge regime, water chemistry, and the introduction of reservoir biota.

Heavy metals and other industrial discharges: Several streams receive inputs of toxicants from coal piles, coal ash basins, seepage basins, and/or metal processing facilities. One stream was also channelized.

Secondary sewage effluent: Although several SRS streams receive treated sanitary effluent (Tim's Branch, Fourmile Branch, Upper Three Runs), these streams also

receive other industrial effluents, which could mask the effects of nutrient enrichment on macroinvertebrate communities. For this reason, we also sampled two locations on Rosemary Creek, which is not on the SRS, but receives sanitary effluent from a secondary sanitary waste treatment plant. One sampling location was immediately downstream from the sanitary outfall, while the second location was about two km downstream from the outfall.

A total of sixteen sampling locations in first through fourth order streams were selected as study sites for Hester-Dendy sampling and testing of the RBP methods. Sampling was conducted in Upper Three Runs, four tributaries of Upper Three Runs (Tinker Creek, Mill Creek, Crouch Branch, and Tim's Branch), Beaver Dam Creek, Fourmile Branch (two locations), Indian Grave Branch, Pen Branch (two locations), Meyer's Branch, Lower Three Runs, and Rosemary Creek (two locations). Of these locations, six represent relatively unperturbed habitats, six are thermal or post-thermal habitat, one is located downstream from a reservoir, at least four are subject to varying degrees of perturbation by industrial discharges, and three are located at varying distances downstream from a sanitary wastewater treatment plant. As shown in Table 2-1, several of the sites have been impacted by more than one type of perturbation. An additional 24 sampling sites in first through third order SRS streams were sampled in 1993 with Hester-Dendy samplers only (Specht, 1994). These 24 sites represented unimpacted, post-thermal, and industrially impacted habitats. The data from these sites were also used in the development of the biotic index. In addition, macroinvertebrate multiplate data that were collected from SRS streams as part of other sampling programs were also used for validation of the biotic index.

3.0 SAMPLING METHODOLOGY

3.1 Hester-Dendy Multiplate Samplers

At each sampling location, five replicate Hester-Dendy multiplate samplers (Figure 3.1-1), each having a surface area of 0.179 m^2 were deployed and allowed to colonize for 28 days. The samplers were retrieved and returned to the laboratory for processing. In the laboratory, the samplers were disassembled and organisms were gently removed from the plates using a soft brush or a stream of water from a wash bottle. Organisms were preserved in 70% ethanol until identified. Organisms were identified to the lowest practical taxon (usually genus). Parameters reported included total number of taxa collected at each station, mean number of taxa per sampler, density of organisms (number per m^2), EPT (number of Ephemeroptera, Plecoptera, and Trichoptera taxa collected at a station), biotic index, ratio of scrapers to collector-filterers, biomass (g ash free dry weight/m^2), relative abundance of functional feeding groups, relative abundance of functional feeding group biomass, relative abundance of major taxonomic groups (usually Order), and a listing of all taxa which comprised greater than 5% of the macroinvertebrates collected at each station. The raw data for each station are presented in Appendix A.

At the time of sampler retrieval, physical and chemical measurements were taken at each station. Parameters included water hardness, pH, conductivity, dissolved oxygen, temperature, water velocity, stream width, and stream depth at one meter intervals across the stream (see Appendix A for physical/chemical data).

TABLE 4.1-1 (cont). SUMMARY OF HESTER-DENDY DATA, SEPTEMBER 1994

Parameter	Crouch Branch at Road 4	Tim's Branch at Road 2	Beaver Dam Creek at metal walkway	Fourmile Branch at Road C	Lower Three Runs at Road B	Indian Grave Branch at Road B	Pen Branch at Road A	Fourmile Branch at Road A-13.2
	Station 4	Station 5	Station 14	Station 7	Station 10	Station 12	Station 13	Station 15
	IND	IND	IND	IND	PT	PT	PT	PT
Total # of organisms	223	1535	450	1754	1943	2256	2001	1726
Total # of taxa	25	39	27	55	23	38	51	48
Mean #/sq. meter	249.2	1715.1	502.8	1959.8	2171.0	2520.7	2235.8	1928.5
Number of samplers	5	5	5	5	5	5	5	5
Mean # taxa/sampler	11.8	22.4	14.4	27.6	14.2	18.0	35.0	30.6
EPT	3	6	9	11	4	9	15	17
SC/CF	2.00	0.01	2.53	0.12	0.14	0.67	0.16	1.11
Biotic Index	8.46	6.64	4.86	6.92	7.60	7.73	6.50	5.63
Biomass (g/m2)	0.0409	0.0327	0.4422	0.0904	0.1012	0.3462	0.5365	0.3176
TAXA								
Hydra	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Hirudinea	0.00	0.00	0.00	0.00	39.99	0.04	0.00	0.00
Nemertea	0.00	0.13	0.00	2.79	0.46	2.26	2.45	0.81
Nematoda	0.90	0.00	0.00	0.00	0.00	0.00	0.35	0.12
Oligochaeta	17.94	3.65	3.56	13.00	0.00	71.81	25.04	4.69
Turbellaria	1.79	0.00	0.00	8.95	1.03	0.00	0.20	0.23
Bivalvia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gastropoda	1.35	0.07	1.11	0.11	0.05	0.53	0.55	0.00
Amphipoda	0.00	0.00	0.22	0.40	0.00	0.00	0.00	0.00
Decapoda	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydracarina	0.00	0.98	0.00	0.11	0.00	0.13	0.40	0.52
Ephemeroptera	2.24	0.39	73.33	1.37	0.41	1.06	14.29	44.67
Plecoptera	0.00	0.33	0.22	0.00	0.00	0.00	0.00	0.17
Trichoptera	0.00	0.07	11.78	0.91	0.93	0.80	24.09	12.63
Odonata	3.59	0.13	0.00	0.46	0.05	0.09	0.40	0.29
Coleoptera	0.00	2.08	1.56	0.91	0.05	0.04	4.60	1.97
Megaloptera	0.00	0.00	1.56	0.00	0.31	0.04	1.10	0.06
Lepidoptera	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00
Chironomini	56.05	11.92	2.22	11.29	40.40	10.06	1.10	3.88
Diamesinae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Orthocladiinae	0.45	17.72	2.00	3.19	7.36	1.24	12.94	4.00
Pseudochironomini	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
Tanypodinae	9.87	3.65	0.67	14.42	7.31	4.65	3.30	5.45
Tanytarsini	4.48	57.20	1.78	41.28	0.51	5.54	8.75	19.93
Other Diptera	0.90	1.69	0.00	0.74	1.13	1.68	0.30	0.52

IND - Receives industrial effluents
PT - Post-thermal

TABLE 4.1-1 (cont). SUMMARY OF HESTER-DENDY DATA, SEPTEMBER 1994

Parameter	Crouch Branch at Road 4	Tim's Branch at Road 2	Beaver Dam Creek at metal walkway	Fourmile Branch at Road C	Lower Three Runs at Road B	Indian Grave Branch at Road B	Pen Branch at Road A	Fourmile Branch at Road A-13.2
	Station 4	Station 5	Station 14	Station 7	Station 10	Station 12	Station 13	Station 15
	IND	IND	IND	IND	PT	PT	PT	PT
FUNCTIONAL GR.								
Collector-gatherer	78.48	62.93	54.67	66.19	88.68	88.70	56.62	55.97
Collector-filterer	1.35	25.54	11.78	4.85	1.90	1.33	27.39	14.25
Predator	16.59	6.71	2.44	27.82	9.16	7.45	8.60	8.69
Scraper	2.69	0.33	29.78	0.57	0.26	0.89	4.25	15.76
Shredder	0.00	4.50	1.11	0.40	0.00	1.24	0.50	0.98
Herbivore	0.90	0.00	0.22	0.17	0.00	0.40	2.65	4.35
FUNC. GR. BIOMASS								
Collector-gatherer	49.18	47.44	13.95	47.71	21.08	18.55	21.01	26.35
Collector-filterer	4.10	20.14	20.06	4.33	9.05	4.45	14.47	20.72
Predator	13.66	15.02	20.59	35.35	68.87	5.65	43.82	5.80
Scraper	7.38	2.73	26.12	6.43	0.99	4.26	10.29	29.41
Shredder	0.00	11.26	16.17	3.46	0.00	66.34	5.91	7.11
Herbivore	25.68	3.41	3.11	2.72	0.00	0.74	4.50	10.62

IND - Receives industrial effluents
PT - Post-thermal

3) total number of taxa and number of EPT (Ephemeroptera, Plecoptera, and Trichoptera) taxa;
4) proportional abundances of functional groups and functional group similarity to reference sites;
5) indicators of community balance including the North Carolina Biotic Index (NCBI, Lenat 1993), taxonomic similarity to reference sites, and a dominance index; 6) total density (no./m^2) and total biomass (g ash-free dry weight/m^2).

We selected the preceding variables on the basis of theoretical expectations, their use in other indices, and prior experience. We used the nonparametric, univariate Kruskal-Wallis test to determined if each of them significantly differed among stream orders (which would necessitate the development of stream order based criteria) and between impacted and unimpacted streams. We did not correct for the increased probability of Type I error associated with multiple tests because we viewed these tests as preliminary and exploratory.

We used the Pinkham and Pearson community similarity index (Pinkham and Pearson 1976, Plafkin et al. 1989) to measure community and functional group similarities between reference and ambient sites. For taxonomic group similarity, we calculated the average percent abundance at the subfamily, family, or ordinal level for the 15 most abundant taxa at the reference stations, then used the index to measure the similarity between these average abundances and the percent abundances at each station. Analogous procedures were used for functional group similarities.

The dominance index consisted of the percent contribution of the dominant taxa. The assumption is that high percent dominance by a single taxon indicates impairment (Plafkin et al. 1989, Barbour et al. 1992).

The North Carolina Biotic Index (NCBI) is a method for summarizing the pollution tolerances of the invertebrates collected from a sample site based on preassigned values reflecting sensitivity to organic and/or toxic materials (Lenat 1993). Index values range from one to 10 with lower scores indicating better water quality. We based the tolerance values for the macroinvertebrates in our streams on the tolerance values for North Carolina stream macroinvertebrates given by Lenat (1993).

As an additional test of the usefulness of the taxonomic data, we employed canonical discriminant analysis (CDA) to determine if the densities (no./m^2) of the 25 most abundant taxa could be used to distinguish among industrially impacted, post-thermal, and unimpacted streams. To better meet the criteria for multivariate normality, densities were log10(x+1) transformed prior to analysis. The significance of differences among sites was tested with the Wilk's Lambda, Pillai Trace, Hotelling-Lawley Trace, and Theta procedures ($P<0.05$).

We developed a multi-metric index employing a variety of assemblage level attributes following the general format presented by Karr et al. (1986) for fish and by Kerans and Karr (1994) for macroinvertebrates. Criteria for inclusion of a metric in the multi-metric index were that it accurately discriminated between impacted and unimpacted sites and was not highly redundant (Spearman $r>0.80$) with other metrics. Each metric was assigned a value of one, three, or five, and the biotic index was calculated by summing the scores for each metric. The score received for each metric was based on

stream types and are well known to be sensitive to environmental perturbations (see Lenat 1988, Kerans and Karr 1994, Karr et al. 1986).

2) Community balance variables. Community balance variables included percent Tanytarsini, percent Trichoptera, percent Ephemeroptera, and community similarity using the Pearson-Pinkham community similarity index. The first three variables accurately discriminated impacted from unimpacted streams, with percent Tanytarsini separating both industrially impacted and post-thermal streams from unimpacted streams, percent Trichoptera separating post-thermal streams from unimpacted streams, and percent Ephemeroptera separating industrially impacted streams from unimpacted streams. The similarity index provided an integrative comparison of overall taxonomic similarity between the impacted and unimpacted streams.

3) Community function variables. Functional group composition in both industrially impacted and post-thermal streams deviated from that in the unimpacted streams, although the types of deviations exhibited by the industrially impacted and post-thermal streams differed. Therefore, we employed the Pinkham-Pearson similarity index to compute the similarity between each station and the average functional group composition at the 15 unimpacted sites, an approach that would be sensitive to any type of deviation from the expected condition. We also included density as a community function variable since it is sensitive to changes in nutrient levels (resulting in increases) as well as the presence of toxicants (resulting in decreases). Since both unusually high and unusually low densities are indicative of disturbed conditions (Table 4.1-3), we expressed the average density at each station as a standard deviate (Sokal and Rohlf 1981) from the average density in the unimpacted streams.

Table 4.1-4 summarizes the index metrics and the scoring criteria for each metric. The criteria were somewhat arbitrary and chosen to maximize the separation between reference and impacted sites. There were other variables that significantly differed between impacted and unimpacted streams (Table 4.1-3) that were not included in the index because they were redundant (Spearman $r>0.80$) with the variables already in the index and/or because they failed to add to the index's ability to discriminate between impacted and unimpacted sites.

Spearman correlations among the eight variables included in the index ranged from 0.01 to 0.79. The highest correlations were between number of EPT taxa and total number of taxa (0.79), number of EPT taxa and percent Ephemeroptera (0.69), community similarity and number of taxa (0.60), number of EPT taxa and percent Trichoptera (0.59), and number of taxa and functional group similarity (0.56) indicating high to moderate redundancy among some metrics. However, we retained all of them in our index because they enhanced the ability of the index to discriminate between impacted and unimpacted sites.

4.1.2.4 Evaluation of the Index

Index values significantly ($P\leq0.001$) differed among unimpacted, industrially impacted, and post-thermal streams and overlapped very little between impacted and unimpacted streams (Figure 4.1-1). One relatively low index value (28) occurred at an ostensibly unimpacted site, probably because this site occasionally experienced low dissolved oxygen levels (2.0 mg/l)

TABLE 4.1-4 METRICS AND SCORING CRITERIA USED IN THE MACROINVERTEBRATE BIOTIC INDEX.

	Scoring criteria		
Metrics	1	3	5
Number of taxa	<35	35-45	>45
Standardized density[a]	>2.5	>1.5-2.5	≤1.5
Number EPT[b] taxa	<10	10-14	>15
Tanytarsini (%)	<10	10-25	>25
Trichoptera (%)	0 or >10		>0-10
Ephemeroptera (%)	<2	2-7	>7
Taxonomic similarity[c]	<0.25	0.25-0.45	>0.45
Functional group[d]	<0.45	0.45-0.55	>0.55

Individual metrics are assigned scores of one, three, or five. The biotic index is calculated by summing the scores for the individual metrics.

[a]Standardized density = |(X-M)/SD|: where X=density, M=average density for the unimpacted station (1309/m^2) and SD=standard deviation of the mean for the unimpacted stations (396/m^2).

[b]Ephemeroptera, Plecoptera, and Trichoptera.

[c]Similarity to the average taxonomic composition at the unimpacted stations (calculated with Pinkham and Pearson index)

[d]Similarity to the average functional group composition at the unimpacted stations (calculated with Pinkham and Pearson index)

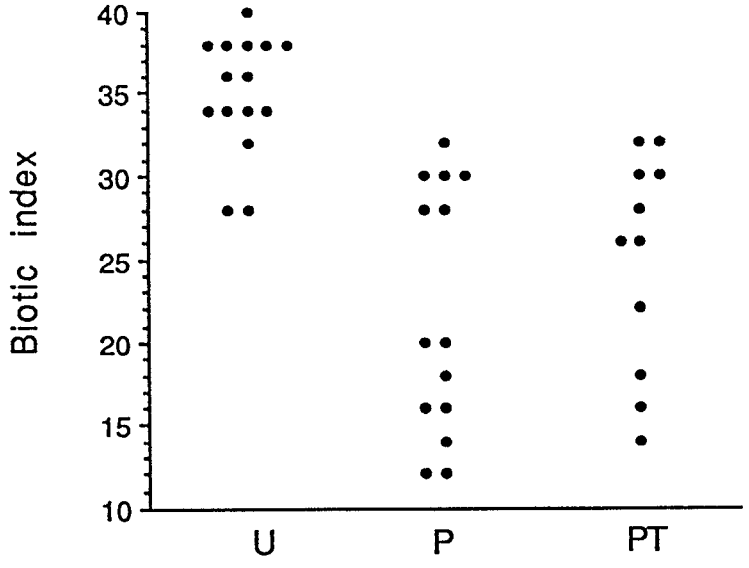

FIGURE 4.1-1. BIOTIC INDEX VALUES FOR MACROINVERTEBRATE DATA COLLECTED WITH MULTIPLATE ARTIFICIAL SUBSTRATES FROM UNIMPACTED (U), POST-THERMAL (PT) AND POLLUTED (P) STREAMS ON THE UPPER COASTAL PLAIN OF SOUTH CAROLINA.

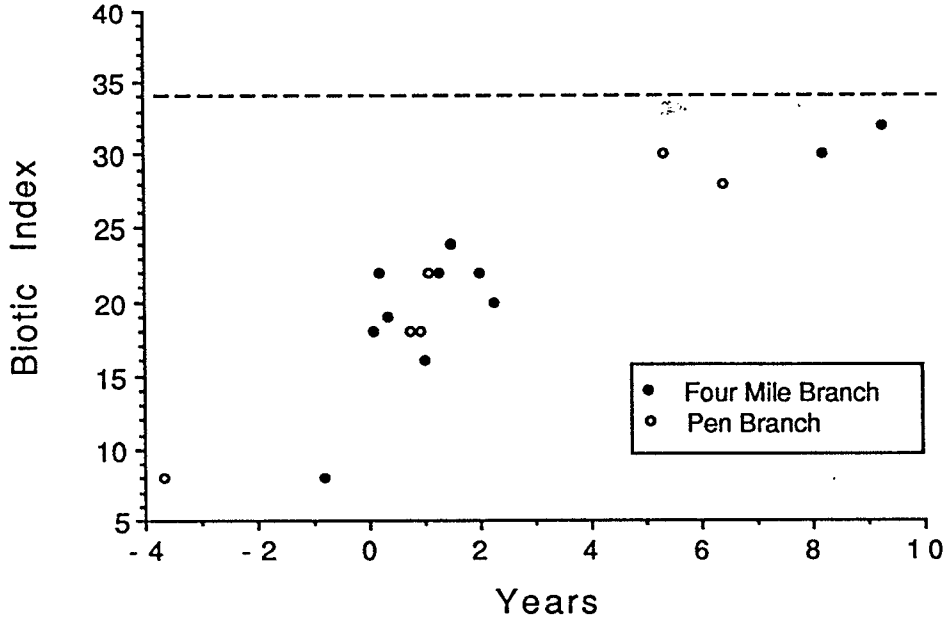

FIGURE 4.1-2. BIOTIC INDEX VALUES FOR MACROINVERTEBRATE DATA COLLECTED FROM TWO STREAMS ON THE UPPER COASTAL PLAIN OF SOUTH CAROLINA DURING AND AFTER THEY WERE IMPACTED BY RELEASES OF HIGH TEMPERATURE COOLING WATER FROM NUCLEAR REACTORS. ZERO ON THE X-AXIS DENOTES THE TIME AT WHICH THE REACTORS WERE SHUT DOWN. THE DOTTED LINE REPRESENTS TYPICAL MINIMUM BIOTIC INDEX VALUES FOR UNIMPACTED SITES.

for unknown reasons. The lowest index values (8-16) occurred in several of the industrially impacted streams, at sites that formerly received the most severe thermal impacts (Kondratieff and Kondratieff 1985), and at one stream station located immediately downstream from a reservoir.

Additional data were collected from two SRS streams (Pen Branch and Four Mile Branch) during and at various times after they received thermal reactor discharge (Lauritsen and Starkel 1989, Kondratieff and Kondratieff 1985). These data were not used in index development and represented conditions not included in the first data set (i.e., periods of thermal discharge and early recovery phases). Therefore, we used them to test the bioassessment methodology developed with the first data set. Index values from both streams were extremely low (8) when heated reactor cooling water was being discharged (Figure 4.1-2). After discharge ceased, index values in Four Mile Creek rose rapidly (within approximately one month) to 18-22 as macroinvertebrates recolonized the stream. However, they failed to increase above this level for the next two years because of low taxa richness, low taxonomic and functional group similarity to the unimpacted streams, and abnormally high densities. Even after eight to ten years had elapsed, index values had not reached levels typical of unimpacted streams (Figure 4.1-2). A similar recovery pattern was exhibited in Pen Branch, although fewer data were collected from this stream. The preceding patterns made sense considering the history of the streams and the types of damage they incurred and strengthened our confidence in the index as a useful assessment tool.

4.1.2.5 Discussion

Multi-metric indices reflecting community structure, community function, and community balance are an effective method of summarizing macroinvertebrate data for assessment purposes. Because they include a variety of metrics that are sensitive to different environmental perturbations, multi-metric indices reflect a wide range of chemical and physical impacts. For example, total number of taxa and number of EPT taxa were sensitive indicators of toxicity in the polluted streams but not of habitat alterations in the post-thermal streams. Conversely, percent abundance of Trichoptera and Tanytarsini were good indicators of habitat alterations in the post-thermal streams. Because the index included all of the preceding metrics, it effectively measured both types of impacts.

There are various factors to consider when choosing metrics to include in multi-metric indices. Ecological theory is important but empirical comparisons of impacted and unimpacted sites can sometimes identify useful metrics that might have been overlooked on the basis of apriori ecological considerations. For example, we found percent Trichoptera to be the best discriminator of impacted from post-thermal streams. In hindsight, we believe the ecological basis for this increased abundance of Trichoptera in post-thermal streams is that the trophic base in these streams has been altered. However, this link did not become obvious until empirical comparisons revealed large differences in the relative abundance of Trichoptera between unimpacted and post-thermal streams.

In addition to our index for streams in the upper coastal plain of South Carolina, two other multi-metric indices have recently appeared in the literature, one for rivers of the

Tennessee Valley (Kerans and Karr 1994) and one covering a larger geographic area (Oregon, Colorado, and Kentucky, Barbour et al. 1992). It is significant that all three indices contain similar categories of metrics although the specific metrics within each category usually differ (Table 4.1-5). The categories are community structure, community balance, and community function. Community structure metrics generally consist of taxa counts. Community balance metrics are of three types, proportional abundance of indicator groups (with unusually high or low abundances indicating degradation), taxonomic similarity indices which relate taxonomic composition to the taxonomic composition expected in unimpacted reference streams, and biotic indices (such as Hilsenhoff's index (1987) or the NCBI (Lenat, 1993)) that summarize tolerances of the organisms in the macroinvertebrate community. Community function metrics are of three types, proportional abundances of different functional feeding groups, functional group similarity indices that relate functional group composition to functional group composition in unimpacted streams, and measures of total organism abundance. The fact that these metrics have been tested and proven useful in several geographic areas indicates that they accurately represent basic aspects of community structure and function that change in response to habitat degradation.

While multi-metric indices often include the same categories of metrics, the specific metrics within each category usually differ (with the exception of total taxa richness and number of EPT taxa which seem to be of widespread applicability). As an example of differences, we found that the proportional abundances of Tanytarsini chironomids, Trichoptera, and Ephemeroptera were effective indicators of community balance in streams on the upper coastal plain of South Carolina. In contrast, Kerans and Karr (1994) found that the proportional abundances of *Corbicula*, Oligochaetes, and Chironomidae were good indicators of community balance in Tennessee Valley streams. Such differences result from the influence of ecoregion, stream size, habitat (e.g., pool vs. riffle) and sampling method (as a result of the biases associated with each method) on faunal composition and ecological processes. Therefore, metrics that are effective in one ecoregion/habitat combination may be ineffective in others. In summary, it is likely that multi-metric indices from different ecoregions (or for use with data collected by different methods) will include the same classes of metrics but (with some exceptions) not the same metrics. They will appear superficially different but measure the same things.

As previously noted, similarity indices are often included in multi-metric indices (see Plafkin et al. 1989 and Barbour et al. 1992 for more on the use of similarity indices). Taxonomic or functional group similarity is generally calculated between an individual reference site, chosen to be representative of unimpacted conditions, and each ambient site under evaluation. Where possible, we advocate that reference conditions be represented by average values for a number of unimpacted sites rather than a single site in order to accommodate variability among unimpacted sites. We found similarity indices to be particularly effective when degradation could be indicated by either positive or negative deviations from community attributes in unimpacted streams.

Most bioassessment protocols require that macroinvertebrates be collected from natural substrates. Collections may be restricted to certain habitats known to support types of invertebrates useful for bioassessment (e.g., riffles, see Hilsenhoff 1987) or

TABLE 4.1-5. METRICS INCLUDED IN THREE BIOTIC INDICES DEVELOPED FOR USE IN DIFFERENT GEOGRAPHIC AREAS.

South Carolina coastal plain streams (Specht and Paller)	Oregon, Colorado, and Kentucky streams (Barbour et al. 1992)	Tennessee Valley Rivers (Kerans and Karr 1994)
	Community structure	
Taxa richness	Taxa richness	Taxa richness
Number EPT taxa	Number EPT taxa	Number EPT taxa
		Number intolerant mussel species
		Sediment surface taxa richness
	Community balance	
% Tanytarsini	Hydropsychidae/ Trichoptera	% Corbicula
% Trichoptera	Hilsenhoff Biotic Index	% Oligochaetes
% Ephemeroptera	Quantitative similarity index	% Chironomids
Taxonomic similarity (Pinkham and Pearson)	Taxonomic similarity (Pinkham and Pearson)	Proportion in two dominant taxa
	Proportion in the dominant taxa	
	Dominants in common	
	Community function	
Functional group similarity (Pinkham and Pearson)	Scrapers/(scrapers & filterers)	% omnivores and scavengers
Total abundance (standardized)	Shredders/total	% detritivores
	Quantitative similarity index for functional groups	% shredders
		% collector-gatherers
		% collector-filterers
		% grazer-scrapers
		% predators
		Total abundance

may be apportioned among a variety of habitats to sample the full range of macroinvertebrate diversity in the reach under study (Lenat 1988). Using artificial substrates to collect macroinvertebrates (as we did) is more comparable to the former because artificial substrates tend to be selectively colonized by certain taxa (Rosenberg and Resh 1982). This is not necessarily problematical for bioassessment providing that the taxa that colonize the substrates are sensitive to environmental degradation. Our experience indicates that the invertebrates that colonize multi-plate artificial substrates comprise an assemblage that is highly sensitive to a variety of environmental impacts. There are a number of logistical factors to consider when comparing bioassessment protocols employing samples from artificial versus natural substrates. Samples from natural substrates must be collected by skilled personnel, while (after initial site selection by skilled personnel), artificial substrates can be deployed and retrieved by relatively unskilled workers. Artificial substrates generally require colonization times of several weeks for assemblage structure to stabilize while sampling from natural substrates may be completed in several hours or less (Hilsenhoff 1987, Plafkin et al. 1989). Sample processing time (sorting and identification) is also likely to differ between samples collected from natural and artificial substrates, depending upon the type and quantity of natural substrate that is sampled and the number of specimens that are processed.

A final issue that must be addressed is sampling variability. In this study, we pooled the samples from each station to generate better estimates of actual taxa richness (because of the species-area effect) and a complete species list. However, this practice provides no information on inter-replicate variability which is needed to statistically compare sites and determine the precision of measurement. As the next step in our development of macroinvertebrate bioassessment tools, we will analyze unpooled multi-plate sampler data with the objective of assessing the precision of the index values. This will necessitate the modification of scoring criteria for taxa richness and other metrics that are area dependent.

4.2 RBP II Protocol

The RBP II data are summarized in Tables 4.2-1 and 4.2-2. The intent of using the RBP II Protocol was to compare the results obtained to those of the RBP III Protocol, to see if the less intensive and less costly method would yield comparable results. For this reason, fewer locations were sampled using the RBP II methods. One unimpacted and four potentially impacted locations were sampled using this protocol. However, the location that was chosen to represent unimpacted conditions showed definite signs of impact using the RBP methods. Based on the fish and Hester-Dendy data from the station, as well as data collected during other studies, we do not believe this station to be impacted. However, since we had no other unimpacted RBP II data to use for comparisons with the impacted stations, no further analyses were conducted with this data set. However, a cursory comparison of the RBP II and RBP III data sets for the same locations (Table 4.2-3) shows fairly good agreement for most of the metrics.

4.3 RBP III Protocol

The data collected using the RBP III methods were analyzed using the methods described in Section 3.2.2. Because the RBP methods require specific comparisons

TABLE 4.2-1 SUMMARY STATISTICS FOR RBP II DATA

	Tinker Creek at Kennedy Pond Road	Rosemary Creek, 2 km downstream from a sanitary treatment plant	Crouch Branch at Road E	Fourmile Branch at Road C	Indian Grave Branch at Raod B
	STATION 3	STATION 1	STATION 4	STATION 7	STATION 12
STREAM ORDER	2	1	1	2	1
IMPACT STATUS	Unimpacted	San. Waste	Industrial	Industrial	Post-Thermal
Taxa Richness	25	16	11	24	23
Number of Specimens	126	181	82	144	192
EPT Index	5	8	0	2	11
EPT Abundance	11	80	0	3	59
Chironomidae Taxa	3	3	2	4	4
Chironomidae Abundance	39	47	7	59	98
EPT/Chironomidae Abundance	0.28	1.7	0	0.05	0.6
North Carolina Biotic Index	7.1	5.71	8.7	6.28	5.86
Scraper/Collector Filterers	0.36	a	0.50	3.01	0.15
Shredders/Total	0.02	0.01	0	0	0.05
Percent Dominant Taxon	22.22	22.1	67.07	14.58	31.77
Number Of Dominant Taxa	5	4	2	7	5
Percent Collector-Filterers	8.73	0	2.44	0.69	20.83
Percent Collector-Gatherers	51.59	65.19	71.95	42.36	61.98
Percent Predators	28.57	3.87	17.07	47.92	8.85
Percent Herbivores	5.56	26.52	2.44	6.94	0.52
Percent Scrapers	3.17	3.31	1.22	2.08	3.13
Percent Shredders	2.38	1.1	0	0	4.69
Percent Composition					
Hydracarina	0.79	0	0	1.39	1.04
Amphipoda	0.79	0	0	7.64	0
Hirudinea	0	0	0	0	0
Oligochaeta	22.22	0	67.07	5.56	4.17
Coelenterata	0	0	0	Coe	0
Coleoptera	0	1.66	0	1.39	1.56
Decapoda	4.76	26.52	2.44	2.78	0.52
Chironomini	16.67	3.31	4.88	9.03	31.77
Other Diptera	3.17	0	1.22	1.39	8.85
Orthocladiinae	0	0	0	2.78	5.73
Tanypodinae	10.32	2.21	3.66	14.58	4.69
Tanytarsini	3.97	20.44	0	14.58	8.85
Ephemeroptera	7.94	43.09	0	2.08	13.02
Heteroptera	0.79	0	0	0	0
Isopoda	0	0	0	0.69	0
Lepidoptera	0	0	0	4.17	0
Mollusca, Bivalvia	8.73	0	1.22	0	0
Megaloptera	2.38	0	0	0	0
Mollusca, Gastropoda	3.17	0	1.22	0.69	0
Nematoda	3.97	0	4.88	3.47	0
Nemertea	0.79	0	1.22	0	0
Odonata	7.94	1.66	12.2	13.19	1.56
Plecoptera	0.79	0.55	0	0	4.69
Trichoptera	0	0.55	0	0	13.02
Turbellaria	0.79	0	0	13.89	0.52

[a]Could not be calculated, since CF=0.

TABLE 4.2-2. DOMINANT TAXA AT EACH STATION, RBP II

	Tinker Creek at Kennedy Pond Road	Rosemary Creek, 2 km downstream from a sanitary treatment plant	Crouch Branch at Road E	Fourmile Branch at Road C	Indian Grave Branch at Raod B
	STATION 3	STATION 1	STATION 4	STATION 7	STATION 12
STREAM ORDER	2	1	1	2	1
IMPACT STATUS	Unimpacted	San. Waste	Industrial	Industrial	Post-Thermal
EPHEMEROPTERA					
Caenidae		21.55			
Leptophlebiidae		4.97			
Siphlonuridae	5.56				
Tricorythidae		11.05			
TRICHOPTERA					
Hydropsychidae					11.46
ODONATA					
Coenagrionidae			10.98	10.42	
DIPTERA					
Tanytarsini		20.44		14.58	8.85
Chironomini	16.67		4.88	9.03	31.77
Tanypodinae	10.32		3.66	14.58	
Orthocladiinae					5.73
Simuliidae					8.85
CRUSTACEA					
Palaemonidae		22.10			
MOLLUSCA					
Sphaeriidae	8.73				
WORMS					
Nemertea			4.88		
Oligochaeta	22.22		67.07		
Turbellaria				13.89	

TABLE 4.2-3. SUMMARY STATISTICS FOR RBP II AND III

	RBP II	RBP III		RBP II	RBP III		RBP II	RBP III		RBP II	RBP III		RBP II	RBP III
	Mill Creek at Road E-2	Mill Creek at Road E-2		Crouch Branch at Road 4	Crouch Branch at Road 4		Fourmile Branch at Road C	Fourmile Branch at Road C		Indian Grave Branch at Road B	Indian Grave Branch at Road B		Rosemary Creek, 2 km below sanitary plant	Rosemary Creek, 2 km below sanitary plant
	Station 3	Station 3		Station 4	Station 4		Station 7	Station 7		Station 12	Station 12		Station 1	Station 1
Stream Order	2	2		1	1		2	2		1	1		3	3
Impact Status	U	U		IND	IND		IND	IND		PT	PT		SAN	SAN
Taxa Richness	25	30		11	5		24	24		23	26		16	25
Number of Specimens	126	154		82	40		144	166		192	189		181	162
EPT Index	5	6		0	0		2	1		11	7		8	7
EPT Abundance	11	14		0	0		3	3		59	99		80	46
Chironomidae Taxa	3	10		2	1		4	8		4	7		3	6
Chironomidae Abundance	39	41		7	2		59	41		98	25		47	12
EPT/Chironomidae Ab.	0.28	0.34		0.00	0.00		0.05	0.07		0.60	3.96		1.70	3.83
Scraper/CF	0.36	0.46		0.50	a		3.01	1.50		0.15	0.13		a	1.25
Shredders/Total	0.02	0.03		0.00	0.00		0.00	0.00		0.05	0.01		0.01	0.00
NC Biotic Index	7.10	7.33		8.70	8.06		6.28	7.43		5.86	6.42		5.71	6.29
Percent Dominant Taxon	22.22	35.06		67.07	80.00		14.58	17.37		31.77	47.09		22.10	32.10
Number Of Dominant Taxa	5	4		2	4		7	6		5	5		4	5
Percent Collector-Filterers	8.73	7.14		2.44	0.00		0.69	1.20		20.83	4.23		0.00	14.81
Percent Collector-Gatherers	51.59	61.69		71.95	80.00		42.36	43.71		61.98	70.37		65.19	24.07
Percent Predators	28.57	23.38		17.07	15.00		47.92	48.50		8.85	21.16		3.87	7.41
Percent Herbivores	5.56	1.30		2.44	0.00		6.94	4.79		0.52	2.65		26.52	35.19
Percent Scrapers	3.17	3.25		1.22	5.00		2.08	1.80		3.13	0.53		3.31	18.52
Percent Shredders	2.38	3.25		0.00	0.00		0.00	0.00		4.69	1.06		1.10	0.00

U - Unimpacted
SAN - Receives treated sanitary effluent
IND - Receives industrial effluents
PT - Post-thermal

TABLE 4.2-3 (cont.). SUMMARY STATISTICS FOR RBP II AND III

	RBP II	RBP III		RBP II	RBP III		RBP II	RBP III		RBP II	RBP III		RBP II	RBP III
	Mill Creek at Road E-2	Mill Creek at Road E-2		Crouch Branch at Road 4	Crouch Branch at Road 4		Fourmile Branch at Road C	Fourmile Branch at Road C		Indian Grave Branch at Road B	Indian Grave Branch at Road B		Rosemary Creek, 2 km below sanitary plant	Rosemary Creek, 2 km below sanitary plant
	Station 3	Station 3		Station 4	Station 4		Station 7	Station 7		Station 12	Station 12		Station 1	Station 1
Stream Order	2	2		1	1		2	2		1	1		3	3
Impact Status	U	U		IND	IND		IND	IND		PT	PT		SAN	SAN
Percent Composition														
Hydracarina	0.79	0.00		0.00	0.00		1.39	1.80		1.04	0.00		0.00	0.00
Amphipoda	0.79	1.30		0.00	0.00		7.64	12.57		0.00	5.82		0.00	0.00
Hirudinea	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00
Oligochaeta	22.22	35.06		67.07	80.00		5.56	17.37		4.17	7.41		0.00	1.85
Coelenterata	0.00	0.00		0.00	0.00		0.69	0.00		0.00	0.00		0.00	0.00
Coleoptera	0.00	1.30		0.00	0.00		1.39	0.00		1.56	0.00		1.66	0.62
Decapoda	4.76	1.30		2.44	0.00		2.78	0.60		0.52	0.53		26.52	35.19
Chironomini	16.67	8.44		4.88	0.00		9.03	2.99		31.77	4.76		3.31	2.47
Other Diptera	3.17	7.14		1.22	0.00		1.39	0.00		8.85	1.06		0.00	0.00
Orthocladiinae	0.00	0.00		0.00	0.00		2.78	0.00		5.73	0.00		0.00	0.00
Tanypodinae	10.32	7.14		3.66	5.00		14.58	11.38		4.69	2.65		2.21	3.70
Tanytarsini	3.97	11.04		0.00	0.00		14.58	10.18		8.85	5.82		20.44	1.23
Ephemeroptera	7.94	8.44		0.00	0.00		2.08	1.80		13.02	49.74		43.09	24.07
Heteroptera	0.79	0.00		0.00	0.00		0.00	0.00		0.00	0.53		0.00	0.00
Isopoda	0.00	0.00		0.00	0.00		0.69	0.00		0.00	0.00		0.00	0.00
Lepidoptera	0.00	0.00		0.00	0.00		4.17	4.19		0.00	0.53		0.00	0.00
Mollusca, Bivalvia	8.73	6.49		1.22	0.00		0.00	0.60		0.00	0.00		0.00	10.49
Megaloptera	2.38	0.00		0.00	0.00		0.00	1.20		0.00	0.00		0.00	0.62
Mollusca, Gastropoda	3.17	1.95		1.22	5.00		0.69	1.20		0.00	0.53		0.00	12.35
Nematoda	3.97	4.55		4.88	0.00		3.47	0.00		0.00	0.53		0.00	0.00
Nemertea	0.79	0.00		1.22	0.00		0.00	0.00		0.00	0.00		0.00	0.00
Odonata	7.94	4.55		12.20	10.00		13.19	16.77		1.56	11.64		1.66	3.09
Plecoptera	0.79	0.00		0.00	0.00		0.00	0.00		4.69	0.00		0.55	0.00
Trichoptera	0.00	0.65		0.00	0.00		0.00	0.00		13.02	2.65		0.55	4.32
Turbellaria	0.79	0.65		0.00	0.00		13.89	17.37		0.52	5.82		0.00	0.00

U - Unimpacted
SAN - Receives treated sanitary effluent
IND - Receives industrial effluents
PT - Post-thermal

between an unimpacted and impacted location for calculating one of the parameters (community loss), mean values for the unimpacted stations as a group could not be used as they were with the multiplate data. We chose the Meyer's Branch station (Station 9) as a reference station to which all other stations were compared. Meyer's Branch was chosen because of its known history as a high-quality stream and because when sampled using the RBP III methods, it had the greatest number of taxa (46) and greatest number of EPT taxa (15) of any of the stations that were sampled. Table 4.3-1 contains a summary of the results of the RBP III data, while Table 4.3-2 contains a list of the dominant taxa that were collected using the RBP III sampling methods. The RBP III ratings are presented in Table 4.3-3.

4.3.1 Data Overview

At the unimpacted stations (excluding fourth-order stream, Upper Three Runs) the total number of taxa collected with RBP III ranged from 26 at Pen Branch Road B to 46 in Meyer's Branch; EPT ranged from 5 to 15 taxa, and North Carolina Biotic Index values ranged from 5.62 in Meyer's Branch to 7.33 in Mill Creek. The percent abundance for the most dominant taxon ranged from 13.2 in Meyer's Branch to 35.1 in Mill Creek. EPT/Chironomid abundance varied widely, ranging from 0.34 in Mill Creek to 2.14 at Pen Branch Road B. Scraper/Collector-filterer ratios varied from 0.12 to 0.50. Shredders were collected in low numbers at all of the stations, ranging from 2 to 4% of the organisms collected.

At the stations that were influenced by industrial discharges, slightly fewer taxa were collected (24 to 32), except at Crouch Branch, where only five taxa were found. The number of EPT taxa was also lower at most locations, ranging from 0 to 7. North Carolina Biotic Index values ranged from 5.31 at Beaver Dam Creek to 8.06 at Crouch Branch. The percent abundance for the most dominant taxon was much higher at Crouch Branch (80%), than at the other three industrial stations, where the values (17.4 to 36.5) were fairly comparable to the values at the unimpacted stations. EPT/Chironomid Abundance (0 to 10.61) and Scraper/Collector-filterer ratios (0.05 to 0.69) both varied more at the industrial stations that at the unimpacted stations. Shredders comprised 0 to 3% of the organisms collected. The number of taxa collected at the post-thermal stations (23 to 31) and EPT (2 to 7) were similar to the data from the industrial stations. Biotic index values ranged from 6.9 to 7.26.

4.3.2 RBP Scores

As discussed in Section 3.2, eight metrics are used in the RBP III method. For each of the eight metrics, a station can receive a score of 0, 2, 4, or 6, with a score of 6 indicating equivalency to the reference station. For the eight metrics combined, a station can receive a maximum total of 48 points. The number of points that a station receives is then divided by 48, (the number of points that the reference station automatically receives), and the results are expressed as a percentage value. These values are then compared to those in a table of ranges (Table 4.3-4), and assigned ratings of not impaired, slightly impaired, moderately impaired, or severely impaired.

When compared to Meyer's Branch, all of the other unimpacted stations received ratings of "slightly impaired", with scores ranging from 54.2% for Mill Creek to 70.8% for

TABLE 4.3-1. SUMMARY DATA FOR RBP III

	Tinker Creek at Kennedy Pond Road	Mill Creek at Road E-2	Upper Three Runs at Road C	Pen Branch at Road C	Meyer's Branch at Road 9	Pen Branch At Road B	Rosemary Creek, 2 km downstream from sanitary treatment plant	Rosemary Creek, just downstream from sanitary treatment plant
	Station 2	Station 3	Station 6	Station 8	Station 9	Station 11	Station 1	Station 16
Stream Order	3	2	4	2	3	2	3	2
Impact Status	U	U	U	U	U	U	SAN	SAN
Taxa Richness	37	30	21	39	46	26	25	40
Number of Specimens	214	154	234	203	197	236	162	244
EPT Index	10	6	5	10	15	5	7	12
EPT Abundance	79	14	92	50	80	62	46	93
Chironomidae Taxa	13	10	4	10	11	5	6	15
Chironomidae Abundance	108	41	33	60	46	29	12	120
EPT/Chironomidae Abundance	0.73	0.34	2.79	0.83	1.74	2.14	3.83	0.78
North Carolina Biotic Index	5.92	7.33	6.40	6.60	5.62	6.85	6.29	5.95
Scraper/CF	0.50	0.27	0.14	0.30	0.23	0.12	0.07	0.49
Shredders/Total	0.02	0.03	0.00	0.04	0.04	0.03	0.00	0.03
Percent Dominant Taxon	17.76	35.06	36.75	13.79	13.20	27.97	32.10	11.89
Number Of Dominant Taxa	6.00	4.00	5.00	6.00	7.00	5.00	5.00	8.00
Percent Collector-Filterers	19.16	7.14	4.70	29.06	14.21	13.98	14.81	26.64
Percent Collector-Gatherers	59.35	61.69	52.99	41.38	55.84	60.59	24.07	51.64
Percent Predators	12.15	23.38	13.25	20.69	10.66	15.68	7.41	11.89
Percent Herbivores	2.80	1.30	2.99	0.00	9.64	5.51	35.19	1.64
Percent Scrapers	4.21	3.25	26.07	4.93	5.58	1.69	18.52	5.33
Percent Shredders	2.34	3.25	0.00	3.94	4.06	2.54	0.00	2.99

U - Unimpacted
SAN - Receives treated sanitary effluent

TABLE 4.3-1 (cont.). SUMMARY DATA FOR RBP III

	Tinker Creek at Kennedy Pond Road	Mill Creek at Road E-2	Upper Three Runs at Road C	Pen Branch at Road C	Meyer's Branch at Road 9	Pen Branch At Road B	Rosemary Creek, 2 km downstream from sanitary treatment plant	Rosemary Creek, just downstream from sanitary treatment plant
	Station 2	Station 3	Station 6	Station 8	Station 9	Station 11	Station 1	Station 16
Impact Status	U	U	U	U	U	U	SAN	SAN
Percent Composition								
Hydracarina	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00
Amphipoda	0.93	1.30	1.28	0.00	0.00	0.00	0.00	0.41
Hirudinea	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.41
Oligochaeta	1.40	35.06	5.56	13.79	11.68	27.97	1.85	0.00
Coleoptera	0.00	1.30	2.14	4.43	4.57	1.27	0.62	0.82
Decapoda	1.87	1.30	0.00	0.00	9.64	5.51	35.19	4.10
Chironomini	17.29	8.44	5.98	9.36	9.14	2.97	2.47	8.61
Other Diptera	0.93	7.14	0.85	3.94	1.52	0.00	0.00	2.87
Orthocladiinae	0.47	0.00	0.00	0.00	0.00	0.00	0.00	13.52
Tanypodinae	5.61	7.14	2.56	4.43	3.55	2.97	3.70	2.87
Tanytarsini	27.10	11.04	5.56	15.76	10.66	6.36	1.23	24.18
Ephemeroptera	35.05	8.44	38.03	11.33	26.90	23.31	24.07	18.44
Heteroptera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lepidoptera	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00
Mollusca, Bivalvia	1.40	6.49	0.43	6.40	2.03	12.29	10.49	2.05
Megaloptera	0.00	0.00	0.00	0.49	0.51	0.00	0.62	0.00
Mollusca, Gastropoda	0.47	1.95	25.21	1.97	2.03	1.69	12.35	0.00
Nematoda	0.47	4.55	0.00	1.48	0.00	1.69	0.00	0.82
Odonata	4.67	4.55	8.55	13.30	3.55	11.02	3.09	1.23
Plecoptera	0.47	0.00	0.00	0.00	1.02	0.00	0.00	7.38
Trichoptera	1.40	0.65	1.28	13.30	12.69	2.97	4.32	12.30
Turbellaria	0.47	0.65	1.28	0.00	0.00	0.00	0.00	0.00

U - Unimpacted
SAN - Receives treated sanitary effluent

TABLE 4.3-1 (cont.). SUMMARY DATA FOR RBP III

	Crouch Branch at Road 4	Tim's Branch at Road 2	Fourmile Branch at Road C	Beaver Dam Creek at metal walkway	Lower Three Runs at Road B	Indian Grave Branch at Road B	Pen Branch at Road A	Fourmile Branch at Road A-13.2
	Station 4	Station 5	Station 7	Station 14	Station 10	Station 12	Station 13	Station 15
Stream Order	1	2	2	1	3	1	2	3
Impact Status	IND	IND	IND	IND	PT	PT	PT	PT
Taxa Richness	5	32	24	28	23	26	31	29
Number of Specimens	40	274	166	274	257	189	256	329
EPT Index	0	4	1	7	2	7	6	7
EPT Abundance	0	13	3	191	13	99	33	34
Chironomidae Taxa	1	12	8	8	6	7	11	9
Chironomidae Abundance	2	188	41	18	76	25	95	143
EPT/Chironomidae Abundance	0.00	0.07	0.07	10.61	0.17	3.96	0.35	0.24
North Carolina Biotic Index	8.06	6.91	7.43	5.31	6.90	6.42	7.26	7.16
Scrapers/Collector Filterers	0.05	0.69	0.25	0.07	0.30	0.13	0.37	0.43
Shredders/Total	0.00	0.02	0.00	0.03	0.00	0.01	0.01	0.01
Percent Dominant Taxon	80.00	24.82	17.37	36.50	34.24	47.09	21.88	25.84
Number Of Dominant Taxa	4.00	3.00	6.00	4.00	6.00	5.00	6.00	5.00
Percent Collector-Filterers	0.00	17.52	1.20	1.46	38.13	4.23	8.59	3.04
Percent Collector-Gatherers	80.00	54.74	43.71	44.53	26.85	70.37	72.27	74.47
Percent Predators	15.00	21.30	48.50	11.31	27.24	21.16	9.77	18.24
Percent Herbivores	0.00	3.65	4.79	2.92	1.17	2.65	4.30	2.74
Percent Scrapers	5.00	0.00	1.80	37.23	6.61	0.53	4.30	0.30
Percent Shredders	0.00	2.19	0.00	2.55	0.00	1.06	0.78	1.22

IND - Receives industrial effluents
PT - Post-thermal

TABLE 4.3-1 (cont.). SUMMARY DATA FOR RBP III

	Crouch Branch at Road 4	Tim's Branch at Road 2	Fourmile Branch at Road C	Beaver Dam Creek at metal walkway	Lower Three Runs at Road B	Indian Grave Branch at Road B	Pen Branch at Road A	Fourmile Branch at Road A-13.2
	Station 4	Station 5	Station 7	Station 14	Station 10	Station 12	Station 13	Station 15
Impact Status	IND	IND	IND	IND	PT	PT	PT	PT
Percent Composition								
Hydracarina	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.91
Amphipoda	0.00	4.01	12.57	0.00	0.00	5.82	5.86	18.24
Hirudinea	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00
Oligochaeta	80.00	2.19	17.37	9.12	8.95	7.41	21.88	15.20
Coleoptera	0.00	2.55	0.00	1.82	1.56	0.00	1.17	0.00
Decapoda	0.00	3.65	0.60	2.19	1.17	0.53	2.34	0.61
Chironomini	0.00	17.52	2.99	2.55	17.90	4.76	14.06	7.60
Other Diptera	0.00	4.01	0.00	0.00	0.39	1.06	0.39	0.30
Orthocladiinae	0.00	1.46	0.00	0.36	0.00	0.00	1.56	0.61
Tanypodinae	5.00	7.66	11.38	2.19	10.51	2.65	2.73	8.51
Tanytarsini	0.00	41.97	10.18	1.46	1.17	5.82	18.75	26.75
Ephemeroptera	0.00	2.92	1.80	67.52	4.67	49.74	10.94	7.29
Heteroptera	0.00	0.00	0.00	0.00	0.00	0.53	0.39	0.00
Lepidoptera	0.00	0.00	4.19	0.73	0.00	0.53	0.39	0.30
Mollusca, Bivalvia	0.00	0.00	0.60	0.36	36.19	0.00	6.25	2.13
Megaloptera	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00
Mollusca, Gastropoda	5.00	0.00	1.20	0.73	1.95	0.53	4.30	0.00
Nematoda	0.00	1.09	0.00	0.00	5.06	0.53	1.95	0.91
Odonata	10.00	9.12	16.77	8.03	5.45	11.64	5.08	3.65
Plecoptera	0.00	1.82	0.00	0.00	0.00	0.00	0.00	0.00
Trichoptera	0.00	0.00	0.00	2.19	0.39	2.65	1.95	3.04
Turbellaria	0.00	0.00	17.37	0.36	4.67	5.82	0.00	3.95

IND - Receives industrial effluents
PT - Post-thermal

TABLE 4.3-2 DOMINANT TAXA, RBP III

	Mill Creek at Road E-2	Pen Branch at Road C	Pen Branch at Road B	Tinker Creek at Kennedy Pond Road	Meyer's Branch at Road 9	Upper Three Runs at Road C	Crouch Branch at Road 4	Beaver Dam Creek at metal walkway	Tim's Branch at Road 2	Fourmile Branch at Road C	Lower Three Runs at Road B	Indian Grave Branch at Raod B	Pen Branch at Road A	Fourmile Branch at Road A-13.2	Rosemary Creek, 2 km below sanitary plant	Rosemary Creek, just below sanitary plant
	STA 3	STA 8	STA 11	STA 2	STA 9	STA 6	STA 4	STA 14	STA 5	STA 7	STA 10	STA 12	STA 13	STA 15	STA 1	STA 16
STREAM ORDER	2	2	2	3	3	4	1	1	2	2	3	1	2	3	3	2
IMPACT STATUS	U	U	U	U	U	U	I	I	I	I	PT	PT	PT	PT	SAN	SAN
Acerpenna				14.95												
Baetis						36.75		6.93				47.07	8.98			
Caenis				5.61												
Ephemerella																6.97
Hexagenia															8.64	
Neoephemera			5.93													
Stenonema								36.50							6.17	
Tricorythodes			12.71		13.20			23.20								
Cheumatopsyche		6.90														9.02
Argia							7.50					8.99				
Enallagma		9.85				6.41	2.50	4.01								
Rheotanytarsus				17.76					17.15							11.89
Tanytarsus	10.39	10.84	5.08	8.88	9.14				24.82	9.58			17.58	25.84		11.89
Polypedilum		8.37		12.15	6.09	5.98			13.50		16.34		11.72	6.38		8.20
Ablabesmyia										7.19	5.45			6.69		
Conchapelopia									4.38		5.06					
Labrundinia							5.00									
Ceratopogonidae	5.19															
Palaemonetes					8.63										32.10	
Amphipoda										12.57		5.82	5.86	18.24		
Corbicula											34.24					
Sphaerium	6.49		11.86										5.86		6.79	
Campeloma															11.73	
Hydrobiidae						24.79										
Planorbidae							5.00									
Nemertea	4.55															
Oligochaeta	35.06	13.79	27.97		11.68	5.56	80.00	9.12		17.37	8.95	7.41	21.88	15.20		
Turbellaria										17.37		5.82				

TABLE 4.3-3. RBP III RATINGS, ALL STATIONS vs. MEYER'S BRANCH

	Tinker Creek at Kennedy Pond Road	Mill Creek at Road E-2	Pen Branch at Road C	Pen Branch at Road B	Crouch Branch at Road 4	Tim's Branch at Road 2	Fourmile Branch at Road C	Beaver Dam Creek at Metal Walkway	Lower Three Runs at Road B	Indian Grave Branch at Road B	Pen Branch at Road A	Fourmile Branch at Road A-13.2	Rosemary Creek, 2 km below sanitary plant	Rosemary Creek, just below sanitary plant
STATION	ST. 2	ST. 3	ST. 8	ST. 11	ST. 4	ST. 5	ST. 7	ST. 14	ST. 10	ST. 12	ST. 13	ST. 15	ST. 1	ST. 16
Impact Status	U	U	U	U	IND	IND	IND	IND	PT	PT	PT	PT	SAN	SAN
Taxa Richness	6	4	6	2	0	4	2	4	2	2	4	4	2	6
NCBI	6	4	4	4	2	4	4	6	4	6	4	4	6	6
Sc/CF	6	6	4	2	6	0	6	6	4	2	6	2	6	6
EPT/Chir	2	0	2	6	0	0	0	6	0	6	0	0	6	2
%Dominant	6	2	6	4	0	4	6	2	2	0	4	4	2	6
EPT	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Comm. Loss	4	4	4	4	0	4	4	4	2	4	4	4	4	4
Shredder/Total	4	6	6	6	0	4	0	6	0	2	2	2	0	6
Total	34	26	32	28	8	20	22	34	14	22	24	20	26	39
Total/Ref (48)*	70.8%	54.2%	66.7%	58.3%	16.7%	41.7%	45.8%	70.8%	29.2%	45.8%	50.0%	41.7%	54.2%	81.2%
Rating	Slightly impaired	Slightly impaired	Slightly impaired	Slightly impaired	Severely Impaired	Mod. Impaired	Mod. Impaired	Slightly impaired	Mod. Impaired	Mod. Impaired	Mod. Impaired	Mod. Impaired	Slightly impaired	Slightly impaired

*All Stations are compared to Meyer's Branch (Station 9)
U - Unimpacted
SAN - Receives treated sanitary effluent
IND - Receives industrial effluent
PT - Post-thermal

TABLE 4.3-4. RBP III SCORING CRITERIA

METRIC	BIOLOGICAL CONDITION SCORING CRITERIA			
	6	4	2	0
Taxa Richness	>80%	60-80%	40-60%	<40%
Biotic Index	>85%	70-85%	50-70%	<50%
Scraper/CF	>50%	35-50%	20-35%	<20%
EPT/Chironomidae	>75%	50-75%	25-50%	<25%
% Dominant Taxon	<20%	20-30%	30-40%	>40%
EPT Index	>90%	80-90%	70-80%	<70%
Community Loss Ind.	<0.5	0.5-1.5	1.5-4.0	>4.0
Shredders/Total	>50%	35-50%	20-35%	<20%

% Comparison to Reference Score	
>83%	Non-impaired
54-79%	Slightly Impaired
21-50%	Moderately Impaired
<17%	Severely Impaired

Source: Plafkin et al. (1989)

Tinker Creek at Kennedy Pond Road (Table 4.3-3). Somewhat surprisingly, Station 16 on Rosemary Creek, which is located immediately downstream from a sanitary treatment plant received a higher rating (81.2%) than any of the reference stations. The more downstream station on Rosemary Creek also received a relatively high rating of 54.2%. Beaver Dam Creek, which is impacted by elevated temperatures, coal ash, and treated sanitary waste also received a relatively high rating of 70.8%, which was the same rating as the highest rated unimpacted reference station. All of the post-thermal sampling locations and all but one of the locations that receives industrial effluents received ratings of "moderately impaired", with scores ranging from 29.2 to 50.0%. Only Crouch Branch received a rating of "severely impaired", with a score of just 16.7%.

These results suggest that although the RBP III method is capable of detecting impacts, it is also capable of erroneously concluding that there is impact at unimpacted locations. This error could possibly be corrected by adjusting the values for "unimpacted" in Table 4.3-4 slightly lower, although this could come at the expense of failing to detect impact at other stations, as well. The RBP scoring system groups stations into very broad categories, with stations receiving values of 29 and 50 both being rated as "moderately impaired". This weakness could be corrected by increasing the number of rating categories. The RBP method is also capable of not detecting impact, when a stream is impacted, as evidenced by the relatively high rating for Beaver Dam Creek. This station received the highest rating possible for four of the eight metrics, due in part to the dominance by a genus of tolerant mayfly.

4.3.3 Statistical Analysis of RBP Metrics and Selected Other Metrics

The values of each of the eight metrics used in computing the RBP scores were compared for unimpacted and impacted stations using the Kruskal-Wallis test. Comparisons included: all unimpacted vs. all impacted stations and all unimpacted vs. industrial vs. post-thermal stations (Table 4.3-5). In addition to the eight metrics used in the RBP III methods, we performed statistical comparisons of six additional metrics to assess their utility in detecting impact. these metrics included changes in predator abundance, percent abundance of four groups of chironomids, and a ratio of two groups of generally sensitive chironomids (Tanytarsini and Orthocladiinae) to two groups of relatively tolerant chironomids (Tanypodinae and Chironomini). We focused on metrics that emphasized changes chironomid groups primarily because the dominance of chironomids in southeastern coastal plain streams. Although Station 16 on Rosemary Branch was originally grouped with the impacted stations, due to its proximity to the sanitary treatment plant, both the multiplate and RBP data suggest that this station is not impacted or is only minimally impacted. Therefore the Kruskal-Wallis tests were repeated without including the data from Station 16 (Table 4.3-6). The statistical results indicate that of the eight metrics used in the RBP index, only two (shredder/total, and possibly taxa richness) are significantly different between the unimpacted and unimpacted stations. We believe that the shredder/total metric results may be an anomaly, since shredders are not very abundant in our streams and comprised < 4% of the organisms collected using the RBP III methods. Due to the paucity of shredders, very small differences could result in differences that were statistically significant.

These results suggest that although each of the metrics alone is not very useful in detecting changes in the macroinvertebrate community, together, the eight metrics are reasonably good at detecting gross differences among macroinvertebrate communities, although as discussed in Section 4.3.2, in our study the RBP III detected impact when there was none, and also failed to detect much impact at one station that was moderately to severely perturbed.

Two of the six additional metrics that we tested (% Tanytarsini and % Orthocladiinae) performed as well as most of the eight RBP metrics (Tables 4.3-5 and 4.3-6). The addition of these two metrics to the RBP III suite of metrics, and elimination of the Scraper/Collector metric, which had significance values close to 1.0, should result in a stronger test that is more useful in southeastern coastal plain streams.

4.4 Comparison of RBP III and Hester-Dendy Data

A comparison of the Hester-Dendy data and the RBP III data indicates that almost without exception, fewer taxa and fewer EPT taxa were collected with the RBP III methods. We also found that at some stations, the RBP data suggested impacts where there probably were none. For example, the Hester-Dendy data for Mill Creek at Road E-2 show no evidence of impact, while the RBP III data for this location indicate that fewer total taxa and EPT taxa were collected at this station that three of the other five unimpacted stations and the biotic index value was 7.33 (Table 4.3-1), which strongly suggests that this location was impacted. In contrast, the station on Beaver Dam Creek that was clearly impacted, but contained high numbers of one genus of

TABLE 4.3-5 PROBABILITY VALUES FOR SIGNIFICANT DIFFERENCES OF KRUSKAL-WALLIS TESTS ON RBP III METRICS (INCLUDING STATION 16 - ROSEMARY CREEK JUST BELOW A SANITARY TREATMENT PLANT)

Parameter	Unimpacted vs. Impacted	Unimp. vs. Industrial vs. Post-thermal
Taxa Richness	0.075*	0.172
NCBI	0.391	0.590
Sc/CF	0.951	0.717
EPT/Chironomidae	0.391	0.590
% Dominant	0.270	0.533
EPT	0.155	0.314
Community Loss		-
Shredder/Total	0.010*	0.023*
Percent Predators	1.000	0.298
Chironomid Ratio[a]	0.668	0.898
%Tanypodinae	1.000	0.613
%Tanytarsini	0.391	0.677
%Chironomini	0.462	0.403
%Orthocladiinae	0.214	0.395

*Marginally significant
** Significantly different at p=0.05
[a](Tanytarsini + Orthocladiinae)/(Tanypodinae + Chironomini)

TABLE 4.3-6 PROBABILITY VALUES FOR SIGNIFICANT DIFFERENCES OF KRUSKAL-WALLIS TESTS ON RBP III METRICS (EXCLUDING STATION 16 - ROSEMARY CREEK JUST BELOW A SANITARY TREATMENT PLANT)

Parameter	Unimpacted vs. Impacted	Unimp. vs. Industrial vs. Post-thermal
Taxa Richness	0.033**	0.102
NCBI	0.317	0.421
Sc/CF	1.000	0.987
EPT/Chironomidae	0.386	0.634
% Dominant	0.125	0.198
EPT	0.079*	0.214
Community Loss		
Shredder/Total	0.006**	0.021**
Percent Predators	0.841	0.373
Chironomid Ratio[a]	0.423	0.503
%Tanypodinae	0.739	0.676
%Tanytarsini	0.257	0.418
%Chironomini	0.463	0.298
%Orthocladiinae	0.312	0.600

*Marginally significant
** Significantly different at p=0.05
[a](Tanytarsini + Orthocladiinae)/(Tanypodinae + Chironomini)

tolerant mayfly scored only "slightly impacted" using the RBP III methods. However, both methods found the same taxon to be dominant at this station.
Although some of the differences may be due to the naturally patchy distribution of macroinvertebrates, and to limited numbers of replicates, it appears that the RBP III methods are less than ideally suited for use in coastal plain streams, which do not havethe riffle-run habitat for which the protocol was designed. However, we have developed a biotic index that can be used with multiplate data that appears to be very useful in detecting impacted macroinvertebrate communities in southeastern coastal plain streams.

5.0 CONCLUSIONS

In general, the data from the Hester-Dendy multiplate samplers were more sensitive at detecting impacts than were the RBP data. A Biotic Index for the Hester-Dendy data was developed which incorporated eight community structure, function, and balance parameters. When tested using a data set that was unrelated to the data set that was used in developing the Biotic Index, the index was very successful at detecting impact.

We also evaluated the sensitivity of the RBP methods in detecting impact in coastal plain streams. Of the eight metrics used, only one was statistically significant in detecting differences between impacted and unimpacted streams. Although, the eight metrics combined were able to detect some degree of impact at most impacted stations, at several sampling stations they erroneously detected impact when none was present (based on other macroinvertebrate and fisheries data, and operational data that indicate that absence of SRS activities upstream of the at locations that we believe to be unimpacted). Detecting impact when none is present is a serious shortcoming, and indicates that RBP results should be interpreted with extreme caution if used in southeastern coastal plain streams. We evaluated six additional metrics for possible incorporation into the RBP index. Four of the metrics did not detect differences between impacted and unimpacted locations, while the remaining two were as sensitive as most of the RBP metrics in detecting impacts.

In conclusion, the Biotic Index that we developed for use with the Hester-Dendy multiplate data appears to provide a better means of detecting impacts to stream macroinvertebrate communities in southeastern coastal plain streams than the EPA Rapid Bioassessment Protocol methods.

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APPENDIX A

MACROINVERTEBRATE DATA

RESULTS OF MACROINVERTEBRATE SAMPLING AT SELECTED SAVANNAH RIVER SITE LOCATIONS AUGUST/SEPTEMBER 1994 SUBCONTRACT NO.AA86028N

SUBMITTED TO:
WESTINGHOUSE SAVANNAH RIVER COMPANY
AIKEN, SOUTH CAROLINA

DECEMBER 1994

SUBMITTED BY:

SHEALY ENVIRONMENTAL SERVICES, INC.
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SCDHEC LABORATORY CERTIFICATION NO. 26103

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PART I

Part 1. INTRODUCTION

This report presents the results of the August-September 1994 macroinvertebrate samplingconducted by SHEALY ENVIRONMENTAL SERVICES, INC., as specified under section 5.2 of WESTINGHOUSE SAVANNAH RIVER COMPANY subcontract number AA86028N. A total of 15 sampling sites on 10 streams were included in this study. The study utilized five replicate Hester-Dendy multiplate samples and a UNITED STATES ENVIRONMENTAL PROTECTION AGENCY Rapid Bioassessment Protocol (RBP) III collection at all of the 15 sampling sites. An additional RPB Protocol II sampling was conducted at five sampling sites.

The report contains the results of the identification, enumeration and summary statistics for each of the 15 sampling sites as well as the ash free dry weight data of the functional feeding groups inhabiting Hester-Dendy samplers and the physicochemical data collected in conjunction with the macroinvertebrate sampling. The report is divided into eight parts. Part II presents the methods and materials used in the Hester-Dendy, physicochemical and rapid bioassessment sampling. Part III presents the physicochemical data and the stream cross-sectional profiles.

Part IV presents the Hester-Dendy sampler data for each location. Data is presented in four tables for each site. The first table gives of the taxa identified and the number of specimens collected for the five replicate samples. Table 2 presents the summary statistics, including the taxa richness, the EPT index, the biotic index and the relative abundance of the major taxonomic

groups and the functional feeding groups. Table 3 is a list of taxa collected. Table 4 is a list of the dominant taxa collected. Part V presents the ash free dry weight data for functional feeding groups. Part VI presents the results of the RBP II sampling conducted on Rosemary Creek, Mill Creek, Four Mile Creek at Road C, Crouch Branch and Indian Grave Branch. The tolerance values utilized in the biotic index were obtained from Hilsenhoff (1988) and Plafkin et al. (1989). Part VII presents the results of the RBP III sampling. Part VIII presents the results of the RBP III site comparisons between the two sampling sites on Four Mile Creek (stations 7 and 15) and for the three Pen Branch sites (stations 8,11 and 13). The results of these three parts are arranged in five tables. The first table in each section presents the taxa list and the number of specimens collected. Table 2 presents the taxa richness, EPT index, relative abundance of the functional feeding groups and similarity indices calculated when appropriate. The tolerance values utilized in the biotic index calculated for these samples were obtained from Lenat (1993). Table 3 presents the relative abundance data for the major taxonomic groups and the functional feeding groups in the riffle-run sample and of the functional feeding groups of the CPOM sample. Table 4 presents the taxa list. Table 5 presents the dominant taxa and their relative abundance.

PART II. MATERIALS AND METHODS

Section I. PHYSICOCHEMICAL MEASUREMENTS

Physicochemical parameters were measured at midstream and mid-depth at the time of Hester-Dendy retrieval and are presented in Table 1. Conductivity was measured using a Yellow Springs Instruments Model 57 meter checked for accuracy utilizing standard solutions of 98.5, 1000 and 10,000 μmhos/cm. Dissolved oxygen and temperature were determined using a Yellow Springs Instruments Model 33 meter and

pH with an Orion model SA210 meter. A separate water sample was collected and returned to the laboratory for determination of total hardness by EPA method 130.2. Stream width and depth measurements were taken at each sampling location in order to construct stream cross-section profiles. Depth was measured at 10 equidistant points for streams greater than five meters wide and at 50 cm intervals for streams less than five meters wide. Water velocity was measured at each point where depth was measured and at mid-channel using a Swoffer model 2100 flow meter.

SECTION II. HESTER-DENDY MULTIPLATE SAMPLING

Hester-Dendy multiplate samplers consisting of 14 square masonite plates measuring 7.6 cm x 7.6 cm x 0.3 cm separated by 0.3 cm thick nylon spacers were utilized for this part of the study and are illustrated in Figure 1. Five replicate samplers were suspended 0.5 m below the water surface at each sampling location and allowed to colonized for 29-30 days. Samplers were removed from the stream by slowly lifting the sampler to just below the surface where a 0.5 mm

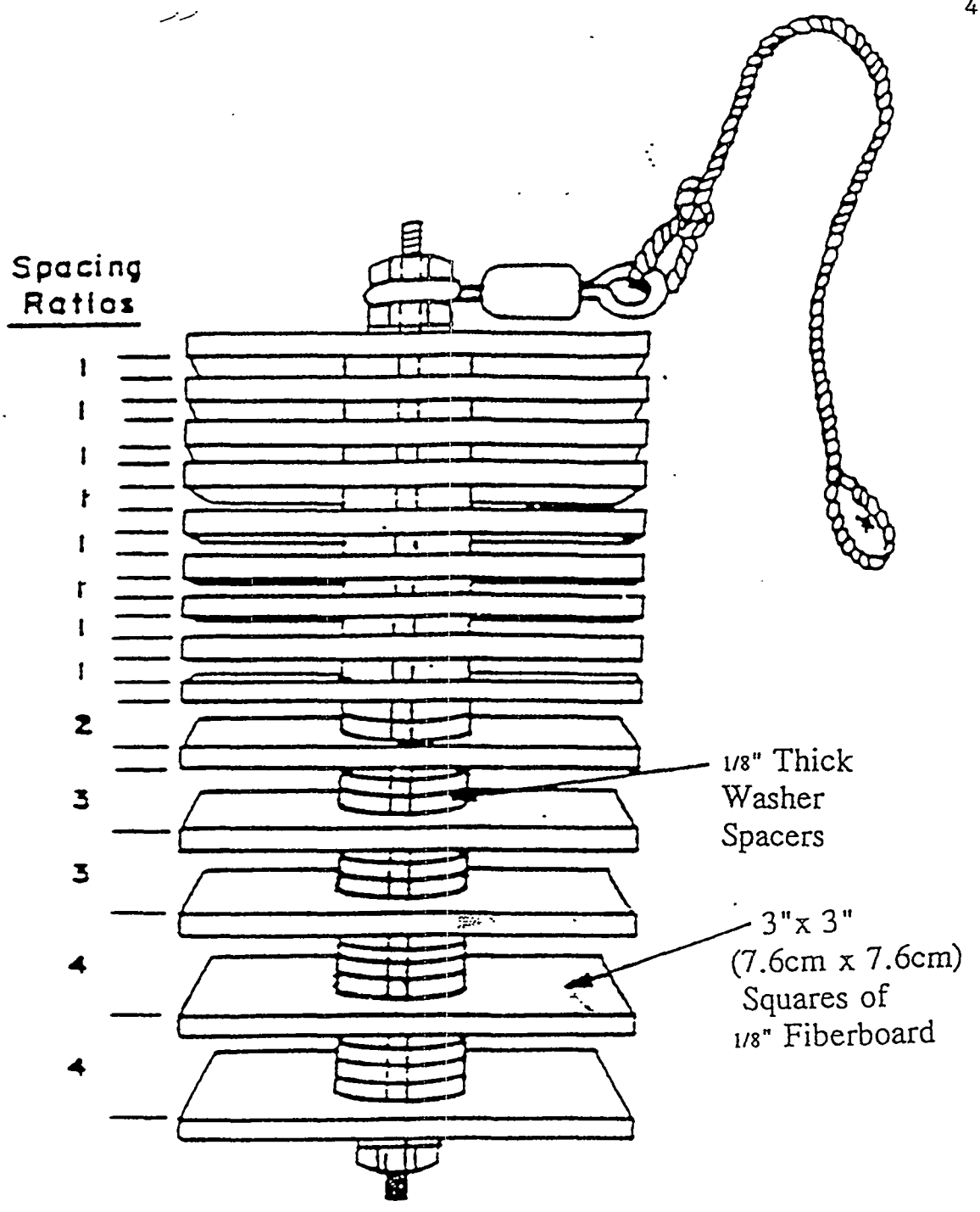

Figure 1. Diagram of Hester-Dendy Multiplate Sampler used in this study.

mesh dipnet was placed under the sampler in order to prevent the loss of dislodged organisms. Once removed, the sampler was placed in a labelled plastic bag and preserved with 10% formalin until processed in the laboratory. In the laboratory, each sampler was disassembled, the plates washed with a soft brush, and there moved material rinsed through a U.S. Standard No. 30 sieve (0.6 mm mesh). The material retained on the sieve was then preserved with 70% ethanol stained with rose bengal.The macroinvertebrates were sorted from the remaining debris using a stereomicroscope, identified to the lowest positive taxon and enumerated. Quality control checks were performed on 10% of the samples in order to insure a sorting efficiency of greater than 90%. After the organisms were enumerated, they were separated into functional feeding groups following Merritt and Cummins(1984), dried at 105°C, weighed to the nearest milligram and then ashed at 500°C. Ash free dry weight was determined by weighing the remaining ash to the nearest milligram and determining the difference between the dry weight and ash weight.

SECTION III. RAPID BIOASSESSMENT PROCEDURES

Qualitative collections of macroinvertebrates were made utilizing the USEPA rapid bioassessment protocol II and III(Plafkin et al. (1989) which focus primarily on evaluating riffle-run or other hard surface habitats, supplemented with a separate coarse particulate organic matter (CPOM) sample. Samples were collected using a standard D-frame aquatic dipnet, placed in labelled plastic bags and preserved with 10% formalin. Upon return to the laboratory the samples were cleaned of large objects, washed through a U.S. Standard No. 30 sieve and then preserved with 70% ethanol stained with rose bengal. Samples were sorted in white developing

trays which had a grid drawn on the bottom dividing the sample into 1/8 subsamples. The samples were picked until approximately 200 organisms were removed and the subsampled area recorded.

Comparison of the macroinvertebrate community composition was based on the metrics outlined in the USEPA rapid bioassessment protocols (Plafkin et al. 1989).

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Merritt, R.W. and K.W. Cummins, eds. 1984. An introduction to the aquatic insects of North America, 2nd ed. Kendall/Hunt Publishing, Dubuque, IA.

Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Grossand, R.M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers. USEPA Assessment and Watershed Protection Division, Washington, D.C. EPA/444/4-89/001.

PART III

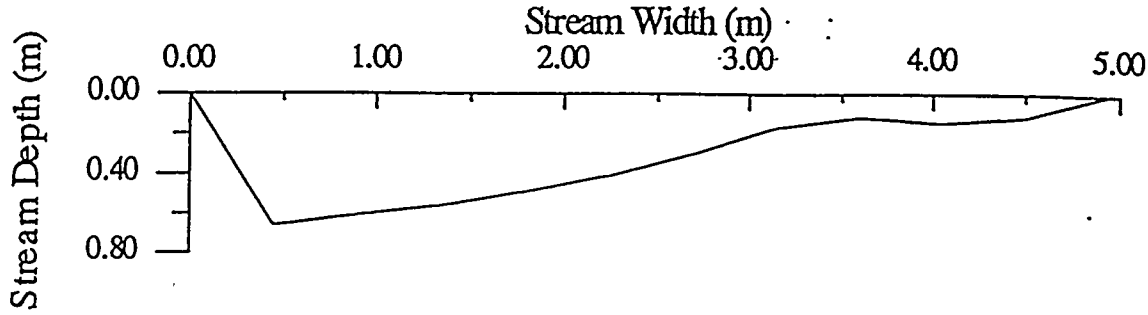
Physicochemical measurements taken in conjunction with the Hester-Denty Macroinvertebrate study at the Savannah River Site, August- September, 1994. Measurements made on sampler retrieval date.

Station #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Placement Date	8/22/94	8/22/94	8/22/94	8/22/94	8/22/94	8/22/94	8/22/94	8/22/94	8/23/94	8/24/94	8/24/94	8/22/94	8/24/94	8/23/94	8/23/94
Retrieval Date	10/20/94	10/20/94	10/20/94	10/20/94	10/20/94	10/20/94	10/20/94	10/20/94	10/20/94	10/20/94	10/21/94	10/21/94	10/21/94	10/21/94	10/21/94
Hardness (mg/l)	12.7	<10.0	23.3	14.2	<10.0	<10.0	<10.0	20.7	16.2	20.2	19.2	12.8	14.7	14.4	<10.0
pH (SU)	7.23	7.44	7.59	7.00	7.24	7.20	6.95	7.24	7.60	6.99	7.78	7.50	7.44	7.35	7.26
Conductivity (umhos/cm)	48.3	26.6	49.3	119.0	98.3	24.0	74.1	53.2	42.0	66.5	117.0	99.8	95.5	103.0	60.2
DO (mg/l)	8.0	7.4	8.5	5.4	7.4	8.0	4.9	7.7	8.3	6.6	7.9	7.6	7.5	6.6	8.0
Temperature (C)	17.0	17.8	17.5	20.0	18.2	19.0	21.0	19.0	19.5	23.5	19.5	22.5	22.0	28.5	20.5
Flow (m/s) mid channel	0.08	0.13	0.04	0.00	0.29	0.40	0.08	0.00	0.50	0.23	0.17	0.24	0.33	0.59	0.16
Flow (m/s) mean (N)	0.05(10)	0.12(10)	0.02(10)	0.00(1)	0.18(3)	0.34(10)	0.05(10)	0.00(3)	0.16(8)	0.13(10)	0.13(10)	0.14(10)	0.16(10)	0.44(10)	0.10(10)
Stream Width (m)	4.94	8.99	6.16	0.91	2.07	15.64	7.25	1.16	4.05	5.18	3.38	12.12	10.61	4.82	13.11
(meters from left bank) Depth															
Depth 1	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0	(0) 0
Depth 2	(0.3) 0.66	(0.8) 0.27	(0.6) 0.46	(0.3) 0.12	(0.3) 0.49	(1.4) 0.82	(0.7) 0.67	(0.9) 0.61	(0.5) 0.23	(0.5) 0.09	0.6) 0.60	(1.1) 0.30	(1.0) 0.52	(0.4) 0.09	(1.2) 0.37
Depth 3	(0.9) 0.61	(1.6) 0.46	(1.0) 0.73	(0.5) 0.27	(0.5) 0.46	(2.8) 0.76	(1.3) 0.73	(1.9) 0.58	(0.9) 0.46	(0.9) 0.21	(1.1) 0.09	(2.2) 0.55	(1.9) 0.40	(0.8) 0.40	(2.4) 0.58
Depth 4	(1.3) 0.56	(2.5) 0.52	(1.7) 0.91	(0.8) 0.06	(1.0) 0.43	(4.3) 0.70	(2.0) 0.91	(2.9) 0.34	(1.3) 0.61	(1.4) 0.29	(1.7) 0.15	(3.3) 0.67	(2.9) 0.34	(1.2) 0.37	(3.6) 0.49
Depth 5	(1.8) 0.49	(3.3) 0.64	(2.3) 1.01	(0.9) 0	(1.3) 0.34	(5.7) 0.76	(2.6) 1.16	(3.8) 0	(1.8) 0.67	(1.9) 0.34	(2.3) 0.12	(4.4) 0.70	(3.9) 0.46	(1.6) 0.49	(4.8) 0.52
Depth 6	(2.5) 0.41	(4.1) 0.61	(2.8) 0.82		(1.5) 0.15	(7.1) 0.91	(3.3) 1.16		(2.3) 0.53	(2.3) 0.37	(2.8) 0.15	(5.5) 0.70	(4.8) 0.52	(2.0) 0.46	(5.9) 0.43
Depth 7	(2.7) 0.30	(4.9) 0.61	(3.4) 0.79		(2.0) 0	(8.5) 0.79	(4.0) 1.16		(2.7) 0.37	(2.8) 0.37	(3.4) 0	(6.6) 0.73	(5.8) 0.61	(2.4) 0.37	(7.1) 0.37
Depth 8	(3.1) 0.17	(5.7) 0.70	(3.9) 0.67			(9.9) 0.70	(4.6) 1.13		(3.1) 0.30	(3.3) 0.37		(7.7) 0.79	(6.7) 0.61	(2.8) 0.34	(8.3) 0.43
Depth 9	(3.6) 0.12	(6.6) 0.73	(4.5) 0.67			(11.3)0.67	(5.3) 1.10		(3.6) 0.23	(3.8) 0.34		(8.8) 0.73	(7.7) 0.70	(3.2) 0	(9.6) 0.52
Depth 10	(4.0) 0.15	(7.4) 0.67	(5.1) 0.70			(12.8)0.61	(5.9) 1.01		(4.1) 0	(4.2) 0.24		(9.9) 0.46	(8.7) 0.73		(10.7)0.61
Depth 11	(4.5) 0.12	(8.2) 0.40	(5.6) 0.18			(14.2)0.30	(6.6) 0.98			(4.7) 0.12		(11.0)0.27	(9.6) 0.61		(11.9)0.52
Depth 12	(4.9) 0	(9.0) 0	(6.2) 0			(15.6) 0	(7.3) 0			(5.2) 0		(12.1) 0	(10.6) 0		(13.1) 0

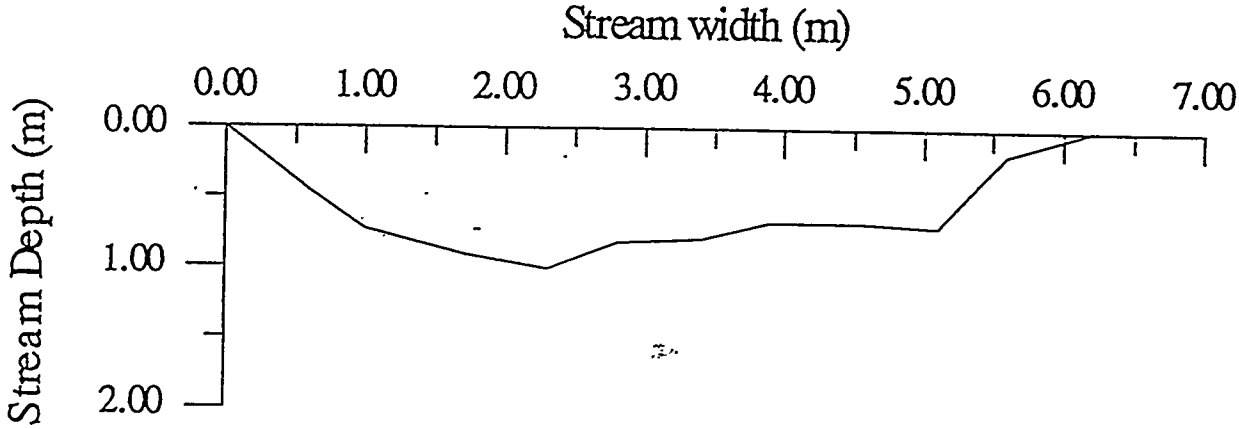
Physicochemical measurements taken in conjunction with the Hester-Denty Macroinvertebrate study at Rosemary Creek downstream of Williston WWTP. 17 December 1994. Measurements made on sampler retrieval date.

Rosemary Creek Station 16	
Downstream Williston WWTP	
Placement Date	Nov. 16, 1994
Retrieval Date	Dec. 17, 1994
Hardness (mg/l)	92.5
pH (SU)	6.69
Conductivity (umhos/cm)	45
DO (mg/l)	9.1
Temperature (C)	12.5
Flow (m/s) Mid Channel	0.18
Stream Width (m)	4.08
(meters from left bank) Depth	
Depth 1	(0.0) 0
Depth 2	(0.51) 0.30
Depth 3	(1.02) 0.24
Depth 4	(1.53) 0.18
Depth 5	(2.04) 0.24
Depth 6	(2.55) 0.18
Depth 7	(3.06) 0.27
Depth 8	(3.57) 0.21
Depth 9	(4.08) 0

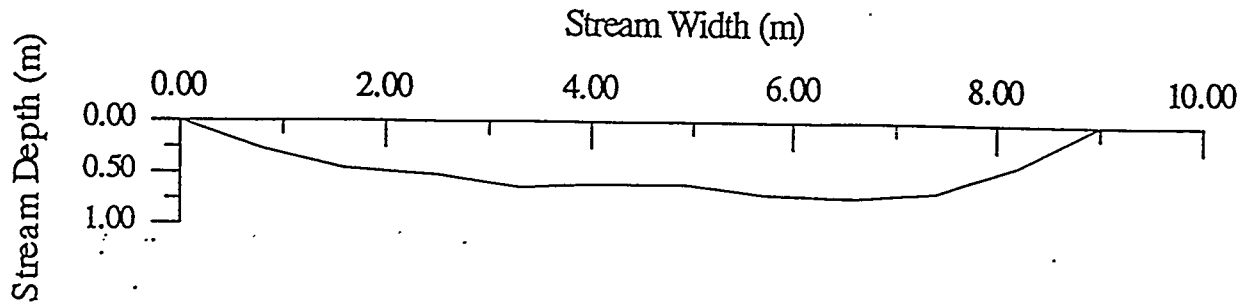
Station 1. Rosemary Creek near Rosemary Chruch



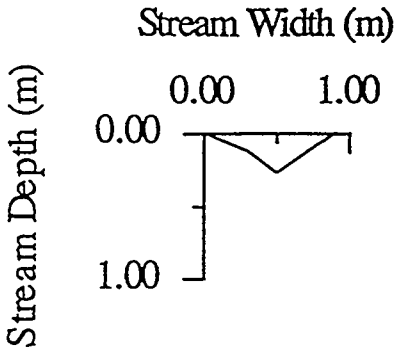
Station 3. Mill Creek @ Rd. E-2.



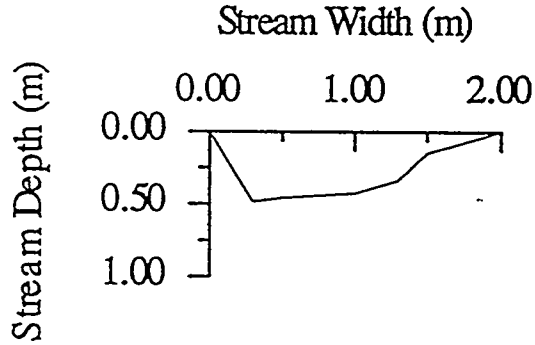
Station 2. Tinker Cr. @ Kennedy's Pond Rd.



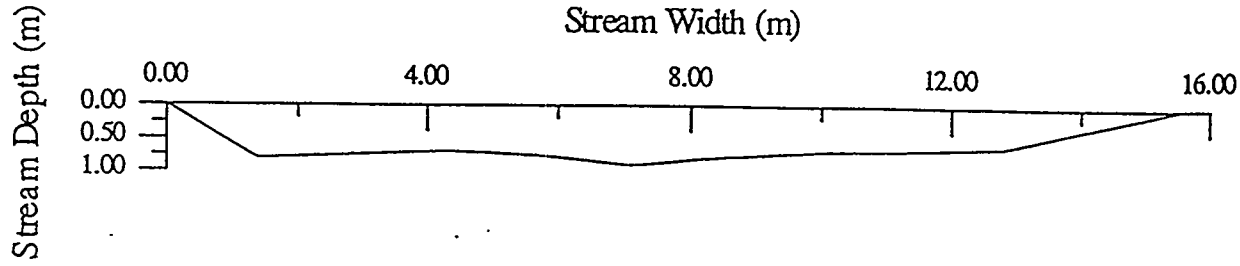
Station 4. Crouch Branch @ Rd. 4.



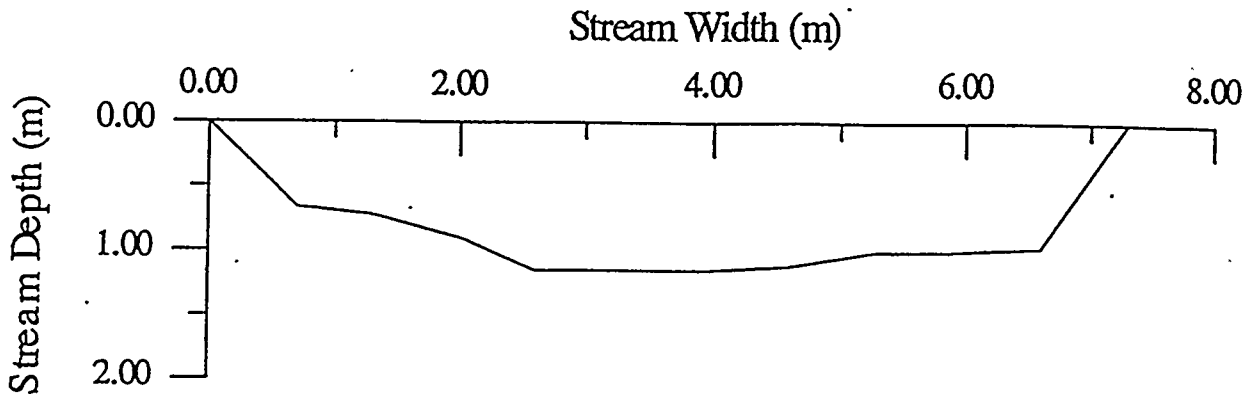
Station 5. Tims Branch @ Rd. 2.



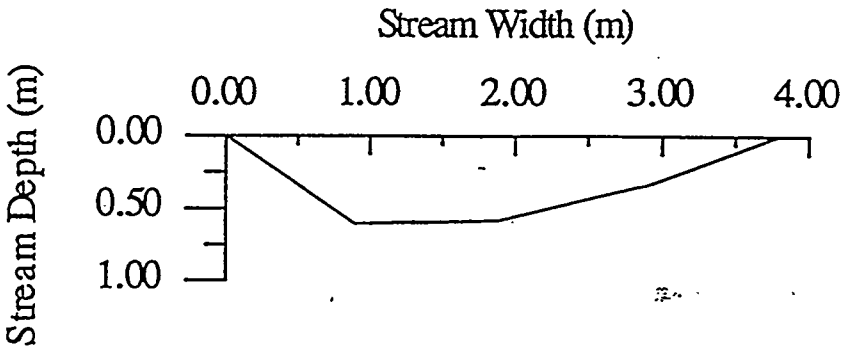
Station 6. Upper Three Runs Cr. @ Rd. C



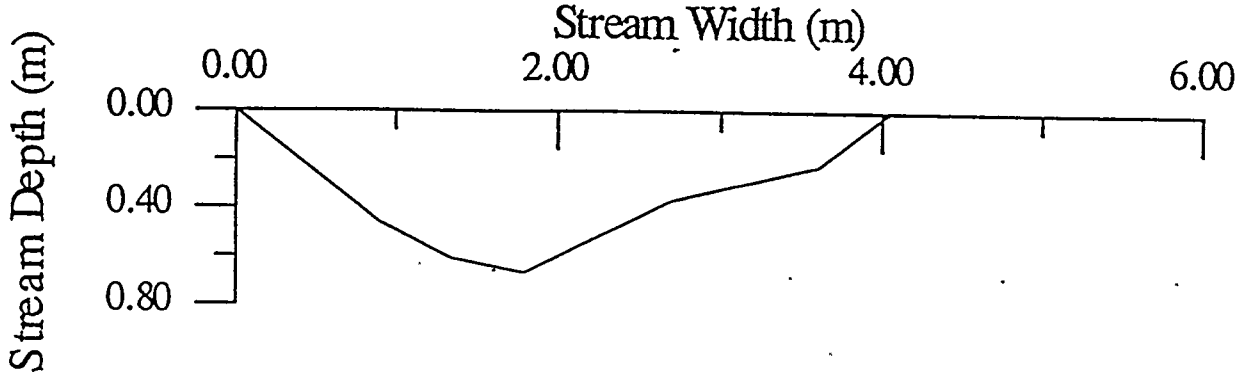
Station 7. Four Mile Creek @ Rd. C.



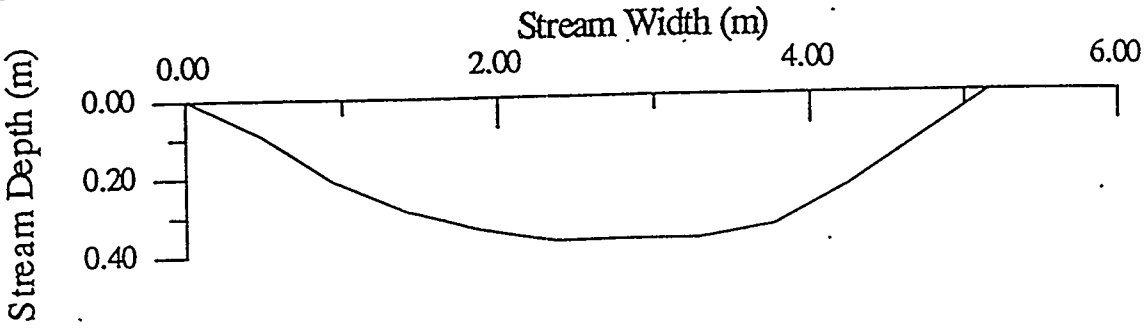
Station 8. Pen Branch @ Rd. C.



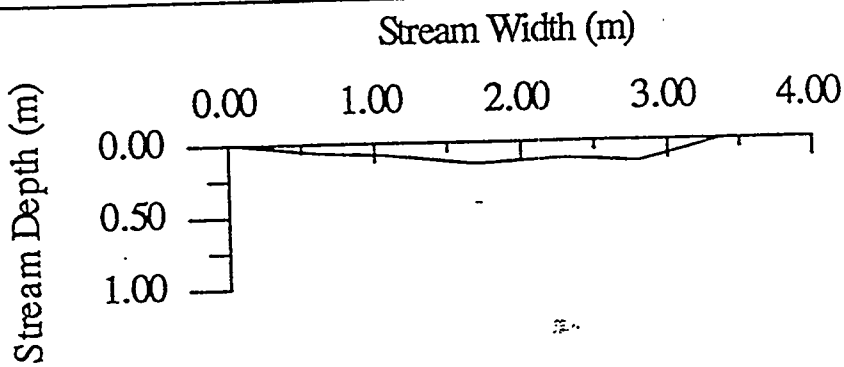
Station 9. Meyers Branch @ Road 9



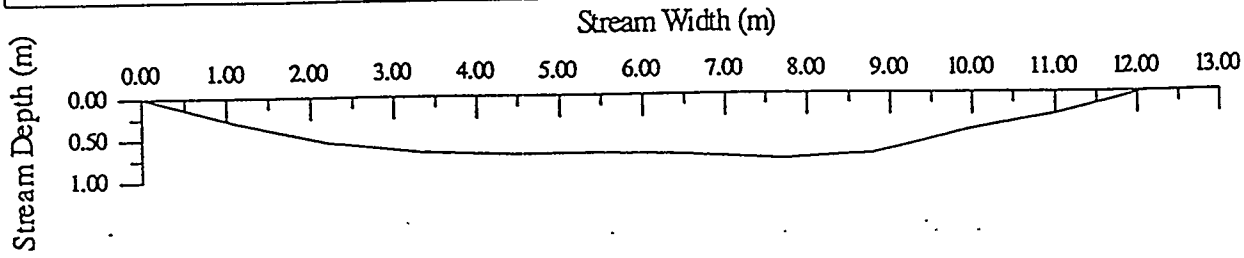
Station 10. Lower Three Runs Creek @ Road B



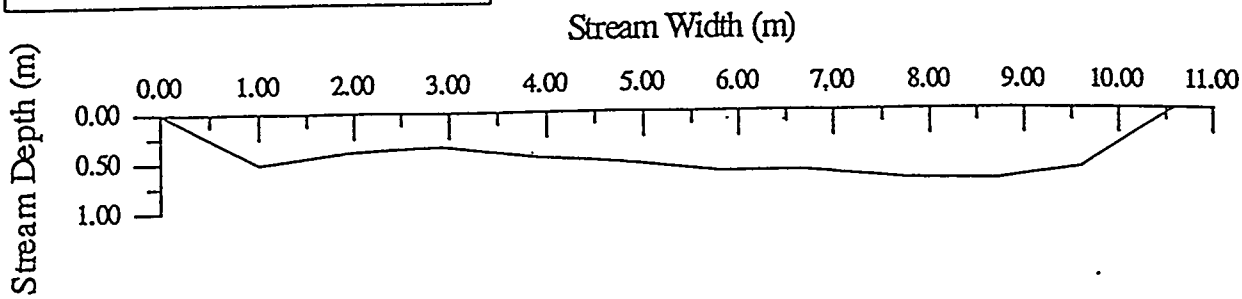
Station 11. Pen Branch @ Rd. B.



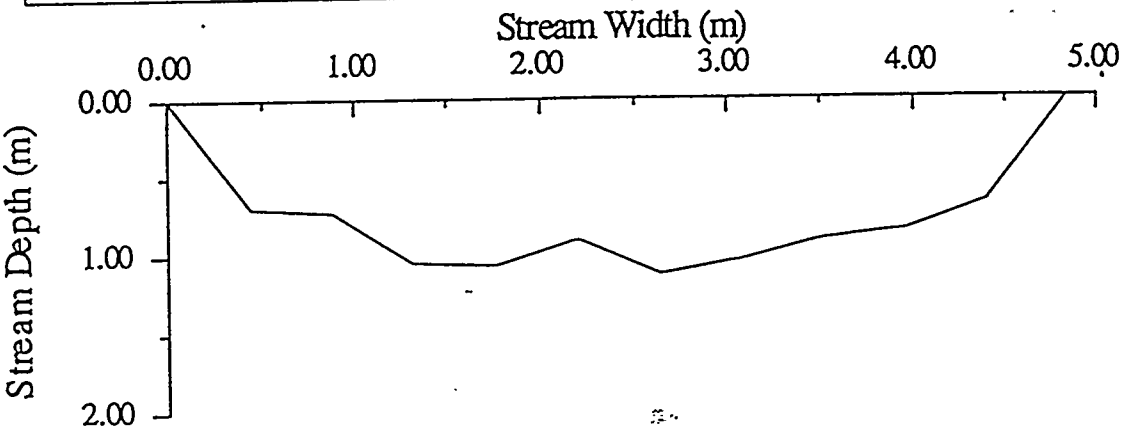
Station 12. Indian Grave Branch @ Rd. B.



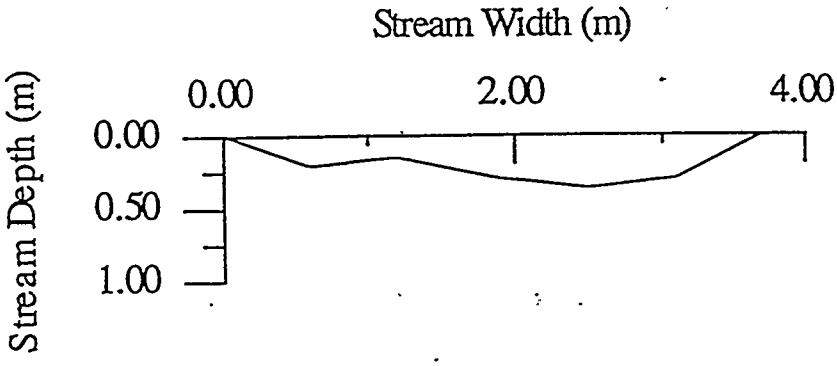
Station 13. Pen Branch @ Rd. A.



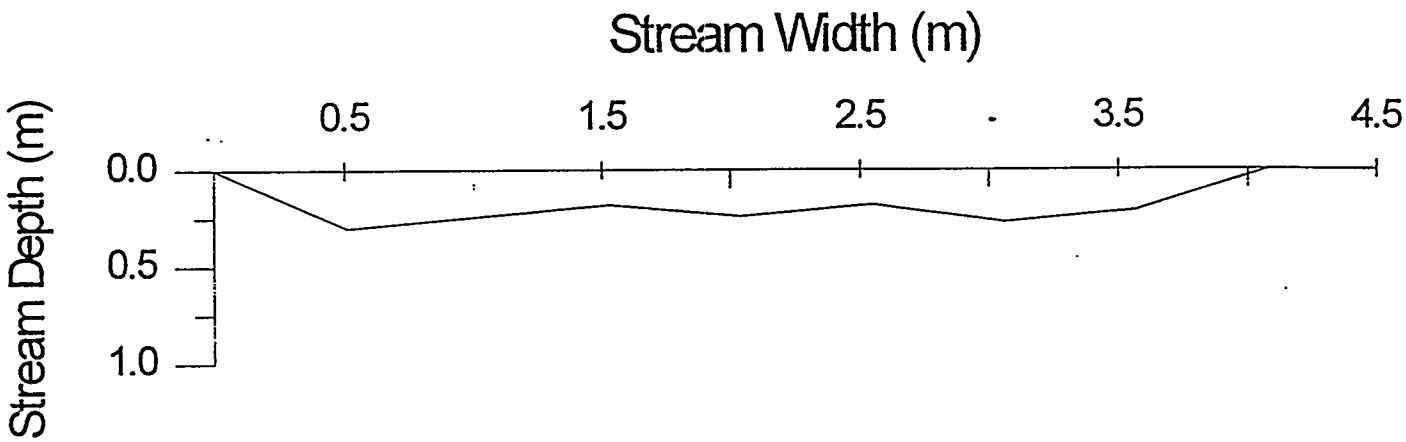
Station 14. Beaver Dam Creek near Metal Walkway



Station 15. Four Mile Creek @ Rd. 13.2.



Rosemarry Creek downstream
Williston WWTP. 17 December 1994
Station 16



PART IV

TABLE 2. ABBREVIATIONS AND EXPLANATION OF TERMS USED IN THE MACROINVERTEBRATE DATA AND SUMMARY STATISTICS

I. CODES OF MAJOR TAXA

1)	ANO	-	Annelida, Oligochaeta
2)	ANH	-	Annelidae, Hirudinea
3)	AHC	-	Acari, Hydracarina
4)	AM	-	Amphipoda
5)	DC	-	Decapoda
6)	EP	-	Hexapoda, Ephemeroptera
7)	OD	-	Hexapoda, Odonata
8)	PL	-	Hexapoda, Plecoptera
9)	CO	-	Hexapoda, Coleoptera
10)	ME	-	Hexapoda, Megaloptera
11)	TR	-	Hexapoda, Trichoptera
12)	DO	-	Hexapoda, Diptera, Other
13)	DTA	-	Hexapoda, Diptera, Chironomidae, Tanypodinae
14)	DOR	-	Hexapoda, Diptera, Chironomidae, Orthocladiinae
15)	DCC	-	Hexapoda, Diptera, Chironomidae, Chironomini
16)	DPC	-	Hexapoda, Diptera, Chironomidae, Pseudochironomini
17)	DTY	-	Hexapoda, Diptera, Chironomidae, Tanytarsini
18)	DD	-	Hexapoda, Diptera, Chironomidae Diamesinae
19)	HA	-	Hexapoda, Heteroptera
20)	LEP	-	Hexapoda, Lepidoptera
21)	MB	-	Mollusca, Bivalvia
22)	MG	-	Mollusca, Gastropoda
23)	IS	-	Isopoda

II. FUNCTIONAL FEEDING GROUP CODES

1)	CG	-	Collector/Gatherer
2)	C	-	Collector/Filterer
3)	P	-	Predator
4)	SC	-	Scrapper
5)	SH	-	Shredder
6)	H	-	Herbivor

III. STATISTICAL SUMMARY ABBREVIATIONS

1) Bio. Index - North Carolina Biotic Index= $\frac{\Sigma TV_i N_i}{\text{TOTAL N}}$

Where: TV_i=Tolerance Values
N_i=Number of Individuals of a Taxon
N=Total Number of Individuals in the Sample

2) Mean Tax/Samp -Mean number of taxa per sampler
3) Total Orgs. -Total number of organisms for the station
4) Tot. Tax -Total number of taxa for the station
5) Tot. Mean# -Total mean number of organisms per m^2
6) FG -Functional group
7) Rel. Abd. -Relative abundance

8) Community loss Index = d-a/e
9) Jaccard Coefficient of similarity = a/a+b+c

where: a=number taxa present in sample A and B
b=number taxa present only in sample B
c=number taxa present only in sample A
d=number taxa present in sample A
e=number present in sample B

Station 1, Rosemary Creek at Rosemary Chruch, 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	5.7	P	51.3		1	3		5		0.34749
2	Amphipoda	AM	8	CG	24		1				2	0.11583
3	Oligochaeta	ANO	8.2	CG	1279.2		70	14	13	11	48	6.023166
4	Hydra spp.	CN		P	0						3	0.11583
5	Ancyronyx variegatus	CO	6.9	CG	48.3		4	2			1	0.27027
6	Dubiraphia bivittata	CO	6.4	CG	6.4						1	0.03861
7	Ectopria nervosa	CO	4.3	SC	4.3			1				0.03861
8	Macronychus glabratus	CO	4.7	CG	37.8		3	1	3		1	0.30888
9	Stenelmis humerosa	CO	5.4	CG	27		2	1	1		1	0.19305
10	Cambaridae	DC	6.8	H	6.8		1					0.03861
11	Palaemonetes paludosus	DC	6.7	CG	6.7						1	0.03861
12	Chironomus spp.	DCC	9.8	CG	9.8						1	0.03861
13	Cryptochironomus spp.	DCC	7.3	P	0							0
14	Cryptotendipes spp.	DCC	6.1	CG	0							0
15	Dicrotendipes spp.	DCC	7.9	CG	7.9						1	0.03861
16	Microtendipes rydalensis	DCC	6.2	CG	49.6		4			1	3	0.30888
17	Microtendipes spp.	DCC	6.2	CG	6.2						1	0.03861
18	Nilothauma babiyi	DCC	5.5	CG	22		3				1	0.15444
19	Phaenopsectra flavipes	DCC	8.5	CG	42.5					1	4	0.19305
20	Polypedilum fallax	DCC	6.7	SH	107.2			6		6	4	0.617761
21	Polypedilum spp.	DCC	6.9	CG	448.5		11	12	26	8	6	2.509653
22	Stelechomyia perpulchra	DCC	4.6	SH	50.6		6			5		0.42471
23	Stenochironomus sp.	DCC	6.4	SH	0							0
24	Tribelos jucundum	DCC	6.6	CG	19.8						3	0.11583
25	Porthastia longmana	DD	7.4	CG	0							0
26	Atherix lantha	DO	2.1	P	0							0
27	Carstopogonidae	DO	6.5	P	6.5						1	0.03861
28	Hemerodromia spp.	DO	8.1	CG	24.3		2		1			0.11583
29	Simulium spp.	DO	4.4	CF	0							0
30	Brilla flavifrons	DOR	5.2	SH	0							0
31	Corynoneura spp.	DOR	6.2	CG	117.8		3	8	4	1	3	0.733591
32	Cricotopus/Ortho spp.	DOR	8.8	CG	0							0
33	Eukiefferiella spp.	DOR	5.7	CG	0							0
34	Lopescladius spp.	DOR	2.2	CG	0							0
35	Nanocladius spp.	DOR	7.2	CG	7.2						1	0.03861
36	Parakiefferiella sp.1	DOR	5.9	CG	47.2		5	1			2	0.30888
37	Parametriocnemus sp.	DOR	3.7	CG	7.4			1		1		0.07722
38	Rheocricotopus spp.	DOR	7.3	CG	554.8		13	27	24	10	2	2.934363
39	Synorthocladius semivirens	DOR	4.7	CG	0							0
40	Thienemanniella spp.	DOR	6	CG	492		17	24	22	9	10	3.166023
41	Tvetenia spp.	DOR	4	CG	0							0
42	Xylopus par	DOR	6.6	SH	0							0
43	Ablabesmyia spp.	DTA	6.4	P	70.4		2				9	0.42471
44	Conchapelopia spp.	DTA	8.7	P	95.7		6		3		2	0.42471
45	Labrundinia spp.	DTA	6	P	0							0
46	Larsia spp.	DTA	8.3	P	8.3			1				0.03861
47	Nilotanypus spp.	DTA	4	P	0							0
48	Paramerina sp.	DTA	2.8	P	2.8						1	0.03861
49	Penteneura inconspicua	DTA	4.6	P	64.4		7	3	2	1	1	0.540541
50	Procladius spp.	DTA	9.3	P	0							0
51	Rheotanytarsus spp.	DTY	6.4	CF	294.4		13	8	11	11	3	1.776062
52	Stempellinella spp.	DTY	5.3	CG	10.6						2	0.07722
53	Tanytarsus spp.	DTY	6.7	CG	9279.5		248	95	61	109	872	53.4749
54	Acarpenna pygmaeus	EP	3.7	CG	0							0
55	Baetis spp.	EP	5.4	CG	415.8		7	14	40	15	1	2.972973
56	Caenis spp.	EP	7.6	CG	372.4		35	6		3	5	1.891892
57	Callibaetis spp.	EP	9.3	CG	0							0
58	Eurylophella spp.	EP	3	CG	0							0
59	Heptagenia spp.	EP	2.8	SC	0							0
60	Hexagenia spp.	EP	4.7	CG	65.8		2				12	0.540541
61	Isonychia spp.	EP	3.8	CF	0							0
62	Neoephemera youngi	EP	2.1	CG	23.1		1	3	2	5		0.42471
63	Paraleptophlebia spp.	EP	1.2	CG	12		3	2			5	0.3861
64	Stenonema spp.	EP	3.4	SC	979.2		48	69	83	67	21	11.11969
65	Tricorythodes spp.	EP	5.4	CG	297		22	12	2	10	9	2.123552
66	Corydalus cornutus	ME	5.6	P	0							0
67	Nigronia serricornis	ME	5.5	P	0							0
68	Sialis spp.	ME	7.5	P	0							0
69	Ferrissia sp.	MG	6.9	SC	193.2		9	8	2		9	1.081081
70	Spiraerium spp.	MP	7.7	CF	0							0
71	Nematoda	NE		CG	0					1	1	0.07722
72	Boyeria vinosa	OD	6.3	P	0							0
73	Enallagma spp.	OD	9	P	0							0
74	Gomphus spp.	OD	6.2	P	6.2						1	0.03861
75	Libellula spp.	OD	9.8	P	9.8						1	0.03861
76	Neurocordulia spp.	OD	5.8	P	5.8		1					0.03861
77	Progomphus spp.	OD	8.7	P	0							0
78	Acroneuria abnormis	PL	2.2	P	0							0
79	Acroneuria arenosa	PL	2.2	P	0							0
80	Acroneuria spp.	PL	1.4	P	4.2			2	1			0.11583
81	Allocapnia spp.	PL	2.8	SH	0							0
82	Paragentina kansensis	PL	2	P	0							0
83	Paragentina spp.	PL	2	P	0							0
84	Perlesta spp.	PL	4.9	P	0							0
85	Perlinella ephyre	PL	0	P	0							0
86	Perlinella spp.	PL	0	P	0							0
87	Pteronarcys dorsata	PL	1.6	SH	0							0
88	Brachycentrus numerosus	TR	1.6	CF	0							0
89	Cheumatopsyche spp.	TR	6.6	CF	165		4	9	6	6		0.965251
90	Chimarra spp.	TR	2.8	CF	0							0
91	Diplectrona modesta	TR	2.2	CF	0							0
92	Hydropsyche spp.	TR	4	CF	8			1			1	0.07722
93	Hydroptila spp.	TR	6.2	H	0							0
94	Lype diversa	TR	4.3	SC	146.2		7	4	4	11	8	1.312741
95	Micrasema spp.	TR	0.8	SH	0							0
96	Nectopsyche pavida	TR	4.2	SH	0							0
97	Nectopsyche spp.	TR	4.1	SH	0							0
98	Neureclipsis spp.	TR	4.4	CF	0							0

Station 1. Rosemary Creek at Rosemary Chruch. 20 September 1994

99	Nyctiophylax spp.	TR	0.9	CF	0						0
100	Oecetis spp.	TR	6.7	P	0						0
101	Polycentropus spp.	TR	3.6	CF	10.5					3	0.11583
102	Pycnopsyche spp.	TR	2.3	SH	0						0
103	Rhyacophila spp.	TR	2.6	P	2.6					1	0.03861
104	Turbellaria	TU	7.5	P	90			1	1	9	0.46332

Station 1. Rosemary Creek at Rosemary Chruch. 20 September 1994

	Table size:	104	Total orgs:	2590	Tot Tax:	56	tot. mean #	2893.855
	Number Samps:	5	SC/CF:	4.61842105	Bio Index:	6.234633		
	Mean TAX/Samp	30						
	EPT:	13						
Statistical Summary:								
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Taxon Rel Abd.	FG Rel. Abd	
AHC		1	9	1.8	10.0559	.3475		
AM		1	3	.6	3.352	.1158		
ANO		1	156	31.2	174.3017	6.0232		
CN		1	3	.6	3.352	.1158		
CO		5	22	4.4	24.581	.8494		
DC		2	2	.4	2.2346	.0772		
DCC		10	115	23.	128.4916	4.4402		
DD		0	0	.	.	.		
DO		2	4	.8	4.4693	.1544		
DOR		6	188	37.6	210.0559	7.2587		
DTA		5	38	7.6	42.4581	1.4672		
DTY		3	1433	286.6	1601.1173	55.3282		
EP		7	504	100.8	563.1285	19.4595		
ME		0	0	.	.	.		
MG		1	28	5.6	31.2849	1.0811		
MP		0	0	.	.	.		
NE		1	2	.4	2.2346	.0772		
OD		3	3	.6	3.352	.1158		
PL		1	3	.6	3.352	.1158		
TR		5	65	13.	72.6257	2.5097		
TU		1	12	2.4	13.4078	.4633		
	P	14	70	14.	78.2123		2.702703	
	CG	31	2065	413.	2307.2626		79.72973	
	SC	4	351	70.2	392.1788		13.55212	
	H	1	1	.2	1.1173		0.03861	
	SH	2	27	5.4	30.1676		1.042471	
	CF	4	76	15.2	84.9162011		2.934363	

Station 1. Rosemary Creek at Rosemary Chruch. 20 September 1994

Taxa List:
Hydracarina
Amphipoda
Oligochaeta
Hydra spp.
Ancyronyx variegatus
Dubiraphia bivattata
Ectopria nervosa
Macronychus glabratus
Stenelmis humerosa
Cambaridae
Palaemonetes paludosus
Chironomus spp.
Dicrotendipes spp.
Microtendipes rydalensis
Microtendipes spp.
Nilothauma babiyi
Phaenopsectra flavipes
Polypedilum fallax
Polypedilum spp.
Stelechomyia perpulchra
Tribelos jucundum
Ceratopogonidae
Hemerodromia spp.
Corynoneura spp.
Nanocladius spp.
Parakiefferiella sp.1
Parametriocnemus sp.
Rheocricotopus spp.
Thienemanniella spp.
Ablabesmyia spp.
Conchapelopia spp.
Larsia spp.
Paramerina sp.
Pentaneura inconspicua
Rheotanytarsus spp.
Stempellinella spp.
Tanytarsus spp.
Baetis spp.
Caenis spp.
Hexagenia spp.
Neoephemera youngi
Paraleptophlebia spp.
Stenonema spp.
Tricorythodes spp.
Ferrissia sp.
Nematoda
Gomphus spp.
Libellula spp.

Station 1. Rosemary Creek at Rosemary Chruch. 20 September 1994

Neurocordulia spp.
Acroneuria spp.
Cheumatopsyche spp.
Hydropsyche spp.
Lype diversa
Polycentropus spp.
Rhyacophila spp.
Turbellaria

Station 1. Rosemary Creek at Rosemary Chruch. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Tanytarsus spp.	DTY	6.7	CG	9279.5		248	95	61	109	872	53.4749
2	Stenonema spp.	EP	3.4	SC	979.2		48	69	83	67	21	11.11969
3	Oligochaeta	ANO	8.2	CG	1279.2		70	14	13	11	48	6.023186

Station 2. Tinker Creek at Kennedy's Pond Road. 20 September 1994.

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	17.1			1	2			0.187032
2	Amphipoda	AM	8	CG	0							0
3	Hirudinea	ANH	8.5	P	8.5		1					0.062344
4	Oligochaeta	ANO	8.2	CG	123		5	3	1		6	0.935162
5	Ancyronyx variegatus	CO	6.9	CG	13.8		1				1	0.124688
6	Ectopria nervosa	CO	4.3	SC	47.3		6	1	1	1		0.685786
7	Macronychus glabratus	CO	4.7	CG	14.1				1		2	0.187032
8	Stenelmis humerosa	CO	5.4	CG	0							0
9	Stenelmis spp.	CO	5.4	CG	0							0
10	Cambaridae	DC	8.8	H	0							0
11	Palaemonetes paludosus	DC	6.7	H	6.7				1			0.062344
12	Cryptochironomus spp.	DCC	7.3	P	0							0
13	Cryptotendipes spp.	DCC	6.1	CG	0							0
14	Dicrotendipes spp.	DCC	7.9	CG	118.5		2	3	1	1	8	0.935162
15	Microtendipes rydalensis	DCC	6.2	CG	93		3	1	6		3	0.935162
16	Microtendipes spp.	DCC	6.2	CG	24.8		3		1			0.249377
17	Nilothauma babiyi	DCC	5.5	CG	27.5					1	4	0.311721
18	Phaenopsectra flavipes	DCC	8.5	CG	0							0
19	Polypedilum fallax	DCC	6.7	SH	26.8				2	1	1	0.249377
20	Polypedilum spp.	DCC	6.9	CG	1007.4		9	10	107	7	13	9.102244
21	Stelechomyia perpulchra	DCC	4.6	SH	0							0
22	Stenochironomus sp.	DCC	6.4	SH	0							0
23	Tribelos jucundum	DCC	6.6	CG	6.6		1					0.062344
24	Zavreliella spp.	DCC		CG	0						2	0.124688
25	Potthastia longimana	DO	7.4	CG	0							0
26	Atherix lantha	DO	2.1	P	0							0
27	Ceratopogonidae	DO	6.5	P	6.5						1	0.062344
28	Hemerodromia spp.	DO	8.1	CG	32.4		1	1	1		1	0.249377
29	Simulium spp.	DO	4.4	CF	13.2				3			0.187032
30	Brilla flavifrons	DOR	5.2	SH	0							0
31	Corynoneura spp.	DOR	6.2	CG	49.6		3	1	3	1		0.498753
32	Cricotopus/Ortho spp.	DOR	8.8	CG	255.2		1	21	3	1	3	1.80798
33	Eukiefferiella spp.	DOR	5.7	CG	0							0
34	Lopescladius spp.	DOR	2.2	CG	0							0
35	Nanocladius spp.	DOR	7.2	CG	14.4		1				1	0.124688
36	Paraklieferiella sp.1	DOR	6.9	CG	0							0
37	Parametriocnemus sp.	DOR	3.7	CG	37			1	8		1	0.623441
38	Rheocricotopus spp.	DOR	7.3	CG	43.8				3	2	1	0.374065
39	Synorthocladius semivirens	DOR	4.7	CG	23.5		1	2	2			0.311721
40	Thienemanniella spp.	DOR	6	CG	96		1	4	7	1	3	0.997506
41	Tvetenia spp.	DOR	4	CG	0							0
42	Xylopus par	DOR	6.6	SH	0							0
43	Ablabesmyia spp.	DTA	6.4	P	89.6		7	2	1		4	0.872818
44	Conchapelopia spp.	DTA	8.7	P	104.4		1	3	4	2	2	0.74813
45	Labrundinia spp.	DTA	6	P	0							0
46	Nilotanypus spp.	DTA	4	P	0							0
47	Paramerina sp.	DTA	2.8	P	0							0
48	Pentaneura inconspicua	DTA	4.6	P	27.6			3	3			0.374065
49	Procladius sp.	DTA	9.3	P	0							0
50	Rheotanytarsus spp.	DTY	6.4	CF	3699.2		9	4	560	4	1	36.03491
51	Stempellina spp.	DTY	2	CG	8			1	3			0.249377
52	Tanytarsus spp.	DTY	6.7	CG	1668.3		51	49	48	16	85	15.52369
53	Acentrella ampla	EP	3.6	CG	7.2				2			0.124688
54	Acerpenna spp.	EP	3.7	CG	370		1	7	54	3	35	6.234414
55	Baetis spp.	EP	5.4	CG	162		1	6	18		5	1.870324
56	Caenis spp.	EP	7.6	CG	22.8		2		1			0.187032
57	Callibaetis spp.	EP	9.3	CG	0							0
58	Eurylophella spp.	EP	3	CG	0							0
59	Heptagenia spp.	EP	2.8	SC	0							0
60	Isonychia spp.	EP	3.8	CF	0							0
61	Neoephemera youngi	EP	2.1	CG	2.1						1	0.062344
62	Paraleptophlebia spp.	EP	1.2	CG	10.8		7	1			1	0.561097
63	Stenacron spp.	EP	7.1	SC	28.4		4					0.249377
64	Stenonema spp.	EP	3.4	SC	557.6		22	49	50	28	15	10.22444
65	Tricorythodes spp.	EP	5.4	CG	37.8		3			1	3	0.436409
66	Sphaerium spp.	MB	7.7	CF	7.7				1			0.062344
67	Corydalus cornutus	ME	5.6	P	0							0
68	Nigronia serricornis	ME	5.5	P	5.5		1					0.062344
69	Sialis spp.	ME	7.5	P	0							0
70	Ferrissia sp.	MG	6.9	SC	13.8				1		1	0.124688
71	Planorbidae	MG	6.5	SC	6.5				1			0.062344
72	Nemertea	NA		P	0		1					0.062344
73	Argia spp.	OD	8.7	P	34.8		1		2		1	0.249377
74	Boyeria vinosa	OD	8.3	P	0							0
75	Enallagma spp.	OD	9	P	0							0
76	Enallagma spp.	OD	9	P	9				1			0.062344
77	Neurocordulia spp.	OD	5.6	P	0							0
78	Progomphus spp.	OD	8.7	P	0							0
79	Acroneuria abnormis	PL	2.2	P	0							0
80	Acroneuria arenosa	PL	2.2	P	0							0
81	Acroneuria spp.	PL	1.4	P	0							0
82	Allocapnia spp.	PL	2.8	SH	0							0
83	Paragentina kansensis	PL	2	P	0							0
84	Paragentina spp.	PL	2	P	0							0
85	Perlesta spp.	PL	4.9	P	0							0
86	Perlinella ephyre	PL	0	P	0							0
87	Perlinella spp.	PL	0	P	0							0
88	Pteronarcys dorsata	PL	1.6	SH	0							0
89	Brachycentrus numerosus	TR	1.6	CF	0							0
90	Cheumatopsyche spp.	TR	6.6	CF	118.8				16	1	1	1.122195
91	Chimarra spp.	TR	2.6	CF	0							0
92	Diplectrona modesta	TR	2.2	CF	0							0
93	Hydropsyche spp.	TR	4	CF	0							0
94	Hydroptila spp.	TR	6.2	H	0							0
95	Lype diversa	TR	4.3	SC	38.7			1	8			0.561097

Station 2. Tinker Creek at Kennedy's Pond Road, 20 September 1994.

96	Micrasema spp.	TR	0.6	SH	0						0
97	Nectopsyche exquisita	TR	4.2	SH	0						0
98	Nectopsyche spp.	TR	4.1	SH	36.9		9				0.561097
99	Neureclipsis spp.	TR	4.4	CF	8.8					1	1 0.124688
100	Nyctiophylax spp.	TR	0.9	CF	0						0
101	Oecetis spp.	TR	6.7	P	28.5			1	2	2	0.311721
102	Oxyethira spp.	TR	6.2	H	18.6					1	2 0.187032
103	Polycentropus spp.	TR	3.5	CF	7		1				1 0.124688
104	Turbellaria	TU	7.6	P	375		12	3	26	1	8 3.117207

Station 2. Tinker Creek at Kennedy's Pond Road. 20 September 1994.

	Table size:	104	Total orgs:	1604	Tot Tax:	55	tot. mean #	1792.179
	Number Samps:	5	SC/CF:	0.31622517	Bio Index:	5.758791		
	Mean TAX/Samp	29.6						
	EPT:	16						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	3	.6	3.352	.187		
AM		0	0	.	.	.		
ANH		1	1	.2	1.1173	.0623		
ANO		1	15	3.	16.7598	.9352		
CO		3	16	3.2	17.8771	.9975		
DC		1	1	.2	1.1173	.0623		
DCC		8	192	38.4	214.5251	11.9701		
DD		0	0	.	.	.		
DO		3	8	1.6	8.9385	.4988		
DOR		7	76	15.2	84.9162	4.7382		
DTA		3	32	6.4	35.7542	1.995		
DTY		3	831	166.2	928.4916	51.808		
EP		9	320	64.	357.5419	19.9501		
MB		1	1	.2	1.1173	.0623		
ME		1	1	.2	1.1173	.0623		
MG		2	3	.6	3.352	.187		
NA		1	1	.2	1.1173	.0623		
OD		2	5	1.	5.5866	.3117		
PL		0	0	.	.	.		
TR		7	48	9.6	53.6313	2.9925		
TU		1	50	10.	55.8659	3.1172		
	P	12	99	19.8	110.6145		6.17207	
	CG	27	693	138.6	774.3017		43.20449	
	SC	6	191	38.2	213.4078		11.90773	
	H	2	4	.8	4.4693		0.249377	
	SH	2	13	2.6	14.5251		0.810474	
	CF	6	604	120.8	674.860335		37.65586	

Station 2. Tinker Creek at Kennedy's Pond Road. 20 September 1994.

Taxa List:	
Hydracarina	
Hirudinea	
Oligochaeta	
Ancyronyx variegatus	
Ectopria nervosa	
Macronychus glabratus	
Palaemonetes paludosus	
Dicrotendipes spp.	
Microtendipes rydalensis	
Microtendipes spp.	
Nilothauma babiyi	
Polypedilum fallax	
Polypedilum spp.	
Tribelos jucundum	
Zavreliella spp.	
Ceratopogonidae	
Hemerodromia spp.	
Simulium spp.	
Corynoneura spp.	
Cricotopus/Ortho spp.	
Nanocladius spp.	
Parametriocnemus sp.	
Rheocricotopus spp.	
Synorthocladius semivirens	
Thienemanniella spp.	
Ablabesmyia spp.	
Conchapelopia spp.	
Pentaneura inconspicua	
Rheotanytarsus spp.	
Stempellina spp.	
Tanytarsus spp.	
Acentrella ampla	
Acerpenna spp.	
Baetis spp.	
Caenis spp.	
Neoephemera youngi	
Paraleptophlebia spp.	
Stenacron spp.	
Stenonema spp.	
Tricorythodes spp.	
Sphaerium spp.	
Nigronia serricornis	
Ferrissia sp.	
Planorbidae	
Nemertea	
Argia spp.	
Enallagma spp.	
Cheumatopsyche spp.	

Station 2. Tinker Creek at Kennedy's Pond Road. 20 September 1994.

Lype diversa	
Nectopsyche spp.	
Neureclipsis spp.	
Oecetis spp.	
Oxyethira spp.	
Polycentropus spp.	
Turbellaria	

Station 2. Tinker Creek at Kennedy's Pond Road. 20 September 1994.

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Rheotanytarsus spp.	DTY	6.4	CF	3699.2		9	4	560	4	1	36.03491
2	Tanytarsus spp.	DTY	6.7	CG	1668.3		51	49	48	16	85	15.52369
3	Stenonema spp.	EP	3.4	SC	557.6		22	49	50	28	15	10.22444
4	Polypedilum spp.	DCC	6.9	CG	1007.4		9	10	107	7	13	9.102244
5	Acerpenna spp.	EP	3.7	CG	370		1	7	54	3	35	6.234414

Station 3, Mill Creek at Road E-2, 20 September 1994.

Seq	Taxon	TAXC	NCBI	FG	(for 8l)	Sampler De	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	6.7				1			0.064641
2	Amphipoda	AM	6	CG	0							0
3	Oligochaeta	ANO	8.2	CG	492		14	4	30	6	7	3.878474
4	Ancyronyx variegatus	CO	6.9	CG	13.8						2	0.129282
5	Dineutus sp.	CO	5.6	P	0							0
6	Ectopria nervosa	CO	4.3	SC	0							0
7	Macronychus glabratus	CO	4.7	CG	28.2		1	2	2		1	0.387847
8	Stenelmis humerosa	CO	5.4	CG	0							0
9	Stenelmis spp.	CO	5.4	CG	0							0
10	Cambaridae	DC	6.8	H	6.8		1					0.064641
11	Cryptochironomus spp.	DCC	7.3	P	0							0
12	Cryptotendipes spp.	DCC	6.1	CG	0							0
13	Dicrotendipes spp.	DCC	7.9	CG	946		3	30	25	17	45	7.756949
14	Microtendipes rydalensis	DCC	6.2	CG	812.2		60	1	69		1	8.468003
15	Microtendipes spp.	DCC	6.2	CG	6.2		1					0.064641
16	Nilothauma babiyi	DCC	5.5	CG	71.5		4	2	4	3		0.840336
17	Pagastiella spp.	DCC	2.6	CG	7.6		1		2			0.193924
18	Paralauterborniella spp.	DCC	4.8	CG	4.8			1				0.064641
19	Phaenopsectra flavipes	DCC	6.6	CG	68					6	2	0.51713
20	Polypedilum fallax	DCC	6.7	SH	134		1	6		9	4	1.292825
21	Polypedilum spp.	DCC	6.9	CG	455.4		13	7	23	21	2	4.266322
22	Stelechomyia perpulchra	DCC	4.6	SH	0							0
23	Stenochironomus sp.	DCC	6.4	SH	0							0
24	Tribelos jucundum	DCC	6.6	CG	33					2	3	0.323206
25	Potthastia longimana	DD	7.4	CG	0							0
26	Atherix lantha	DO	2.1	P	0							0
27	Cecidomyiidae	DO		H	0						1	0.064641
28	Ceratopogonidae	DO	6.5	P	6.5					1		0.064641
29	Hemerodromia spp.	DO	8.1	CG	8.1				1			0.064641
30	Simulium spp.	DO	4.4	CF	0							0
31	Brilla flavifrons	DOR	5.2	SH	0							0
32	Corynoneura spp.	DOR	6.2	CG	155		14	1	6	3	1	1.616031
33	Cricotopus/Ortho spp.	DOR	6.8	CG	211.2		6		16			1.55139
34	Eukiefferiella spp.	DOR	5.7	CG	0							0
35	Lopescladius spp.	DOR	2.2	CG	0							0
36	Nanocladius spp.	DOR	7.2	CG	172.6		7	5	10		2	1.55139
37	Parakiefferiella sp.1	DOR	5.9	CG	5.9					1		0.064641
38	Parametriocnemus sp.	DOR	3.7	CG	7.4				1	1		0.129282
39	Rheocricotopus spp.	DOR	7.3	CG	87.6		5		6	1		0.775695
40	Synorthocladius semivirens	DOR	4.7	CG	0							0
41	Thienemanniella spp.	DOR	6	CG	144		16		6	2		1.55139
42	Tvetenia spp.	DOR	4	CG	0							0
43	Xylopus par	DOR	6.6	SH	0							0
44	Ablabesmyia spp.	DTA	6.4	P	326.4		8	12	6	12	13	3.295703
45	Conchapelopia spp.	DTA	6.7	P	95.7		7		2	1	1	0.711054
46	Labrundinia spp.	DTA	6	P	18			3				0.193924
47	Nilotanypus spp.	DTA	4	P	0							0
48	Nilotanypus spp.	DTA	4	P	0							0
49	Paramerina sp.	DTA	2.8	P	0							0
50	Pentaneura inconspicua	DTA	4.6	P	27.6		4		2			0.387847
51	Procladius sp.	DTA	9.3	P	0							0
52	Tanypus spp.	DTA	9.6	P	38.4			2		2		0.258565
53	Rheotanytarsus spp.	DTY	6.4	CF	755.2		35		60	2	1	7.627868
54	Stempellina spp.	DTY	2	CG	0							0
55	Stempellinella spp.	DTY	5.3	CG	227.9		12	4	18	9		2.779573
56	Tanytarsus spp.	DTY	6.7	CG	3778.6		241	27	182	90	24	36.45766
57	Acerpenna pygmaeus	EP	3.7	CG	0							0
58	Baetis spp.	EP	5.4	CG	27		3		2			0.323206
59	Caenis spp.	EP	7.6	CG	91.2		3		9			0.775695
60	Callibaetis spp.	EP	9.3	CG	0							0
61	Eurylophella spp.	EP	3	CG	3				1			0.064641
62	Heptagenia spp.	EP	2.8	SC	0							0
63	Hexagenia spp.	EP	4.7	CG	9.4			1		1		0.129282
64	Isonychia spp.	EP	3.6	CF	0							0
65	Neoephemera youngi	EP	2.1	CG	4.2				2			0.129282
66	Paraleptophlebia spp.	EP	1.2	CG	6		1		1	3		0.323206
67	Stenonema spp.	EP	3.4	SC	255		20	1	51	3		4.846093
68	Tricorythodes spp.	EP	5.4	CG	260.8		8	1	33	5	5	3.361345
69	Hydra spp.	HY		P	0				1			0.064641
70	Corydalus cornutus	ME	5.6	P	0							0
71	Nigronia serricornis	ME	5.5	P	5.5						1	0.064641
72	Sialis spp.	ME	7.5	P	7.5						1	0.064641
73	Ferrissia sp.	MG	6.9	SC	0							0
74	Sphaerium spp.	MP	7.7	CF	0							0
75	Argia sp.	OD	6.7	P	17.4				1	1		0.129282
76	Enallagma spp.	OD	9	P	0							0
77	Neurocordulia spp.	OD	5.8	P	0							0
78	Progomphus spp.	OD	8.7	P	0							0
79	Boyeria vinosa	OD	6.3	P	0							0
80	Acroneuria abnormis	PL	2.2	P	0							0
81	Acroneuria arenosa	PL	2.2	P	0							0
82	Acroneuria spp.	PL	1.4	P	0							0
83	Alloperla spp.	PL	2.8	SH	0							0
84	Paragentina kansensis	PL	2	P	0							0
85	Paragentina spp.	PL	2	P	0							0
86	Perlesta spp.	PL	4.9	P	0							0
87	Perlinella ephyre	PL	0	P	0							0
88	Perlinella spp.	PL	0	P	0							0
89	Pteronarcys dorsata	PL	1.8	SH	0							0
90	Brachycentrus numerosus	TR	1.8	CF	1.8				1			0.064641
91	Cheumatopsyche spp.	TR	6.6	CF	85.8		1		12			0.840336
92	Chimarra spp.	TR	2.8	CF	0							0
93	Diplectrona modesta	TR	2.2	CF	0							0
94	Hydropsyche spp.	TR	4	CF	0							0
95	Hydroptila spp	TR	6.2	H	24.8		2		2			0.258565

Station 3. Mill Creek at Road E-2. 20 September 1994.

96	Lype diversa	TR	4.3	SC	4.3		1				0.064641
97	Micrasema spp.	TR	0.6	SH	0						0
98	Nectopsyche exquisita	TR	4.2	SH	0						0
99	Nectopsyche spp.	TR	4.1	SH	4.1				1		0.064641
100	Neureclipsis spp.	TR	4.4	CF	26.4				6		0.387847
101	Nyctiophylax spp.	TR	0.9	CF	3.6		4				0.256565
102	Oecetis spp.	TR	5.7	P	6.7					1	0.064641
103	Oxyethira spp.	TR	6.2	H	6.2			1			0.064641
104	Polycentropus spp.	TR	3.5	CF	7			1		1	0.129282
105	Turbellaria	TU	7.5	P	7.5				1		0.064641

Station 3. Mill Creek at Road E-2. 20 September 1994.

	Table size:	105	Total orgs:	1547	Tot Tax:	56	tot. mean #	1728.492
	Number Samps:	5	SC/CF:	0.52777778	Bio Index:	6.485197		
	Mean TAX/Samp	26.2						
	EPT:	18						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	1	.2	1.1173	.0646		
AM		0	0	.	.	.		
ANO		1	60	12.	67.0391	3.8785		
CO		2	8	1.6	8.9385	.5171		
DC		1	1	.2	1.1173	.0646		
DCC		10	368	73.6	411.1732	23.788		
DD		0	0	.	.	.		
DO		3	3	.6	3.352	.1939		
DOR		7	112	22.4	125.1397	7.2398		
DTA		5	75	15.	83.7989	4.8481		
DTY		3	725	145.	810.0559	46.8649		
EP		8	154	30.8	172.067	9.9548		
HY		1	1	.2	1.1173	.0646		
ME		2	2	.4	2.2346	.1293		
MG		0	0	.	.	.		
MP		0	0	.	.	.		
OD		1	2	.4	2.2346	.1293		
PL		0	0	.	.	.		
TR		10	34	6.8	37.9888	2.1978		
TU		1	1	.2	1.1173	.0646		
	P.	13	84	16.8	93.8547		5.429864	
	CG	29	1215	243.	1357.5419		78.53911	
	SC	2	76	15.2	84.9162		4.912734	
	H	4	7	1.4	7.8212		0.452489	
	SH	2	21	4.2	23.4637		1.357466	
	CF	6	144	28.8	160.893855		9.308339	

Station 3. Mill Creek at Road E-2. 20 September 1994.

Taxa List:
Hydracarina
Oligochaeta
Ancyronyx variegatus
Macronychus glabratus
Cambaridae
Dicrotendipes spp.
Microtendipes rydalensis
Microtendipes spp.
Nilothauma babiyi
Pagastiella spp.
Paralauterborniella spp.
Phaenopsectra flavipes
Polypedilum fallax
Polypedilum spp.
Tribelos jucundum
Cecidomyiidae
Ceratopogonidae
Hemerodromia spp.
Corynoneura spp.
Cricotopus/Ortho spp.
Nanocladius spp.
Parakiefferiella sp.1
Parametriocnemus sp.
Rheocricotopus spp.
Thienemanniella spp.
Ablabesmyia spp.
Conchapelopia spp.
Labrundinia spp.
Pentaneura inconspicua
Tanypus spp.
Rheotanytarsus spp.
Stenpellinella spp.
Tanytarsus spp.
Baetis spp.
Caenis spp.
Eurylophella spp.
Hexagenia spp.
Neoephemera youngi
Paraleptophlebia spp.
Stenonema spp.
Tricorythodes spp.
Hydra spp.
Nigronia serricornis
Sialis spp.
Argia sp.
Brachycentrus numerosus
Cheumatopsyche spp.
Hydroptila spp.

Station 3. Mill Creek at Road E-2. 20 September 1994.

Lype diversa
Nectopsyche spp.
Neureclipsis spp.
Nyctiophylax spp.
Oecetis spp.
Oxyethira spp.
Polycentropus spp.
Turbellaria

Station 3. Mill Creek at Road E-2. 20 September 1994.

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Tanytarsus spp.	DTY	6.7	CG	3778.8		241	27	182	90	24	36.45786
2	Microtendipes rydalensis	DCC	6.2	CG	812.2		60	1	69		1	8.468003
3	Dicrotendipes spp.	DCC	7.9	CG	948		3	30	25	17	45	7.756949
4	Rheotanytarsus spp.	DTY	6.4	CF	755.2		35		80	2	1	7.627666

Station 4, Crouch Branch at Road 4, 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	0							0
2	Amphipoda	AM	8	CG	0							0
3	Oligochaeta	ANO	8.2	CG	328		11	6	6	3	14	17.93722
4	Ancyronyx variegatus	CO	6.9	CG	0							0
5	Ectopria nervosa	CO	4.3	SC	0							0
6	Macronychus glabratus	CO	4.7	CG	0							0
7	Stenelmis humerosa	CO	5.4	CG	0							0
8	Stenelmis spp.	CO	5.4	CG	0							0
9	Cambaridae	DC	8.8	H	8.8						1	0.44843
10	Chironomus spp.	DCC	9.8	CG	127.4		1	6	6			5.829596
11	Cryptochironomus spp.	DCC	7.3	P	7.3		1					0.44843
12	Cryptotendipes spp.	DCC	6.1	CG	0							0
13	Dicrotendipes spp.	DCC	7.9	CG	79		4	2	2	2		4.484305
14	Goeldichironomus holoprasinus	DCC	10	CG	260		1	3	5	9	8	11.65919
15	Kiefferulus dux	DCC	10	CG	600		8	17	7	13	15	26.90583
16	Microtendipes rydalensis	DCC	6.2	CG	0							0
17	Microtendipes spp.	DCC	6.2	CG	6.2						1	0.44843
18	Nilothauma babiyi	DCC	5.5	CG	0							0
19	Phaenopsectra flavipes	DCC	6.5	CG	0							0
20	Polypedilum fallax	DCC	6.7	SH	0							0
21	Polypedilum spp.	DCC	6.9	CG	96.6			3	3	4	4	6.278027
22	Stelechomyia perpulchra	DCC	4.6	SH	0							0
23	Stenochironomus sp.	DCC	6.4	SH	0							0
24	Tribelos jucundum	DCC	6.6	CG	0							0
25	Porthastia longmana	DD	7.4	CG	0							0
26	Atherix lantha	DO	2.1	P	0							0
27	Ceratopogonidae	DO	6.5	P	0							0
28	Ephydridae	DO		H	0						1	0.44843
29	Hemerodromia spp.	DO	6.1	CG	0							0
30	Simulium spp.	DO	4.4	CF	4.4					1		0.44843
31	Brilla flavifrons	DOR	6.2	SH	0							0
32	Corynoneura spp.	DOR	6.2	CG	0							0
33	Cricotopus/Ortho spp.	DOR	8.8	CG	0							0
34	Eukiefferiella spp.	DOR	5.7	CG	0							0
35	Lopescladius spp.	DOR	2.2	CG	0							0
36	Nanocladius spp.	DOR	7.2	CG	0							0
37	Parakiefferiella sp.1	DOR	5.9	CG	0							0
38	Parametriocnemus sp.	DOR	3.7	CG	0							0
39	Rheocricotopus spp.	DOR	7.3	CG	7.3			1				0.44843
40	Synorthocladius semivirens	DOR	4.7	CG	0							0
41	Thienemanniella spp.	DOR	6	CG	0							0
42	Tvetenia spp.	DOR	4	CG	0							0
43	Unella multivirga	DOR	0	CG	0							0
44	Xylopus par	DOR	6.6	SH	0							0
45	Ablabesmyia spp.	DTA	6.4	P	44.8		1	1	1	3	1	3.139013
46	Conchapelopia spp.	DTA	6.7	P	0							0
47	Labrundinia spp.	DTA	6	P	90		6	2		3	4	6.726457
48	Nilotanypus spp.	DTA	4	P	0							0
49	Paramerina sp.	DTA	2.8	P	0							0
50	Pentaneura inconspicua	DTA	4.6	P	0							0
51	Procladius sp.	DTA	9.3	P	0							0
52	Rheotanytarsus spp.	DTY	6.4	CF	12.8		2					0.896861
53	Tanytarsus spp.	DTY	6.7	CG	53.6		4	1		1	2	3.587444
54	Acerpenna pygmaeus	EP	3.7	CG	0							0
55	Baetis spp.	EP	5.4	CG	0							0
56	Caenis spp.	EP	7.6	CG	0							0
57	Callibaetis spp.	EP	9.3	CG	0							0
58	Eurylophella spp.	EP	3	CG	3						1	0.44843
59	Heptagenia spp.	EP	2.8	SC	0							0
60	Isonychia spp.	EP	3.8	CF	0							0
61	Neoephemera youngi	EP	2.1	CG	0							0
62	Paraleptophlebia spp.	EP	1.2	CG	1.2						1	0.44843
63	Stenonema spp.	EP	3.4	SC	10.2						3	1.345291
64	Tricorythodes spp.	EP	5.4	CG	0							0
65	Sphaerium spp.	MB	7.7	CF	0							0
66	Corydalus cornutus	ME	5.6	P	0							0
67	Nigronia serricornis	ME	5.5	P	0							0
68	Sialis spp.	ME	7.5	P	0							0
69	Ferrissia sp.	MG	6.9	SC	13.8			1	1			0.896861
70	Planorbidae	MG	6.5	SC	6.5						1	0.44843
71	Nemertea	NE		P	0				2			0.896861
72	Argia spp.	OD	8.7	P	60.9		3			1	3	3.139013
73	Boyeria vinosa	OD	6.3	P	0							0
74	Calopteryx spp.	OD	8.3	P	8.3				1			0.44843
75	Enallagma spp.	OD	9	P	0							0
76	Neurocordulia spp.	OD	5.8	P	0							0
77	Progomphus spp.	OD	8.7	P	0							0
78	Acroneuria abnormis	PL	2.2	P	0							0
79	Acroneuria spp.	PL	1.4	P	0							0
80	Allocapnia spp.	PL	2.8	SH	0							0
81	Paragentina kansensis	PL	2	P	0							0
82	Paragentina spp.	PL	2	P	0							0
83	Perlesta spp.	PL	4.9	P	0							0
84	Perlinella ephyre	PL	0	P	0							0
85	Perlinella spp.	PL	0	P	0							0
86	Pteronarcys dorsata	PL	1.6	SH	0							0
87	Brachycentrus numerosus	TR	1.8	CF	0							0
88	Cheumatopsyche spp.	TR	6.6	CF	0							0
89	Chimarra spp.	TR	2.6	CF	0							0
90	Diplectrona modesta	TR	2.2	CF	0							0
91	Hydropsyche spp.	TR	4	CF	0							0
92	Hydroptila spp.	TR	6.2	H	0							0
93	Lype diversa	TR	4.3	SC	0							0
94	Micrasema spp.	TR	0.6	SH	0							0
95	Nectopsyche exquisita	TR	4.2	SH	0							0

Station 4, Crouch Branch at Road 4, 20 September 1994

96	Nectopsyche spp.	TR	4.1	SH	0						0
97	Neureclipsis spp.	TR	4.4	CF	0						0
98	Nyctiophylax spp.	TR	0.9	CF	0						0
99	Oecetis spp.	TR	5.7	P	0						0
100	Polycentropus spp.	TR	3.5	CF	0						0
101	Turbellaria	TU	7.5	P	30		2			2	1.793722

Station 4. Crouch Branch at Road 4. 20 September 1994

	Table size:	101	Total orgs:	223	Tot Tax:	25	tot. mean #	249.162
	Number Samps:	5	SC/CF:	2	Bio Index:	8.206726		
	Mean TAX/Samp	11.8						
	EPT:	3						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		0	0	.	.	.		
AM		0	0	.	.	.		
ANO		1	40	8.	44.6927	17.9372		
CO		0	0	.	.	.		
DC		1	1	.2	1.1173	.4484		
DCC		7	125	25.	139.6648	56.0538		
DD		0	0	.	.	.		
DO		2	2	.4	2.2346	.8969		
DOR		1	1	.2	1.1173	.4484		
DTA		2	22	4.4	24.581	9.8655		
DTY		2	10	2.	11.1732	4.4843		
EP		3	5	1.	5.5866	2.2422		
MB		0	0	.	.	.		
ME		0	0	.	.	.		
MG		2	3	.6	3.352	1.3453		
NE		1	2	.4	2.2346	.8969		
OD		2	8	1.6	8.9385	3.5874		
PL		0	0	.	.	.		
TR		0	0	.	.	.		
TU		1	4	.8	4.4693	1.7937		
	P	7	37	7.4	41.3408		16.59193	
	CG	11	175	35.	195.5307		78.47534	
	SC	3	6	1.2	6.7039		2.690583	
	H	2	2	.4	2.2346		0.896861	
	SH	0	0	.	.		0	
	CF	2	3	0.6	3.35195531		1.345291	

Station 4. Crouch Branch at Road 4. 20 September 1994

Taxa List:	
Oligochaeta	
Cambaridae	
Chironomus spp.	
Cryptochironomus spp.	
Dicrotendipes spp.	
Goeldichironomus holoprasinus	
Kiefferulus dux	
Microtendipes spp.	
Polypedilum spp.	
Ephydridae	
Simulium spp.	
Rheocricotopus spp.	
Ablabesmyia spp.	
Labrundinia spp.	
Rheotanytarsus spp.	
Tanytarsus spp.	
Eurylophella spp.	
Paraleptophlebia spp.	
Stenonema spp.	
Ferrissia sp.	
Planorbidae	
Nemertea	
Argia spp.	
Calopteryx spp.	
Turbellaria	

Station 4. Crouch Branch at Road 4. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Kiefferulus dux	DCC	10	CG	600		8	17	7	13	15	26.90583
2	Oligochaeta	ANO	8.2	CG	328		11	6	6	3	14	17.93722
3	Goeldichironomus holoprasinus	DCC	10	CG	260		1	3	5	9	8	11.65919
4	Labrundinia spp.	DTA	6	P	90		6	2		3	4	6.726457
5	Polypedilum spp.	DCC	6.9	CG	96.6			3	3	4	4	6.278027
6	Chironomus spp.	DCC	9.8	CG	127.4		1	6	6			5.829596

Station 5. Time Branch near Road 2. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler De	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	66.5		7	2	1		5	0.977199
2	Amphipoda	AM	8	CG	0							0
3	Oligochaeta	ANO	8.2	CG	459.2		36	9	2	6	3	3.648208
4	Ancylonyx variegatus	CO	6.9	CG	34.5		2	1	1		1	0.326733
5	Ectopria nervosa	CO	4.3	SC	0							0
6	Macronychus glabratus	CO	4.7	CG	56.4		4	1	1	4	2	0.781760
7	Stenelmis humerosa	CO	5.4	CG	43.2		1		4	2	1	0.621173
8	Stenelmis spp.	CO	6.4	CG	37.8			7				0.466026
9	Cambaridae	DC	6.8	H	0							0
10	Cryptochironomus spp.	DCC	7.3	P	153.3		5	4	1	5	6	1.368078
11	Cryptotendipes spp.	DCC	6.1	CG	0							0
12	Dicrotendipes spp.	DCC	7.9	CG	0							0
13	Microtendipes rydalensis	DCC	6.2	CG	12.4			2				0.130293
14	Microtendipes spp.	DCC	6.2	CG	6.2						1	0.065147
15	Nilothauma babiyi	DCC	5.6	CG	11				1		1	0.130293
16	Phaenopsectra flavipes	DCC	6.6	CG	26.6					1	2	0.19544
17	Polypedilum fallax	DCC	6.7	SH	455.6		19	12	10	12	16	4.429987
18	Polypedilum spp.	DCC	6.9	CG	593.4		28	26	9	8	16	5.602608
19	Stelechomyia perpulchra	DCC	4.6	SH	0							0
20	Stenochironomus sp.	DCC	6.4	SH	0							0
21	Tribelos jucundum	DCC	6.6	CG	0							0
22	Potthastia longimana	DD	7.4	CG	0							0
23	Atherix lantha	DO	2.1	P	0							0
24	Ceratopogonidae	DO	6.6	P	13					2		0.130293
25	Hemerodromia spp.	DO	8.1	CG	153.9		5	4		1	9	1.237785
26	Hexatoma spp.	DO	4.7	P	4.7					1		0.065147
27	Simulium spp.	DO	4.4	CF	17.6		1	1			2	0.260586
28	Brilla flavifrons	DOR	5.2	SH	0							0
29	Corynoneura spp.	DOR	6.2	CG	18.6			1		1	1	0.19544
30	Cricotopus/Ortho spp.	DOR	8.8	CG	17.6				1	1		0.130293
31	Eukiefferiella spp.	DOR	5.7	CG	0							0
32	Lopescladius spp.	DOR	2.2	CG	0							0
33	Nanocladius spp.	DOR	7.2	CG	0							0
34	Parakiefferiella sp.1	DOR	5.9	CG	0							0
35	Parametriocnemus sp.	DOR	3.7	CG	181.3		17	7	10	8	7	3.192182
36	Rheocricotopus spp.	DOR	7.3	CG	1116.9		50	36	22	21	24	9.967427
37	Synorthocladius semivirens	DOR	4.7	CG	0							0
38	Thienemanniella spp.	DOR	6	CG	390		24	14	13	5	9	4.234528
39	Tvetenia spp.	DOR	4	CG	0							0
40	Xylopus par	DOR	6.6	SH	0							0
41	Ablabesmyia spp.	DTA	6.4	P	6.4				1			0.065147
42	Conchapelopia spp.	DTA	6.7	P	461.1		11	17	13	6	6	3.452769
43	Labrundinia spp.	DTA	6	P	0							0
44	Larsia spp.	DTA	8.3	P	16.6					1	1	0.130293
45	Nilotanypus spp.	DTA	4	P	0							0
46	Paramerina sp.	DTA	2.8	P	0							0
47	Pentaneura inconspicua	DTA	4.6	P	0							0
48	Procladius sp.	DTA	9.3	P	0							0
49	Paratanytarsus spp.	DTY	7.7	CG	7.7				1			0.065147
50	Rheotanytarsus spp.	DTY	6.4	CF	2483.2		157	72	30	51	78	25.27607
51	Stempellinella spp.	DTY	5.3	CG	68.9		2	4	5	2		0.848908
52	Tanytarsus spp.	DTY	6.7	CG	3189.2		94	109	110	98	65	31.00977
53	Acentrella pygmaeus	EP	3.7	CG	0							0
54	Baetis spp.	EP	5.4	CG	10.8		1		1			0.130293
55	Caenis spp.	EP	7.6	CG	0							0
56	Callibaetis spp.	EP	9.3	CG	0							0
57	Eurylophella spp.	EP	3	CG	0							0
58	Heptagenia spp.	EP	2.8	SC	0							0
59	Isonychia spp.	EP	3.8	CF	0							0
60	Neoephemera youngi	EP	2.1	CG	0							0
61	Paraleptophlebia spp.	EP	1.2	CG	0							0
62	Stenonema spp.	EP	3.4	SC	10.2		1	1	1			0.19544
63	Tricorythodes spp.	EP	5.4	CG	5.4				1			0.065147
64	Sphaerium spp.	MB	7.7	CF	0							0
65	Corydalus cornutus	ME	5.6	P	0							0
66	Nigronia serricornis	ME	5.5	P	0							0
67	Sialis spp.	ME	7.5	P	0							0
68	Ferrissia sp.	MG	6.9	SC	6.9			1				0.065147
69	Nemertea	NA		P	0		1		1			0.130293
70	Argia spp.	OD	8.7	P	8.7					1		0.065147
71	Boyeria vinosa	OD	6.3	P	0							0
72	Calopteryx maculata	OD	8.3	P	8.3					1		0.065147
73	Enallagma spp.	OD	9	P	0							0
74	Neurocordulia spp.	OD	5.8	P	0							0
75	Progomphus spp.	OD	8.7	P	0							0
76	Acroneuria abnormis	PL	2.2	P	0							0
77	Acroneuria spp.	PL	1.4	P	5.6		1	2		1		0.260586
78	Allocapnia spp.	PL	2.8	SH	2.8				1			0.065147
79	Paragentina kansensis	PL	2	P	0							0
80	Paragentina spp.	PL	2	P	0							0
81	Perlesta spp.	PL	4.9	P	0							0
82	Perlinella ephyre	PL	0	P	0							0
83	Perlinella spp.	PL	0	P	0							0
84	Pteronarcys dorsata	PL	1.8	SH	0							0
85	Taeniopteryx sp.	PL	6.3	SH	0							0
86	Brachycentrus numerosus	TR	1.8	CF	0							0
87	Cheumatopsyche spp.	TR	6.6	CF	0							0
88	Chimarra spp.	TR	2.8	CF	0							0
89	Diplectrona modesta	TR	2.2	CF	0							0
90	Hydropsyche spp.	TR	4	CF	0							0
91	Hydroptila spp.	TR	6.2	H	0							0
92	Lype diversa	TR	4.3	SC	4.3			1				0.065147
93	Micrasema spp.	TR	0.8	SH	0							0
94	Nectopsyche exquisita	TR	4.2	SH	0							0
95	Nectopsyche spp.	TR	4.1	SH	0							0

Station 6. Tims Branch near Road 2. 20 September 1994

96	Neureclipsis spp.	TR	4.4	CF	0							0
97	Nyctiophylax spp.	TR	0.9	CF	0							0
98	Oecetis spp.	TR	5.5	P	0							0
99	Polycentropus spp.	TR	3.5	CF	0							0

Station 5. Time Branch near Road 2. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Tanytarsus spp.	DTY	6.7	CG	3189.2		94	109	110	98	65	31.00977
2	Rheotanytarsus spp.	DTY	6.4	CF	2483.2		157	72	30	51	78	25.27687
3	Rheocricotopus spp.	DOR	7.3	CG	1116.9		50	36	22	21	24	9.967427
4	Polypedilum spp.	DCC	6.9	CG	593.4		28	25	9	8	16	5.602606

Station 5. Tims Branch near Road 2. 20 September 1994

	Table size:	99	Total orgs:	1535	Tot Tax:	39	tot. mean #	1715.084
	Number Samps:	5	SC/CF:	0.0127551	Bio Index:	6.634332		
	Mean TAX/Samp	22.4						
	EPT:	6						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	15	3.	16.7598	.9772		
AM		0	0	.	.	.		
ANO		1	56	11.2	62.5698	3.6482		
CO		4	32	6.4	35.7542	2.0847		
DC		0	0	.	.	.		
DCC		7	183	36.6	204.4693	11.9218		
DD		0	0	.	.	.		
DO		4	26	5.2	29.0503	1.6938		
DOR		5	272	54.4	303.9106	17.7199		
DTA		3	56	11.2	62.5698	3.6482		
DTY		4	878	175.6	981.0056	57.1987		
EP		3	6	1.2	6.7039	.3909		
MB		0	0	.	.	.		
ME		0	0	.	.	.		
MG		1	1	.2	1.1173	.0651		
NA		1	2	.4	2.2346	.1303		
OD		2	2	.4	2.2346	.1303		
PL		2	5	1.	5.5866	.3257		
TR		1	1	.2	1.1173	.0651		
	P	11	103	20.6	115.0838		6.710098	
	CG	21	966	193.2	1079.3296		62.9316	
	SC	3	5	1.	5.5866		0.325733	
	H	0	0	.	.		0	
	SH	2	69	13.8	77.095		4.495114	
	CF	2	392	78.4	437.988827		25.53746	

Station 5. Tims Branch near Road 2. 20 September 1994

Taxa List:
Hydracarina
Oligochaeta
Ancyronyx variegatus
Macronychus glabratus
Stemelmis humerosa
Stenelmis spp.
Cryptochironomus spp.
Microtendipes rydalensis
Microtendipes spp.
Nilothauma babiyi
Phaenopsectra flavipes
Polypedilum fallax
Polypedilum spp.
Ceratopogonidae
Hemerodromia spp.
Hexatoma spp.
Simulium spp.
Corynoneura spp.
Cricotopus/Ortho spp.
Parametriocnemus sp.
Rheocricotopus spp.
Thienemanniella spp.
Ablabesmyia spp.
Conchapelopia spp.
Larsia spp.
Paratanytarsus spp.
Rheotanytarsus spp.
Stempellinella spp.
Tanytarsus spp.
Baetis spp.
Stenonema spp.
Tricorythodes spp.
Ferrissia sp.
Nemertea
Argia spp.
Calopteryx maculata
Acroneuria spp.
Allocapnia spp.
Lype diversa

Station 6. Upper Three Runs Creek at Road C. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler De	A	B	C	D	Rel Abd
1	Hydracarina	AHC	5.7	P	0						0
2	Amphipoda	AMG	8	CG	0						0
3	Oligochaeta	ANO	8.2	CG	8.2					1	0.182482
4	Ancyronyx variegatus	CO	6.9	CG	0						0
5	Ectopria nervosa	CO	4.3	SC	0						0
6	Macronychus glabratus	CO	4.7	CG	9.4					2	0.364964
7	Stenelmis humerosa	CO	5.4	CG	21.6		2			2	0.729927
8	Stenelmis spp.	CO	5.4	CG	0						0
9	Cambaridae	DC	8.8	H	0						0
10	Cryptochironomus spp.	DCC	7.3	P	0						0
11	Cryptotendipes spp.	DCC	6.1	CG	0						0
12	Dicrotendipes spp.	DCC	7.9	CG	0						0
13	Microtendipes rydalensis	DCC	6.2	CG	0						0
14	Microtendipes spp.	DCC	6.2	CG	0						0
15	Nilothauma babiyi	DCC	5.5	CG	5.5			1			0.182482
16	Phaenopsectra flavipes	DCC	8.5	CG	0						0
17	Polypedilum fallax	DCC	6.7	SH	26.8		1		2	1	0.729927
18	Polypedilum spp.	DCC	6.9	CG	1152.3		75	34	19	39	30.47445
19	Stelechomyia perpulchra	DCC	4.6	SH	0						0
20	Stenochironomus sp.	DCC	6.4	SH	0						0
21	Tribelos jucundum	DCC	6.6	CG	0						0
22	Potthastia longimana	DD	7.4	CG	0						0
23	Athorix lantha	DO	2.1	P	4.2			2			0.364964
24	Ceratopogonidae	DO	6.5	P	13				2		0.364964
25	Hemerodromia spp.	DO	8.1	CG	8.1		1				0.182482
26	Simulium spp.	DO	4.4	CF	352		61	2		17	14.59854
27	Brilla flavifrons	DOR	5.2	SH	0						0
28	Corynoneura spp.	DOR	6.2	CG	68.2		8	1	1	1	2.007299
29	Cricotopus/Ortho spp.	DOR	8.8	CG	52.8		5			1	1.094891
30	Eukiefferiella spp.	DOR	5.7	CG	0						0
31	Lopescladius spp.	DOR	2.2	CG	0						0
32	Nanocladius spp.	DOR	7.2	CG	0						0
33	Parakiefferiella sp.1	DOR	5.9	CG	0						0
34	Parametriocnemus sp.	DOR	3.7	CG	0						0
35	Rheocricotopus spp.	DOR	7.3	CG	313.9		22	9	1	11	7.846715
36	Synorthocladius semivirens	DOR	4.7	CG	18.8		4				0.729927
37	Thienemanniella spp.	DOR	6	CG	360		45	2	4	9	10.94891
38	Tvetenia spp.	DOR	4	CG	8		1			1	0.364964
39	Xylopus par	DOR	6.6	SH	0						0
40	Ablabesmyia spp.	DTA	6.4	P	0						0
41	Conchapelopia spp.	DTA	8.7	P	69.6		2	1	4	1	1.459854
42	Labrundinia spp.	DTA	6	P	0						0
43	Nilotanypus spp.	DTA	4	P	16		2			2	0.729927
44	Paramerina sp.	DTA	2.8	P	0						0
45	Penteneura inconspicua	DTA	4.6	P	4.6		1				0.182482
46	Procladius sp.	DTA	9.3	P	0						0
47	Rheotanytarsus spp.	DTY	6.4	CF	147.2		16	1	1	5	4.19708
48	Tanytarsus spp.	DTY	6.7	CG	154.1		15	2	2	4	4.19708
49	Acerpenna pygmaeus	EP	3.7	CG	0						0
50	Baetis spp.	EP	5.4	CG	32.4		3	1		2	1.094891
51	Caenis spp.	EP	7.6	CG	0						0
52	Callibaetis spp.	EP	9.3	CG	0						0
53	Eurylophella spp.	EP	3	CG	18		3	2		1	1.094891
54	Heptagenia spp.	EP	2.8	SC	8.4		1	2			0.547445
55	Isonychia spp.	EP	3.8	CF	0						0
56	Neoephemera youngi	EP	2.1	CG	10.5		3	1		1	0.912409
57	Paraleptophlebia spp.	EP	1.2	CG	0						0
58	Stenonema spp.	EP	3.4	SC	102		9	5	7	9	5.474453
59	Tricorythodes spp.	EP	5.4	CG	5.4					1	0.182482
60	Sphaerium spp.	MB	7.7	CF	0						0
61	Corydalus cornutus	ME	5.6	P	16.8		1		1	1	0.547445
62	Nigronia serricornis	ME	5.5	P	0						0
63	Sialis spp.	ME	7.5	P	0						0
64	Ferrissia sp.	MG	6.9	SC	0						0
65	Nematoda	NE		CG	0					1	0.182482
66	Boyeria vinosa	OD	6.3	P	0						0
67	Enallagma spp.	OD	9	P	0						0
68	Neurocordulia spp.	OD	5.8	P	0						0
69	Progomphus spp.	OD	8.7	P	0						0
70	Acroneuria abnormis	PL	2.2	P	30.8		8		6		2.554745
71	Acroneuria spp.	PL	1.4	P	0						0
72	Agnetina spp.	PL	0	P	0						0
73	Allocapnia spp.	PL	2.8	SH	0						0
74	Paragentina immarginata	PL	2	P	14			5	1	1	1.277372
75	Paragentina kansensis	PL	2	P	0						0
76	Perlesta spp.	PL	4.9	P	0						0
77	Perlinella ephyre	PL	0	P	0						0
78	Perlinella spp.	PL	0	P	0						0
79	Pteronarcys dorsata	PL	1.8	SH	1.8					1	0.182482
80	Taeniopteryx sp.	PL	6.3	SH	0						0
81	Brachycentrus numerosus	TR	1.8	CF	3.6					2	0.364964
82	Choumatopsyche spp.	TR	6.6	CF	0						0
83	Chimarra spp.	TR	2.8	CF	2.8		1				0.182482
84	Diplectrona modesta	TR	2.2	CF	0						0
85	Hydropsyche spp.	TR	4	CF	64		9	2	2	3	2.919708
86	Hydroptila spp.	TR	6.2	H	0						0
87	Lype diversa	TR	4.3	SC	0						0
88	Micrasema spp.	TR	0.8	SH	1.8				3		0.547445

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89	Nectopsyche exquisite	TR	4.2	SH	0						0
90	Nectopsyche spp.	TR	4.1	SH	0						0
91	Neureclipsis spp.	TR	4.4	CF	0						0
92	Nyctiophylax spp.	TR	0.9	CF	0						0
93	Oecetis spp.	TR	5.5	P	0						0
94	Polycentropus spp.	TR	3.5	CF	0						0

Station 6. Upper Three Runs Creek at Road C. 20 September 1994

	Table size:	94	Total orgs:	548	Tot Tax:	36	tot. mean #	765.3631
	Number Samps:	4	SC/CF:	0.2704918	Bio Index:	5.705474		
	Mean TAX/Samp	20.75						
	EPT:	13						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		0	0	.	.	.		
AMG		0	0	.	.	.		
ANO		1	1	.25	1.3966	.1825		
CO		2	6	1.5	8.3799	1.0949		
DC		0	0	.	.	.		
DCC		3	172	43.	240.2235	31.3869		
DD		0	0	.	.	.		
DO		4	85	21.25	118.7151	15.5109		
DOR		6	126	31.5	175.9777	22.9927		
DTA		3	13	3.25	18.1564	2.3723		
DTY		2	46	11.5	64.2458	8.3942		
EP		6	51	12.75	71.2291	9.3066		
MB		0	0	.	.	.		
ME		1	3	.75	4.1899	.5474		
MG		0	0	.	.	.		
NE		1	1	.25	1.3966	.1825		
OD		0	0	.	.	.		
PL		3	22	5.5	30.7263	4.0146		
TR		4	22	5.5	30.7263	4.0146		
	P	8	41	10.25	57.2626		7.481752	
	CG	18	344	86.	480.4469		62.77372	
	SC	2	33	8.25	46.0894		6.021898	
	H	0	0	.	.		0	
	SH	3	8	2.	11.1732		1.459854	
	CF	5	122	30.5	170.391061		22.26277	

Station 6. Upper Three Runs Creek at Road C. 20 September 1994

Taxa List:	
Oligochaeta	
Macronychus glabratus	
Stemelmis humerosa	
Nilothauma babiyi	
Polypedilum fallax	
Polypedilum spp.	
Atherix lantha	
Ceratopogonidae	
Hemerodromia spp.	
Simulium spp.	
Corynoneura spp.	
Cricotopus/Ortho spp.	
Rheocricotopus spp.	
Synorthocladius semivirens	
Thienemanniella spp.	
Tvetenia spp.	
Conchapelopia spp.	
Nilotanypus spp.	
Pentaneura inconspicua	
Rheotanytarsus spp.	
Tanytarsus spp.	
Baetis spp.	
Eurylophella spp.	
Heptagenia spp.	
Neoephemera youngi	
Stenonema spp.	
Tricorythodes spp.	
Corydalus cornutus	
Nematoda	
Acroneuria abnormis	
Paragentina immarginata	
Pteronarcys dorsata	
Brachycentrus numerosus	
Chimarra spp.	
Hydropsyche spp.	
Micrasema spp.	

Station 6. Upper Three Runs Creek at Road C. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler D	A	B	C	D	Rel Abd
1	Polypedilum spp.	DCC	6.9	CG	1152.3		75	34	19	39	30.47445
2	Simulium spp.	DO	4.4	CF	352		61	2		17	14.59854
3	Thienemanniella spp.	DOR	6	CG	360		45	2	4	9	10.94891
4	Rheocricotopus spp.	DOR	7.3	CG	313.9		22	9	1	11	7.846715
5	Stenonema spp.	EP	3.4	SC	102		9	5	7	9	5.474453

Station 7. Four Mile Branch at Road C. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	11.4			1	1			0.114025
2	Amphipoda	AM	8	CG	66			3		3	1	0.399088
3	Oligochaeta	ANO	8.2	CG	1869.6		40	61	50	29	19	12.99886
4	Ancyronyx variegatus	CO	6.9	CG	56.2		4	1	1	1	1	0.4561
5	Ectopria nervosa	CO	4.3	SC	0							0
6	Gyrinus spp.	CO	6.3	P	6.3				1			0.057013
7	Macronychus glabratus	CO	4.7	CG	14.1			1	1		1	0.171038
8	Stenelmis humerosa	CO	5.4	CG	0							0
9	Stenelmis spp.	CO	5.4	CG	21.6		2				2	0.22805
10	Cambaridae	DC	8.8	H	0							0
11	Chironomus spp.	DCC	9.8	CG	303.8		1	1		3	26	1.767389
12	Cryptochironomus spp.	DCC	7.3	P	7.3					1		0.057013
13	Cryptotendipes spp.	DCC	6.1	CG	6.1					1		0.057013
14	Dicrotendipes spp.	DCC	7.9	CG	94.8		2	2			8	0.684151
15	Goeldichironomus holopraasinus	DCC	10	CG	20			1	1			0.114025
16	Microtendipes cydalensis	DCC	6.2	CG	0							0
17	Microtendipes spp.	DCC	6.2	CG	0							0
18	Nilothauma babiyi	DCC	5.5	CG	16.5						3	0.171038
19	Pagastiella spp.	DCC	2.6	CG	5.2					2		0.114025
20	Phaenopsectra flavipes	DCC	8.5	CG	0							0
21	Polypedilum fallax	DCC	6.7	SH	46.9				1	6		0.399088
22	Polypedilum spp.	DCC	6.9	CG	752.1		30	30	21	12	7	6.214367
23	Stelechomyia perpulchra	DCC	4.6	SH	0							0
24	Stenochironomus sp.	DCC	6.4	SH	0							0
25	Tribelos fuscicorne	DCC	6.2	CG	148.8		8	2		8	6	1.368301
26	Tribelos jucundum	DCC	6.6	CG	39.6						6	0.342075
27	Pseudochironomus spp.	DCP	4.2	CG	4.2			1				0.057013
28	Potthastia longimana	DD	7.4	CG	0							0
29	Atherix tantha	DO	2.1	P	0							0
30	Ceratopogonidae	DO	6.5	P	78			3	2	4	3	0.684151
31	Hemerodromia spp.	DO	8.1	CG	0							0
32	Simulium spp.	DO	4.4	CF	4.4			1				0.057013
33	Brilla flavifrons	DOR	5.2	SH	0							0
34	Corynoneura spp.	DOR	6.2	CG	18.6		1		1		1	0.171038
35	Cricotopus/Ortho spp.	DOR	8.8	CG	17.6						2	0.114025
36	Eukiefferiella spp.	DOR	5.7	CG	0							0
37	Lopescladius spp.	DOR	2.2	CG	0							0
38	Nanocladius spp.	DOR	7.2	CG	86.4		8	1	2		1	0.684151
39	Parakiefferiella sp.1	DOR	5.9	CG	11.8			2				0.114025
40	Parametriocnemus sp.	DOR	3.7	CG	7.4			2				0.114025
41	Rheocricotopus spp.	DOR	7.3	CG	0							0
42	Synorthocladius semivirens	DOR	4.7	CG	0							0
43	Thienemanniella spp.	DOR	6	CG	210		2	25	6		2	1.995439
44	Tvetenia spp.	DOR	4	CG	0							0
45	Xylopus par	DOR	6.6	SH	0							0
46	Ablabesmyia spp.	DTA	6.4	P	266.4		13	12	9	51	66	8.608894
47	Conchapelopia spp.	DTA	8.7	P	304.5		11	8	10	2	4	1.995439
48	Labrundinia spp.	DTA	6	P	54		2			4	3	0.513113
49	Larsia spp.	DTA	8.3	P	8.3		1					0.057013
50	Nilotanypus spp.	DTA	4	P	0							0
51	Paramerina sp.	DTA	2.8	P	2.8						1	0.057013
52	Pentaneura inconspicua	DTA	4.6	P	253		30	12	10	1	2	3.13569
53	Procladius sp.	DTA	9.3	P	9.3					1		0.057013
54	Cladotanytarsus spp.	DTY	3.7	CG	3.7				1			0.057013
55	Rheotanytarsus spp.	DTY	6.4	CF	518.4		33	29	15	1	3	4.618016
56	Stempellinella spp.	DTY	5.3	CG	5.3			1				0.057013
57	Tanytarsus spp.	DTY	6.7	CG	4294.7		196	210	174	25	36	36.54504
58	Acerpenna pygmaeus	EP	3.7	CG	0							0
59	Baetis spp.	EP	5.4	CG	37.8			2		1	4	0.399088
60	Caenis spp.	EP	7.6	CG	45.6				2	3	1	0.342075
61	Callibaetis spp.	EP	9.3	CG	27.9					1	2	0.171038
62	Eurylophella spp.	EP	3	CG	9					1	2	0.171038
63	Heptagenia spp.	EP	2.8	SC	0							0
64	Isonychia spp.	EP	3.8	CF	0							0
65	Neoephemera youngi	EP	2.1	CG	2.1		1					0.057013
66	Paraleptophlebia spp.	EP	1.2	CG	1.2		1					0.057013
67	Stenonema spp.	EP	3.4	SC	10.2		2		1			0.171038
68	Tricorythodes spp.	EP	5.4	CG	0							0
69	Sphaerium spp.	MB	7.7	CF	0							0
70	Corydalus cornutus	ME	5.6	P	0							0
71	Nigronia serricornis	ME	5.5	P	0							0
72	Sialis spp.	ME	7.5	P	0							0
73	Ferrissia sp.	MG	6.9	SC	6.9			1				0.057013
74	Planorbidae	MG	6.5	SC	6.5			1				0.057013
75	Nemertea	NA		P	0		10	12	10	7	10	2.793615
76	Argia spp.	OD	8.7	P	60.9			1	1	5		0.399088
77	Boyeria vinosa	OD	6.3	P	0							0
78	Enallagma spp.	OD	9	P	9				1			0.057013
79	Neurocordulia spp.	OD	5.8	P	0							0
80	Progomphus spp.	OD	8.7	P	0							0
81	Acroneuria abnormis	PL	2.2	P	0							0
82	Acroneuria spp.	PL	1.4	P	0							0
83	Agnetina spp.	PL	0	P	0							0
84	Allocapnia spp.	PL	2.8	SH	0							0
85	Paragnetina kansensis	PL	2	P	0							0
86	Paragnetina spp.	PL	2	P	0							0
87	Pteronarcys dorsata	PL	4.9	P	0							0
88	Perlinella ephyre	PL	0	P	0							0
89	Perlinella spp.	PL	0	P	0							0
90	Pteronarcys dorsata	PL	1.8	SH	0							0
91	Brachycentrus numerosus	TR	1.8	CF	0							0
92	Cheumatopsyche spp.	TR	6.6	CF	0							0
93	Chimarra spp.	TR	2.8	CF	0							0
94	Diplectrona modesta	TR	2.2	CF	0							0
95	Hydropsyche spp.	TR	4	CF	0							0

Station 7, Four Mile Branch at Road C, 20 September 1994

96	Hydroptila spp.	TR	6.2	H	0							0
97	Lype diversa	TR	4.3	SC	21.6			3			2	0.285063
98	Micrasema spp.	TR	0.6	SH	0							0
99	Nectopsyche exquisita	TR	4.2	SH	0							0
100	Nectopsyche spp.	TR	4.1	SH	0							0
101	Neureclipsis spp.	TR	4.4	CF	0							0
102	Nyctiophylax spp.	TR	0.9	CF	0							0
103	Oecetis spp.	TR	5.6	P	27.6		1	3	1			0.285063
104	Oxyethira spp.	TR	6.2	H	18.6		1	2				0.171038
105	Polycentropus spp.	TR	3.5	CF	10.6				1		2	0.171038
106	Turbellaria	TU	7.5	P	1177.5		33	43	57	10	14	8.950969

Station 7. Four Mile Branch at Road C. 20 September 1994

	Table size:	106	Total orgs:	1754	Tot Tax:	55	tot. mean #	1959.777
	Number Samps:	5	SC/CF:	0.11764706	Bio Index:	6.060034		
	Mean TAX/Samp	27.6						
	EPT:	11						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	2	.4	2.2346	.114		
AM		1	7	1.4	7.8212	.3991		
ANO		1	228	45.6	254.7486	12.9989		
CO		4	16	3.2	17.8771	.9122		
DC		0	0	.	.	.		
DCC		11	198	39.6	221.2291	11.2885		
DCP		1	1	.2	1.1173	.057		
DD		0	0	.	.	.		
DO		2	13	2.6	14.5251	.7412		
DOR		6	56	11.2	62.5698	3.1927		
DTA		7	253	50.6	282.6816	14.4242		
DTY		4	724	144.8	808.9385	41.2771		
EP		7	24	4.8	26.8156	1.3683		
MB		0	0	.	.	.		
ME		0	0	.	.	.		
MG		2	2	.4	2.2346	.114		
NA		1	49	9.8	54.7486	2.7936		
OD		2	8	1.6	8.9385	.4561		
PL		0	0	.	.	.		
TR		4	16	3.2	17.8771	.9122		
TU		1	157	31.4	175.419	8.951		
	P	16	488	97.6	545.2514		27.82212	
	CG	30	1161	232.2	1297.2067		66.19156	
	SC	4	10	2.	11.1732		0.570125	
	H	1	3	.6	3.352		0.171038	
	SH	1	7	1.4	7.8212		0.399088	
	CF	3	85	17	94.972067		4.846066	

Station 7. Four Mile Branch at Road C. 20 September 1994

Taxa List:
Hydracarina
Amphipoda
Oligochaeta
Ancyronyx variegatus
Gyrinus spp.
Macronychus glabratus
Stenelmis spp.
Chironomus spp.
Cryptochironomus spp.
Cryptotendipes spp.
Dicrotendipes spp.
Goeldichironomus holoprasinus
Nilothauma babiyi
Pagastiella spp.
Polypedilum fallax
Polypedilum spp.
Tribelos fuscicorne
Tribelos jucundum
Pseudochironomus spp.
Ceratopogonidae
Simulium spp.
Corynoneura spp.
Cricotopus/Ortho spp.
Nanocladius spp.
Parakiefferiella sp.1
Parametriocnemus sp.
Thienemanniella spp.
Ablabesmyia spp.
Conchapelopia spp.
Labrundinia spp.
Larsia spp.
Paramerina sp.
Pentaneura inconspicua
Procladius sp.
Cladotanytarsus spp.
Rheotanytarsus spp.
Stempellinella spp.
Tanytarsus spp.
Baetis spp.
Caenis spp.
Callibaetis spp.
Eurylophella spp.
Neoephemera youngi
Paraleptophlebia spp.
Stenonema spp.
Ferrissia sp.
Planorbidae
Nemertea

Station 7. Four Mile Branch at Road C. 20 September 1994

Argia spp.	
Enallagma spp.	
Lype diversa	
Oecetis spp.	
Oxyethira spp.	
Polycentropus spp.	
Turbellaria	

Station 7. Four Mile Branch at Road C. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Tanytarsus spp.	DTY	6.7	CG	4294.7		198	210	174	25	36	36.54504
2	Oligochaeta	ANO	8.2	CG	1869.6		49	81	50	29	19	12.99886
3	Turbellaria	TU	7.5	P	1177.5		33	43	57	10	14	8.950969
4	Ablabesmyia spp.	DTA	6.4	P	966.4		13	12	9	51	66	8.608894
5	Polypedilum spp.	DCC	6.9	CG	752.1		39	30	21	12	7	6.214367

Station 8. Pen Branch at Road C. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler De	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	0							0
2	Amphipoda	AM	8	CG	0							0
3	Oligochaeta	ANO	8.2	CG	336.2			6	11	2	23	3.366174
4	Ancyronyx variegatus	CO	6.9	CG	27.6		1		1	1	1	0.328407
5	Ectopria nervosa	CO	4.3	SC	0							0
6	Macronychus glabratus	CO	4.7	CG	0							0
7	Stenelmis humerosa	CO	5.4	CG	21.8					2	2	0.328407
8	Stenelmis spp.	CO	5.4	CG	0							0
9	Cambaridae	DCA	8.8	H	0							0
10	Chironomus spp.	DCC	9.8	CG	9.8					1		0.082102
11	Cryptochironomus spp.	DCC	7.3	P	21.9				1	1	1	0.246305
12	Cryptotendipes spp.	DCC	6.1	CG	0							0
13	Dicrotendipes spp.	DCC	7.9	CG	7.9					1		0.082102
14	Goeldichironomus holoprasinus	DCC	10	CG	10						1	0.082102
15	Kiefferulus dux	DCC	10	CG	20			1	1			0.164204
16	Micrctendipes rydalensis	DCC	6.2	CG	18.6		1		1	1		0.246305
17	Micrctendipes spp.	DCC	6.2	CG	0							0
18	Nilothauma babiyi	DCC	5.5	CG	0							0
19	Paratendipes spp.	DCC	5.3	CG	5.3		1					0.082102
20	Phaenopsectra flavipes	DCC	8.5	CG	119		2	1		7	4	1.149425
21	Polypedilum fallax	DCC	6.7	SH	20.1		1			2		0.246305
22	Polypedilum spp.	DCC	6.9	CG	144.9		3		14	1	3	1.724138
23	Stelechomyia perpulchra	DCC	4.6	SH	0							0
24	Stenochironomus sp.	DCC	6.4	SH	0							0
25	Tribelos jucundum	DCC	6.6	CG	0							0
26	Potthastia longimana	DD	7.4	CG	0							0
27	Atherix lantha	DO	2.1	P	0							0
28	Ceratopogonidae	DO	6.5	P	6.5				1			0.082102
29	Hemerodromia spp.	DO	8.1	CG	0							0
30	Simulium spp.	DO	4.4	CF	0							0
31	Brilla flavifrons	DOR	5.2	SH	0							0
32	Corynoneura spp.	DOR	6.2	CG	37.2		2				4	0.492611
33	Cricotopus/Ortho spp.	DOR	8.8	CG	0							0
34	Eukiefferiella spp.	DOR	5.7	CG	0							0
35	Lopescladius spp.	DOR	2.2	CG	0							0
36	Nanocladius spp.	DOR	7.2	CG	14.4			1		1		0.164204
37	Parakiefferiella sp.1	DOR	5.9	CG	0							0
38	Parametriocnemus sp.	DOR	3.7	CG	0							0
39	Rheocricotopus spp.	DOR	7.3	CG	7.3		1					0.082102
40	Synorthocladius semivirens	DOR	4.7	CG	0							0
41	Thienemanniella spp.	DOR	6	CG	12				2			0.164204
42	Tvetenia spp.	DOR	4	CG	0							0
43	Xylopus par	DOR	6.6	SH	0							0
44	Ablabesmyia spp.	DTA	6.4	P	198.4		4	5	9	4	9	2.545156
45	Conchapelopia spp.	DTA	8.7	P	17.4		1		1			0.164204
46	Labrundinia spp.	DTA	6	P	66		1	2		3	5	0.90312
47	Larsia spp.	DTA	8.3	P	24.9			1	1		1	0.246305
48	Nilotanypus spp.	DTA	4	P	16		2		2			0.328407
49	Paramerina sp.	DTA	2.8	P	0							0
50	Pentaneura inconspicua	DTA	4.6	P	4.6				1			0.082102
51	Procladius sp.	DTA	9.3	P	0							0
52	Rheotanytarsus spp.	DTY	6.4	CF	83.2		3	6	3	1		1.067323
53	Stempellinella spp.	DTY	5.3	CG	116.6		8	7	2	5		1.80624
54	Tanytarsus spp.	DTY	6.7	CG	5011.6		129	94	165	160	180	61.41215
55	Acerpenna pygmaeus	EP	3.7	CG	0							0
56	Baetis spp.	EP	5.4	CG	0							0
57	Caenis spp.	EP	7.6	CG	0							0
58	Callibaetis spp.	EP	9.3	CG	0							0
59	Eurylophella spp.	EP	3	CG	225		16	18	5	9	27	6.157635
60	Heptagenia spp.	EP	2.8	SC	0							0
61	Isonychia spp.	EP	3.8	CF	0							0
62	Neoephemera youngi	EP	2.1	CG	0							0
63	Paraleptophlebia spp.	EP	1.2	CG	42		5	13	1	7	9	2.873563
64	Stenonema spp.	EP	3.4	SC	428.4		20	26	14	15	51	10.34483
65	Tricorythodes spp.	EP	5.4	CG	0							0
66	Sphaerium spp.	MB	7.7	CF	0							0
67	Corydalus cornutus	ME	5.6	P	0							0
68	Nigronia serricornis	ME	5.5	P	0							0
69	Sialis spp.	ME	7.5	P	0							0
70	Ferrissia sp.	MG	6.9	SC	0							0
71	Planorbidae	MG	6.5	SC	13						2	0.164204
72	Nemertea	NA		P	#VALUE!		2	3	2	1	3	0.90312
73	Argia spp.	OD	8.7	P	113.1		2	3	2		8	1.067323
74	Boyeria vinosa	OD	6.3	P	0							0
75	Calopteryx maculata	OD	8.3	P	0							0
76	Enallagma spp.	OD	9	P	0							0
77	Neurocordulia spp.	OD	5.8	P	0							0
78	Progomphus spp.	OD	8.7	P	0							0
79	Acroneuria abnormis	PL	2.2	P	0							0
80	Acroneuria spp.	PL	1.4	P	0							0
81	Agnetina spp.	PL	0	P	0							0
82	Allocapnia spp.	PL	2.8	SH	0							0
83	Paragentina kansensis	PL	2	P	0							0
84	Paragentina spp.	PL	2	P	0							0
85	Perlesta spp.	PL	4.9	P	0							0
86	Perlinella ephyre	PL	0	P	0							0
87	Perlinella spp.	PL	0	P	0							0
88	Pteronarcys dorsata	PL	1.6	SH	0							0
89	Brachycentrus numerosus	TR	1.6	CF	0							0
90	Cheumatopsyche spp.	TR	6.6	CF	0							0
91	Chimarra spp.	TR	2.6	CF	0							0
92	Diplectrona modesta	TR	2.2	CF	0							0
93	Hydropsyche spp.	TR	4	CF	0							0
94	Hydroptila spp.	TR	6.2	H	0							0
95	Lype diversa	TR	4.3	SC	4.3					1		0.082102

96	Micrasema spp.	TR	0.6	SH	0						0
97	Nectopsyche pavida	TR	4.2	SH	0						0
98	Nectopsyche spp.	TR	4.1	SH	0						0
99	Neureclipsis spp.	TR	4.4	CF	26.4		1			2	3	0.492611
100	Nyctiophylax spp.	TR	0.9	CF	0							0
101	Oecetis spp.	TR	5.7	P	5.7			1				0.082102
102	Polycentropus spp.	TR	3.6	CF	0							0
103	Turbellaria	TU	7.5	P	15				1		1	0.164204

Station 8. Pen Branch at Road C. 20 September 1994

	Table size:	103	Total orgs:	1218	Tot Tax:	37	tot. mean #	1360.894
	Number Samps:	5	SC/CF:	6.78947368	Bio Index:	5.941626		
	Mean TAX/Samp	20.2						
	EPT:	6						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		0	0	.	.	.		
AM		0	0	.	.	.		
ANO		1	41	8.2	45.8101	3.3662		
CO		2	8	1.6	8.9385	.6568		
DCA		0	0	.	.	.		
DCC		10	50	10.	55.8659	4.1051		
DD		0	0	.	.	.		
DO		1	1	.2	1.1173	.0821		
DOR		4	11	2.2	12.2905	.9031		
DTA		6	52	10.4	58.1006	4.2693		
DTY		3	783	156.6	874.8603	64.2857		
EP		3	236	47.2	263.6872	19.376		
MB		0	0	.	.	.		
ME		0	0	.	.	.		
MG		1	2	.4	2.2346	.1642		
NA		1	11	2.2	12.2905	.9031		
OD		1	13	2.6	14.5251	1.0673		
PL		0	0	.	.	.		
TR		3	8	1.6	8.9385	.6568		
TU		1	2	.4	2.2346	.1642		
	P	12	83	16.6	92.7374		6.81445	
	CG	19	984	196.8	1099.4413		80.78818	
	SC	3	129	25.8	144.1341		10.59113	
	H	0	0	.	.		0	
	SH	1	3	.6	3.352		0.246305	
	CF	2	19	3.8	21.2290503		1.559934	

Station 8. Pen Branch at Road C. 20 September 1994

Taxa List:	
Oligochaeta	
Ancyronyx variegatus	
Stemelmis hunerosa	
Chironomus spp.	
Cryptochironomus spp.	
Dicrotendipes spp.	
Goeldichironomus holoprasinus	
Kiefferulus dux	
Microtendipes rydalensis	
Paratendipes spp.	
Phaenopsectra flavipes	
Polypedilum fallax	
Polypedilum spp.	
Ceratopogonidae	
Corynoneura spp.	
Nanocladius spp.	
Rheocricotopus spp.	
Thienemanniella spp.	
Ablabesmyia spp.	
Conchapelopia spp.	
Labrundinia spp.	
Larsia spp.	
Nilotanypus spp.	
Pentaneura inconspicua	
Rheotanytarsus spp.	
Stempellinella spp.	
Tanytarsus spp.	
Eurylophella spp.	
Paraleptophlebia spp.	
Stenonema spp.	
Planorbidae	
Nemertea	
Argia spp.	
Lype diversa	
Neureclipsis spp.	
Oecetis spp.	
Turbellaria	

Station 8. Pen Branch at Road C. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Tanytarsus spp.	DTY	6.7	CG	5011.6		129	94	185	160	180	61.41215
2	Stenonema spp.	EP	3.4	SC	428.4		20	26	14	15	51	10.34483
3	Eurylophella spp.	EP	3	CG	225		16	18	5	9	27	6.157635

Station 9. Meyers Branch at Road 9. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	5.7	P	5.7				1			0.072046
2	Amphipoda	AM	8	CG	0							0
3	Oligochaeta	ANO	8.4	CG	268.8		13	4	9	5	1	2.305476
4	Ancyronyx variegatus	CO	6.9	CG	6.9				1			0.072046
5	Ectopria nervosa	CO	4.3	SC	4.3				1			0.072046
6	Macronychus glabratus	CO	4.7	CG	56.4		2	4	4		2	0.864553
7	Stenelmis humerosa	CO	5.4	CG	10.8						2	0.144092
8	Stenelmis spp.	CO	5.4	CG	0							0
9	Cambaridae	DC	8.8	H	0							0
10	Cryptochironomus spp.	DCC	7.3	P	0							0
11	Dicrotendipes spp.	DCC	8.1	CG	0							0
12	Microtendipes rydalensis	DCC	6.2	CG	93			1	6	2	6	1.080692
13	Microtendipes spp.	DCC	6.2	CG	12.4		2					0.144092
14	Nilothauma babiyi	DCC	5.5	CG	5.5						1	0.072046
15	Phaenopsectra flavipes	DCC	8.5	CG	0							0
16	Polypedilum fallax	DCC	6.7	SH	33.5		1	1	1		2	0.360231
17	Polypedilum spp.	DCC	6.9	CG	669.3		13	43	18	5	18	6.988473
18	Stelechomyia perpulchra	DCC	4.6	SH	4.6					1		0.072046
19	Stenochironomus sp.	DCC	6.4	SH	0							0
20	Tribelos jucundum	DCC	6.6	CG	0							0
21	Potthastia longimana	DD	7.4	CG	0							0
22	Atherix lantha	DO	2.1	P	0							0
23	Ceratopogonidae	DO	6.5	P	0							0
24	Hemerodromia spp.	DO	8.1	CG	0							0
25	Hexatoma spp.	DO	4.7	P	14.1		2	1				0.216138
26	Simulium spp.	DO	4.4	CF	70.4		1	13			2	1.152738
27	Brilla flavifrons	DOR	5.2	SH	0							0
28	Corynoneura spp.	DOR	6.2	CG	55.8		2		4		3	0.648415
29	Cricotopus/Ortho spp.	DOR	8.8	CG	114.4		2	2	4	1	4	0.936599
30	Eukiefferiella spp.	DOR	5.7	CG	0							0
31	Lopescladius spp.	DOR	2.2	CG	2.2		1					0.072046
32	Nanocladius spp.	DOR	7.2	CG	0							0
33	Parakiefferiella sp.1	DOR	5.9	CG	35.4		1		2	1	2	0.432277
34	Parametriocnemus sp.	DOR	3.7	CG	103.6		3	4	14	1	6	2.017291
35	Rheocricotopus spp.	DOR	7.3	CG	51.1				2		5	0.504323
36	Synorthocladius semivirens	DOR	4.7	CG	0							0
37	Thienemanniella spp.	DOR	6	CG	90		2	1	4		8	1.080692
38	Tvetenia spp.	DOR	4	CG	0							0
39	Xylopus par	DOR	6.6	SH	0							0
40	Ablabesmyia spp.	DTA	6.4	P	57.6		3			1	5	0.648415
41	Conchapelopia spp.	DTA	8.7	P	17.4					1	1	0.144092
42	Labrundinia spp.	DTA	6	P	0							0
43	Nilotanypus spp.	DTA	4	P	0							0
44	Paramerina sp.	DTA	2.8	P	0							0
45	Pentaneura inconspicua	DTA	4.6	P	32.2		3	1	3			0.504323
46	Rheotanytarsus spp.	DTY	6.4	CF	1638.4		39	36	73	13	95	18.4439
47	Stempellinella spp.	DTY	5.3	CG	10.6		1		1			0.144092
48	Tanytarsus spp.	DTY	6.7	CG	3008.3		204	13	81	73	78	32.3487
49	Acerpenna pygmaeus	EP	3.7	CG	3.7		1					0.072046
50	Baetis spp.	EP	5.4	CG	297		2	30	9	4	10	3.962536
51	Caenis spp.	EP	7.6	CG	30.4			1	1		2	0.288184
52	Eurylophella spp.	EP	3	CG	9			2	1			0.216138
53	Heptagenia spp.	EP	2.8	SC	0							0
54	Isonychia spp.	EP	3.8	CF	64.6		2		5	1	9	1.224784
55	Neoephemera youngi	EP	2.1	CG	75.6		7	11	5	6	7	2.59366
56	Paraleptophlebia spp.	EP	1.2	CG	4.8		1		2	1		0.288184
57	Stenonema spp.	EP	3.4	SC	489.6		25	14	52	18	35	10.37464
58	Tricorythodes spp.	EP	5.4	CG	415.8		21	7	22	15	12	5.54755
59	Corydalus cornutus	ME	5.6	P	0							0
60	Nigronia serricornis	ME	5.5	P	0							0
61	Sialis spp.	ME	7.5	P	0							0
62	Ferrissia sp.	MG	6.9	SC	103.5		1	1	6	5	2	1.080692
63	Planorbidae	MG	6.5	SC	6.5				1			0.072046
64	Nemertea	NA		P	0							0
65	Argia spp.	OD	8.7	P	8.7						1	0.072046
66	Boyeria vinosa	OD	6.3	P	0							0
67	Calopteryx maculata	OD	8.3	P	0							0
68	Enallagma spp.	OD	9	P	9				1			0.072046
69	Acroneuria abnormis	PL	2.2	P	22			8			2	0.720461
70	Acroneuria spp.	PL	1.4	P	2.8		1		1			0.144092
71	Allocapnia spp.	PL	2.8	SH	0							0
72	Paragentina immarginata	PL	2	P	6					2	1	0.216138
73	Paragentina spp.	PL	2	P	0							0
74	Perlesta spp.	PL	4.9	P	0							0
75	Perlinella ephyre	PL	0	P	0							0
76	Perlinella spp.	PL	0	P	0							0
77	Pteronarcys dorsata	PL	1.8	SH	0							0
78	Taeniopteryx sp.	PL	6.3	SH	0							0
79	Brachycentrus numerosus	TR	1.8	CF	1.8				1			0.072046
80	Choumatopsyche spp.	TR	6.6	CF	79.2			2	5	2	3	0.864553
81	Chimarra spp.	TR	2.8	CF	0							0
82	Diplectrona modesta	TR	2.2	CF	2.2						1	0.072046
83	Hydropsyche spp.	TR	4	CF	0							0
84	Hydroptila spp.	TR	6.2	H	0							0
85	Lype diversa	TR	4.3	SC	0							0
86	Micrasema spp.	TR	0.6	SH	0							0
87	Nectopsyche exquisita	TR	4.2	SH	8.4		1			1		0.144092
88	Neureclipsis spp.	TR	4.4	CF	0							0

Station 9. Meyers Branch at Road 9. 20 September 1994

89	Nyctiophylax spp.	TR	0.9	CF	0						0
90	Oecetis spp.	TR	5.7	P	28.5		2		3		0.360231
91	Polycentropus spp.	TR	3.5	CF	0						0
92	Turbellaria	TU	7.5	P	0						0

Station 9. Meyers Branch at Road 9. 20 September 1994

	Table size:	92	Total orgs:	1388	Tot Tax:	48	tot. mean #	1550.838
	Number Samps:	5	SC/CF:	0.53135314	Bio Index:	5.86585		
	Mean TAX/Samp	27						
	EPT:	17						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	1	.2	1.1173	.072		
AM		0	0	.	.	.		
ANO		1	32	6.4	35.7542	2.3055		
CO		4	16	3.2	17.8771	1.1527		
DC		0	0	.	.	.		
DCC		6	121	24.2	135.1955	8.7176		
DD		0	0	.	.	.		
DO		2	19	3.8	21.2291	1.3689		
DOR		7	79	15.8	88.2682	5.6916		
DTA		3	18	3.6	20.1117	1.2968		
DTY		3	707	141.4	789.9441	50.9366		
EP		9	341	68.2	381.0056	24.5677		
ME		0	0	.	.	.		
MG		2	16	3.2	17.8771	1.1527		
NA		0	0	.	.	.		
OD		2	2	.4	2.2346	.1441		
PL		3	15	3.	16.7598	1.0807		
TR		5	21	4.2	23.4637	1.513		
TU		0	0	.	.	.		
	P	11	44	8.8	49.162		3.170029	
	CG	24	872	174.4	974.3017		62.82421	
	SC	4	161	32.2	179.8883		11.59942	
	H	0	0	.	.		0	
	SH	3	8	1.6	8.9385		0.576369	
	CF	6	303	60.6	338.547486		21.82997	

Station 9. Meyers Branch at Road 9. 20 September 1994

Taxa List:
Hydracarina
Oligochaeta
Ancyronyx variegatus
Ectopria nervosa
Macronychus glabratus
Stemelmis humerosa
Microtendipes rydalensis
Microtendipes spp.
Nilothauma babiyi
Polypedilum fallax
Polypedilum spp.
Stelechomyia perpulchra
Hexatoma spp.
Simulium spp.
Corynoneura spp.
Cricotopus/Ortho spp.
Lopescladius spp.
Parakiefferiella sp.1
Parametriocnemus sp.
Rheocricotopus spp.
Thienemanniella spp.
Ablabesmyia spp.
Conchapelopia spp.
Pentaneura inconspicua
Rheotanytarsus spp.
Stempellinella spp.
Tanytarsus spp.
Acerpenna pygmaeus
Baetis spp.
Caenis spp.
Eurylophella spp.
Isonychia spp.
Neoephemera youngi
Paraleptophlebia spp.
Stenonema spp.
Tricorythodes spp.
Ferrissia sp.
Planorbidae
Argia spp.
Enallagma spp.
Acroneuria abnormis
Acroneuria spp.
Paragentina immarginata
Brachycentrus numerosus
Cheumatopsyche spp.
Diplectrona modesta
Nectopsyche exquisita
Oecetis spp.

Station 9. Meyers Branch at Road 9. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Tanytarsus spp.	DTY	6.7	CG	3008.3		204	13	81	73	78	32.3487
2	Rheotanytarsus spp.	DTY	6.4	CF	1638.4		39	36	73	13	95	18.4438
3	Stenonema spp.	EP	3.4	SC	489.6		25	14	52	18	35	10.37464
4	Polypedilum spp.	DCC	6.9	CG	669.3		13	43	18	5	18	6.988473
5	Tricorythodes spp.	EP	5.4	CG	415.8		21	7	22	15	12	5.54755

Station 10. Lower Three Runs Creek at Road B. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	5.7	P	0							0
2	Amphipoda	AM	8	CG	0							0
3	Oligochaeta	ANO	8.2	CG	6371.4		241	258	127	54	97	39.98971
4	Ancyronyx variegatus	CO	6.9	CG	0							0
5	Ectopria nervosa	CO	4.3	SC	0							0
6	Macronychus glabratus	CO	4.7	CG	4.7					1		0.051467
7	Stenelmis humerosa	CO	5.4	CG	0							0
8	Stenelmis spp.	CO	5.4	CG	0							0
9	Cambaridae	DC	8.8	H	0							0
10	Cryptochironomus spp.	DCC	7.3	P	0							0
11	Dicrotendipes spp.	DCC	7.9	CG	0							0
12	Goeldichironomus holoprasinus	DCC	10	CG	510		28	11	5	2	5	2.624807
13	Microtendipes rydalensis	DCC	6.2	CG	0							0
14	Microtendipes spp.	DCC	6.2	CG	6.2		1					0.051467
15	Nilothauma babiyi	DCC	5.5	CG	0							0
16	Parachironomus spp.	DCC	9.2	CG	9.2				1			0.051467
17	Phaenopsectra flavipes	DCC	8.6	CG	0							0
18	Polypedilum fallax	DCC	6.7	SH	0							0
19	Polypedilum spp.	DCC	6.9	CG	5050.8		190	147	124	123	148	37.6737
20	Stelechomyia perpulchra	DCC	4.6	SH	0							0
21	Stenochironomus sp.	DCC	6.4	SH	0							0
22	Tribelos jucundum	DCC	6.6	CG	0							0
23	Potthastia longmana	DD	7.4	CG	0							0
24	Atherix lantha	DO	2.1	P	0							0
25	Ceratopogonidae	DO	6.5	P	0							0
26	Hemerodromia spp.	DO	8.1	CG	24.3		1	1	1			0.1544
27	Simulium spp.	DO	4.4	CF	83.6		15	3	1			0.977869
28	Brilla flavifrons	DOR	5.2	SH	0							0
29	Corynoneura spp.	DOR	6.2	CG	0							0
30	Cricotopus/Ortho spp.	DOR	8.8	CG	17.6		1			1		0.102934
31	Eukiefferiella spp.	DOR	5.7	CG	0							0
32	Nanocladius spp.	DOR	7.2	CG	0							0
33	Orthocladius lignicola	DOR	5.4	SH	0							0
34	Parakiefferiella sp.1	DOR	5.9	CG	0							0
35	Parametriocnemus sp.	DOR	3.7	CG	0							0
36	Rheocricotopus spp.	DOR	7.3	CG	657		30	17	18	14	11	4.632012
37	Synorthocladius semivirens	DOR	4.7	CG	0							0
38	Thienemanniella spp.	DOR	6	CG	306		19	11	4	6	11	2.624807
39	Tvetenia spp.	DOR	4	CG	0							0
40	Xylopus par	DOR	6.6	SH	0							0
41	Ablabesmyia spp.	DTA	6.4	P	12.8			1			1	0.102934
42	Conchapelopia spp.	DTA	8.7	P	1218		31	38	22	23	26	7.205353
43	Labrundinia spp.	DTA	6	P	0							0
44	Nilotanypus spp.	DTA	4	P	0							0
45	Paramerina sp.	DTA	2.8	P	0							0
46	Pentaneura inconspicua	DTA	4.6	P	0							0
47	Rheotanytarsus spp.	DTY	6.4	CF	0							0
48	Tanytarsus spp.	DTY	6.7	CG	67		4	4	2			0.514668
49	Acerpenna pygmaeus	EP	3.7	CG	0							0
50	Baetis spp.	EP	5.4	CG	16.2					2	1	0.1544
51	Caenis spp.	EP	7.6	CG	0							0
52	Eurylophella spp.	EP	3	CG	0							0
53	Heptagenia spp.	EP	2.8	SC	0							0
54	Neoephemera youngi	EP	2.1	CG	2.1			1				0.051467
55	Paraleptophlebia spp.	EP	1.2	CG	0							0
56	Stenonema spp.	EP	3.4	SC	13.6			1	2	1		0.205867
57	Tricorythodes spp.	EP	5.4	CG	0							0
58	Corydalus cornutus	ME	5.6	P	33.6			3	1	1	1	0.308801
59	Nigronia serricornis	ME	5.5	P	0							0
60	Sialis spp.	ME	7.5	P	0							0
61	Ferrissia sp.	MG	6.9	SC	0							0
62	Physella spp.	MG	9.1	SC	9.1			1				0.051467
63	Nemertea	NA		P	0		1	3	4		1	0.463201
64	Argia spp.	OD	8.7	P	0							0
65	Boyeria vinosa	OD	6.3	P	0							0
66	Calopteryx maculata	OD	8.3	P	8.3		1					0.051467
67	Enallagma spp	OD	9	P	0							0
68	Acroneuria abnormis	PL	2.2	P	0							0
69	Acroneuria spp.	PL	1.4	P	0							0
70	Allocapnia spp.	PL	2.8	SH	0							0
71	Paragentina kansensis	PL	2	P	0							0

Station 10. Lower Three Runs Creek at Road B. 20 September 1994

72	Paragentina spp.	PL	2	P	0							0
73	Perlesta spp.	PL	4.9	P	0							0
74	Perlinella ephyre	PL	0	P	0							0
75	Perlinella spp.	PL	0	P	0							0
76	Pteronarcys dorsata	PL	1.8	SH	0							0
77	Brachycentrus numerosus	TR	1.8	CF	0							0
78	Cheumatopsyche spp.	TR	6.6	CF	118.8			8	3	6	1	0.926402
79	Chimarra spp.	TR	2.8	CF	0							0
80	Diplectrona modesta	TR	2.2	CF	0							0
81	Hydropsyche spp.	TR	4	CF	0							0
82	Hydroptila spp.	TR	6.2	H	0							0
83	Lype diversa	TR	4.3	SC	0							0
84	Micrasema spp.	TR	0.6	SH	0							0
85	Nectopsyche spp.	TR	4.1	SH	0							0
86	Neureclipsis spp.	TR	4.4	CF	0							0
87	Nyctiophylax spp.	TR	0.9	CF	0							0
88	Oecetis spp.	TR	5.7	P	0							0
89	Polycentropus spp.	TR	3.5	CF	0							0
90	Tubellaria	TU	7.5	P	150		5	1	6	3	5	1.029336

Station 10. Lower Three Runs Creek at Road B. 20 September 1994

	Table size:	90	Total or	1943	Tot Tax:	23	tot. mean #/	2170.95
	Number Samps:	5	SC/CF:	0.13513514	Bio Index:	7.4834277		
	Mean TAX/Samp	14.2						
	EPT:	4						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		0	0	.	.	.		
AM		0	0	.	.	.		
ANO		1	777	155.4	868.1564	39.9897		
CO		1	1	.2	1.1173	.0515		
DC		0	0	.	.	.		
DCC		4	785	157.	877.095	40.4014		
DD		0	0	.	.	.		
DO		2	22	4.4	24.581	1.1323		
DOR		3	143	28.6	159.7765	7.3598		
DTA		2	142	28.4	158.6592	7.3083		
DTY		1	10	2.	11.1732	.5147		
EP		3	8	1.6	8.9385	.4117		
ME		1	6	1.2	6.7039	.3088		
MG		1	1	.2	1.1173	.0515		
NA		1	9	1.8	10.0559	.4632		
OD		1	1	.2	1.1173	.0515		
PL		0	0	.	.	.		
TR		1	18	3.6	20.1117	.9264		
TU		1	20	4.	22.3464	1.0293		
	P	6	178	35.6	198.8827		9.1610911	
	CG	13	1723	344.6	1925.1397		88.677303	
	SC	2	5	1.	5.5866		0.257334	
	H	0	0	.	.		0	
	SH	0	0	.	.		0	
	CF	2	37	7.4	41.3407821		1.9042717	

Station 10. Lower Three Runs Creek at Road B. 20 September 1994

Taxa List:
Oligochaeta
Macronychus glabratus
Goeldichironomus holoprasinus
Microtendipes spp.
Parachironomus spp.
Polypedilum spp.
Hemerodromia spp.
Simulium spp.
Cricotopus/Ortho spp.
Rheocricotopus spp.
Thienemanniella spp.
Ablabesmyia spp.
Conchapelopia spp.
Tanytarsus spp.
Baetis spp.
Neoephemera youngi
Stenonema spp.
Corydalus cornutus
Physella spp.
Nemertea
Calopteryx maculata
Cheumatopsyche spp.
Tubellaria

Station 10. Lower Three Runs Creek at Road B. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler De	A	B	C	D	E	Rel Abd
1	Oligochaeta	ANO	8.2	CG	6371.4		241	258	127	54	97	39.98970664
2	Polypedilum spp.	DCC	6.9	CG	5050.8		190	147	124	123	148	37.67370046
3	Conchapelopia spp.	DTA	8.7	P	1218		31	38	22	23	26	7.205352548

Station 11. Pen Branch at Road B. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	Rel Abd
1	Hydracarina	AHC	5.7	P	28.5			2	3		0.584795
2	Amphipoda	AM	8	CG	0						0
3	Oligochaeta	ANO	8.2	CG	787.2		11	46	31	8	11.22807
4	Ancyronyx variegatus	CO	6.9	CG	62.1		5	4			1.052632
5	Ectopria nervosa	CO	4.3	SC	0						0
6	Macronychus glabratus	CO	4.7	CG	216.2		8	9	11	18	5.380117
7	Stenelmis humerosa	CO	5.4	CG	0						0
8	Stenelmis spp.	CO	5.4	CG	0						0
9	Cambaridae	DC	8.8	H	0						0
10	Chironomus spp.	DCC	9.8	CG	0						0
11	Cryptochironomus spp.	DCC	7.3	P	29.2		1		3		0.467836
12	Cryptotendipes spp.	DCC	6.1	CG	0						0
13	Dicrotendipes spp.	DCC	7.9	CG	0						0
14	Microtendipes rydalensis	DCC	6.2	CG	0						0
15	Microtendipes spp.	DCC	6.2	CG	0						0
16	Nilothauma babiyi	DCC	5.5	CG	0						0
17	Parachironomus spp.	DCC	9.2	CG	9.2		1				0.116959
18	Phaenopsectra flavipes	DCC	8.5	CG	0						0
19	Polypedilum fallax	DCC	6.7	SH	0						0
20	Polypedilum spp.	DCC	6.9	CG	696.9		62	20	7	12	11.81287
21	Robackia spp.	DCC	3.3	CG	3.3					1	0.116959
22	Stelechomyia perpulchra	DCC	4.6	SH	0						0
23	Stenochironomus sp.	DCC	6.4	SH	0						0
24	Tribelos jucundum	DCC	6.6	CG	0						0
25	Pseudochironomus spp.	DCP	4.2	CG	4.2			1			0.116959
26	Potthastia longimana	DO	7.4	CG	7.4			1			0.116959
27	Atherix lantha	DO	2.1	P	0						0
28	Ceratopogonidae	DO	6.5	P	0						0
29	Hemerodromia spp.	DO	8.1	CG	0						0
30	Simulium spp.	DO	4.4	CF	8.8				1	1	0.233918
31	Brilla flavifrons	DOR	5.2	SH	0						0
32	Corynoneura spp.	DOR	6.2	CG	80.6		4	1	7	1	1.520468
33	Cricotopus/Ortho spp.	DOR	8.8	CG	8.8		1				0.116959
34	Eukiefferiella spp.	DOR	5.7	CG	0						0
35	Lopescladius spp.	DOR	2.2	CG	0						0
36	Nanocladius spp.	DOR	7.2	CG	0						0
37	Parakiefferiella sp.1	DOR	5.9	CG	0						0
38	Parametriocnemus sp.	DOR	3.7	CG	33.3		3	1	3	2	1.052632
39	Rheocricotopus spp.	DOR	7.3	CG	401.5		6	6	34	9	6.432749
40	Synorthocladius semivirens	DOR	4.7	CG	0						0
41	Thienemanniella spp.	DOR	6	CG	144		7	3	12	2	2.807018
42	Tvetenia spp.	DOR	4	CG	0						0
43	Xylopus par	DOR	6.6	SH	0						0
44	Ablabesmyia spp.	DTA	6.4	P	19.2			1		2	0.350877
45	Conchapelopia spp.	DTA	8.7	P	43.5				3	2	0.584795
46	Labrundinia spp.	DTA	6	P	0						0
47	Nilotanypus spp.	DTA	4	P	48		1	3	8		1.403509
48	Paramerina sp.	DTA	2.8	P	0						0
49	Pentaneura inconspicua	DTA	4.6	P	36.8		1	2	2	3	0.935673
50	Procladius sp.	DTA	9.3	P	0						0
51	Rheotanytarsus spp.	DTY	6.4	CF	236.8		5	3	11	18	4.327485
52	Tanytarsus spp.	DTY	6.7	CG	1520.9		20	76	100	31	26.54971
53	Acerpenna pygmaeus	EP	3.7	CG	0						0
54	Baetis spp.	EP	5.4	CG	135		7	2	11	5	2.923977
55	Caenis spp.	EP	7.6	CG	0						0
56	Callibaetis spp.	EP	9.3	CG	0						0
57	Eurylophella spp.	EP	3	CG	3		1				0.116959
58	Heptagenia spp.	EP	2.8	SC	0						0
59	Hexagenia spp.	EP	4.7	CG	0						0
60	Isonychia spp.	EP	3.8	CF	15.2					4	0.467836
61	Neocephemera youngi	EP	2.1	CG	18.9			3	2	4	1.052632
62	Paraleptophlebia spp.	EP	1.2	CG	0						0
63	Stenonema spp.	EP	3.4	SC	251.6		13	24	13	24	8.654971
64	Tricorythodes spp.	EP	5.4	CG	151.2		2	3	16	7	3.274854
65	Sphaerium spp.	MB	7.7	CF	30.8					4	0.467836
66	Corydalus cornutus	ME	5.6	P	39.2		2	1	2	2	0.818713
67	Nigronia serricornis	ME	5.5	P	0						0
68	Sialis spp.	ME	7.5	P	0						0
69	Forrissia sp.	MG	6.9	SC	82.8		3	4	5		1.403509
70	Nemertea	NA		P	0		1	2	3		0.701754
71	Boyeria vinosa	OD	6.3	P	0						0
72	Calopteryx maculata	OD	8.3	P	16.6			1	1		0.233918
73	Enallagma spp.	OD	9	P	0						0
74	Gomphus spp.	OD	6.2	P	12.4			2			0.233918
75	Neurocordulia spp.	OD	5.8	P	0						0
76	Progomphus spp.	OD	8.7	P	0						0
77	Acroneuria abnormis	PL	2.2	P	0						0
78	Acroneuria spp.	PL	1.4	P	9.8		1	2	2	2	0.818713
79	Allocapnia spp.	PL	2.8	SH	0						0
80	Leuctra spp.	PL	0.7	SH	1.4			1	1		0.233918
81	Paragentina kanconsis	PL	2	P	0						0
82	Paragentina spp.	PL	2	P	0						0
83	Perlesta spp.	PL	4.9	P	0						0
84	Perlinella ephyre	PL	0	P	0						0
85	Perlinella spp.	PL	0	P	0						0
86	Pteronarcys dorsata	PL	1.8	SH	0						0
87	Taeniopteryx sp.	PL	6.3	SH	0						0
88	Brachycentrus numerosus	TR	1.8	CF	0						0

Station 11. Pen Branch at Road B. 20 September .1994

89	Cheumatopsyche spp.	TR	6.6	CF	13.2				1	1	0.233918
90	Chimarra spp.	TR	2.6	CF	0						0
91	Diplectrona modesta	TR	2.2	CF	0						0
92	Hydropsyche spp.	TR	4	CF	0						0
93	Hydroptila spp.	TR	6.2	H	0						0
94	Lype diversa	TR	4.3	SC	30.1		4	2	1		0.818713
95	Micrasema spp.	TR	0.6	SH	0						0
96	Noctopsyche exquisita	TR	4.2	SH	0						0
97	Noctopsyche spp.	TR	4.1	SH	0						0
98	Nouretipsis spp.	TR	4.4	CF	0						0
99	Nyctiophylax spp.	TR	0.9	CF	0						0
100	Oecetis spp.	TR	5.5	P	5.5			1			0.116959
101	Polycentropus spp.	TR	3.5	CF	0						0
102	Turbellaria spp.	TU	7.5	P	7.5				1		0.116959

Station 11. Pen Branch at Road B. 20 September 1994

	Table size:	102	Total orgs:	855	Tot Tax:	40	tot. mean #	1194.134
	Number Samps:	4	SC/CF:	1.89795918	Bio Index:	6.132281		
	Mean TAX/Samp	26						
	EPT:	11						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	5	1.25	6.9832	.5848		
AM		0	0	.	.	.		
ANO		1	96	24.	134.0782	11.2281		
CO		2	55	13.75	76.8156	6.4327		
DC		0	0	.	.	.		
DCC		4	107	26.75	149.4413	12.5146		
DCP		1	1	.25	1.3966	.117		
DD		1	1	.25	1.3966	.117		
DO		1	2	.5	2.7933	.2339		
DOR		5	102	25.5	142.4581	11.9298		
DTA		4	28	7.	39.1061	3.2749		
DTY		2	264	66.	368.7151	30.8772		
EP		6	141	35.25	196.9274	16.4912		
MB		1	4	1.	5.5866	.4678		
ME		1	7	1.75	9.7765	.8187		
MG		1	12	3.	16.7598	1.4035		
NA		1	6	1.5	8.3799	.7018		
OD		2	4	1.	5.5866	.4678		
PL		2	9	2.25	12.5698	1.0526		
TR		3	10	2.5	13.9665	1.1696		
TU		1	1	.25	1.3966	.117		
	P	13	63	15.75	87.9888		7.368421	
	CG	18	648	162.	905.0279		75.78947	
	SC	3	93	23.25	129.8883		10.87719	
	SH	1	2	.5	2.7933		0.233918	
	CF	5	49	12.25	68.4358		5.730994	
	H	0	0	0	0		0	

Station 11. Pen Branch at Road B. 20 September 1994

Taxa List:
Hydracarina
Oligochaeta
Ancyronyx variegatus
Macronychus glabratus
Cryptochironomus spp.
Parachironomus spp.
Polypedilum spp.
Robackia spp.
Pseudochironomus spp.
Potthastia longmana
Simulium spp.
Corynoneura spp.
Cricotopus/Ortho spp.
Parametriocnemus sp.
Rheocricotopus spp.
Thienemanniella spp.
Ablabesmyia spp.
Conchapelopia spp.
Nilotanypus spp.
Pentaneura inconspicua
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Eurylophella spp.
Isonychia spp.
Neoephemera youngi
Stenonema spp.
Tricorythodes spp.
Sphaerium spp.
Corydalus cornutus
Ferrissia sp.
Nemertea
Calopteryx maculata
Gomphus spp.
Acroneuria spp.
Leuctra spp.
Cheumatopsyche spp.
Lype diversa
Oecetis spp.
Turbellaria spp.

Station 11. Pen Branch at Road B. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler D	A	B	C	D	Rel Abd
1	Tanytarsus spp.	DTY	6.7	CG	1520.9		20	76	100	31	26.54971
2	Polypedilum spp.	DCC	6.9	CG	696.9		62	20	7	12	11.81287
3	Oligochaeta	ANO	8.2	CG	787.2		11	46	31	8	11.22807
4	Stenonema spp.	EP	3.4	SC	251.6		13	24	13	24	8.654971
5	Rheocricotopus spp.	DOR	7.3	CG	401.5		6	6	34	9	6.432749
6	Macronychus glabratus	CO	4.7	CG	216.2		8	9	11	18	5.380117

Station 12, Indian Grave Branch at Road 8, 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	17.1					1	2	0.132979
2	Amphipoda	AM	8	CG	0							0
3	Hirudinea	ANH	8.5	P	8.5					1		0.044326
4	Oligochaeta	ANO	8.2	CG	13284		126	333	225	358	578	71.00851
5	Ancyronyx variegatus	CO	6.9	CG	6.9						1	0.044326
6	Ectopria nervosa	CO	4.3	SC	0							0
7	Macronychus glabratus	CO	4.7	CG	0							0
8	Stenelmis humerosa	CO	5.4	CG	0							0
9	Stenelmis spp.	CO	5.4	CG	0							0
10	Cambaridae	DCA	6.8	H	0							0
11	Chironomus spp.	DCC	9.8	CG	0							0
12	Cryptochironomus spp.	DCC	7.3	P	0							0
13	Cryptotendipes spp.	DCC	6.1	CG	0							0
14	Dicrotendipes spp.	DCC	7.9	CG	7.9		1					0.044326
15	Microtendipes pydalensis	DCC	6.2	CG	0							0
16	Microtendipes spp.	DCC	6.2	CG	0							0
17	Nilothauma babiyi	DCC	5.6	CG	0							0
18	Phaenopsectra flavipes	DCC	8.5	CG	8.5			1				0.044326
19	Polypedilum fallax	DCC	6.7	SH	33.6		2	1	1		1	0.221631
20	Polypedilum spp.	DCC	6.9	CG	1511.1		90	40	2	6	61	9.707447
21	Stefechomyia perpulchra	DCC	4.6	SH	0							0
22	Stenochironomus sp.	DCC	6.4	SH	0							0
23	Tribelos jucundum	DCC	6.6	CG	6.6		1					0.044326
24	Potthastia longimana	DD	7.4	CG	0							0
25	Atherix lantha	DO	2.1	P	0							0
26	Ceratopogonidae	DO	6.5	P	32.5			1	3		1	0.221631
27	Ephydridae	DO		H	0			2			6	0.35461
28	Hemerodromia spp.	DO	8.1	CG	16.2						2	0.088652
29	Limonia spp.	DO	10	SH	10						1	0.044326
30	Simulium spp.	DO	4.4	CF	0							0
31	Tipula spp.	DO	7.7	SH	109.4		6			9	7	0.975177
32	Brilla flavifrons	DOR	5.2	SH	0							0
33	Corynoneura spp.	DOR	6.2	CG	62		1		3		6	0.443262
34	Cricotopus/Ortho spp.	DOR	8.8	CG	0							0
35	Eukiefferiella spp.	DOR	5.7	CG	0							0
36	Lopescladius spp.	DOR	2.2	CG	0							0
37	Nanocladius spp.	DOR	7.2	CG	50.4		3		3		1	0.310284
38	Parakiefferiella sp.1	DOR	5.9	CG	0							0
39	Parametriocnemus sp.	DOR	3.7	CG	0							0
40	Rheocricotopus spp.	DOR	7.3	CG	51.1				1	1	5	0.310284
41	Synorthocladius semivirens	DOR	4.7	CG	0							0
42	Thienemanniella spp.	DOR	6	CG	24		4					0.177305
43	Tvetenia spp.	DOR	4	CG	0							0
44	Xylopus par	DOR	6.6	SH	0							0
45	Ablabesmyia spp.	DTA	6.4	P	640		43	3	5	24	25	4.432624
46	Conchapelopia spp.	DTA	8.7	P	0							0
47	Labrundinia spp.	DTA	6	P	6					1		0.044326
48	Nilotanypus spp.	DTA	4	P	0							0
49	Pasmerina sp.	DTA	2.8	P	0							0
50	Pentaneura inconspicua	DTA	4.6	P	18.4		1			1	2	0.177305
51	Procladius sp.	DTA	9.3	P	0							0
52	Rheotanytarsus spp.	DTY	6.4	CF	51.2		1		7			0.35461
53	Tanytarsus spp.	DTY	6.7	CG	783.9		30	3	10	7	61	5.18617
54	Acerpenna pygmaeus	EP	3.7	CG	0							0
55	Baetis spp.	EP	5.4	CG	21.6					1	3	0.177305
56	Caenis spp.	EP	7.6	CG	15.2		2					0.088652
57	Callibaetis spp.	EP	9.3	CG	0							0
58	Eurylophella spp.	EP	3	CG	3			1				0.044326
59	Heptagenia spp.	EP	2.8	SC	0							0
60	Hexagenia spp.	EP	4.7	CG	0							0
61	Isonychia spp.	EP	3.8	CF	19					4	1	0.221631
62	Neoephemera youngi	EP	2.1	CG	0							0
63	Paraleptophlebia spp.	EP	1.2	CG	0							0
64	Stenonema spp.	EP	3.4	SC	27.2				3	4	1	0.35461
65	Tricorythodes spp.	EP	5.4	CG	21.6		1	1		1	1	0.177305
66	Sphaerium spp.	MB	7.7	CF	0							0
67	Corydalus cornutus	ME	5.6	P	5.6					1		0.044326
68	Nigronia serricornis	ME	5.5	P	0							0
69	Sialis spp.	ME	7.5	P	0							0
70	Ferrissia sp.	MG	6.9	SC	27.6		2		2			0.177305
71	Hydrobiidae	MG		SC	0				3		2	0.221631
72	Physella spp.	MG	9.1	SC	27.3		2	1				0.132979
73	Nemertea	NA		P	0		8	12	3	8	20	2.260838
74	Argia spp.	OD	8.7	P	17.4					2		0.088652
75	Boyeria vinosa	OD	6.3	P	0							0
76	Enallagma spp.	OD	9	P	0							0
77	Neurocordulia spp.	OD	5.8	P	0							0
78	Progomphus spp.	OD	8.7	P	0							0
79	Acroneuria abnormis	PL	2.2	P	0							0
80	Acroneuria spp.	PL	1.4	P	0							0
81	Allocapnia spp.	PL	2.8	SH	0							0
82	Paragentina kansensis	PL	2	P	0							0
83	Paragentina spp.	PL	2	P	0							0
84	Perlesta spp.	PL	4.9	P	0							0
85	Perlinella ephyre	PL	0	P	0							0
86	Perlinella spp.	PL	0	P	0							0
87	Pteronarcys dorsata	PL	1.8	SH	0							0
88	Taeniopteryx sp.	PL	6.3	SH	0							0
89	Brachycentrus numerosus	TR	1.8	CF	0							0
90	Cheumatopsyche spp.	TR	6.6	CF	19.8					1	2	0.132979
91	Chimarra spp.	TR	2.8	CF	39.2		1		2	1	10	0.620567
92	Diplectrona modesta	TR	2.2	CF	0							0
93	Hydropsyche spp.	TR	4	CF	0							0
94	Hydroptila spp.	TR	6.2	H	6.2		1					0.044326
95	Lype diversa	TR	4.3	SC	0							0

Station 12. Indian Grave Branch at Road B. 20 September 1994

96	Micrasema spp.	TR	0.6	SH	0							0
97	Nectopsyche exquisita	TR	4.2	SH	0							0
98	Nectopsyche spp.	TR	4.1	SH	0							0
99	Neureclipsis spp.	TR	4.4	CF	0							0
100	Nyctiophylax spp.	TR	0.9	CF	0							0
101	Oecetis spp.	TR	6.5	P	0							0
102	Polycentropus spp.	TR	3.5	CF	0							0

Station 12. Indian Grave Branch at Road B. 20 September 1994

	Table size:	102	Total orgs:	2256	Tot Tax:	38	tot. mean #	2520.67
	Number Samps:	5	SC/CF:	0.66666667	Bio Index:	7.55758		
	Mean TAX/Samp	18						
	EPT:	9						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	3	.6	3.352	.133		
AM		0	0	.	.	.		
ANH		1	1	.2	1.1173	.0443		
ANO		1	1620	324.	1810.0559	71.8085		
CO		1	1	.2	1.1173	.0443		
DCA		0	0	.	.	.		
DCC		5	227	45.4	253.6313	10.0621		
DD		0	0	.	.	.		
DO		5	38	7.6	42.4581	1.6844		
DOR		4	28	5.6	31.2849	1.2411		
DTA		3	105	21.	117.3184	4.6543		
DTY		2	125	25.	139.6648	5.5408		
EP		6	24	4.8	26.8156	1.0638		

Station 12. Indian Grave Branch at Road B. 20 September 1994

Taxa List:
Hydracarina
Hirudinea
Oligochaeta
Ancyronyx variegatus
Dicrotendipes spp.
Phaenopsectra flavipes
Polypedilum fallax
Polypedilum spp.
Tribelos jucundum
Ceratopogonidae
Ephydridae
Hemerodromia spp.
Limonia spp.
Tipula spp.
Corynoneura spp.
Nanocladius spp.
Rheocricotopus spp.
Thienemanniella spp.
Ablabesmyia spp.
Labrundinia spp.
Pentaneura inconspicua
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Caenis spp.
Eurylophella spp.
Isonychia spp.
Stenonema spp.
Tricorythodes spp.
Corydalus cornutus
Ferrissia sp.
Hydrobiidae
Physella spp.
Nemertea
Argia spp.
Cheumatopsyche spp.
Chimarra spp.
Hydroptila spp.

Station 12. Indian Grave Branch at Road B. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Oligochaeta	ANO	8.2	CG	13284		126	333	225	358	578	71.80851
2	Polypedilum spp.	DCC	6.9	CG	1511.1		90	40	2	6	81	9.707447
3	Tanytarsus spp.	DTY	6.7	CG	783.9		36	3	10	7	61	5.18617

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	5.7	P	45.6			2	4		2	0.3998
2	Amphipoda	AM	8	CG	0							0
3	Oligochaeta	ANO	8.2	CG	4108.2		190	62	116	65	49	25.03748
4	Ancylonyx variegatus	CO	6.9	CG	20.7			1	1	1		0.149925
5	Ectopria nervosa	CO	4.3	SC	0							0
6	Macronychus glabratus	CO	4.7	CG	324.3		3	13	22	6	26	3.446276
7	Stenelmis humerosa	CO	5.4	CG	0							0
8	Stenelmis spp.	CO	5.4	CG	108		9	2	4	3	2	0.9995
9	Cambaridae	DC	8.8	H	0							0
10	Chironomus spp.	DCC	9.8	CG	0							0
11	Cryptochironomus spp.	DCC	7.3	P	7.3					1		0.049975
12	Cryptotendipes spp.	DCC	6.1	CG	0							0
13	Dicrotendipes spp.	DCC	7.9	CG	15.8					2		0.09995
14	Microtendipes rydalensis	DCC	6.2	CG	0							0
15	Microtendipes spp.	DCC	6.2	CG	0							0
16	Nilothauma babiyi	DCC	5.5	CG	0							0
17	Phaenopsectra flavipes	DCC	8.5	CG	8.5				1			0.049975
18	Polypedilum fallax	DCC	6.7	SH	20.1				2		1	0.149925
19	Polypedilum spp.	DCC	6.9	CG	103.5			7	2	4	2	0.749625
20	Stelechomyia perpulchra	DCC	4.6	SH	0							0
21	Stenochironomus sp.	DCC	6.4	SH	0							0
22	Tribelos jucundum	DCC	6.6	CG	0							0
23	Potthastia longimana	DO	7.4	CG	0							0
24	Atherix lantha	DO	2.1	P	0							0
25	Ceratopogonidae	DO	6.5	P	6.5		1					0.049975
26	Helicus spp.	DO	7.7	CG	7.7						1	0.049975
27	Hemerodromia spp.	DO	8.1	CG	32.4		1		3			0.1999
28	Simulium spp.	DO	4.4	CF	0							0
29	Bezzia flavifrons	DOR	5.2	SH	0							0
30	Corynoneura spp.	DOR	8.2	CG	65.6		2	5	1		1	0.449775
31	Cricotopus/Ortho spp.	DOR	8.8	CG	1381.6		9	13	31	91	13	7.846077
32	Eukiefferiella spp.	DOR	5.7	CG	0							0
33	Lopescladius spp.	DOR	2.2	CG	0							0
34	Nanocladius spp.	DOR	7.2	CG	244.8		3	3	1	25	2	1.69916
35	Parakiefferiella sp.1	DOR	5.9	CG	64.9		2	1	1	7		0.549725
36	Parametriocnemus sp.	DOR	3.7	CG	0							0
37	Rheocricotopus spp.	DOR	7.3	CG	182.5		4	7	4	6	4	1.249375
38	Synorthocladius semivitens	DOR	4.7	CG	0							0
39	Thienemanniella spp.	DOR	6	CG	126		5	4	4	5	3	1.049475
40	Tvetenia spp.	DOR	4	CG	8				2			0.09995
41	Xylopus par	DOR	6.6	SH	0							0
42	Ablabesmyia spp.	DTA	6.4	P	166.4		4	1	11	9	1	1.29935
43	Conchapelopia spp.	DTA	8.7	P	156.6		6	2	6	2	3	0.89955
44	Labrundinia spp.	DTA	6	P	6				1			0.049975
45	Nilotanypus spp.	DTA	4	P	16			1	1	1	1	0.1999
46	Paramerina sp.	DTA	2.8	P	0							0
47	Pentaneura inconspicua	DTA	4.6	P	78.2		4	3	3	4	3	0.849575
48	Procladius sp.	DTA	9.3	P	0							0
49	Rheotanytarsus spp.	DTY	6.4	CF	202.4		1	5	8	16	11	2.048976
50	Tanytarsus spp.	DTY	6.7	CG	897.8		15	22	10	63	24	6.696652
51	Acentrella ampla	EP	3.6	CG	18				3	1	1	0.249875
52	Acerpenna pygmaeus	EP	3.7	CG	0							0
53	Baetis spp.	EP	5.4	CG	410.4		13	15	22	6	20	3.798101
54	Caenis spp.	EP	7.6	CG	45.6		1	1		2	2	0.29985
55	Callibaetis spp.	EP	9.3	CG	0							0
56	Eurylophella spp.	EP	3	CG	3			1				0.049975
57	Heptagenia spp.	EP	2.8	SC	0							0
58	Hexagenia spp.	EP	4.7	CG	0							0
59	Isonychia spp.	EP	3.8	CF	364.8		14	13	39	15	15	4.797601
60	Neoephemera youngi	EP	2.1	CG	0							0
61	Paraleptophlebia spp.	EP	1.2	CG	0							0
62	Stenonema spp.	EP	3.4	SC	224.4		6	8	15	19	18	3.298351
63	Tricorythodes spp.	EP	5.4	CG	194.4		5	4	6	11	10	1.7991
64	Pyralidae	LEP		H	0		1	1		1		0.149925
65	Sphaerium spp.	MB	7.7	CF	0							0
66	Corydalus cornutus	ME	5.6	P	112			4	6	1	9	0.9995
67	Nigronia serricornis	ME	5.5	P	0							0
68	Sialis spp.	ME	7.5	P	15					1	1	0.09995
69	Ferrissia sp.	MG	6.9	SC	75.9			1		5	5	0.549725
70	Nemertea	NA		P	0							0
71	Nemertea	NA		P	0		16	8	3	8	14	2.448776
72	Nematoda	NE		P	0		1			5	1	0.349825
73	Argia spp.	OD	8.7	P	60.9		3	1		3		0.349825
74	Boyeria vinosa	OD	6.3	P	0							0
75	Enallagma spp.	OD	9	P	0							0
76	Gomphus spp.	OD	6.2	P	6.2		1					0.049975
77	Neurocordulia spp.	OD	5.8	P	0							0
78	Progomphus spp.	OD	8.7	P	0							0
79	Acroneuria abnormis	PL	2.2	P	0							0
80	Acroneuria spp.	PL	1.4	P	0							0
81	Allocapnia spp.	PL	2.6	SH	0							0
82	Paragentina kansensis	PL	2	P	0							0
83	Paragentina spp.	PL	2	P	0							0
84	Perlesta spp.	PL	4.9	P	0							0
85	Perlinella ephyre	PL	0	P	0							0
86	Perlinella spp.	PL	0	P	0							0
87	Pteronarcys dorsata	PL	1.8	SH	0							0
88	Taeniopteryx sp.	PL	6.3	SH	0							0
89	Brachycentrus numerosus	TR	1.8	CF	0							0
90	Cheumatopsyche spp.	TR	6.6	CF	1003.8		36	21	94	32	60	12.14393
91	Chimarra spp.	TR	2.6	CF	0							0
92	Diplectrona modesta	TR	2.2	CF	0							0
93	Hydropsyche spp.	TR	4	CF	640		4	6	73	11	66	7.996002
94	Hydroptila spp.	TR	6.2	H	310		3	4	18	14	11	2.498751
95	Lype diversa	TR	4.3	SC	34.4				1		7	0.3998

Station 13. Pen Branch at Road A. 21 September 1994

96	Micrasema spp.	TR	0.6	SH	0							0
97	Nectopsyche exquisita	TR	4.2	SH	29.4			1	1	5		0.349825
98	Nectopsyche spp.	TR	4.1	SH	0							0
99	Neureclipsis spp.	TR	4.4	CF	13.2		2		1			0.149925
100	Nyctiophylax spp.	TR	0.9	CF	0							0
101	Oecetis spp.	TR	6.5	P	33		1	1	1	3		0.29986
102	Polycentropus spp.	TR	3.5	CF	17.6			3			2	0.249875
103	Turbellaria	TU	7.5	P	30		3				1	0.1999

Station 13. Pen Branch at Road A. 21 September 1994

	Table size:	103	Total orgs:	2001	Tot Tax:	51	tot. mean #	2235.754
	Number Samps:	5	SC/CF:	0.15510949	Bio Index:	6.330585		
	Mean TAX/Samp	35						
	EPT:	15						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	8	1.6	8.9385	.3998		
AM		0	0	.	.	.		
ANO		1	501	100.2	559.7765	25.0375		
CO		3	92	18.4	102.7933	4.5977		
DC		0	0	.	.	.		
DCC		5	22	4.4	24.581	1.0995		
DD		0	0	.	.	.		
DO		3	6	1.2	6.7039	.2999		
DOR		7	259	51.8	289.3855	12.9435		
DTA		5	66	13.2	73.743	3.2984		
DTY		2	175	35.	195.5307	8.7456		
EP		7	286	57.2	319.5531	14.2929		
LEP		1	3	.6	3.352	.1499		
MB		0	0	.	.	.		
ME		2	22	4.4	24.581	1.0995		
MG		1	11	2.2	12.2905	.5497		
NA		1	49	9.8	54.7486	2.4488		
NE		1	7	1.4	7.8212	.3498		
OD		2	8	1.6	8.9385	.3998		
PL		0	0	.	.	.		
TR		8	482	96.4	538.5475	24.088		
TU		1	4	.8	4.4693	.1999		
	P	16	172	34.4	192.1788		8.595702	
	CG	22	1133	226.6	1265.9218		56.62169	
	SC	3	85	17.	94.9721		4.247876	
	H	2	53	10.6	59.2179		2.648676	
	SH	2	10	2.	11.1732		0.49975	
	CF	6	548	109.6	612.290503		27.38631	

Station 13. Pen Branch at Road A. 21 September 1994

Taxa List:
Hydracarina
Oligochaeta
Ancyronyx variegatus
Macronychus glabratus
Stenelmis spp.
Cryptochironomus spp.
Dicrotendipes spp.
Phaenopsectra flavipes
Polypedilum fallax
Polypedilum spp.
Ceratopogonidae
Helicus spp.
Hemerodromia spp.
Corynoneura spp.
Cricotopus/Ortho spp.
Nanocladius spp.
Parakiefferiella sp.1
Rheocricotopus spp.
Thienemanniella spp.
Tvetenia spp.
Ablabesmyia spp.
Conchapelopia spp.
Labrundinia spp.
Nilotanypus spp.
Pentaneura inconspicua
Rheotanytarsus spp.
Tanytarsus spp.
Acentrella ampla
Baetis spp.
Caenis spp.
Eurylophella spp.
Isonychia spp.
Stenonema spp.
Tricorythodes spp.
Pyralidae
Corydalus cornutus
Sialis spp.
Ferrissia sp.
Nemertea
Nematoda
Argia spp.
Gomphus spp.
Cheumatopsyche spp.
Hydropsyche spp.
Hydroptila spp.
Lype diversa
Nectopsyche exquisita
Neureclipsis spp.

Station 13. Pen Branch at Road A. 21 September 1994

Oecetis spp.	
Polycentropus spp.	
Turbellaria	

Station 13. Pen Branch at Road A. 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Oligochaeta	ANO	8.2	CG	4108.2		190	62	115	85	49	25.03748
2	Cheumatopsyche spp.	TR	6.6	CF	1603.8		36	21	94	32	60	12.14393
3	Hydropsyche spp.	TR	4	CF	640		4	6	73	11	66	7.996002
4	Cricotopus/Ortho spp.	DOR	8.8	CG	1381.6		9	13	31	91	13	7.846077
5	Tanytarsus spp.	DTY	6.7	CG	897.8		15	22	10	63	24	6.696652

Station 14, Beaver Dam Creek at metal walkway, 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sample Da	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	0							0
2	Amphipoda	AM	8	CG	8			3	4		1	0.222222
3	Oligochaeta	ANO	8.2	CG	131.2					3	6	3.555556
4	Ancyronyx variegatus	CO	6.9	CG	6.9				1			0.222222
5	Ectopria nervosa	CO	4.3	SC	0							0
6	Macronychus glabratus	CO	4.7	CG	4.7					1		0.222222
7	Stenelmis humerosa	CO	5.4	CG	0							0
8	Stenelmis spp.	CO	5.4	CG	27		1	1	1	2		1.111111
9	Cambaridae	DC	8.8	H	0							0
10	Chironomus spp.	DCC	9.8	CG	0							0
11	Cryptochironomus spp.	DCC	7.3	P	0							0
12	Cryptotendipes spp.	DCC	6.1	CG	0							0
13	Dicrotendipes spp.	DCC	7.9	CG	0							0
14	Microtendipes rydalensis	DCC	6.2	CG	0							0
15	Microtendipes spp.	DCC	6.2	CG	0							0
16	Nilothauma babiyi	DCC	5.5	CG	0							0
17	Phaenopsectra flavipes	DCC	6.5	CG	0							0
18	Polypedilum fallax	DCC	6.7	SH	0							0
19	Polypedilum spp.	DCC	6.9	CG	41.4		1	1	1	2	1	1.333333
20	Stelechomyia perpulchra	DCC	4.6	SH	0							0
21	Stenochironomus sp.	DCC	6.4	SH	25.6		1	1	1		1	0.888889
22	Tribelos jucundum	DCC	6.6	CG	0							0
23	Potthastia longimana	DD	7.4	CG	0							0
24	Atherix lantha	DO	2.1	P	0							0
25	Ceratopogonidae	DO	6.5	P	0							0
26	Hemerodromia spp.	DO	8.1	CG	0							0
27	Simulium spp.	DO	4.4	CF	0							0
28	Brilla flavifrons	DOR	5.2	SH	0							0
29	Corynoneura spp.	DOR	6.2	CG	0							0
30	Cricotopus/Ortho spp.	DOR	6.8	CG	17.6		1			1		0.444444
31	Eukiefferiella spp.	DOR	5.7	CG	0							0
32	Lopescladius spp.	DOR	2.2	CG	0							0
33	Nanocladius spp.	DOR	7.2	CG	0							0
34	Parakiefferiella sp.1	DOR	5.9	CG	0							0
35	Parametriocnemus sp.	DOR	3.7	CG	3.7						1	0.222222
36	Rheocricotopus spp.	DOR	7.3	CG	14.6			1	1			0.444444
37	Synorthocladius semivirens	DOR	4.7	CG	0							0
38	Thienemanniella spp.	DOR	6	CG	18			1	2			0.666667
39	Tvetenia spp.	DOR	4	CG	4			1				0.222222
40	Xylopus par	DOR	6.6	SH	0							0
41	Ablabesmyia spp.	DTA	6.4	P	19.2		2		1			0.666667
42	Conchapelopia spp.	DTA	8.7	P	0							0
43	Labrundinia spp.	DTA	6	P	0							0
44	Nilotanypus spp.	DTA	4	P	0							0
45	Paramerina sp.	DTA	2.8	P	0							0
46	Pentaneura inconspicua	DTA	4.6	P	0							0
47	Procladius sp.	DTA	9.3	P	0							0
48	Rheotanytarsus spp.	DTY	6.4	CF	12.8		1	1				0.444444
49	Tanytarsus spp.	DTY	6.7	CG	40.2		4		2			1.333333
50	Acerpenna pygmaeus	EP	3.7	CG	0							0
51	Baetis spp.	EP	5.4	CG	993.6		13	61	42	47	31	40.88889
52	Caenis spp.	EP	7.6	CG	0							0
53	Callibaetis spp.	EP	9.3	CG	0							0
54	Eurylophella spp.	EP	3	CG	0							0
55	Heptagenia spp.	EP	2.8	SC	0							0
56	Hexagenia spp.	EP	4.7	CG	0							0
57	Isonychia spp.	EP	3.8	CF	0							0
58	Neoephemera youngi	EP	2.1	CG	0							0
59	Paraleptophlebia spp.	EP	1.2	CG	0							0
60	Stenonema spp.	EP	3.4	SC	438.6		44	25	30	16	14	28.66667
61	Tricorythodes spp.	EP	5.4	CG	91.8		2	4	5	1	5	3.777778
62	Sphaerium spp.	MB	7.7	CF	0							0
63	Corydalus cornutus	ME	5.6	P	39.2		2	1	1	1	2	1.555556
64	Nigronia serricornis	ME	5.5	P	0							0
65	Stalis spp.	ME	7.5	P	0							0
66	Ferrissia sp.	MG	6.9	SC	27.6		1	2		1		0.888889
67	Hydrobiidae	MG		SC	0						1	0.222222
68	Nemertea	NA		P	0							0
69	Boyeria vinosa	OD	6.3	P	0							0
70	Enallagma spp.	OD	9	P	0							0
71	Neurocordulia spp.	OD	5.8	P	0							0
72	Progomphus spp.	OD	6.7	P	0							0
73	Acroneuria abnormis	PL	2.2	P	2.2		1					0.222222
74	Acroneuria spp.	PL	1.4	P	0							0
75	Allocapnia spp.	PL	2.8	SH	0							0
76	Paragentina kansensis	PL	2	P	0							0
77	Paragentina spp.	PL	2	P	0							0
78	Perlesta spp.	PL	4.9	P	0							0
79	Perlinella ephyre	PL	0	P	0							0
80	Perlinella spp.	PL	0	P	0							0
81	Pteronarcys dorsata	PL	1.8	SH	0							0
82	Taeniopteryx sp.	PL	6.3	SH	0							0
83	Brachycentrus numerosus	TR	1.8	CF	0							0
84	Cheumatopsyche spp.	TR	6.6	CF	19.8			1	1	1		0.666667
85	Chimarra spp.	TR	2.8	CF	14			2	2		1	1.111111
86	Diplectrona modesta	TR	2.2	CF	0							0
87	Hydropsyche spp.	TR	4	CF	172		3	16	11	10	3	9.555556
88	Hydroptila spp.	TR	6.2	H	6.2					1		0.222222
89	Lype diversa	TR	4.3	SC	0							0
90	Micrasema spp.	TR	0.0	SH	0							0
91	Nectopsyche exquisita	TR	4.2	SH	4.2						1	0.222222
92	Nectopsyche spp.	TR	4.1	SH	0							0
93	Neureclipsis spp.	TR	4.4	CF	0							0
94	Nyctiophylax spp.	TR	0.0	CF	0							0
95	Oecetis spp.	TR	5.5	P	0							0

Station 14, Beaver Dam Creek at metal walkway, 21 September 1994

96	Polycentropus spp.	TR	3.5	CF	0							0

Station 14. Beaver Dam Creek at metal walkway. 21 September 1994

	Table size:	96	Total orgs:	450	Tot Tax:	27	tot. mean #/	502.7933
	Number Samps:	5	SC/CF:	2.52830189	Bio Index:	4.853556		
	Mean TAX/Samp	14.4						
	EPT:	9						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		0	0	.	.	.		
AM		1	1	.2	1.1173	.2222		
ANO		1	16	3.2	17.8771	3.5556		
CO		3	7	1.4	7.8212	1.5556		
DC		0	0	.	.	.		
DCC		2	10	2.	11.1732	2.2222		
DD		0	0	.	.	.		
DO		0	0	.	.	.		
DOR		5	9	1.8	10.0559	2.		
DTA		1	3	.6	3.352	.6667		
DTY		2	8	1.6	8.9385	1.7778		
EP		3	330	66.	368.7151	73.3333		
MB		0	0	.	.	.		
ME		1	7	1.4	7.8212	1.5556		
MG		2	5	1.	5.5866	1.1111		
NA		0	0	.	.	.		
OD		0	0	.	.	.		
PL		1	1	.2	1.1173	.2222		
TR		5	53	10.6	59.2179	11.7778		
	P	3	11	2.2	12.2905		2.4444444	
	CG	14	246	49.2	274.8603		54.666667	
	SC	3	134	26.8	149.7207		29.777778	
	H	1	1	.2	1.1173		0.2222222	
	SH	2	5	1.	5.5866		1.1111111	
	CF	4	53	10.6	59.2178771		11.777778	

Station 14. Beaver Dam Creek at metal walkway. 21 September 1994

Taxa List:	
Amphipoda	
Oligochaeta	
Ancyronyx variegatus	
Macronychus glabratus	
Stenelmis spp.	
Polypedilum spp.	
Stenochironomus sp.	
Cricotopus/Ortho spp.	
Parametriocnemus sp.	
Rheocricotopus spp.	
Thienemanniella spp.	
Tvetenia spp.	
Ablabesmyia spp.	
Rheotanytarsus spp.	
Tanytarsus spp.	
Baetis spp.	
Stenonema spp.	
Tricorythodes spp.	
Corydalus cornutus	
Ferrissia sp.	
Hydrobiidae	
Acroneuria abnormis	
Cheumatopsyche spp.	
Chimarra spp.	
Hydropsyche spp.	
Hydroptila spp.	
Nectopsyche exquisita	

Station 14. Beaver Dam Creek at metal walkway. 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Baetis spp.	EP	5.4	CG	993.6		13	51	42	47	31	40.88889
2	Stenonema spp.	EP	3.4	SC	438.6		44	25	30	16	14	28.66667
3	Hydropsyche spp.	TR	4	CF	172		3	16	11	10	3	9.555556

Station 15. Four Mile Creek; at Road 13.2. 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler De	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	5.7	P	61.3		3	4	1	1		0.621437
2	Amphipoda	AM	8	CG	0							0
3	Oligochaeta	ANO	8.2	CG	664.2		8	9	4	6	64	4.692032
4	Ancyronyx variegatus	CO	6.9	CG	0							0
5	Ectopria nervosa	CO	4.3	SC	0							0
6	Macronychus glabratus	CO	4.7	CG	103.4		11	7	2	1	1	1.274623
7	Stenelmis humerosa	CO	5.4	CG	0							0
8	Stenelmis spp.	CO	5.4	CG	64.8		8	3			1	0.695249
9	Cambaridae	DC	8.8	H	0							0
10	Chironomus spp.	DCC	9.8	CG	0							0
11	Cryptochironomus spp.	DCC	7.3	P	0							0
12	Cryptotendipes spp.	DCC	6.1	CG	0							0
13	Dicrotendipes spp.	DCC	7.9	CG	110.6			3	6		5	0.811124
14	Microtendipes rydalensis	DCC	6.2	CG	0							0
15	Microtendipes spp.	DCC	6.2	CG	0							0
16	Nilothauma babiyi	DCC	5.6	CG	0							0
17	Phaenopsectra flavipes	DCC	8.5	CG	0							0
18	Polypedilum fallax	DCC	6.7	SH	40.2		2	1	1	2		0.347625
19	Polypedilum spp.	DCC	6.9	CG	324.3		10	22	3	5	7	2.723059
20	Stelechomyia perpulchra	DCC	4.6	SH	0							0
21	Stenochironomus sp.	DCC	6.4	SH	0							0
22	Tribelos jucundum	DCC	6.6	CG	0							0
23	Potthastia longimana	DD	7.4	CG	0							0
24	Atherix lantha	DO	2.1	P	0							0
25	Ceratopogonidae	DO	6.5	P	19.5		2				1	0.173812
26	Hemerodromia spp.	DO	8.1	CG	24.3		2	1				0.173812
27	Simulium spp.	DO	4.4	CF	13.2		2	1				0.173812
28	Brilla flavifrons	DOR	5.2	SH	0							0
29	Corynoneura spp.	DOR	6.2	CG	93		3	6	1		6	0.869061
30	Cricotopus/Ortho spp.	DOR	6.8	CG	226.8		3	8	6	1	8	1.506373
31	Eukiefferiella spp.	DOR	5.7	CG	0							0
32	Lopescladius spp.	DOR	2.2	CG	0							0
33	Nanocladius spp.	DOR	7.2	CG	7.2						1	0.057937
34	Parakiefferiella sp.1	DOR	5.9	CG	11.8						2	0.115875
35	Parametriocnemus sp.	DOR	3.7	CG	0							0
36	Rheocricotopus spp.	DOR	7.3	CG	87.6		3	6	2	1		0.695249
37	Synorthocladius semivirens	DOR	4.7	CG	0							0
38	Thienemanniella spp.	DOR	6	CG	78		3	7			3	0.753187
39	Tvetenia spp.	DOR	4	CG	0							0
40	Xylopus par	DOR	6.6	SH	0							0
41	Ablabesmyia spp.	DTA	6.4	P	396.8		7	7	8	7	33	3.592121
42	Conchapelopia spp.	DTA	8.7	P	43.5		2	1	1	1		0.289687
43	Labrundinia spp.	DTA	6	P	18				1	1	1	0.173812
44	Nilotanypus spp.	DTA	4	P	32		5	3				0.463499
45	Paramerina sp.	DTA	2.8	P	2.8						1	0.057937
46	Pentaneura inconspicua	DTA	4.6	P	69		3	4	6	1	1	0.869061
47	Procladius sp.	DTA	9.3	P	0							0
48	Rheotanytarsus spp.	DTY	6.4	CF	281.6		16	19	3	1	6	2.549247
49	Tanytarsus spp.	DTY	6.7	CG	2010		21	30	37	10	202	17.38123
50	Acerpenna pygmaeus	EP	3.7	CG	0							0
51	Baetis spp.	EP	5.4	CG	1728		16	113	113	48	30	18.53998
52	Caenis spp.	EP	7.6	CG	0							0
53	Callibaetis spp.	EP	9.3	CG	0							0
54	Eurylophella spp.	EP	3	CG	45		7	3	1	3	1	0.869061
55	Heptagenia spp.	EP	2.8	SC	0							0
56	Hexagenia spp.	EP	4.7	CG	0							0
57	Isonychia spp.	EP	3.8	CF	311.6		29	29	17	6	1	4.750869
58	Neoephemera youngi	EP	2.1	CG	0							0
59	Paraleptophlebia spp.	EP	1.2	CG	0							0
60	Serratella deficiens	EP	2.7	CG	10.8		4					0.23175
61	Stenonema spp.	EP	3.4	SC	921.4		56	60	73	31	31	15.70104
62	Tricorythodes spp.	EP	5.4	CG	426.6		15	24	22	9	9	4.577057
63	Hydra	HY		P	0		1					0.057937
64	Sphaerium spp.	MB	7.7	CF	0							0
65	Corydalus cornutus	ME	5.6	P	5.6		1					0.057937
66	Nigronia serricornis	ME	5.5	P	0							0
67	Sialis spp.	ME	7.5	P	0							0
68	Ferrissia sp.	MG	6.9	SC	0							0
69	Nemertea	NA		P	0							0
70	Nemertea	NA		P	0		1	2	3	1	7	0.811124
71	Nematoda	NE		P	0					2		0.115875
72	Argia spp.	OD	8.7	P	34.8			2	1		1	0.23175
73	Boyeria vinosa	OD	6.3	P	0							0
74	Enallagma spp.	OD	9	P	0							0
75	Macromia spp.	OD	6.7	P	6.7						1	0.057937
76	Neurocordulia spp.	OD	5.8	P	0							0
77	Progomphus spp.	OD	8.7	P	0							0
78	Acroneuria abnormis	PL	2.2	P	0							0
79	Acroneuria spp.	PL	1.4	P	1.4			1				0.057937
80	Allocapnia spp.	PL	2.8	SH	0							0
81	Paragentina kansensis	PL	2	P	0							0
82	Paragentina spp.	PL	2	P	0							0
83	Perlesta spp.	PL	4.9	P	9.8		2					0.115875
84	Perlinella ephyre	PL	0	P	0							0
85	Perlinella spp.	PL	0	P	0							0
86	Pteronarcys dorsata	PL	1.8	SH	0							0
87	Taeniopteryx sp.	PL	6.3	SH	0							0
88	Brachycentrus numerosus	TR	1.8	CF	0							0
89	Cheumatopsyche spp.	TR	6.6	CF	627		51	21	15	8		5.504056
90	Chimarra spp.	TR	2.8	CF	0							0
91	Diplectrona modesta	TR	2.2	CF	0							0
92	Hydropsyche spp.	TR	4	CF	72		8	8	2			1.042874
93	Hydroptila spp.	TR	6.2	H	458.8		17	37	2	11	7	4.28737
94	Lype diversa	TR	4.3	SC	4.3						1	0.057937
95	Micrasema spp.	TR	0.6	SH	0							0

Station 15. Four Mile Creek at Road 13.2. 21 September 1994

96	Nectopsyche exquisita	TR	4.2	SH	46.2		3	2	1	2	3	0.637312
97	Nectopsyche spp.	TR	4.1	SH	0							0
98	Neuroclipsis spp.	TR	4.4	CF	6.8			1			1	0.116875
99	Nyctiophylax spp.	TR	0.9	CF	0							0
100	Oecetis spp.	TR	5.5	P	77		6	4	3	1	1	0.811124
101	Oxyethira spp.	TR	6.2	H	6.2			1				0.057937
102	Polycentropus spp.	TR	3.5	CF	7				1	1		0.116875
103	Turbellaria	TU	7.6	P	30			3	1			0.23175

Station 15. Four Mile Creek at Road 13.2. 21 September 1994

	Table size:	103	Total orgs:	1726	Tot Tax:	48	tot. mean #/	1928.492
	Number Samps:	5	SC/CF:	1.10569106	Bio Index:	5.553244		
	Mean TAX/Samp	30.6						
	EPT:	17						
Statistical Summary:						Taxon		
TAXC	FG	#Taxa	Total #	Mean/Samp	mean #/m^2	Rel Abd.	FG Rel. Abd	
AHC		1	9	1.8	10.0559	.5214		
AM		0	0	.	.	.		
ANO		1	81	16.2	90.5028	4.6929		
CO		2	34	6.8	37.9888	1.9699		
DC		0	0	.	.	.		
DCC		3	67	13.4	74.8603	3.8818		
DD		0	0	.	.	.		
DO		3	9	1.8	10.0559	.5214		
DOR		6	69	13.8	77.095	3.9977		
DTA		6	94	18.8	105.0279	5.4461		
DTY		2	344	68.8	384.3575	19.9305		
EP		6	771	154.2	861.4525	44.6698		
HY		1	1	.2	1.1173	.0579		
MB		0	0	.	.	.		
ME		1	1	.2	1.1173	.0579		
MG		0	0	.	.	.		
NA		1	14	2.8	15.6425	.8111		
NE		1	2	.4	2.2346	.1159		
OD		2	5	1.	5.5866	.2897		
PL		2	3	.6	3.352	.1738		
TR		9	218	43.6	243.5754	12.6304		
TU		1	4	.8	4.4693	.2317		
	P	18	150	30.	167.5978		8.6906141	
	CG	17	966	193.2	1079.3296		55.967555	
	SC	2	272	54.4	303.9106		15.75898	
	H	2	75	15.	83.7989		4.3453071	
	SH	2	17	3.4	18.9944		0.9849363	
	CF	7	246	49.2	274.860335		14.252607	

Station 15. Four Mile Creek at Road 13.2. 21 September 1994

Taxa List:	
Hydracarina	
Oligochaeta	
Macronychus glabratus	
Stenelmis spp.	
Dicrotendipes spp.	
Polypedilum fallax	
Polypedilum spp.	
Ceratopogonidae	
Hemerodromia spp.	
Simulium spp.	
Corynoneura spp.	
Cricotopus/Ortho spp.	
Nanocladius spp.	
Parakiefferiella sp.1	
Rheocricotopus spp.	
Thienemanniella spp.	
Ablabesmyia spp.	
Conchapelopia spp.	
Labrundinia spp.	
Nilotanypus spp.	
Paramerina sp.	
Pentaneura inconspicua	
Rheotanytarsus spp.	
Tanytarsus spp.	
Baetis spp.	
Eurylophella spp.	
Isonychia spp.	
Serratella deficiens	
Stenonema spp.	
Tricorythodes spp.	
Hydra	
Corydalus cornutus	
Nemertea	
Nematoda	
Argia spp.	
Macromia spp.	
Acroneuria spp.	
Perlesta spp.	
Cheumatopsyche spp.	
Hydropsyche spp.	
Hydroptila spp.	
Lype diversa	
Nectopsyche exquisita	
Neureclipsis spp.	
Oecetis spp.	
Oxyethira spp.	
Polycentropus spp.	
Turbellaria	

Station 15. Four Mile Creek at Road 13.2. 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Da	A	B	C	D	E	Rel Abd
1	Baetis spp.	EP	5.4	CG	1728		16	113	113	48	30	18.53998
2	Tanytarsus spp.	DTY	6.7	CG	2010		21	30	37	10	202	17.38123
3	Stenonema spp.	EP	3.4	SC	921.4		56	80	73	31	31	15.70104
4	Cheumatopsyche spp.	TR	6.6	CF	627		51	21	15	8		5.504056

Rosemary Creek Downstream Williston WWTP, Hester Dendy Data. 17 December 1994

Seq	Taxon	TAXC	NCBI	FG	(for BI)	Sampler Date:	A	B	C	D	E	Rel Abd
1	Hydracarina	AHC	6.7	P	0							0
2	Amphipoda	AM	8	CG	64				8			0.873362
3	Oligochaeta	ANO	8.4	CG	193.2		1	4	9	1	8	2.510917
4	Hydra spp.	CN		P					1	1		0.218341
5	Ancyronyx variegatus	CO	7.1	CG	0							0
6	Dubiraphia bivittata	CO	6.6	CG	0							0
7	Ectopria nervosa	CO	4.6	SC	0							0
8	Macronychus glabratus	CO	4.9	CG	4.9						1	0.10917
9	Stenelmis sp.	CO	5.6	CG	5.6				1			0.10917
10	Cambaridae	DC	9	H	9					1		0.10917
11	Palaemonetes paludosus	DC	6.9	CG	0							0
12	Chironomus spp.	DCC	10	CG	0							0
13	Cryptochironomus spp.	DCC	7.5	P	0							0
14	Cryptotendipes spp.	DCC	6.3	CG	0							0
15	Dicrotendipes spp.	DCC	8.1	CG	0							0
16	Microtendipes rydalensis	DCC	6.4	CG	0							0
17	Microtendipes spp.	DCC	6.4	CG	0							0
18	Nilotheuma babiyi	DCC	5.7	CG	0							0
19	Pheanopsectra flavipes	DCC	8.7	CG	0							0
20	Polypedilum laticx	DCC	6.9	SH	27.6				3		1	0.436881
21	Polypedilum spp.	DCC	7.1	CG	284		4		18	12	6	4.366812
22	Robackia sp.	DCC	3.5	CG	3.5						1	0.10917
23	Stelechomyia perpulchra	DCC	4.8	SH	0							0
24	Stenochironomus sp.	DCC	6.6	SH	13.2		1		1			0.218341
25	Tribelos jucundum	DCC	6.8	CG	6.8				1			0.10917
26	Xestochironomus sp.	DCC		SH				4				0.436881
27	Potthastia longimana	DO	7.6	CG	0							0
28	Atherix lantha	DO	2.3	P	0							0
29	Ceratopogonidae	DO	6.7	P	0							0
30	Hemerodromia spp.	DO	8.3	CG	24.9			1	1		1	0.327511
31	Simulium spp.	DO	4.6	CF	64.4		12			2		1.528384
32	Tipula abdominalis	DO	7.9	SH	15.8				1		1	0.218341
33	Brilla flavitans	DOR	5.4	SH	5.4				1			0.10917
34	Corynoneura spp.	DOR	6.4	CG	2568.4		7	3	270	56	65	43.77728
35	Cricotopus/Ortho spp.	DOR	9	CG	0							0
36	Eukiefferiella spp.	DOR	5.9	CG	0							0
37	Lopescladius spp.	DOR	2.2	CG	0							0
38	Nanocladius spp.	DOR	7.4	CG	0							0
39	Parakiefferiella sp.1	DOR	6.1	CG	12.2				1		1	0.218341
40	Parametriocnemus sp.	DOR	3.9	CG	68.5		1		11		3	1.637656
41	Rheocricotopus spp.	DOR	7.5	CG	602.5		4	4	24	6	30	7.31441
42	Synorthocladius semivirens	DOR	4.9	CG	0							0
43	Thienemanniella spp.	DOR	6.2	CG	235.6		8		4	23	3	4.148472
44	Tvetenia spp.	DOR	4.2	CG	46.2				6		6	1.200873
45	Xylotopus par	DOR	6.8	SH	0							0
46	Ablabesmyia spp.	DTA	6.6	P	13.2				1	1		0.218341
47	Conchapelopia spp.	DTA	8.9	P	63.4				2	4		0.656022
48	Labrundinia spp.	DTA	6.2	P	0							0
49	Larsia spp.	DTA	8.5	P	8.5				1			0.10917
50	Nilotanypus spp.	DTA	4.2	P	0							0
51	Paramerina sp.	DTA	3	P	0							0
52	Pentaneura inconspicua	DTA	4.8	P	0							0
53	Procladius spp.	DTA	9.5	P	0							0
54	Rheotanytarsus spp.	DTY	6.6	CF	191.4		3		2	23	1	3.165939
55	Stempellinella spp.	DTY	5.5	CG	82.6				15			1.637656
56	Tanytarsus spp.	DTY	6.9	CG	351.9			2	31	8	10	6.567898
57	Acerpenna pygmaeus	EP	3.9	CG	0							0
58	Baetis spp.	EP	5.6	CG	145.6		2	1	6	13	4	2.838428
59	Caenis spp.	EP	7.8	CG	-0							0
60	Callibaetis spp.	EP	9.5	CG	0							0
61	Ephemerella sp.	EP	1.6	CG	9.6		1		1		4	0.655022
62	Eurylophella spp.	EP	3.2	CG	9.6				3			0.327511
63	Heptagenia spp.	EP	3	SC	0							0
64	Hexagenia spp.	EP	4.7	CG	0							0
65	Isonychia spp.	EP	4	CF	0							0
66	Neoephemera youngi	EP	2.3	CG	0							0
67	Paraleptophlebia spp.	EP	1.4	CG	0							0
68	Stenonema spp.	EP	3.6	SC	205.2		1	1	16	38	1	8.222707
69	Tricorythodes spp.	EP	5.6	CG	0							0
70	Corbicula sp.	MB	6.5	CF	13					1	1	0.218341
71	Sphaerium spp.	MB	7.9	CF	47.4				6			0.656022
72	Corydalus cornutus	ME	5.6	P	5.6				1			0.10917
73	Nigronia serricornis	ME	5.7	P	11.4				2			0.218341
74	Sialis spp.	ME	7.7	P	0							0
75	Ferrissia sp.	MG	7.1	SC	7.1						1	0.10917
76	Nemertea	NA		P							1	0.10917
77	Nematoda	NE		CG								0
78	Bayaria vinosa	OD	6.6	P	0							0
79	Enallagma spp.	OD	9.2	P	0							0
80	Gomphus spp.	OD	6.4	P	0							0
81	Libellula spp.	OD	10	P	0							0
82	Neurocordulia spp.	OD	8	P	0							0
83	Progomphus spp.	OD	8.9	P	0							0
84	Acroneuria abnormis	PL	2.4	P	2.4					1		0.10917
85	Acroneuria arenosa	PL	2.4	P	0							0
86	Acroneuria spp.	PL	1.6	P	0							0
87	Alloperla spp.	PL	3	SH	0							0
88	Cloperla clio	PL	5	P	60		6		3	1	1	1.091703
89	Paragentina kansensis	PL	2.2	P	0							0
90	Paragentina spp.	PL	2.2	P	0							0
91	Perlesta spp.	PL	5.1	P	186.7		1	4	11	11	10	4.039301
92	Perlinella ephyre	PL	0.2	P	0							0
93	Perlinella spp.	PL	0.2	P	0							0
94	Pteronarcys dorsata	PL	2	SH	0							0
95	Taeniopteryx sp.	PL	6.5	SH	13					1	1	0.218341
96	Brachycentrus numerosus	TR	2	CF	0							0
97	Cheumatopsyche spp.	TR	6.8	CF	40.8					4	2	0.655022
98	Chimarra spp.	TR	3	CF	0							0
99	Diplectrona modesta	TR	2.4	CF	0							0
100	Hydatophylax argus	TR	2.5	SH	12.5				5			0.545852

Xeno

Rosemary Creek Downstream Williston WWTP, Hester Dendy Data. 17 December 1994

101	Hydropsyche spp.	TR	4.2	CF	0							0
102	Hydroptila spp.	TR	6.4	H	0							0
103	Lype diversa	TR	4.6	SC	4.6				1			0.10017
104	Micrasema spp.	TR	0.8	SH	0							0
106	Nectopsyche pavida	TR	4.4	SH	0							0
108	Nectopsyche spp.	TR	4.3	SH	0							0
107	Neuroclipsis spp.	TR	4.6	CF	0							0
108	Nyctiophylax spp.	TR	1.1	CF	0							0
109	Oecetis spp.	TR	5.9	P	0							0
110	Polycentropus spp.	TR	3.7	CF	0							0
111	Psychopsyche spp.	TR	2.5	SH	7.5				3			0.327611
112	Tubifleria	TV	7.7	P	0							0

Rosemary Creek Downstream Williston WWTP, Hester Dendy Data. 17 December 1994

	Table size:	112	Total orgs:	916	Tot Tax:	46	Tot. mean #/m^2:	1023.46
	Number Samps:	5	SC/CF:	1.04	Bio Index:	6.18		
	Mean TAX/Samp:	20.6						
	EPT Index:	12						
Statistical Summary:						Taxon		
TAXC		#Taxa	Total #	Mean/Samp	Mean #/m^2	Rel Abd.		
AHC		0	0	0.00	0.00	0.00		
AM		1	8	1.60	8.94	0.87		
ANO		1	23	4.60	25.70	2.51		
CN		1	2	0.40	2.23	0.22		
CO		2	2	0.40	2.23	0.22		
DC		1	1	0.20	1.12	0.11		
DCC		6	52	10.40	58.10	5.68		
DD		0	0	0.00	0.00	0.00		
DO		3	19	3.80	21.23	2.07		
DOR		7	535	107.00	597.77	58.41		
DTA		3	9	1.80	10.06	0.98		
DTY		3	95	19.00	106.15	10.37		
EP		4	92	18.40	102.79	10.04		
MB		2	8	1.60	8.94	0.87		
ME		2	3	0.60	3.35	0.33		
MG		1	1	0.20	1.12	0.11		
NA		1	1	0.20	1.12	0.11		
NE		0	0	0.00	0.00	0.00		
OD		0	0	0.00	0.00	0.00		
PL		4	50	10.00	55.87	5.46		
TR		4	15	3.00	16.76	1.64		
TU		0	0	0.00	0.00	0.00		
	Functional Group						FG Rel. Abd.	
	CF	5	57	11.40	63.69		6.88	
	CG	19	713	142.60	796.65		77.84	
	H	1	1	0.20	1.12		6.44	
	P	10	63	12.60	70.39		0.11	
	SC	3	59	11.80	65.92		2.51	
	SH	8	23	4.60	25.70		6.22	

Rosemary Creek Downstream Williston WWTP, Hester Dendy Data. 17 December 1994

Taxa List:
Amphipoda
Oligochaeta
Hydra spp.
Macronychus glabratus
Stenelmis sp.
Cambaridae
Polypedilum fallax
Polypedilum spp.
Robackia sp.
Stenochironomus sp.
Tribelos jucundum
Xestochironomus sp.
Hemerodromia spp.
Simulium spp.
Tipula abdominalis
Brilla flavifrons
Corynoneura spp.
Parakiefferiella sp.1
Parametriocnemus sp.
Rheocricotopus spp.
Thienemanniella spp.
Tvetenia spp.
Ablabesmyia spp.
Conchapelopia spp.
Larsia spp.
Rheotanytarsus spp.
Stempellinella spp.
Tanytarsus spp.
Baetis spp.
Ephemerella sp.
Eurylophella spp.
Stenonema spp.
Corbicula sp.
Spiraerium spp.
Corydalus cornutus
Nigronia serricornis
Ferrissia sp.
Nemertea
Acroneuria abnormis
Clioperla clio
Perlesta spp.
Taeniopteryx sp.
Cheumatopsyche spp.
Hydatophylax argus
Lype diversa
Pycnopsyche spp.

Rosemary Creek Downstream Williston WWTP, Hester Dendy Data- Dominant Taxa. 17 December 1994

Seq	Taxon	TAXC	NCBI	FG	Sampler Data:	A	B	C	D	E	Total #	Rel Abd
1	Corynoneura spp.	DOR	6.4	CG		7	3	270	56	65	401	43.77729
2	Rheocricotopus spp.	DOR	7.5	CG		4	4	24	5	30	67	7.31441
3	Stenonema spp.	EP	3.6	SC		1	1	16	38	1	57	6.222707
4	Tanytarsus spp.	DTY	6.9	CG			2	31	8	10	51	5.567686

PART V

ASH FREE DRY WEIGHT DATA, 1994

STATION #	FG	REPLICATE #1	REPLICATE #2	REPLICATE #3	REPLICATE #4	REPLICATE #5	TOTAL	%RELATIVE ABUNDANCE	STATION MEAN G/M2
#1	CG	0.0069	0.0030	0.0053	0.0067	0.0342	0.0561	29.22	0.0627
Rosemary	CF	0.0007	0.0015	0.0173	0.0016	0.0018	0.0229	11.93	0.0256
Creek	P	0.0009	0.0005	0.0012	0.0003	0.0011	0.0040	2.08	0.0045
	SC	0.0053	0.0065	0.0283	0.0172	0.0226	0.0799	41.61	0.0893
	SH	0.0003	0.0005	0	0.0262	0.0009	0.0279	14.53	0.0312
	H	0.0012	0	0	0	0	0.0012	0.63	0.0013
TOTAL							0.1920		0.2145
#2	CG	0.0025	0.0009	0.0063	0.0006	0.0045	0.0148	17.28	0.0165
Tinker	CF	0.0012	0.0003	0.0027	0.0005	0.0002	0.0049	5.72	0.0055
Creek	P	0.0043	0.0006	0.0019	0.0008	0.0004	0.0080	9.35	0.0089
	SC	0.0095	0.0084	0.0127	0.0122	0.0056	0.0484	56.54	0.0541
	SH	0.0002	0	0.0005	0.0001	0.0001	0.0009	1.05	0.0010
	H	0	0	0.0082	0.0002	0.0002	0.0086	10.05	0.0096
TOTAL							0.0856		0.0956
#3	CG	0.0119	0.0051	0.0179	NA	0.0043	0.0392	44.44	0.0438
Mill	CF	0.0020	0.0006	0.0030	NA	0.0010	0.0066	8.16	0.0074
Creek	P	0.0013	0.0012	0.0022	NA	0.0036	0.0083	9.45	0.0093
	SC	0.0053	0.0010	0.0163	0.0013	0	0.0239	27.10	0.0267
	SH	0.0003	0.0021	0.0006	0.0022	0.0003	0.0055	6.24	0.0061
	H	0.0019	0.0009	0.0010	0	0.0009	0.0047	5.33	0.0053
TOTAL							0.0882		0.0986
#4	CG	0.0003	0.0050	0.0070	0.0030	0.0027	0.0180	49.18	0.0201
Crouch	CF	0.0011	0	0	0.0004	0	0.0015	4.10	0.0017
Branch	P	0.0003	0.0005	0.0017	0.0011	0.0014	0.0050	13.66	0.0056
	SC	0	0.0001	0.0010	0	0.0016	0.0027	7.38	0.0030
	SH	0	0	0	0	0	0	0	0
	H	0	0	0	0	0.0094	0.0094	25.68	0.0105
TOTAL							0.0366		0.0409
#5	CG	0.0037	0.0031	0.0041	0.0005	0.0025	0.0139	47.44	0.0155
Tims	CF	0.0012	0.0014	0.0008	0.0008	0.0017	0.0059	20.14	0.0066
Branch	P	0.0003	0.0010	0.0008	0.0019	0.0004	0.0044	15.02	0.0049
	SC	0.0001	0.0002	0.0003	0	0.0002	0.0008	2.73	0.0009
	SH	0	0.0012	0.0001	0.0011	0.0009	0.0033	11.26	0.0037
	H	0.0010	0		0	0	0.0010	3.41	0.0011
TOTAL							0.0293		0.0327

*All measures in grams
NA = weights less than 0.0001g.

ASH FREE DRY WEIGHT DATA, 1994

STATION #	FG	REPLICATE #1	REPLICATE #2	REPLICATE #3	REPLICATE #4	REPLICATE #5	TOTAL	%RELATIVE ABUNDANCE	STATION MEAN G/M2
#6	CG	0.0016	0.0012	0.0003	0.0021		0.0052	2.35	0.0073
Upper Three	CF	0.0029	0.0001	NA	0.0021		0.0051	2.31	0.0071
Runs Creek	P	0.0496	0.0142	0.1238	0.0100		0.1976	89.33	0.2760
	SC	0.0033	0.0048	0.0010	0.0004		0.0095	4.29	0.0133
	SH	0.0004	0	0.0001	0.0033		0.0038	1.72	0.0053
	H	0	0	0	0		0	0	0
TOTAL							0.2212		0.3090
#7	CG	0.0105	0.0067	0.0058	0.0020	0.0136	0.0386	47.71	0.0431
Four Mile	CF	0.0015	0.0007	0.0005	0.0002	0.0006	0.0035	4.33	0.0039
Cr. @ Rd. C	P	0.0056	0.0072	0.0073	0.0055	0.0030	0.0286	35.35	0.0320
	SC	0.0038	0.0009	0.0002	0	0.0003	0.0052	6.43	0.0058
	SH	0	0	NA	0.0028	0	0.0028	3.46	0.0031
	H	0.0008	0.0014	0	0	0	0.0022	2.72	0.0025
TOTAL							0.0809		0.0904
#8	CG	0.0026	0.0023	0.0017	0.0026	0.0030	0.0122	40.53	0.0136
Pen Branch @	CF	0.0004	0.0002	0.0005	0.0006	0.0009	0.0026	8.64	0.0029
Rd. C	P	0.0004	0.0008	0.0004	0.0003	0.0007	0.0026	8.64	0.0029
	SC	0.0028	0	0.0012	0.0019	0.0042	0.0101	33.55	0.0113
	SH	0.0003	0.0019	0	0.0004	0	0.0026	8.64	0.0029
	H	0	0	0	0	0	0	0	0
TOTAL							0.0301		0.0336
#9	CG	0.0033	0.0061	0.0045	0.0024	0.0035	0.0198	20.65	0.0221
Meyers	CF	0.0027	0.0016	0.0041	0.0006	0.0082	0.0172	17.94	0.0192
Branch	P	0.0007	0.0071	0.0014	0.0058	0.0002	0.0152	15.85	0.0170
	SC	0.0105	0.0053	0.0109	0.0040	0.0109	0.0416	43.38	0.0465
	SH	0.0004	0.0003	0.0003	0.0005	0.0006	0.0021	2.19	0.0023
	H	0	0	0	0	0	0	0	0
TOTAL							0.0959		0.1071
#10	CG	0.0044	0.0036	0.0041	0.0023	0.0047	0.0191	21.08	0.0213
Lower Three	CF	0.0028	0.0017	0.0008	0.0018	0.0011	0.0082	9.05	0.0092
Runs Creek	P	0.0015	0.0017	0.0020	0.0489	0.0083	0.0624	68.87	0.0697
	SC	0	NA	0.0009	NA	0	0.0009	0.99	0.0010
	SH	0	0	0	0	0	0	0	0
	H	0	0	0	0	0	0	0	0
TOTAL							0.0906		0.1012

*All measures in grams

NA = weights less than 0.0001g.

ASH FREE DRY WEIGHT DATA, 1994

STATION #	FG	REPLICATE #1	REPLICATE #2	REPLICATE #3	REPLICATE #4	REPLICATE #5	TOTAL	%RELATIVE ABUNDANCE	STATION MEAN G/M2
#11	CG	0.0067	0.0085	0.0102	0.0150		0.0404	19.95	0.0564
Pen Branch @	CF	0.0006	0.0002	0.0011	0.0012		0.0031	1.53	0.0043
Rd. B	P	0.0098	0.0098	0.0978	0.0092		0.1266	62.58	0.1768
	SC	0.0064	0.0076	0.0001	0.0143		0.0284	14.02	0.0397
	SH	0	0.0003	0.0037	0		0.0040	1.98	0.0056
	H	0	0	0	0		0	0.00	0
TOTAL							0.2025		0.2828
#12	CG	0.0118	0.0124	0.0055	0.0093	0.0185	0.0575	18.55	0.0642
Indian Grave	CF	0.0013	0	0.0014	0.0083	0.0028	0.0138	4.45	0.0154
Branch	P	0.0027	0.0019	0.0012	0.0100	0.0017	0.0175	5.65	0.0196
	SC	0.0015	0	0.0011	0.0099	0.0007	0.0132	4.26	0.0147
	SH	0.0011	0.0463	0.0006	0.0868	0.0708	0.2056	66.34	0.2297
	H	0.0006	0.0004	0	0	0.0013	0.0023	0.74	0.0026
TOTAL			-				0.3099		0.3462
#13	CG	0.0011	0.0282	0.0409	0.0046	0.0261	0.1009	21.01	0.1127
Pen Branch @	CF	0.0091	0.0192	0.0185	0.0035	0.0192	0.0695	14.47	0.0777
Rd. A	P	0.0076	0.0198	0.0382	0.0201	0.1247	0.2104	43.82	0.2351
	SC	0.0009	0.0216	0.0116	0.0025	0.0128	0.0494	10.29	0.0552
	SH	0.0010	0.0072	0.0011	0.0073	0.0118	0.0284	5.91	0.0317
	H	NA	0.0020	0.0069	0.0110	0.0017	0.0216	4.50	0.0241
TOTAL							0.4802		0.5365
#14	CG	0.0045	0.0022	0.0202	0.0092	0.0191	0.0552	13.95	0.0617
Beaver Dam	CF	0.0084	0.0126	0.0109	0.0266	0.0209	0.0794	20.06	0.0887
Creek	P	0.0298	0.0016	0.0097	0.0217	0.0187	0.0815	20.59	0.0911
	SC	0.0192	0.0154	0.0250	0.0167	0.0271	0.1034	26.12	0.1155
	SH	0.0043	0.0039	0.0150	0.0139	0.0269	0.0640	16.17	0.0715
	H	0	0	0	0.0123	0	0.0123	3.11	0.0137
TOTAL							0.3958		0.4422
#15	CG	0.0239	0.0211	0.0142	0.0078	0.0079	0.0749	26.35	0.0837
Four Mile	CF	0.0252	0.0120	0.0176	0.0033	0.0008	0.0589	20.72	0.0658
Creek @	P	0.0099	0.0015	0.0017	0.0013	0.0021	0.0165	5.80	0.0184
Rd. 13.2	SC	0.0277	0.0214	0.0156	0.0134	0.0055	0.0836	29.41	0.0934
	SH	0.0177	0.0006	0.0007	0.0008	0.0004	0.0202	7.11	0.0226
	H	0.0012	0.0020	0.0252	0.0009	0.0009	0.0302	10.62	0.0337
TOTAL							0.2843		0.3176

*All measures in grams
NA = weights less than 0.0001g.

ASH FREE DRY WEIGHT (grams) DATA
Rosemary Creek downstream of Williston WWTP 17 Dec 1994

STATION #	FG	REPLICATE #1	REPLICATE #2	REPLICATE #3	REPLICATE #4	REPLICATE #5	TOTAL	%RELATIVE ABUNDANCE	STATION MEAN G/M2
#16	CF	0.0015	0	0.0049	0.0081	0.0049	0.0194	2.59	0.0217
Rosemary	CG	0.0008	0.0009	0.0126	0.0028	0.126	0.1431	19.07	0.1599
Creek	H	0	0	0	0.2651	0	0.2651	35.34	0.2962
17-Dec-94	P	0.0043	0.0008	0.2183	0.0027	0.0017	0.2278	30.37	0.2545
	SC	0.0001	0.0003	0.0045	0.0436	0.0010	0.0495	6.60	0.0553
	SH	NA	0.0004	0.0259	0.0001	0.0189	0.0453	6.04	0.0506
TOTAL							0.7502		0.8382

NA = <o.ooo1 grams

PART VI

Station 1. Rosemary Creek near Rosemary Chruch. RBP II. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	6	P	0.00		0.00
2	Amphipoda	AM	6	CG	0.00		0.00
3	Hirudinea	ANH	10	P	0.00		0.00
4	Oligochaeta	ANO	9	CG	0.00		0.00
5	Hydra	CN		P			0.00
6	Elmidae	CO	4	CG	12.00	3	1.66
7	Cambaridae	DC	6	H	48.00	8	4.42
8	Palaemonidae	DC	6	H	240.00	40	22.10
9	Chironomini	DCC	8	CG	48.00	6	3.31
10	Ceratopogonidae	DO	6	P	0.00		0.00
11	Culicidae	DO		CF			0.00
12	Simuliidae	DO	6	CF	0.00		0.00
13	Tabanidae	DO	6	P	0.00		0.00
14	Tipulidae	DO	3	SH	0.00		0.00
15	Orthocladiinae	DOR	6	CG	0.00		0.00
16	Tanypodinae	DTA	6	P	24.00	4	2.21
17	Tanytarsini	DTY	6	CG	222.00	37	20.44
18	Baetidae	EP	4	CG	12.00	3	1.66
19	Caenidae	EP	7	CG	273.00	39	21.55
20	Ephemerellidae	EP	1	CG	0.00		0.00
21	Ephemeridae	EP	4	CG	4.00	1	0.55
22	Heptageniidae	EP	4	SC	24.00	6	3.31
23	Leptophlebiidae	EP	2	CG	18.00	9	4.97
24	Neoephemeridae	EP		CG			0.00
25	Oligoneuriidae	EP	2	CF	0.00		0.00
26	Siphlonuridae	EP	7	CG	0.00		0.00
27	Tricorythidae	EP	4	CG	80.00	20	11.05
28	Corixidae	HT	9	H	0.00		0.00
29	Isopoda	IS	8	CG	0.00		0.00
30	Pyralidae	LEP	5	H	0.00		0.00
31	Sphaeriidae	MB	8	CF	0.00		0.00
32	Corydalidae	ME	0	P	0.00		0.00
33	Sialidae	ME	4	P	0.00		0.00
34	Planorbidae	MG	6	SC	0.00		0.00
35	Viviparidae	MG	7	SC	0.00		0.00
36	Nemertea	NA		P			0.00
37	Nematoda	NE		P	0.00		0.00
38	Aeshnidae	OD	3	P	0.00		0.00
39	Calopterygidae	OD	5	P	5.00	1	0.55
40	Coenagrionidae	OD	9	P	18.00	2	1.10
41	Corduliidae	OD	5	P	0.00		0.00
42	Gomphidae	OD	1	P	0.00		0.00
43	Libellulidae	OD	9	P	0.00		0.00
44	Macromiidae	OD	3	P	0.00		0.00
45	Capniidae	PL	1	SH	1.00	1	0.55
46	Leuctridae	PL	0	SH	0.00		0.00
47	Perlidae	PL	1	P	0.00		0.00
48	Pteronarcyidae	PL	0	SH	0.00		0.00
49	Brachycentridae	TR	1	CF	0.00		0.00
50	Hydropsychidae	TR	4	CF	0.00		0.00
51	Hydroptilidae	TR	4	H	0.00		0.00
52	Lepidostomatidae	TR	1	SH	0.00		0.00
53	Leptoceridae	TR	4	SH	4.00	1	0.55
54	Philopotamidae	TR	3	CF	0.00		0.00
55	Polycentropodidae	TR	6	CF	0.00		0.00
56	Psychomyiidae	TR	2	SC	0.00		0.00
57	Turbellaria	TU	4	P	0.00		0.00

Station 1. Rosemary Creek near Rosemary Chruch. RBP II. 20 September 1994

Rosemary Creek near Rosemary Chruch	Station 1
Taxa Richness	16
Number of Specimens	181
EPT Index	8
EPT Abunance	80
Chironomidae Taxa	3
Chironomidae Abundance	47
EPT/Chironomidae Abundance	1.70
North Carolina Biotic Index	5.71
Percent Collector-Filterers	0.00
Percent Collector-Gatherers	65.19
Percent Predators	3.87
Percent Herbivores	26.52
Percent Scrapers	3.31
Percent Shredders	1.10
Scraper/Scraper & Collector Filterers	1.00
Shredders/Total	0.01
Percent Dominant Taxon	22.10
Number Of Dominant Taxa	4
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 1. Rosemary Creek near Rosemary Chruch. RBP II. 20 September 1994

Table Size:	57	Total Orgs:	181	SC/CF:	
Number of Samples:	1	Taxa Richness:	16	EPT:	8
Sample Sorted:	50%	Biotic Index:	5.71		

	Number Taxa	Number Orgs	Rel Abumence
Taxa			
AHC	0	0	0.00
AM	0	0	0.00
ANH	0	0	0.00
ANO	0	0	0.00
CN	0	0	0.00
CO	1	3	1.66
DC	2	48	26.52
DCC	1	6	3.31
DD	0	0	0.00
DDR	0	0	0.00
DTA	1	4	2.21
DTY	1	37	20.44
EP	6	78	43.09
HT	0	0	0.00
IS	0	0	0.00
LEP	0	0	0.00
MB	0	0	0.00
ME	0	0	0.00
MG	0	0	0.00
NA	0	0	0.00
NE	0	0	0.00
OD	2	3	1.66
PL	1	1	0.55
TR	1	1	0.55
TU	0	0	0.00
Functional Group			
P	3	7	3.87
CG	8	118	65.19
H	2	48	26.52
CF	0	0	0.00
SH	2	2	1.10
SC	1	6	3.31
Functional Group CPOM SAMPLE			
P		13	13.00
CG		46	46.00
H		3	3.00
CF		27	27.00
SH		4	4.00
SC		7	7

Station 1. Rosemary Creek near Rosemary Chruch. RBP II. 20 September 1994

Taxa List
Elmidae
Cambaridae
Palaemonidae
Chironomini
Tanypodinae
Tanytarsini
Baetidae
Caenidae
Ephemeridae
Heptageniidae
Leptophlebiidae
Tricorythidae
Calopterygidae
Coenagrionidae
Capniidae
Leptoceridae

Station 1. Rosemary Creek near Rosemary Chruch. RBP II. 20 September 1994

Taxon	A	Rel Abd
Palaemonidae	40	22.10
Caenidae	39	21.55
Tanytarsini	37	20.44
Tricorythidae	20	11.05

Station 3. Mill Creek at Road E-2. RBP II. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
3	Hydracarina	AHC	6	P	6.00	1	0.79
4	Amphipoda	AM	6	CG	6.00	1	0.79
5	Hirudinea	ANH	10	P	0.00		0.00
6	Oligochaeta	ANO	9	CG	252.00	28	22.22
7	Hydra	CN		P			0.00
8	Elmidae	CO	4	CG	0.00		0.00
9	Cambaridae	DC	6	H	0.00		0.00
10	Palaemonidae	DC	6	H	36.00	6	4.76
11	Chironomini	DCC	8	CG	168.00	21	16.67
12	Ceratopogonidae	DO	6	P	6.00	1	0.79
13	Culicidae	DO		CF			0.00
14	Simuliidae	DO	6	CF	0.00		0.00
15	Tabanidae	DO	6	P	6.00	1	0.79
16	Tipulidae	DO	3	SH	6.00	2	1.59
17	Orthocladiinae	DOR	6	CG	0.00		0.00
18	Tanypodinae	DTA	6	P	78.00	13	10.32
19	Tanytarsini	DTY	6	CG	30.00	5	3.97
20	Baetidae	EP	4	CG	0.00		0.00
21	Caenidae	EP	7	CG	7.00	1	0.79
22	Ephemerellidae	EP	1	CG	0.00		0.00
23	Ephemeridae	EP	4	CG	4.00	1	0.79
24	Heptageniidae	EP	4	SC	0.00		0.00
25	Leptophlebiidae	EP	2	CG	0.00		0.00
26	Neoephemeridae	EP		CG			0.00
27	Oligoneuriidae	EP	2	CF	0.00		0.00
28	Siphlonuridae	EP	7	CG	49.00	7	5.56
29	Tricorythidae	EP	4	CG	4.00	1	0.79
30	Corixidae	HT	9	H	9.00	1	0.79
31	Isopoda	IS	8	CG	0.00		0.00
32	Pyralidae	LEP	5	H	0.00		0.00
33	Sphaeriidae	MB	8	CF	88.00	11	8.73
34	Corydalidae	ME	0	P	0.00		0.00
35	Sialidae	ME	4	P	12.00	3	2.38
36	Planorbidae	MG	6	SC	0.00		0.00
37	Viviparidae	MG	7	SC	28.00	4	3.17
38	Nemertea	NA		P		5	3.97
39	Nematoda	NE		P		1	0.79
40	Aeshnidae	OD	3	P	3.00	1	0.79
41	Calopterygidae	OD	5	P	0.00		0.00
42	Coenagrionidae	OD	9	P	45.00	5	3.97
43	Corduliidaae	OD	5	P	0.00		0.00
44	Gomphidae	OD	1	P	4.00	4	3.17
45	Libellulidae	OD	9	P	0.00		0.00
46	Macromiidae	OD	3	P	0.00		0.00
47	Capniidae	PL	1	SH	1.00	1	0.79
48	Leuctridae	PL	0	SH	0.00		0.00
49	Perlidae	PL	1	P	0.00		0.00
50	Pteronarcyidae	PL	0	SH	0.00		0.00
51	Brachycentridae	TR	1	CF	0.00		0.00
52	Hydropsychidae	TR	4	CF	0.00		0.00
53	Hydroptilidae	TR	4	H	0.00		0.00
54	Lepidostomatidae	TR	1	SH	0.00		0.00
55	Leptoceridae	TR	4	SH	0.00		0.00
56	Philopotamidae	TR	3	CF	0.00		0.00
57	Polycentropodidae	TR	6	CF	0.00		0.00
58	Psychomyiidae	TR	2	SC	0.00		0.00
59	Turbellaria	TU	4	P	4.00	1	0.79

Station 3. Mill Creek at Road E-2. RBP II. 20 September 1994

Mill Creek at Road E-2	Station 3
Taxa Richness	25
Number of Specimens	126
EPT Index	5
EPT Abunance	11
Chironomidae Taxa	3
Chironomidae Abundance	39
EPT/Chironomidae Abundance	0.28
North Carolina Biotic Index	7.10
Percent Collector-Filterers	8.73
Percent Collector-Gatherers	51.59
Percent Predators	28.57
Percent Herbivores	5.56
Percent Scrapers	3.17
Percent Shredders	2.38
Scraper/Scraper & Collector Filterers	0.27
Shredders/Total	0.02
Percent Dominant Taxon	22.22
Number Of Dominant Taxa	5
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 3. Mill Creek at Road E-2. RBP II. 20 September 1994

Table Size:	59	Total Orgs:	126	SC/CF:	0.36
Number of Samples:	1	Taxa Richness:	25	EPT:	5
Sample Sorted:	100%	Biotic Index:	7.10		

	Number Taxa	Number Orgs	Rel Abunance
Taxa			
AHC	1	1	0.79
AM	1	1	0.79
ANH	0	0	0.00
ANO	1	28	22.22
CN	0	0	0.00
CO	0	0	0.00
DC	1	6	4.76
DCC	1	21	16.67
DO	3	4	3.17
DOR	0	0	0.00
DTA	1	13	10.32
DTY	1	5	3.97
EP	4	10	7.94
HT	1	1	0.79
IS	0	0	0.00
LEP	0	0	0.00
MB	1	11	8.73
ME	1	3	2.38
MG	1	4	3.17
NA	1	5	3.97
NE	1	1	0.79
OD	3	10	7.94
PL	1	1	0.79
TR	0	0	0.00
TU	1	1	0.79
Functional Group			
P	11	36	28.57
CG	8	65	51.59
H	2	7	5.56
CF	1	11	8.73
SH	2	3	2.38
SC	1	4	3.17
Functional Group			
CPOM Sample			
Sample Sorted: 50%			
P		21	15.67
CG		94	70.15
H		1	0.75
CF		10	7.46
SH		3	2.24
SC		5	3.73

Station 3. Mill Creek at Road E-2. RBP II. 20 September 1994

Taxa List
Hydracarina
Amphipoda
Oligochaeta
Palaemonidae
Chironomini
Ceratopogonidae
Tabanidae
Tipulidae
Tanypodinae
Tanytarsini
Caenidae
Ephemeridae
Siphlonuridae
Tricorythidae
Corixidae
Sphaeriidae
Sialidae
Viviparidae
Nemertea
Nematoda
Aeshnidae
Coenagrionidae
Gomphidae
Capniidae
Turbellaria

Station 3. Mill Creek at Road E-2. RBP II. 20 September 1994

Taxon	A	Rel Abd
Oligochaeta	28	22.22
Chironomini	21	16.67
Tanypodinae	13	10.32
Sphaeriidae	11	8.73
Siphlonuridae	7	5.56

Station 4. Crouch Branch at Road 4. RBP II. 20 September 1994.

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	6	P	0.00		0.00
2	Amphipoda	AM	6	CG	0.00		0.00
3	Hirudinea	ANH	10	P	0.00		0.00
4	Oligochaeta	ANO	9	CG	495.00	55	67.07
5	Hydra	CN		P			0.00
6	Elmidae	CO	4	CG	0.00		0.00
7	Cambaridae	DC	6	H	12.00	2	2.44
8	Palaemonidae	DC	6	H	0.00		0.00
9	Chironomini	DCC	8	CG	32.00	4	4.88
10	Ceratopogonidae	DO	6	P	0.00		0.00
11	Culicidae	DO		CF		1	1.22
12	Simuliidae	DO	6	CF	0.00		0.00
13	Tabanidae	DO	6	P	0.00		0.00
14	Tipulidae	DO	3	SH	0.00		0.00
15	Orthocladiinae	DOR	6	CG	0.00		0.00
16	Tanypodinae	DTA	6	P	18.00	3	3.66
17	Tanytarsini	DTY	6	CG	0.00		0.00
18	Baetidae	EP	4	CG	0.00		0.00
19	Caenidae	EP	7	CG	0.00		0.00
20	Ephemerellidae	EP	1	CG	0.00		0.00
21	Ephemeridae	EP	4	CG	0.00		0.00
22	Heptageniidae	EP	4	SC	0.00		0.00
23	Leptophlebiidae	EP	2	CG	0.00		0.00
24	Neoephemeridae	EP		CG			0.00
25	Oligoneuriidae	EP	2	CF	0.00		0.00
26	Siphlonuridae	EP	7	CG	0.00		0.00
27	Tricorythidae	EP	4	CG	0.00		0.00
28	Corixidae	HT	9	H	0.00		0.00
29	Isopoda	IS	8	CG	0.00		0.00
30	Pyralidae	LEP	5	H	0.00		0.00
31	Sphaeriidae	MB	8	CF	8.00	1	1.22
32	Corydalidae	ME	0	P	0.00		0.00
33	Sialidae	ME	4	P	0.00		0.00
34	Planorbidae	MG	6	SC	6.00	1	1.22
35	Viviparidae	MG	7	SC	0.00		0.00
36	Nemertea	NA		P		4	4.88
37	Nematoda	NE		P		1	1.22
38	Aeshnidae	OD	3	P	0.00		0.00
40	Coenagrionidae	OD	9	P	81.00	9	10.98
41	Corduliidaae	OD	5	P	0.00		0.00
42	Gomphidae	OD	1	P	0.00		0.00
43	Libellulidae	OD	9	P	9.00	1	1.22
44	Macromiidae	OD	3	P	0.00		0.00
45	Capniidae	PL	1	SH	0.00		0.00
46	Leuctridae	PL	0	SH	0.00		0.00
47	Perlidae	PL	1	P	0.00		0.00
48	Pteronarcyidae	PL	0	SH	0.00		0.00
49	Brachycentridae	TR	1	CF	0.00		0.00
50	Hydropsychidae	TR	4	CF	0.00		0.00
51	Hydroptilidae	TR	4	H	0.00		0.00
52	Lepidostomatidae	TR	1	SH	0.00		0.00
53	Leptoceridae	TR	4	SH	0.00		0.00
54	Philopotamidae	TR	3	CF	0.00		0.00
55	Polycentropodidae	TR	6	CF	0.00		0.00
56	Psychomyiidae	TR	2	SC	0.00		0.00
57	Turbellaria	TU	4	P	0.00		0.00

Station 4. Crouch Branch at Road 4. RBP II. 20 September 1994.

Crouch Branch at Road 4	Station 4
Taxa Richness	11
Number of Specimens	82
EPT Index	0
EPT Abunance	0
Chironomidae Taxa	2
Chironomidae Abundance	7
EPT/Chironomidae Abundance	0.00
North Carolina Biotic Index	8.70
Percent Collector-Filterers	2.44
Percent Collector-Gatherers	71.95
Percent Predators	17.07
Percent Herbivores	2.44
Percent Scrapers	1.22
Percent Shredders	0.00
Scraper/Scraper & Collector Filterers	0.33
Shredders/Total	0.00
Percent Dominant Taxon	67.07
Number Of Dominant Taxa	2
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 4. Crouch Branch at Road 4. RBP II. 20 September 1994.

Table Size:	57	Total Orgs:	82	SC/CF:	0.5
Number of Samples:	1	Taxa Richness:	11	EPT:	0
Sample Sorted:	100%	Biotic Index:	8.70		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	0	0	0.00
AM	0	0	0.00
ANH	0	0	0.00
ANO	1	55	67.07
CN	0	0	0.00
CO	0	0	0.00
DC	1	2	2.44
DCC	1	4	4.88
DO	1	1	1.22
DOR	0	0	0.00
DTA	1	3	3.66
DTY	0	0	0.00
EP	0	0	0.00
HT	0	0	0.00
IS	0	0	0.00
LEP	0	0	0.00
MB	1	1	1.22
ME	0	0	0.00
MG	1	1	1.22
NA	1	4	4.88
NE	1	1	1.22
OD	2	10	12.20
PL	0	0	0.00
TR	0	0	0.00
TU	0	0	0.00
Functional Group			
P	5	18	21.95
CG	2	59	71.95
H	1	2	2.44
CF	2	2	2.44
SH	0	0	0.00
SC	1	1	1.22
Functional Group CPOM Sample Sample Sorted: 100%			
P		0	0
CG		98	100
H		0	0
CF		0	0
SH		0	0
SC		0	0

Station 4. Crouch Branch at Road 4. RBP II. 20 September 1994.

Taxa List
Oligochaeta
Cambaridae
Chironomini
Culicidae
Tanypodinae
Sphaeriidae
Planorbidae
Nemertea
Nematoda
Coenagrionidae
Libellulidae

Station 4. Crouch Branch at Road 4. RBP II. 20 September 1994.

Taxon	A	Rel Abd
Oligochaeta	55	67.07
Coenagrionidae	9	10.98

Station 7. Four Mile Creek at Road C. RBP II. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	6	P	12.00	2	1.39
2	Amphipoda	AM	6	CG	66.00	11	7.64
3	Hirudinea	ANH	10	P	0.00		0.00
4	Oligochaeta	ANO	9	CG	72.00	8	5.56
5	Hydra	CN		P		1	0.69
6	Elmidae	CO	4	CG	8.00	2	1.39
7	Cambaridae	DC	6	H	18.00	3	2.08
8	Palaemonidae	DC	6	H	6.00	1	0.69
9	Chironomini	DCC	8	CG	104.00	13	9.03
10	Ceratopogonidae	DO	6	P	6.00	1	0.69
11	Culicidae	DO		CF			0.00
12	Simuliidae	DO	6	CF	6.00	1	0.69
13	Tabanidae	DO	6	P	0.00		0.00
14	Tipulidae	DO	3	SH	0.00		0.00
15	Orthocladiinae	DOR	6	CG	24.00	4	2.78
16	Tanypodinae	DTA	6	P	126.00	21	14.58
17	Tanytarsini	DTY	6	CG	126.00	21	14.58
18	Baetidae	EP	4	CG	0.00		0.00
19	Caenidae	EP	7	CG	7.00	1	0.69
20	Ephemerellidae	EP	1	CG	0.00		0.00
21	Ephemeridae	EP	4	CG	0.00		0.00
22	Heptageniidae	EP	4	SC	8.00	2	1.39
23	Leptophlebiidae	EP	2	CG	0.00		0.00
24	Neoephemeridae	EP		CG			0.00
25	Oligoneuriidae	EP	2	CF	0.00		0.00
26	Siphlonuridae	EP	7	CG	0.00		0.00
27	Tricorythidae	EP	4	CG	0.00		0.00
28	Corixidae	HT	9	H	0.00		0.00
29	Isopoda	IS	8	CG	8.00	1	0.69
30	Pyralidae	LEP	5	H	30.00	6	4.17
31	Sphaeriidae	MB	8	CF	0.00		0.00
32	Corydalidae	ME	0	P	0.00		0.00
33	Sialidae	ME	4	P	0.00		0.00
34	Planorbidae	MG	6	SC	6.00	1	0.69
35	Viviparidae	MG	7	SC	0.00		0.00
36	Nemertea	NA		P		5	3.47
37	Nematoda	NE		P			0.00
38	Aeshnidae	OD	3	P	0.00		0.00
39	Calopterygidae	OD	5	P	5.00	1	0.69
40	Coenagrionidae	OD	9	P	135.00	15	10.42
41	Cordulliidaae	OD	5	P	10.00	2	1.39
42	Gomphidae	OD	1	P	0.00		0.00
43	Libellulidae	OD	9	P	0.00		0.00
44	Macromiidae	OD	3	P	3.00	1	0.69
45	Capniidae	PL	1	SH	0.00		0.00
46	Leuctridae	PL	0	SH	0.00		0.00
47	Perlidae	PL	1	P	0.00		0.00
48	Pteronarcyidae	PL	0	SH	0.00		0.00
49	Brachycentridae	TR	1	CF	0.00		0.00
50	Hydropsychidae	TR	4	CF	0.00		0.00
51	Hydroptilidae	TR	4	H	0.00		0.00
52	Lepidostomatidae	TR	1	SH	0.00		0.00
53	Leptoceridae	TR	4	SH	0.00		0.00
54	Philopotamidae	TR	3	CF	0.00		0.00
55	Polycentropodidae	TR	6	CF	0.00		0.00
56	Psychomyiidae	TR	2	SC	0.00		0.00
57	Turbellaria	TU	4	P	80.00	20	13.89

Station 7. Four Mile Creek at Road C. RBP II. 20 September 1994

Four Mile Creek at Road C	Station 7
Taxa Richness	24
Number of Specimens	144
EPT Index	2
EPT Abunance	3
Chironomidae Taxa	4
Chironomidae Abundance	59
EPT/Chironomidae Abundance	0.05
North Carolina Biotic Index	6.28
Percent Collector-Filterers	0.69
Percent Collector-Gatherers	42.36
Percent Predators	47.92
Percent Herbivores	6.94
Percent Scrapers	2.08
Percent Shredders	0.00
Scraper/Scraper & Collector Filterers	0.75
Shredders/Total	0.00
Percent Dominant Taxon	14.58
Number Of Dominant Taxa	7
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 7. Four Mile Creek at Road C. RBP II. 20 September 1994

Table Size:	57	Total Orgs:	144	SC/CF:	3.00
Number of Samples:	1	Taxa Richness:	24	EPT:	2
Sample Sorted:	50%	Biotic Index:	6.28		

	Number Taxa	Number Orgs	Rel Abunance
Taxa			
AHC	1	2	1.39
AM	1	11	7.64
ANH	0	0	0.00
ANO	1	8	5.56
CN	1	1	0.69
CO	1	2	1.39
DC	2	4	2.78
DCC	1	13	9.03
DO	2	2	1.39
DOR	1	4	2.78
DTA	1	21	14.58
DTY	1	21	14.58
EP	2	3	2.08
HT	0	0	0.00
IS	1	1	0.69
LEP	1	6	4.17
MB	0	0	0.00
ME	0	0	0.00
MG	1	1	0.69
NA	1	5	3.47
NE	0	0	0.00
OD	4	19	13.19
PL	0	0	0.00
TR	0	0	0.00
TU	1	20	13.89
Functional Group			
P	10	69	47.92
CG	8	61	42.36
H	3	10	6.94
CF	1	1	0.69
SH	0	0	0.00
SC	2	3	2.08
Functional Group CPOM SAMPLE Sample Sorted: 100%			
P		27	15.00
CG		130	72.22
H		1	0.56
CF		14	7.70
SH		3	1.67
SC		5	2.78

Station 7. Four Mile Creek at Road C. RBP II. 20 September 1994

Taxa List
Hydracarina
Amphipoda
Oligochaeta
Hydra
Elmidae
Cambaridae
Palaemonidae
Chironomini
Ceratopogonidae
Simuliidae
Orthocladiinae
Tanypodinae
Tanytarsini
Caenidae
Heptageniidae
Isopoda
Pyralidae
Planorbidae
Nemertea
Calopterygidae
Coenagrionidae
Cordullidaae
Macromiidae
Turbellaria

Station 7. Four Mile Creek at Road C. RBP II. 20 September 1994

Taxon	A	Rel Abd
Tanypodinae	21	14.58
Tanytarsini	21	14.58
Turbellaria	20	13.89
Coenagrionidae	15	10.42
Chironomini	13	9.03
Amphipoda	11	7.64
Oligochaeta	8	5.56

Station 12. Indian Grave Branch at Road B. RBP II. 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	6	P	12.00	2	1.04
2	Amphipoda	AM	6	CG	0.00		0.00
3	Hirudinea	ANH	10	P	0.00		0.00
4	Oligochaeta	ANO	9	CG	72.00	8	4.17
5	Hydra	CN		P			0.00
6	Elmidae	CO	4	CG	12.00	3	1.56
7	Cambaridae	DC	6	H	6.00	1	0.52
8	Palaemonidae	DC	6	H	0.00		0.00
9	Chironomini	DCC	8	CG	488.00	61	31.77
10	Ceratopogonidae	DO	6	P	0.00		0.00
11	Culicidae	DO		CF			0.00
12	Simuliidae	DO	6	CF	102.00	17	8.85
13	Tabanidae	DO	6	P	0.00		0.00
14	Tipulidae	DO	3	SH	0.00		0.00
15	Orthocladiinae	DOR	6	CG	66.00	11	5.73
16	Tanypodinae	DTA	6	P	54.00	9	4.69
17	Tanytarsini	DTY	6	CG	102.00	17	8.85
18	Baetidae	EP	4	CG	24.00	6	3.13
19	Caenidae	EP	7	CG	14.00	2	1.04
20	Ephemerellidae	EP	1	CG	5.00	5	2.60
21	Ephemeridae	EP	4	CG	0.00		0.00
22	Heptageniidae	EP	4	SC	24.00	6	3.13
23	Leptophlebiidae	EP	2	CG	6.00	3	1.56
24	Neoephemeridae	EP		CG		3	1.56
25	Oligoneuriidae	EP	2	CF	0.00		0.00
26	Siphlonuridae	EP	7	CG	0.00		0.00
27	Tricorythidae	EP	4	CG	0.00		0.00
28	Corixidae	HT	9	H	0.00		0.00
29	Isopoda	IS	8	CG	0.00		0.00
30	Pyralidae	LEP	5	H	0.00		0.00
31	Sphaeriidae	MB	8	CF	0.00		0.00
32	Corydalidae	ME	0	P	0.00		0.00
33	Sialidae	ME	4	P	0.00		0.00
34	Planorbidae	MG	6	SC	0.00		0.00
35	Viviparidae	MG	7	SC	0.00		0.00
36	Nemertea	NA		P			0.00
37	Nematoda	NE		P			0.00
38	Aeshnidae	OD	3	P	3.00	1	0.52
39	Calopterygidae	OD	5	P	0.00		0.00
40	Coenagrionidae	OD	9	P	0.00		0.00
41	Corduliidaae	OD	5	P	0.00		0.00
42	Gomphidae	OD	1	P	0.00		0.00
43	Libellulidae	OD	9	P	0.00		0.00
44	Macromiidae	OD	3	P	6.00	2	1.04
45	Capniidae	PL	1	SH	7.00	7	3.65
46	Leuctridae	PL	0	SH	0.00		0.00
47	Perlidae	PL	1	P	2.00	2	1.04
48	Pteronarcyidae	PL	0	SH	0.00		0.00
49	Brachycentridae	TR	1	CF	0.00		0.00
50	Hydropsychidae	TR	4	CF	88.00	22	11.46
51	Hydroptilidae	TR	4	H	0.00		0.00
52	Lepidostomatidae	TR	1	SH	0.00		0.00
53	Leptoceridae	TR	4	SH	8.00	2	1.04
54	Philopotamidae	TR	3	CF	3.00	1	0.52
55	Polycentropodidae	TR	6	CF	0.00		0.00
56	Psychomyiidae	TR	2	SC	0.00		0.00
57	Turbellaria	TU	4	P	4.00	1	0.52

Station 12. Indian Grave Branch at Road B. RBP-II. 21 September 1994.

Indian Grave Branch at Road B	Station 12
Taxa Richness	23
Number of Specimens	192
EPT Index	11
EPT Abunance	59
Chironomidae Taxa	4
Chironomidae Abundance	98
EPT/Chironomidae Abundance	0.60
North Carolina Biotic Index	5.86
Percent Collector-Filterers	20.83
Percent Collector-Gatherers	61.98
Percent Predators	8.85
Percent Herbivores	0.52
Percent Scrapers	3.13
Percent Shredders	4.69
Scraper/Scraper & Collector Filterers	0.13
Shredders/Total	0.05
Percent Dominant Taxon	31.77
Number Of Dominant Taxa	5
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Rosemary Creek downstream of Williston WWTP. 17 December 1994. RBP II.

Seq	Taxon	TAXC	NCBI	FG	NUMBER	Rel Abd
1	Amphipoda	AM	6	CG	1	0.37
2	Oligochaeta	ANO	9	CG	3	1.12
3	Elmidae	CO	4	CG	1	0.37
4	Cambaridae	DC	6	H	1	0.37
5	Palaemonidae	DC	6	H	10	3.73
6	Chironomini	DCC	8	CG	15	5.60
7	Empedidae	DO	6	CG	1	0.37
8	Simuliidae	DO	6	CF	2	0.75
9	Orthocladiinae	DOR	6	CG	13	4.85
10	Tanypodinae	DTA	6	P	3	1.12
11	Tanytarsini	DTY	6	CG	79	29.48
12	Baetidae	EP	4	CG	42	15.67
13	Ephemerellidae	EP	1	CG	21	7.84
14	Heptageniidae	EP	4	SC	11	4.10
15	Corbiculidae	MB	6	CF	3	1.12
16	Sphaeriidae	MB	8	CF	2	0.75
17	Ancylidae	MG	6	SC	2	0.75
18	Aeshnidae	OD	3	P	4	1.49
19	Calopterygidae	OD	5	P	4	1.49
20	Coenagrionidae	OD	9	P	1	0.37
21	Cordulegasteridae	OD	3	P	1	0.37
22	Perlidae	PL	1	P	15	5.60
23	Perlodidae	PL	2	P	1	0.37
24	Taeniopterygidae	PL	2	SH	1	0.37
25	Brachycentridae	TR	1	CF	1	0.37
26	Hydropsychidae	TR	4	CF	23	8.58
27	Leptoceridae	TR	4	SH	3	1.12
28	Limnephilidae	TR	4	SH	4	1.49

Rosemary Creek downstream of Williston WWTP. 17 December 1994. RBP II.

Rosemary Creek downstream Williston WWTP	Station 1
Taxa Richness	28
Number of Specimens	268
EPT Index	10
EPT Abunance	122
Chironomidae Taxa	4
Chironomidae Abundance	110
EPT/Chironomidae Abundance	1.11
North Carolina Biotic Index	4.75
Percent Collector-Filterers	11.57
Percent Collector-Gatherers	65.67
Percent Predators	10.82
Percent Herbivores	4.10
Percent Scrapers	4.85
Percent Shredders	2.99
Scraper/Scraper & Collector Filterers	0.30
Shredders/Total	0.03
Percent Dominant Taxon	29.48
Number Of Dominant Taxa	6

Rosemary Creek downstream of Williston WWTP. 17 December 1994. RBP II.

Table Size:	28	Total Orgs:	268	SC/CF:	0.42
Number of Samples:	1	Taxa Richness:	28	EPT:	6
Sample Sorted:	50%	Biotic Index:	4.75		

Taxa	Number Taxa	Number Orgs	Rel Abundance
AM	1	1	0.37
ANO	1	3	1.12
CO	1	1	0.37
DC	2	11	4.10
DCC	1	15	5.60
DO	2	3	1.12
DOR	1	13	4.85
DTA	1	3	1.12
DTY	1	79	29.48
EP	3	74	27.61
MB	2	5	1.87
MG	1	2	0.75
OD	4	10	3.73
PL	3	17	6.34
TR	4	31	11.57

Functional Group			
CF	5	31	11.57
CG	9	176	65.67
H	2	11	4.10
P	7	29	10.82
SC	2	13	4.85
SH	3	8	2.99

Functional Group CPOM Sample Sample Sorted: 100%			
CF		20	7.58
CG		188	71.21
H		0	0
P		16	6.06
SC		13	4.92
SH		27	10.23

Rosemary Creek downstream of Williston WWTP. 17 December 1994. RBP II.

Taxa List
Amphipoda
Oligochaeta
Elmidae
Cambaridae
Palaemonidae
Chironomini
Empedidae
Simuliidae
Orthocladiinae
Tanypodinae
Tanytarsini
Baetidae
Ephemerellidae
Heptageniidae
Corbiculidae
Sphaeriidae
Ancylidae
Aeshnidae
Calopterygidae
Coenagrionidae
Cordulegasteridae
Perlidae
Perlodidae
Taeniopterygidae
Brachycentridae
Hydropsychidae
Leptoceridae
Limnephilidae

Rosemary Creek downstream of Williston WWTP. 17 December 1994. RBP II.

Taxon	NUMBER	Rel Abd
Tanytarsini	79	29.48
Baetidae	42	15.67
Hydropsychidae	23	8.58
Ephemerellidae	21	7.84
Chironomini	15	5.60
Perlidae	15	5.60

Station 1. Rosemary Creek near Rosemary Chruch. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	162	SC/CF:	1.25
Number of Samples:	1	Taxa Richness:	25	EPT:	7
Sample Sorted:	100%	Biotic Index:	6.29		

Taxa	Number Taxa	Number Orgs	Rel Abundance
AHC	0	0	0.00
AM	0	0	0.00
ANH	0	0	0.00
ANO	1	3	1.85
CO	1	1	0.62
Co	0	0	0.00
DC	2	57	35.19
DCC	2	4	2.47
DO	0	0	0.00
DOR	0	0	0.00
DTA	3	6	3.70
DTY	1	2	1.23
EP	6	39	24.07
HT	0	0	0.00
LEP	0	0	0.00
MB	2	17	10.49
ME	1	1	0.62
MG	2	20	12.35
NA	0	0	0.00
OD	3	5	3.09
PL	0	0	0.00
TR	1	7	4.32
TU	0	0	0.00
Functional Group			
P	7	12	7.41
CG	10	39	24.07
SH	0	0	0.00
H	2	57	35.19
CF	3	24	14.81
SC	3	30	18.52
Functional Group CPOM SAMPLE Sample Sorted: 50%			
P		5	3.91
CG		82	64.06
SH		7	5.47
H		8	6.25
CF		11	8.59
SC		15	11.72

Station 1. Rosemary Creek near Rosemary Chruch. RBP III. 20 September 1994

Taxa List
Oligochaeta
Stenelmis humerosa
Cambaridae
Palaemonetes paludosus
Microtendipes rydalensis
Polypedilum spp.
Ablabesmyia spp.
Apsectrotanypus johnsoni
Clinotanypus pinguis
Tanytarsus spp.
Baetis spp.
Caenis spp.
Hexagenia spp.
Paraleptophlebia spp.
Stenonema spp.
Tricorythodes spp.
Corbicula sp.
Sphaerium spp.
Sialis spp.
Campeloma sp.
Physella spp.
Boyeria vinosa
Calopteryx spp.
Gomphus spp.
Phylocentropus spp.

Station 1. Rosemary Creek near Rosemary Chruch. RBP III. 20 September 1994

Taxon	A	Rel Abd
Palaemonetes paludosus	52	32.10
Campeloma sp.	19	11.73
Hexagenia spp.	14	8.64
Sphaerium spp.	11	6.79
Stenonema spp.	10	6.17

Station 2. Tinker Creek at Kennedy Pond Road. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	16.00	2	0.93
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	24.60	3	1.40
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus spp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	8.80	1	0.47
19	Palaemonetes paludosus	DC	6.7	H	20.10	3	1.40
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma spp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	18.60	3	1.40
26	Pagastiella spp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella spp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	8.50	1	0.47
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	179.40	26	12.15
32	Stenochironomus sp.	DCC	6.4	SH	19.20	3	1.40
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavreliella sp.	DCC		CG		4	1.87
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	13.00	2	0.93
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	3.70	1	0.47
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	38.40	6	2.80
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	27.30	3	1.40
53	Conchapelopia spp.	DTA	8.7	P	8.70	1	0.47
54	Labrundinia spp.	DTA	6	P	0.00		0.00
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	9.20	2	0.93
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	243.20	38	17.76

Station 2. Tinker Creek at Kennedy Pond Road. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	5.30	1	0.47
60	Tanytarsus spp.	DTY	6.7	CG	127.30	19	8.88
61	Acentrella ampla	EP	3.6	CG	39.60	11	5.14
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	118.40	32	14.95
64	Baetis spp.	EP	5.4	CG	0.00		0.00
65	Caenis spp.	EP	7.6	CG	91.20	12	5.61
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	4.70	1	0.47
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	1.20	1	0.47
72	Siphlonurus spp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	27.20	8	3.74
74	Tricorythodes spp.	EP	5.4	CG	54.00	10	4.67
75	Belostoma spp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa spp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	6.80	2	0.93
80	Sphaerium spp.	MB	7.7	CF	7.70	1	0.47
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	6.70	1	0.47
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P		1	0.47
89	Argia spp.	OD	8.7	P	8.70	1	0.47
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	41.50	5	2.34
92	Enallagma spp.	OD	9	P	27.00	3	1.40
93	Gomphus spp.	OD	6.2	P	0.00		0.00
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neurocordulia spp.	OD	5.8	P	5.80	1	0.47
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.70	1	0.47
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	4.10	1	0.47
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	12.40	2	0.93
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	7.50	1	0.47

Station 2. Tinker Creek at Kennedy Pond Road. RBP III. 20 September 1994

Tinker Creek at Kennedy Pond Road	Station 2
Taxa Richness	37
Number of Specimens	214
EPT Index	10
EPT Abunance	79
Chironomidae Taxa	13
Chironomidae Abundance	108
EPT/Chironomidae Abundance	0.73
North Carolina Biotic Index	5.92
Percent Collector-Filterers	19.16
Percent Collector-Gatherers	59.35
Percent Predators	12.15
Percent Herbivores	2.80
Percent Scrapers	4.21
Percent Shredders	2.34
Scraper/Scraper & Collector Filterers	0.18
Shredders/Total	0.02
Percent Dominant Taxon	17.76
Number Of Dominant Taxa	6
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 2. Tinker Creek at Kennedy Pond Road. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	214	SC/CF:	0.22
Number of Samples:	1	Taxa Richness:	37	EPT:	10
Sample Sorted:	75%	Biotic Index:	5.92		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	0	0	0.00
AM	1	2	0.93
ANH	0	0	0.00
ANO	1	3	1.40
CO	0	0	0.00
DC	2	4	1.87
DCC	5	37	17.29
DO	1	2	0.93
DOR	1	1	0.47
DTA	4	12	5.61
DTY	3	58	27.10
EP	7	75	35.05
HT	0	0	0.00
LEP	0	0	0.00
MB	2	3	1.40
ME	0	0	0.00
MG	1	1	0.47
NA	1	1	0.47
OD	4	10	4.67
PL	1	1	0.47
TR	2	3	1.40
TU	1	1	0.47
Functional Group			
P	11	26	12.15
CG	15	127	59.35
SH	3	5	2.34
SC	2	9	4.21
H	3	6	2.80
CF	3	41	19.16
Functional Group			
CPOM Sample			
Sample sorted: 75%			
P		35	17.86
CG		71	36.22
SH		29	14.8
SC		41	20.92
H		7	3.57
CF		13	6.63

Station 2. Tinker Creek at Kennedy Pond Road. RBP III. 20 September 1994

Taxa List
Amphipoda
Oligochaeta
Cambaridae
Palaemonetes paludosus
Microtendipes rydalensis
Phaenopsectra flavipes
Polypedilum spp.
Stenochironomus sp.
Zavreliella sp.
Ceratopogonidae
Parametriocnemus sp.
Ablabesmyia spp.
Clinotanypus pinguis
Conchapelopia spp.
Pentaneura inconspicua
Rheotanytarsus spp.
Stempellinella spp.
Tanytarsus spp.
Acentrella ampla
Acerpenna spp.
Caenis spp.
Hexagenia spp.
Paraleptophlebia spp.
Stenonema spp.
Tricorythodes spp.
Elliptio spp.
Sphaerium spp.
Campeloma sp.
Nemertea
Argia spp.
Calopteryx spp.
Enallagma spp.
Neurocordulia spp.
Leuctra spp.
Nectopsyche exquisita
Oxyethira spp.
Turbellaria

Station 2. Tinker Creek at Kennedy Pond Road. RBP III. 20 September 1994

Taxon	A	Rel Abd
Rheotanytarsus spp.	38	17.76
Acerpenna spp.	32	14.95
Polypedilum spp.	26	12.15
Tanytarsus spp.	19	8.88
Caenis spp.	12	5.61
Acentrella ampla	11	5.14

Station 3. Mill Creek at Road E-2. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	16.00	2	1.30
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	442.80	54	35.06
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	P	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	8.50	1	0.65
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	8.90	1	0.65
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	0.00		0.00
19	Palaemonetes paludosus	DC	6.7	H	13.40	2	1.30
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	15.80	2	1.30
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	31.00	5	3.25
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	27.60	4	2.60
32	Stenochironomus sp.	DCC	6.4	SH	12.80	2	1.30
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella sp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	52.00	8	5.19
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	30.00	3	1.95
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	25.60	4	2.60
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	36.40	4	2.60
53	Conchapelopia spp.	DTA	8.7	P	8.70	1	0.65
54	Labrundinia spp.	DTA	6	P	0.00		0.00
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	18.60	2	1.30
58	Rheotanytarsus spp.	DTY	6.4	CF	6.40	1	0.65

Station 3. Mill Creek at Road E-2. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	107.20	16	10.39
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	16.20	3	1.95
65	Caenis spp.	EP	7.6	CG	7.60	1	0.65
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	23.50	5	3.25
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	5.20	2	1.30
73	Stenonema spp.	EP	3.4	SC	6.80	2	1.30
74	Tricorythodes spp.	EP	5.4	CG	0.00		0.00
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	77.00	10	6.49
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	13.40	2	1.30
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	9.10	1	0.65
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P		7	4.55
89	Argia spp.	OD	8.7	P	0.00		0.00
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	0.00		0.00
92	Enallagma spp.	OD	9	P	0.00		0.00
93	Gomphus spp.	OD	6.2	P	37.20	6	3.90
94	Macromia spp.	OD	6.7	P	6.70	1	0.65
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Leuctra spp.	PL	0.7	SH	0.00		0.00
99	Acroneuria spp.	PL	1.4	P	0.00		0.00
100	Allocapnia spp.	PL	2.8	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	5.70	1	0.65
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	7.50	1	0.65

Station 3. Mill Creek at Road E-2. RBP III. 20 September 1994

Mill Creek at Road E-2	Station 3
Taxa Richness	30
Number of Specimens	154
EPT Index	6
EPT Abunance	14
Chironomidae Taxa	10
Chironomidae Abundance	41
EPT/Chironomidae Abundance	0.34
North Carolina Biotic Index	7.33
Percent Collector-Filterers	7.14
Percent Collector-Gatherers	61.69
Percent Predators	23.38
Percent Herbivores	1.30
Percent Scrapers	3.25
Percent Shredders	3.25
Scraper/Scraper & Collector Filterers	0.31
Shredders/Total	0.03
Percent Dominant Taxon	35.06
Number Of Dominant Taxa	4
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 3. Mill Creek at Road E-2. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	154	SC/CF:	0.45
Number of Samples:	1	Taxa Richness:	30	EPT:	6
Sample Sorted:	50%	Biotic Index:	7.33		

Taxa	Number Taxa	Number Orgs	Rel Abundance
AHC	0	0	0.00
AM	1	2	1.30
ANH	0	0	0.00
ANO	1	54	35.06
CO	2	2	1.30
DC	1	2	1.30
DCC	4	13	8.44
DG	2	11	7.14
DOR	0	0	0.00
DTA	4	11	7.14
DTY	2	17	11.04
EP	5	13	8.44
HT	0	0	0.00
LEP	0	0	0.00
MB	1	10	6.49
ME	0	0	0.00
MG	2	3	1.95
NA	1	7	4.55
OD	2	7	4.55
PL	0	0	0.00
TR	1	1	0.65
TU	1	1	0.65
Functional Group			
P	11	36	23.38
CG	11	95	61.69
SH	2	5	3.25
SC	3	5	3.25
H	1	2	1.30
CF	2	11	7.14
Functional Group CPOM Sample Sample Sorted:50%			
P		22	13.58
CG		116	71.60
SH		5	3.09
SC		2	1.23
H		5	3.09
CF		12	7.41

Station 3. Mill Creek at Road E-2. RBP III. 20 September 1994

Taxa List
Amphipoda
Oligochaeta
Haliplus sp.
Hydroporus spp.
Palaemonetes paludosus
Dicrotendipes spp.
Microtendipes rydalensis
Polypedilum spp.
Stenochironomus sp.
Ceratopogonidae
Limonia spp.
Ablabesmyia spp.
Clinotanypus pinguis
Conchapelopia spp.
Procladius spp.
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Caenis spp.
Hexagenia spp.
Siphlonurus sp.
Stenonema spp.
Sphaerium spp.
Campeloma sp.
Physella spp.
Nemertea
Gomphus spp.
Macromia spp.
Oecetis spp.
Turbellaria

Station 3. Mill Creek at Road E-2. RBP III. 20 September 1994

Taxon	A	Rel Abd
Oligochaeta	54	35.06
Tanytarsus spp.	16	10.39
Sphaerium spp.	10	6.49
Ceratopogonidae	8	5.19

Station 4. Crouch Branch at Road 4. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	0.00		0.00
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	262.40	32	80.00
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	0.00		0.00
19	Palaemonetes paludosus	DC	6.7	H	0.00		0.00
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	0.00		0.00
32	Stenochironomus sp.	DCC	6.4	SH	0.00		0.00
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	0.00		0.00
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	0.00		0.00
53	Conchapelopia spp.	DTA	8.7	P	0.00		0.00
54	Labrundinia spp.	DTA	6	P	12.00	2	5.00
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	0.00		0.00

Station 4. Crouch Branch at Road 4. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	0.00		0.00
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	0.00		0.00
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	0.00		0.00
74	Tricorythodes spp.	EP	5.4	CG	0.00		0.00
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	0.00		0.00
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	13.00	2	5.00
88	Nemertea	NA		P			0.00
89	Argia spp.	OD	8.7	P	26.10	3	7.50
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	0.00		0.00
92	Enallagma spp.	OD	9	P	9.00	1	2.50
93	Gomphus spp.	OD	6.2	P	0.00		0.00
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	0.00		0.00

Station 4. Crouch Branch at Road 4. RBP III. 20 September 1994

Crouch Branch at Road 4	Station 4
Taxa Richness	5
Number of Specimens	40
EPT Index	0
EPT Abunance	0
Chironomidae Taxa	1
Chironomidae Abundance	2
EPT/Chironomidae Abundance	0.00
North Carolina Biotic Index	8.06
Percent Collector-Filterers	0.00
Percent Collector-Gatherers	80.00
Percent Predators	15.00
Percent Herbivores	0.00
Percent Scrapers	5.00
Percent Shredders	0.00
Scraper/Scraper & Collector Filterers	1.00
Shredders/Total	0.00
Percent Dominant Taxon	80
Number Of Dominant Taxa	4
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 4. Crouch Branch at Road 4. RBP III. 20-September 1994

Table Size:	116	Total Orgs:	40	SC/CF:	
Number of Samples:	1	Taxa Richness:	5	EPT:	0
Sample Sorted:	100%	Biotic Index:	8.06		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	0	0	0.00
AM	0	0	0.00
ANH	0	0	0.00
ANO	1	32	80.00
CO	0	0	0.00
DC	0	0	0.00
DCC	0	0	0.00
DO	0	0	0.00
DOR	0	0	0.00
DTA	1	2	5.00
DTY	0	0	0.00
EP	0	0	0.00
HT	0	0	0.00
LEP	0	0	0.00
MB	0	0	0.00
ME	0	0	0.00
MG	1	2	5.00
NA	0	0	0.00
OD	2	4	10.00
PL	0	0	0.00
TR	0	0	0.00
TU	0	0	0.00

Functional Group			
P	3	6	15.00
CG	1	32	80.00
SH	0	0	0.00
SC	1	2	5.00
H	0	0	0.00
CF	0	0	0.00

Functional Group CPOM Sample Sample Sorted: 100%		
P	3	5.00
CG	54	90.00
SH	0	0.00
SC	0	0.00
H	0	0.00
CF	3	5.00

Station 12. Indian Grave Branch at Road B. RBP II. 21 September 1994

Table Size:	57	Total Orgs:	192	SC/CF:	0.15
Number of Samples:	1	Taxa Richness:	23	EPT:	11
Sample Sorted:	50%	Biotic Index:	5.86		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	1	2	1.04
AM	0	0	0.00
ANH	0	0	0.00
ANO	1	8	4.17
CN	0	0	0.00
CO	1	3	1.56
DC	1	1	0.52
DCC	1	61	31.77
DO	1	17	8.85
DOR	1	11	5.73
DTA	1	9	4.69
DTY	1	17	8.85
EP	6	25	13.02
HT	0	0	0.00
IS	0	0	0.00
LEP	0	0	0.00
MB	0	0	0.00
ME	0	0	0.00
MG	0	0	0.00
NA	0	0	0.00
NE	0	0	0.00
OD	2	3	1.56
PL	2	9	4.69
TR	3	25	13.02
TU	1	1	0.52
Functional Group			
P	6	17	8.85
CG	10	119	61.98
H	1	1	0.52
CF	3	40	20.83
SH	2	9	4.69
SC	1	6	3.13
Functional Group CPOM Sample Sorted: 50%			
P		46	18.7
CG		83	33.74
H		0	0
CF		116	47.15
SH		0	0
SC		1	0.41

Station 12. Indian Grave Branch at Road B. RBP II. 21 September 1994

Taxa List
Hydracarina
Oligochaeta
Elmidae
Cambaridae
Chironomini
Simuliidae
Orthocladiinae
Tanypodinae
Tanytarsini
Baetidae
Caenidae
Ephemerellidae
Heptageniidae
Leptophlebiidae
Neoephemeridae
Aeshnidae
Macromiidae
Capnlidae
Perlidae
Hydropsychidae
Leptoceridae
Philopotamidae
Turbellaria

Station 12. Indian Grave Branch at Road B. RBP II. 21 September 1994

Taxon	A	Rel Abd
Chironomini	61	31.77
Hydropsychidae	22	11.46
Simuliidae	17	8.85
Tanytarsini	17	8.85
Orthocladiinae	11	5.73

PART VII

Station 1. Rosemary Creek near Rosemary Chruch. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	0.00		0.00
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	24.60	3	1.85
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	Co	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	CG	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	5.40	1	0.62
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	44.00	5	3.09
19	Palaemonetes paludosus	DC	6.7	H	348.40	52	32.10
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	12.40	2	1.23
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	13.80	2	1.23
32	Stenochironomus sp.	DCC	6.4	SH	0.00		0.00
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella sp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	6.40	1	0.62
51	Apsectrotanypus johnsoni	DTA	0	P	0.00	1	0.62
52	Clinotanypus pinguis	DTA	9.1	P	36.40	4	2.47
53	Conchapelopia spp.	DTA	8.7	P	0.00		0.00
54	Labrundinia spp.	DTA	6	P	0.00		0.00
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	0.00		0.00

Station 1. Rosemary Creek near Rosemary Chruch. RBP.III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	13.40	2	1.23
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	16.20	3	1.85
65	Caenis spp.	EP	7.6	CG	22.80	3	1.85
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	65.80	14	8.64
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	3.60	3	1.85
72	Siphlonurus spp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	34.00	10	6.17
74	Tricorythodes spp.	EP	5.4	CG	32.40	6	3.70
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	CG	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	37.80	6	3.70
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	84.70	11	6.79
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	7.70	1	0.62
83	Campeloma sp.	MG	6.7	SC	127.30	19	11.73
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	9.10	1	0.62
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P			0.00
89	Argia spp.	OD	8.7	P	0.00		0.00
90	Boyeria vinosa	OD	6.3	P	12.60	2	1.23
91	Calopteryx spp.	OD	8.3	P	8.30	1	0.62
92	Enallagma spp.	OD	9	P	0.00		0.00
93	Gomphus spp.	OD	6.2	P	12.40	2	1.23
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neyrocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	39.20	7	4.32
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	0.00		0.00

Station 1. Rosemary Creek near Rosemary Chruch. RBP III. 20 September 1994

Rosemary Creek near Rosemary Church	Station 1
Taxa Richness	25
Number of Specimens	162
EPT Index	7
EPT Abunance	46
Chironomidae Taxa	6
Chironomidae Abundance	12
EPT/Chironomidae Abundance	3.83
North Carolina Biotic Index	6.29
Percent Collector-Filterers	14.81
Percent Collector-Gatherers	24.07
Percent Predators	7.41
Percent Herbivores	35.19
Percent Scrapers	18.52
Percent Shredders	0.00
Scraper/Scraper & Collector Filterers	0.56
Shredders/Total	0.00
Percent Dominant Taxon	32.10
Number Of Dominant Taxa	5
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 4. Crouch Branch at Road 4. RBP III. 20 September 1994

Taxa List
Oligochaeta
Labrundinia spp.
Planorbidae
Argia spp.
Enallagma spp.

Station 4. Crouch Branch at Road 4. RBP III. 20 September 1994

Taxon	A	Rel Abd
Oligochaeta	32	80.00
Argia spp.	3	7.50
Labrundinia spp.	2	5.00
Planorbidae	2	5.00

Station 5. Tims Branch at Road 2. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	88.00	11	4.01
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	49.20	6	2.19
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancryonyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	11.00	2	0.73
8	Dubiraphia bivittata	CO	6.4		0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	9.40	2	0.73
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	16.20	3	1.09
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	88.00	10	3.65
19	Palaemonetes paludosus	DC	6.7	H	0.00		0.00
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	44.40	6	2.19
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	34.00	4	1.46
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	255.30	37	13.50
32	Stenochironomus sp.	DCC	6.4	SH	6.40	1	0.36
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG		7	2.55
39	Hemerodromia spp	DO	8.1	CG	8.10	1	0.36
40	Hexatoma spp.	DO	4.7	P	9.40	2	0.73
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	4.40	1	0.36
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	7.40	2	0.73
47	Rheocricotopus spp.	DOR	7.3	CG	7.30	1	0.36
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	6.60	1	0.36
50	Ablabesmyia spp.	DTA	6.4	P	51.20	8	2.92
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	9.10	1	0.36
53	Conchapelopia spp.	DTA	8.7	P	104.40	12	4.38
54	Labrundinia spp.	DTA	6	P	0.00		0.00
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	300.80	47	17.15

Station 5. Tims Branch at Road 2. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	455.60	68	24.82
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	37.80	7	2.55
65	Caenis spp.	EP	7.6	CG	7.60	1	0.36
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	0.00		0.00
74	Tricorythodes spp.	EP	5.4	CG	0.00		0.00
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	0.00		0.00
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P		3	1.09
89	Argia spp.	OD	8.7	P	104.40	12	4.38
90	Boyeria vinosa	OD	6.3	P	6.30	1	0.36
91	Calopteryx spp.	OD	8.3	P	83.00	10	3.65
92	Enallagma spp.	OD	9	P	0.00		0.00
93	Gomphus spp.	OD	6.2	P	6.20	1	0.36
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	8.70	1	0.36
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	2.80	4	1.46
101	Perlinella spp.	PL	0	P	0.00	1	0.36
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	0.00		0.00

Station 5. Tims Branch at Road 2. RBP III. 20 September 1994

Tims Branch at Road 2	Station 5
Taxa Richness	32
Number of Specimens	274
EPT Index	4
EPT Abunance	13
Chironomidae Taxa	12
Chironomidae Abundance	188
EPT/Chironomidae Abundance	0.07
North Carolina Biotic Index	6.91
Percent Collector-Filterers	17.52
Percent Collector-Gatherers	54.74
Percent Predators	21.30
Percent Herbivores	3.65
Percent Scrapers	0.00
Percent Shredders	2.19
Scraper/Scraper & Collector Filterers	0.00
Shredders/Total	0.02
Percent Dominant Taxon	24.82
Number Of Dominant Taxa	3
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 5. Tims Branch at Road 2. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	274	SC/CF:	
Number of Samples:	1	Taxa Richness:	32	EPT:	4
Sample Sorted:	75%	Biotic Index:	6.91		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	0	0	0.00
AM	1	11	4.01
ANH	0	0	0.00
ANO	1	6	2.19
CO	3	7	2.55
DC	1	10	3.65
DCC	4	48	17.52
DG	4	11	4.01
DOR	3	4	1.46
DTA	3	21	7.66
DTY	2	115	41.97
EP	2	8	2.92
HT	0	0	0.00
LEP	0	0	0.00
MB	0	0	0.00
ME	0	0	0.00
MG	0	0	0.00
NA	1	3	1.09
OD	5	25	9.12
PL	2	5	1.82
TR	0	0	0.00
TU	0	0	0.00

Functional Group			
P	14	60	21.30
CG	13	150	54.74
SH	3	6	2.19
SC	0	0	0.00
H	1	10	3.65
CF	2	48	17.52

Functional Group CPOM Sample Sample Sorted: 75%			
P		38	12.62
CG		128	42.52
SH		54	17.94
SC		1	0.33
H		79	26.26
CF			

Station 5. Tims Branch at Road 2. RBP III. 20 September 1994

Taxa List
Amphipoda
Oligochaeta
Dineutus spp.
Macronychus glabratus
Stenelmis humerosa
Cambaridae
Cryptochironomus spp.
Phaenopsectra flavipes
Polypedilum spp.
Stenochironomus sp.
Helius spp.
Hemerodromia spp
Hexatoma spp.
Simulium spp.
Parametriocnemus sp.
Rheocricotopus spp.
Xylopus par
Ablabesmyia spp.
Clinotanypus pinguis
Conchapelopia spp.
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Caenis spp.
Nemertea
Argia spp.
Boyeria vinosa
Calopteryx spp.
Gomphus spp.
Progomphus spp.
Leuctra spp.
Perlinella spp.

Station 5. Tims Branch at Road 2. RBP III. 20 September 1994

Taxon	A	Rel Abd
Tanytarsus spp.	68	24.82
Rheotanytarsus spp.	47	17.15
Polypedilum spp.	37	13.50

Station 6. Upper Three Runs Creek at Road C. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	11.40	2	0.85
2	Amphipoda	AM	8	CG	24.00	3	1.28
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	106.60	13	5.56
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	CG	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	42.50	5	2.14
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	0.00		0.00
19	Palaemonetes paludosus	DC	6.7	H	0.00		0.00
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	96.60	14	5.98
32	Stenochironomus sp.	DCC	6.4	SH	0.00		0.00
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	9.20	2	0.85
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	38.40	6	2.56
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	0.00		0.00
53	Conchapelopia spp.	DTA	8.7	P	0.00		0.00
54	Labrundinia spp.	DTA	6	P	0.00		0.00
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	51.20	8	3.42

Station 6. Upper Three Runs Creek at Road C. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	33.50	5	2.14
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	464.40	86	36.75
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	6.80	2	0.85
74	Tricorythodes spp.	EP	5.4	CG	5.40	1	0.43
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	5.00	1	0.43
78	Corbicula sp.	MB	6.3	CF	6.30	1	0.43
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	0.00		0.00
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC		58	24.79
86	Physella spp.	MG	9.1	SC	9.10	1	0.43
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P			0.00
89	Argia spp.	OD	8.7	P	43.50	5	2.14
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	0.00		0.00
92	Enallagma spp.	OD	9	P	135.00	15	6.41
93	Gomphus spp.	OD	6.2	P	0.00		0.00
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	8.00	2	0.85
107	Hydroptila spp.	TR	6.2	H	6.20	1	0.43
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	22.50	3	1.28

Station 6. Upper Three Runs Creek at Road C. RBP III. 20 September 1994

Upper Three Runs Creek at Road C	Station 6
Taxa Richness	21
Number of Specimens	234
EPT Index	5
EPT Abunance	92
Chironomidae Taxa	4
Chironomidae Abundance	33
EPT/Chironomidae Abundance	2.79
North Carolina Biotic Index	6.40
Percent Collector-Filterers	4.70
Percent Collector-Gatherers	52.99
Percent Predators	13.25
Percent Herbivores	2.99
Percent Scrapers	26.07
Percent Shredders	0.00
Scraper/Scraper & Collector Filterers	0.85
Shredders/Total	0.00
Percent Dominant Taxon	36.75
Number Of Dominant Taxa	5
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 6. Upper Three Runs Creek at Road C. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	234	SC/CF:	5.55
Number of Samples:	1	Taxa Richness:	21	EPT:	5
Sample Sorted:	75%	Biotic Index:	6.40		

Taxa	Number Taxa	Number Orgs	Rel Abundance
AHC	1	2	0.85
AM	1	3	1.28
ANH	0	0	0.00
ANO	1	13	5.56
CO	1	5	2.14
DC	0	0	0.00
DCC	1	14	5.98
DO	1	2	0.85
DOR	0	0	0.00
DTA	1	6	2.56
DTY	2	13	5.56
EP	3	89	38.03
HT	0	0	0.00
LEP	1	1	0.43
MB	1	1	0.43
ME	0	0	0.00
MG	2	59	25.21
NA	0	0	0.00
OD	2	20	8.55
PL	0	0	0.00
TR	2	3	1.28
TU	1	3	1.28
Functional Group			
P	5	31	13.25
CG	7	124	52.99
SH	0	0	0.00
H	3	7	2.99
CF	3	11	4.70
SC	3	61	26.07
Functional Group CPOM Sample Sorted: 75%			
P		31	13.14
CG		108	45.76
SH		13	5.51
H		7	2.97
CF		65	27.54
SC		12	5.08

Station 6. Upper Three Runs Creek at Road C. RBP III. 20 September 1994

Taxa List
Hydracarina
Amphipoda
Oligochaeta
Peltodytes spp.
Polypedilum spp.
Antocha spp.
Ablabesmyia spp.
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Stenonema spp.
Tricorythodes spp.
Pyralidae
Corbicula sp.
Hydrobiidae
Physella spp.
Argia spp.
Enallagma spp.
Hydropsyche spp.
Hydroptila spp.
Turbellaria

Station 6. Upper Three Runs Creek at Road C. RBP III. 20 September 1994

Taxon	A	Rel Abd
Baetis spp.	86	36.75
Hydrobiidae	58	24.79
Enallagma spp.	15	6.41
Polypedilum spp.	14	5.98
Oligochaeta	13	5.56

Station 7. Four Mile Creek at Road C. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	17.10	3	1.80
2	Amphipoda	AM	8	CG	168.00	21	12.57
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	237.80	29	17.37
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	CG	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	0.00		0.00
19	Palaemonetes paludosus	DC	6.7	H	6.70	1	0.60
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	27.60	4	2.40
32	Stenochironomus sp.	DCC	6.4	SH	0.00		0.00
33	Tribelos jucundum	DCC	6.6	CG	6.60	1	0.60
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	76.80	12	7.19
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	0.00		0.00
53	Conchapelopia spp.	DTA	8.7	P	34.80	4	2.40
54	Labrundinia spp.	DTA	6	P	12.00	2	1.20
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	4.60	1	0.60
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	6.40	1	0.60

Station 7. Four Mile Creek at Road C. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	107.20	16	9.68
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	10.80	2	1.20
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	3.40	1	0.60
74	Tricorythodes spp.	EP	5.4	CG	0.00		0.00
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	35.00	7	4.19
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	7.70	1	0.60
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	15.40	2	1.20
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	9.10	1	0.60
87	Planorbidae	MG	6.5	SC	6.50	1	0.60
88	Nemertea	NA		P			0.00
89	Argia spp.	OD	8.7	P	78.30	9	5.39
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	33.20	4	2.40
92	Enallagma spp.	OD	9	P	72.00	8	4.79
93	Gomphus spp.	OD	6.2	P	0.00		0.00
94	Macromia spp.	OD	6.7	P	13.40	2	1.20
95	Neurocordulia spp.	OD	5.8	P	29.00	5	2.99
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	217.50	29	17.37

Station 7. Four Mile Creek at Road C. RBP III. 20 September 1994

Four Mile Creek at Road C	Station 7
Taxa Richness	25
Number of Specimens	167
EPT Index	2
EPT Abunance	3
Chironomidae Taxa	8
Chironomidae Abundance	41
EPT/Chironomidae Abundance	0.07
North Carolina Biotic Index	7.41
Percent Collector-Filterers	1.20
Percent Collector-Gatherers	43.71
Percent Predators	48.50
Percent Herbivores	4.79
Percent Scrapers	1.80
Percent Shredders	0.00
Scraper/Scraper & Collector Filterers	0.60
Shredders/Total	0.00
Percent Dominant Taxon	17.37
Number Of Dominant Taxa	6
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 7. Four Mile Creek at Road C. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	167	SC/CF:	1.50
Number of Samples:	1	Taxa Richness:	25	EPT:	2
Sample Sorted:	75%	Biotic Index:	7.41		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	1	3	1.80
AM	1	21	12.57
ANH	0	0	0.00
ANO	1	29	17.37
CO	0	0	0.00
DC	1	1	0.60
DCC	2	5	2.99
DG	0	0	0.00
DOR	0	0	0.00
DTA	4	19	11.38
DTY	2	17	10.18
EP	2	3	1.80
HT	0	0	0.00
LEP	1	7	4.19
MB	1	1	0.60
ME	1	2	1.20
MG	2	2	1.20
NA	0	0	0.00
OD	5	28	16.77
PL	0	0	0.00
TR	0	0	0.00
TU	1	29	17.37

Functional Group			
P	12	81	48.50
CG	8	73	43.71
SH	0	0	0.00
H	2	8	4.79
CF	2	2	1.20
SC	3	3	1.80

Functional Group CPOM Sample Sample Sorted: 100%			
P		36	33.33
CG		54	50.00
SH		4	3.70
H		5	4.63
CF		4	3.70
SC		5	4.63

Station 7. Four Mile Creek at Road C. RBP III. .20 September 1994

Taxa List
Hydracarina
Amphipoda
Oligochaeta
Palaemonetes paludosus
Polypedilum spp.
Tribelos jucundum
Ablabesmyia spp.
Conchapelopia spp.
Labrundinia spp.
Pentaneura inconspicua
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Stenonema spp.
Pyralidae
Sphaerium spp.
Sialis spp.
Physella spp.
Planorbidae
Argia spp.
Calopteryx spp.
Enallagma spp.
Macromia spp.
Neurocordulia spp.
Turbellaria

Station 7. Four Mile Creek at Road C. RBP III. 20 September 1994

Taxon	A	Rel Abd
Oligochaeta	29	17.37
Turbellaria	29	17.37
Amphipoda	21	12.57
Tanytarsus spp.	16	9.58
Ablabesmyia spp.	12	7.19
Argia spp.	9	5.39

Station 8. Pen Branch at Road C. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	C	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	0.00		0.00
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	229.60	28	13.79
5	Anchytarsus bicolor	CO	3.8	SH	3.80	1	0.49
6	Ancyronyx variegatus	CO	6.4	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	12.80	2	0.99
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	8.90	1	0.49
14	Macronychus glabratus	CO	4.7	CG	9.40	2	0.99
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	16.20	3	1.48
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	0.00		0.00
19	Palaemonetes paludosus	DC	6.7	H	0.00		0.00
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	7.40	1	0.49
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	117.30	17	8.37
32	Stenochironomus sp.	DCC	6.4	SH	6.40	1	0.49
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	26.40	6	2.96
43	Tipula spp.	DO	7.7	SH	15.40	2	0.99
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	32.00	5	2.46
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	9.10	1	0.49
53	Conchapelopia spp.	DTA	8.7	P	8.70	1	0.49
54	Labrundinia spp.	DTA	6	P	6.00	1	0.49
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	9.30	1	0.49
58	Rheotanytarsus spp.	DTY	6.4	CF	64.00	10	4.93

Station 8. Pen Branch at Road C. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	147.40	22	10.84
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CF	25.90	7	3.45
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	27.00	5	2.46
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	15.00	5	2.46
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	20.40	6	2.96
74	Tricorythodes spp.	EP	5.4	CG	0.00		0.00
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	100.10	13	6.40
81	Nigronia serricornis	ME	5.5	P	5.50	1	0.49
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	20.70	3	1.48
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	6.50	1	0.49
88	Nemertea	NA		P		3	1.48
89	Argia spp.	OD	8.7	P	8.70	1	0.49
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	0.00		0.00
92	Enallagma spp.	OD	9	P	180.00	20	9.85
93	Gomphus spp.	OD	6.2	P	18.60	3	1.48
94	Macromia spp.	OD	6.7	P	6.70	1	0.49
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	9.60	1	0.49
97	Progomphus spp.	OD	8.7	P	8.70	1	0.49
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	92.40	14	6.90
105	Chimarra spp.	TR	2.8	CF	19.60	7	3.45
106	Hydropsyche spp.	TR	4	CF	4.00	1	0.49
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	12.30	3	1.48
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	5.60	1	0.49
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	2.30	1	0.49
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	0.00		0.00

Station 8. Pen Branch at Road C. RBP III. 20 September 1994

Pen Branch at Road C	Station 8
Taxa Richness	39
Number of Specimens	203
EPT Index	10
EPT Abunance	50
Chironomidae Taxa	10
Chironomidae Abundance	60
EPT/Chironomidae Abundance	0.83
North Carolina Biotic Index	6.60
Percent Collector-Filterers	29.06
Percent Collector-Gatherers	41.38
Percent Predators	20.69
Percent Herbivores	0.00
Percent Scrapers	4.93
Percent Shredders	3.94
Scraper/Scraper & Collector Filterers	0.14
Shredders/Total	0.04
Percent Dominant Taxon	13.79
Number Of Dominant Taxa	6
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 8. Pen Branch at Road C. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	203	SC/CF:	0.17
Number of Samples:	1	Taxa Richness:	39	EPT:	10
Sample Sorted:	100%	Biotic Index:	6.60		

	Number Taxa	Number Orgs	Rel Abunance
Taxa			
AHC	0	0	0.00
AM	0	0	0.00
ANH	0	0	0.00
ANO	1	28	13.79
CO	5	9	4.43
DC	0	0	0.00
DCC	3	19	9.36
DG	2	8	3.94
DOR	0	0	0.00
DTA	5	9	4.43
DTY	2	32	15.76
EP	4	23	11.33
HT	0	0	0.00
LEP	0	0	0.00
MB	1	13	6.40
ME	1	1	0.49
MG	2	4	1.97
NA	1	3	1.48
OD	6	27	13.30
PL	0	0	0.00
TR	6	27	13.30
TU	0	0	0.00
Functional Group			
P	15	42	20.69
CG	8	84	41.38
SH	5	8	3.94
SC	3	10	4.93
H	0	0	0.00
CF	8	59	29.06
Functional Group CPOM Sample Sample Sorted:100%			
P		26	13.61
CG		39	20.42
SH		0	0.00
SC		102	53.40
H		2	1.05
CF		22	11.52

Station 8. Pen Branch at Road C. RBP III. 20 September 1994

Taxa List
Oligochaeta
Anchytarsus bicolor
Dubiraphia bivittata
Hydroporus spp.
Macronychus glabratus
Stenelmis humerosa
Cryptochironomus spp.
Polypedilum spp.
Stenochironomus sp.
Simulium spp.
Tipula spp.
Ablabesmyia spp.
Clinotanypus pinguis
Conchapelopia spp.
Labrundinia spp.
Procladius spp.
Rheotanytarsus spp.
Tanytarsus spp.
Acerpenna pygmaeus
Baetis spp.
Eurylophella spp.
Stenonema spp.
Sphaerium spp.
Nigronia serricornis
Ferrissia sp.
Planorbidae
Nemertea
Argia spp.
Enallagma spp.
Gomphus spp.
Macromia spp.
Pachydiplax longipennis
Progomphus spp.
Cheumatopsyche spp.
Chimarra spp.
Hydropsyche spp.
Nectopsyche exquisita
Phylocentropus spp.
Pycnopsyche spp.

Station 8. Pen Branch at Road C. RBP III. 20 September 1994

	Taxon	C	Rel Abd
	Oligochaeta	28	13.79
	Tanytarsus spp.	22	10.84
	Enallagma spp.	20	9.85
	Polypedilum spp.	17	8.37
	Cheumatopsyche spp.	14	6.90
	Sphaerium spp.	13	6.40

Station 9. Meyers Branch at Road 9. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	0.00		0.00
3	Hirudinea	ANH		P		1	0.51
4	Oligochaeta	ANO	8.2	CG	188.60	23	11.68
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	6.90	1	0.51
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	12.80	2	1.02
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	10.80	2	1.02
13	Hydroporus spp.	CO	8.9	P	8.90	1	0.51
14	Macronychus glabratus	CO	4.7	CG	9.40	2	1.02
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	5.40	1	0.51
18	Cambaridae	DC	8.8	H	17.60	2	1.02
19	Palaemonetes paludosus	DC	6.7	H	113.90	17	8.63
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	2.60	1	0.51
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	4.80	1	0.51
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	6.70	1	0.51
31	Polypedilum spp.	DCC	6.9	CG	82.80	12	6.09
32	Stenochironomus sp.	DCC	6.4	SH	12.80	2	1.02
33	Tribelos jucundum	DCC	6.6	CG	6.60	1	0.51
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp..	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	6.50	1	0.51
38	Helius spp.	DO		CG		1	0.51
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	4.40	1	0.51
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	12.80	2	1.02
51	Apsectrotanypus johnsoni	DTA	0	P	0.00	2	1.02
52	Clinotanypus pinguis	DTA	9.1	P	0.00		0.00
53	Conchapelopia spp.	DTA	8.7	P	0.00		0.00
54	Labrundinia spp.	DTA	6	P	18.00	3	1.52
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	19.20	3	1.52

Station 9. Meyers Branch at Road 9. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	120.60	18	9.14
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	21.60	4	2.03
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	23.50	5	2.64
69	Isonychia spp.	EP	3.8	CF	3.80	1	0.51
70	Neoephemera youngi	EP	2.1	CG	23.10	11	5.58
71	Paraleptophlebia spp.	EP	1.2	CG	1.20	1	0.51
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	17.00	5	2.64
74	Tricorythodes spp.	EP	5.4	CG	140.40	26	13.20
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	30.80	4	2.03
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	7.70	1	0.51
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	13.80	2	1.02
85	Hydrobiidae	MG		SC		2	1.02
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P			0.00
89	Argia spp.	OD	8.7	P	0.00		0.00
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	16.60	2	1.02
92	Enallagma spp.	OD	9	P	0.00		0.00
93	Gomphus spp.	OD	6.2	P	18.60	3	1.52
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neurocordulia spp.	OD	5.8	P	11.60	2	1.02
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	2.80	2	1.02
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	1.60	2	1.02
103	Brachycentrus numerosus	TR	1.8	CF	19.80	11	5.58
104	Cheumatopsyche spp.	TR	6.6	CF	13.20	2	1.02
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	2.00	2	1.02
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	5.70	1	0.51
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	33.60	6	3.05
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	4.70	1	0.51
116	Turbellaria	TU	7.5	P	0.00		0.00

Station 9. Meyers Branch at Road 9. RBP III. 20 September 1994

Meyers Branch at Road 9	Station 9
Taxa Richness	46
Number of Specimens	197
EPT Index	15
EPT Abunance	80
Chironomidae Taxa	11
Chironomidae Abundance	46
EPT/Chironomidae Abundance	1.74
North Carolina Biotic Index	5.62
Percent Collector-Filterers	14.21
Percent Collector-Gatherers	55.84
Percent Predators	10.66
Percent Herbivores	9.64
Percent Scrapers	5.58
Percent Shredders	4.06
Scraper/Scraper & Collector Filterers	0.28
Shredders/Total	0.04
Percent Dominant Taxon	13.20
Number Of Dominant Taxa	7
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 9. Meyers Branch at Road 9. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	197	SC/CF:	0.39
Number of Samples:	1	Taxa Richness:	46	EPT:	15
Sample Sorted:	100%	Biotic Index:	5.62		

Taxa	Number Taxa	Number Orgs	Rel Abundance
AHC	0	0	0.00
AM	0	0	0.00
ANH	1	1	0.51
ANO	1	23	11.68
CO	6	9	4.57
DC	2	19	9.64
DCC	6	18	9.14
DG	3	3	1.52
DGR	0	0	0.00
DTA	3	7	3.55
DTY	2	21	10.66
EP	7	53	26.90
HT	0	0	0.00
LEP	0	0	0.00
MB	1	4	2.03
ME	1	1	0.51
MG	2	4	2.03
NA	0	0	0.00
OD	3	7	3.55
PL	1	2	1.02
TR	7	25	12.69
TU	0	0	0.00

Functional Group			
P	12	21	10.66
CG	16	110	55.84
SH	5	8	4.06
SC	4	11	5.58
H	2	19	9.64
CF	7	28	14.21

Functional Group CPOM Sample Sample Sorted: 100%			
P		28	11.97
CG		107	45.73
SH		16	6.84
SC		18	7.69
H		8	3.42
CF		57	24.36

Station 9. Meyers Branch at Road 9. RBP III. 20 September 1994

Taxa List
Hirudinea
Oligochaeta
Ancyronyx variegatus
Dubiraphia bivittata
Helichus fastigatus
Hydroporus spp.
Macronychus glabratus
Stenelmis spp.
Cambaridae
Palaemonetes paludosus
Pagastiella sp.
Paralauterborniella sp.
Polypedilum fallax
Polypedilum spp.
Stenochironomus sp.
Tribelos jucundum
Ceratopogonidae
Helius spp.
Simulium spp.
Ablabesmyia spp.
Apsectrotanypus johnsoni
Labrundinia spp.
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Hexagenia spp.
Isonychia spp.
Neoephemera youngi
Paraleptophlebia spp.
Stenonema spp.
Tricorythodes spp.
Sphaerium spp.
Sialis spp.
Ferrissia sp.
Hydrobiidae
Calopteryx spp.
Gomphus spp.
Neurocordulia spp.
Acroneuria spp.
Anisocentropus pyraloides
Brachycentrus numerosus
Cheumatopsyche spp.
Lepidostoma spp.
Oecetis spp.
Phylocentropus spp.
Triaenodes tardus

Station 9. Meyers Branch at Road 9. RBP III. 20 September 1994

Taxon	A	Rel Abd
Tricorythodes spp.	26	13.20
Oligochaeta	23	11.68
Tanytarsus spp.	18	9.14
Palaemonetes paludosus	17	8.63
Polypedilum spp.	12	6.09
Neoephemera youngi	11	5.58
Brachycentrus numerosus	11	5.58

Station 10. Lower Three Runs Creek at Road B. RBP III. 20 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	0.00		0.00
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	188.60	23	8.95
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	25.20	4	1.56
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	17.60	2	0.78
19	Palaemonetes paludosus	DC	6.7	H	6.70	1	0.39
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	30.00	3	1.17
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp	DCC	9.2	CG	9.20	1	0.39
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	289.80	42	16.34
32	Stenochironomus sp.	DCC	6.4	SH	0.00		0.00
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	4.40	1	0.39
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	89.60	14	5.45
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	0.00		0.00
53	Conchapelopia spp.	DTA	8.7	P	113.10	13	5.06
54	Labrundinia spp.	DTA	6	P	0.00		0.00
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	19.20	3	1.17

Station 10. Lower Three Runs Creek at Road B. RBP III. 20 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	0.00		0.00
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	0.00		0.00
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	40.80	12	4.67
74	Tricorythodes spp.	EP	5.4	CG	0.00		0.00
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	554.40	88	34.24
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	38.50	5	1.95
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	45.50	5	1.95
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P		13	5.06
89	Argia spp.	OD	8.7	P	52.20	6	2.33
90	Boyeria vinosa	OD	6.3	P	12.60	2	0.78
91	Calopteryx spp.	OD	8.3	P	0.00		0.00
92	Enallagma spp.	OD	9	P	36.00	4	1.56
93	Gomphus spp.	OD	6.2	P	6.20	1	0.39
94	Macromia spp.	OD	6.7	P	6.70	1	0.39
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	6.60	1	0.39
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	90.00	12	4.67

Station 10. Lower Three Runs Creek at Road B. RBP III. 20 September 1994

Lower Three Runs Creek at Road B	Station 10
Taxa Richness	23
Number of Specimens	257
EPT Index	2
EPT Abunance	13
Chironomidae Taxa	6
Chironomidae Abundance	76
EPT/Chironomidae Abundance	0.17
North Carolina Biotic Index	6.90
Percent Collector-Filterers	38.13
Percent Collector-Gatherers	26.85
Percent Predators	27.24
Percent Herbivores	1.17
Percent Scrapers	6.61
Percent Shredders	0.00
Scraper/Scraper & Collector Filterers	0.15
Shredders/Total	0.00
Percent Dominant Taxon	34.24
Number Of Dominant Taxa	6
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 10. Lower Three Runs Creek at Road B. RBP III. 20 September 1994

Table Size:	116	Total Orgs:	257	SC/CF:	0.17
Number of Samples:	1	Taxa Richness:	23	EPT:	2
Sample Sorted:	75%	Biotic Index:	6.90		

	Number Taxa	Number Orgs	Rel Abunance
Taxa			
AHC	0	0	0.00
AM	0	0	0.00
ANH	0	0	0.00
ANO	1	23	8.95
CO	1	4	1.56
DC	2	3	1.17
DCC	3	46	17.90
DO	1	1	0.39
DOR	0	0	0.00
DTA	2	27	10.51
DTY	1	3	1.17
EP	1	12	4.67
HT	0	0	0.00
LEP	0	0	0.00
MB	2	98	38.19
ME	0	0	0.00
MG	1	5	1.95
NA	1	13	5.06
OD	5	14	5.45
PL	0	0	0.00
TR	1	1	0.39
TU	1	12	4.67
Functional Group			
P	10	70	27.24
CG	4	69	26.85
SH	0	0	0.00
SC	2	17	6.61
H	2	3	1.17
CF	5	98	38.13
Functional Group			
CPOM Sample			
Sample Sorted: 50%			
P		34	12.64
CG		214	79.55
SH		0	0.00
SC		1	0.37
H		0	0.00
CF		20	7.43

Station 10. Lower Three Runs Creek at Road B. RBP III. 20 September 1994

Taxa List
Oligochaeta
Gyrinus spp.
Cambaridae
Palaemonetes paludosus
Goeldichironomus holoprasinus
Parachironomus spp
Polypedilum spp.
Simulium spp.
Ablabesmyia spp.
Conchapelopia spp.
Rheotanytarsus spp.
Stenonema spp.
Corbicula sp.
Sphaerium spp.
Physella spp.
Nemertea
Argia spp.
Boyeria vinosa
Enallagma spp.
Gomphus spp.
Macromia spp.
Cheumatopsyche spp.
Turbellaria

Station 10. Lower Three Runs Creek at Road B. RBP III. 20 September 1994

Taxon	A	Rel Abd
Corbicula sp.	88	34.24
Polypedilum spp.	42	16.34
Oligochaeta	23	8.95
Ablabesmyia spp.	14	5.45
Conchapelopia spp.	13	5.06
Nemertea	13	5.06

Station 11. Pen Branch at Road B. RBP III. 21 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	80.40	12	5.08
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CF	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	59.40	11	4.66
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	29.40	14	5.93
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	0.00		0.00
74	Tricorythodes spp.	EP	5.4	CG	162.00	30	12.71
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	0.00		0.00
78	Corbicula sp.	MB	6.3	CF	6.30	1	0.42
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	215.60	28	11.86
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	27.60	4	1.69
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P		4	1.69
89	Argia spp.	OD	8.7	P	69.60	8	3.39
90	Boyeria vinosa	OD	6.3	P	6.30	1	0.42
91	Calopteryx spp.	OD	8.3	P	66.40	8	3.39
92	Enallagma spp.	OD	9	P	9.00	1	0.42
93	Gomphus spp.	OD	6.2	P	37.20	6	2.54
94	Macromia spp.	OD	6.7	P	6.70	1	0.42
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	8.70	1	0.42
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	5.60	1	0.42
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	28.20	6	2.54
116	Turbellaria	TU	7.5	P	0.00		0.00

Station 11. Pen Branch at Road B. RBP III. 21 September 1994

Pen Branch at Road B	Station 11
Taxa Richness	26
Number of Specimens	236
EPT Index	5
EPT Abunance	62
Chironomidae Taxa	5
Chironomidae Abundance	29
EPT/Chironomidae Abundance	2.14
North Carolina Biotic Index	6.85
Percent Collector-Filterers	13.98
Percent Collector-Gatherers	60.59
Percent Predators	15.68
Percent Herbivores	5.51
Percent Scrapers	1.69
Percent Shredders	2.54
Scraper/Scraper & Collector Filterers	0.11
Shredders/Total	0.03
Percent Dominant Taxon	27.97
Number Of Dominant Taxa	5
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 11. Pen Branch at Road B. RBP III. 21 September 1994

Table Size:	116	Total Orgs:	236	SC/CF:	0.12
Number of Samples:	1	Taxa Richness:	26	EPT:	5
Sample Sorted:	75%	Biotic Index:	6.85		

	Number Taxa	Number Orgs	Rel Abundance
Taxa			
AHC	0	0	0.00
AM	0	0	0.00
ANH	0	0	0.00
ANO	1	66	27.97
CO	2	3	1.27
DC	2	13	5.51
DCC	1	7	2.97
DO	0	0	0.00
DOR	0	0	0.00
DTA	2	7	2.97
DTY	2	15	6.36
EP	3	55	23.31
HT	0	0	0.00
LEP	0	0	0.00
MB	2	29	12.29
ME	0	0	0.00
MG	1	4	1.69
NA	1	4	1.69
OD	7	26	11.02
PL	0	0	0.00
TR	2	7	2.97
TU	0	0	0.00
Functional Group			
P	10	37	15.68
CG	8	143	60.59
SH	1	6	2.54
SC	1	4	1.69
H	2	13	5.51
CF	4	33	13.98
Functional Group			
CPOM SAMPLE			
Sample Sorted: 100%			
P		13	5.18
CG		172	68.53
SH		11	4.38
SC		36	14.34
H		1	0.4
CF		18	7.17

Station 11. Pen Branch at Road B. RBP III. 21 September 1994

Taxa List
Oligochaeta
Macronychus glabratus
Stenelmis spp.
Cambaridae
Palaemonetes paludosus
Polypedilum spp.
Ablabesmyia spp.
Conchapelopia spp.
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Neocephemera youngi
Tricorythodes spp.
Corbicula sp.
Sphaerium spp.
Ferrissia sp.
Nemertea
Argia spp.
Boyeria vinosa
Calopteryx spp.
Enallagma spp.
Gomphus spp.
Macromia spp.
Progomphus spp.
Phylocentropus spp.
Triaenodes tardus

Station 11. Pen Branch at Road B. RBP III. 21 September 1994

Taxon	B	Rel Abd
Oligochaeta	66	27.97
Tricorythodes spp.	30	12.71
Sphaerium spp.	28	11.86
Neoephemera youngi	14	5.93
Tanytarsus spp.	12	5.08

Station 12. Indian Grave Branch at Road B. RBP III. 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	88.00	11	5.82
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	114.80	14	7.41
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	8.80	1	0.53
19	Palaemonetes paludosus	DC	6.7	H	0.00		0.00
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	55.20	8	4.23
32	Stenochironomus sp.	DCC	6.4	SH	6.40	1	0.53
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	9.20	2	1.06
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	6.40	1	0.53
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	0.00		0.00
53	Conchapelopia spp.	DTA	8.7	P	0.00		0.00
54	Labrundinia spp.	DTA	6	P	0.00		0.00
55	Nilotanypus spp.	DTA	4	P	4.00	1	0.53
56	Pentaneura inconspicua	DTA	4.6	P	13.80	3	1.59
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	44.80	7	3.70

Station 12. Indian Grave Branch at Road B. RBP III. 21 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	26.80	4	2.12
61	Acentrella ampla	EP	3.6	CG	3.60	1	0.53
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	480.60	89	47.09
65	Caenis spp.	EP	7.6	CG	7.60	1	0.53
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	0.00		0.00
74	Tricorythodes spp.	EP	5.4	CG	16.20	3	1.59
75	Belostoma sp.	HT	9.8	P	9.80	1	0.53
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	5.00	1	0.53
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	0.00		0.00
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC		1	0.53
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P		1	0.53
89	Argia spp.	OD	8.7	P	147.90	17	8.99
90	Boyeria vinosa	OD	6.3	P	6.30	1	0.53
91	Calopteryx spp.	OD	8.3	P	0.00		0.00
92	Enallagma spp.	OD	9	P	36.00	4	2.12
93	Gomphus spp.	OD	6.2	P	0.00		0.00
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	18.60	3	1.59
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	3.50	1	0.53
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	4.70	1	0.53
116	Turbellaria	TU	7.5	P	82.50	11	5.82

Station 12. Indian Grave Branch at Road B. RBP III. 21 September 1994

Indian Grave Branch at Road B	Station 12
Taxa Richness	26
Number of Specimens	189
EPT Index	7
EPT Abunance	99
Chironomidae Taxa	7
Chironomidae Abundance	25
EPT/Chironomidae Abundance	3.96
North Carolina Biotic Index	6.42
Percent Collector-Filterers	4.23
Percent Collector-Gatherers	70.37
Percent Predators	21.16
Percent Herbivores	2.65
Percent Scrapers	0.53
Percent Shredders	1.06
Scraper/Scraper & Collector Filterers	0.11
Shredders/Total	0.01
Percent Dominant Taxon	47.09
Number Of Dominant Taxa	5
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 12. Indian Grave Branch at Road B. RBP III. 21 September 1994

Table Size:	116	Total Orgs:	189	SC/CF:	0.13
Number of Samples:	1	Taxa Richness:	26	EPT:	7
Sample Sorted:	50%	Biotic Index:	6.42		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	0	0	0.00
AM	1	11	5.82
ANH	0	0	0.00
ANO	1	14	7.41
CO	0	0	0.00
DC	1	1	0.53
DCC	2	9	4.76
DO	1	2	1.06
DOR	0	0	0.00
DTA	3	5	2.65
DTY	2	11	5.82
EP	4	94	49.74
HT	1	1	0.53
LEP	1	1	0.53
MB	0	0	0.00
ME	0	0	0.00
MG	1	1	0.53
NA	1	1	0.53
OD	3	22	11.64
PL	0	0	0.00
TR	3	5	2.65
TU	1	11	5.82

Functional Group			
P	9	40	21.16
CG	8	133	70.37
SH	2	2	1.06
SC	1	1	0.53
H	3	5	2.65
CF	2	8	4.23

Functional Group CPOM Sample Sample Sorted: 100%		
P	13	5.83
CG	130	58.30
SH	2	0.90
SC	0	0.00
H	5	2.24
CF	73	32.74

Station 12. Indian Grave Branch at Road B. RBP III. 21 September 1994

Taxa List
Amphipoda
Oligochaeta
Cambaridae
Polypedilum spp.
Stenochironomus sp.
Antocha spp.
Ablabesmyia spp.
Nilotanypus spp.
Pentaneura inconspicua
Rheotanytarsus spp.
Tanytarsus spp.
Acentrella ampla
Baetis spp.
Caenis spp.
Tricorythodes spp.
Belostoma sp.
Pyralidae
Hydrobiidae
Nemertea
Argia spp.
Boyeria vinosa
Enallagma spp.
Hydroptila spp.
Polycentropus spp.
Triaenodes tardus
Turbellaria

Station 12. Indian Grave Branch at Road B. RBP III. 21 September 1994

Taxon	A	Rel Abd
Baetis spp.	89	47.09
Argia spp.	17	8.99
Oligochaeta	14	7.41
Amphipoda	11	5.82
Turbellaria	11	5.82

Station 13. Pen Branch at Road A. RBP III. 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	120.00	15	5.86
3	Hirudinea	ANH		P			0.00
4	Oligochaeta	ANO	8.2	CG	459.20	56	21.88
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.4	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivittata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	25.50	3	1.17
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	0.00		0.00
18	Cambaridae	DC	8.8	H	0.00		0.00
19	Palaemonetes paludosus	DC	6.7	H	40.20	6	2.34
20	Chironomus spp.	DCC	9.8	CG	29.40	3	1.17
21	Cladopelma sp.	DCC	5	CG	5.00	1	0.39
22	Cryptochironomus spp.	DCC	7.4	P	0.00		0.00
23	Dicrotendipes spp.	DCC	7.9	CG	7.90	1	0.39
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	207.00	30	11.72
32	Stenochironomus sp.	DCC	6.4	SH	0.00		0.00
33	Tribelos jucundum	DCC	6.6	CG	6.60	1	0.39
34	Xestochironomus sp.	DCC	6.4	SH	0.00		0.00
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	4.60	1	0.39
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Corynoneura spp.	DOR	6.2	CG	0.00		0.00
45	Cricotopus/Ortho spp.	DOR	8.8	CG	35.20	4	1.56
46	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
47	Rheocricotopus spp.	DOR	7.3	CG	0.00		0.00
48	Thienemanniella spp.	DOR	6	CG	0.00		0.00
49	Xylopus par	DOR	6.6	SH	0.00		0.00
50	Ablabesmyia spp.	DTA	6.4	P	25.60	4	1.56
51	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
52	Clinotanypus pinguis	DTA	9.1	P	0.00		0.00
53	Conchapelopia spp.	DTA	8.7	P	8.70	1	0.39
54	Labrundinia spp.	DTA	6	P	12.00	2	0.78
55	Nilotanypus spp.	DTA	4	P	0.00		0.00
56	Pentaneura inconspicua	DTA	4.6	P	0.00		0.00
57	Procladius spp.	DTA	9.3	P	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	19.20	3	1.17

Station 13. Pen Branch at Road A. RBP III. 21 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	301.50	45	17.58
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CF	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	124.20	23	8.98
65	Caenis spp.	EP	7.6	CG	7.60	1	0.39
66	Callibaetis spp.	EP	9.3	CG	18.60	2	0.78
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	0.00		0.00
74	Tricorythodes spp.	EP	5.4	CG	10.80	2	0.78
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	9.00	1	0.39
77	Pyralidae	LEP	5	H	5.00	1	0.39
78	Corbicula sp.	MB	6.3	CF	6.30	1	0.39
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	115.50	15	5.86
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC		11	4.30
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P		5	1.95
89	Argia spp.	OD	8.7	P	60.90	7	2.73
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	0.00		0.00
92	Enallagma spp.	OD	9	P	36.00	4	1.56
93	Gomphus spp.	OD	6.2	P	0.00		0.00
94	Macromia spp.	OD	6.7	P	13.40	2	0.78
95	Neurocordulia spp.	OD	5.8	P	0.00		0.00
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	19.80	3	1.17
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	8.20	2	0.78
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	0.00		0.00
116	Turbellaria	TU	7.5	P	0.00		0.00

Station 13. Pen Branch at Road A. RBP III. 21 September 1994

Pen Branch at Road A	Station 13
Taxa Richness	31
Number of Specimens	256
EPT Index	6
EPT Abunance	33
Chironomidae Taxa	11
Chironomidae Abundance	95
EPT/Chironomidae Abundance	0.35
North Carolina Biotic Index	7.26
Percent Collector-Filterers	8.59
Percent Collector-Gatherers	72.27
Percent Predators	9.77
Percent Herbivores	4.30
Percent Scrapers	4.30
Percent Shredders	0.78
Scraper/Scraper & Collector Filterers	0.33
Shredders/Total	0.01
Percent Dominant Taxon	21.88
Number Of Dominant Taxa	6
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 13. Pen Branch at Road A. RBP III. 21 September 1994

Table Size:	116	Total Orgs:	256	SC/CF:	0.50
Number of Samples:	1	Taxa Richness:	31	EPT:	6
Sample Sorted:	75%	Biotic Index:	7.26		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	0	0	0.00
AM	1	15	5.86
ANH	0	0	0.00
ANO	1	56	21.88
CO	1	3	1.17
DC	1	6	2.34
DCC	5	36	14.06
DG	1	1	0.39
DGR	1	4	1.56
DTA	3	7	2.73
DTY	2	48	18.75
EP	4	28	10.94
HT	1	1	0.39
LEP	1	1	0.39
MB	2	16	6.25
ME	0	0	0.00
MG	1	11	4.30
NA	1	5	1.95
OD	3	13	5.08
PL	0	0	0.00
TR	2	5	1.95
TU	0	0	0.00
Functional Group			
P	7	25	9.77
CG	14	185	72.27
SH	1	2	0.78
SC	1	11	4.30
H	4	11	4.30
CF	4	22	8.59
Functional Group CPOM SAMPLE Sample Sorted 50%			
P		24	8.33
CG		108	37.5
SH		2	0.69
SC		8	2.78
H		3	1.04
CF		143	49.66

Station 13. Pen Branch at Road A. RBP III. 21 September 1994

Taxa List
Amphipoda
Oligochaeta
Peltodytes spp.
Palaemonetes paludosus
Chironomus spp.
Cladopelma sp.
Dicrotendipes spp.
Polypedilum spp.
Tribelos jucundum
Antocha spp.
Cricotopus/Ortho spp.
Ablabesmyia spp.
Conchapelopia spp.
Labrundinia spp.
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Caenis spp.
Callibaetis spp.
Tricorythodes spp.
Hesperocorixa sp.
Pyralidae
Corbicula sp.
Sphaerium spp.
Hydrobiidae
Nemertea
Argia spp.
Enallagma spp.
Macromia spp.
Cheumatopsyche spp.
Nectopsyche exquisita

Station 13. Pen Branch at Road A. RBP III. 21 September 1994

Taxon	A	Rel Abd
Oligochaeta	56	21.88
Tanytarsus spp.	45	17.58
Polypedilum spp.	30	11.72
Baetis spp.	23	8.98
Amphipoda	15	5.86
Sphaerium spp.	15	5.86

Station 14. Beaver Dam Creek at Metal Walkway. RBP III. 21 September 1994

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	0.00		0.00
3	Hirudinea	ANH		P		1	0.36
4	Oligochaeta	ANO	8.2	CG	205.00	25	9.12
5	Anchytarsus bicolor	CO	3.8	SH	0.00		0.00
6	Ancyronyx variegatus	CO	6.9	CG	0.00		0.00
7	Dineutus spp.	CO	5.5	P	0.00		0.00
8	Dubiraphia bivattata	CO	6.4	CG	0.00		0.00
9	Dubiraphia spp.	CO	6.4	CG	0.00		0.00
10	Gyrinus spp.	CO	6.3	P	0.00		0.00
11	Haliplus sp.	CO	8.5	CG	0.00		0.00
12	Helichus fastigatus	CO	5.4	SC	0.00		0.00
13	Hydroporus spp.	CO	8.9	P	0.00		0.00
14	Macronychus glabratus	CO	4.7	CG	0.00		0.00
15	Peltodytes spp.	CO	8.5	H	0.00		0.00
16	Stenelmis humerosa	CO	5.4	CG	0.00		0.00
17	Stenelmis spp.	CO	5.4	CG	27.00	5	1.82
18	Cambaridae	DC	8.8	H	52.80	6	2.19
19	Palaemonetes paludosus	DC	6.7	H	0.00		0.00
20	Chironomus spp.	DCC	9.8	CG	0.00		0.00
21	Cladopelma sp.	DCC	5	CG	0.00		0.00
22	Cryptochironomus spp.	DCC	7.4	P	7.40	1	0.36
23	Dicrotendipes spp.	DCC	7.9	CG	0.00		0.00
24	Goeldichironomus holoprasinus	DCC	10	CG	0.00		0.00
25	Microtendipes rydalensis	DCC	6.2	CG	0.00		0.00
26	Pagastiella sp.	DCC	2.6	CG	0.00		0.00
27	Parachironomus spp.	DCC	9.2	CG	0.00		0.00
28	Paralauterborniella sp.	DCC	4.8	CG	0.00		0.00
29	Phaenopsectra flavipes	DCC	8.5	CG	0.00		0.00
30	Polypedilum fallax	DCC	6.7	SH	0.00		0.00
31	Polypedilum spp.	DCC	6.9	CG	13.80	2	0.73
32	Stenochironomus sp.	DCC	6.4	SH	12.80	2	0.73
33	Tribelos jucundum	DCC	6.6	CG	0.00		0.00
34	Xestochironomus sp.	DCC	6.4	SH	12.80	2	0.73
35	Zavrelliella spp.	DCC		CG			0.00
36	Antocha spp.	DO	4.6	CG	0.00		0.00
37	Ceratopogonidae	DO	6.5	P	0.00		0.00
38	Helius spp.	DO		CG			0.00
39	Hemerodromia spp.	DO	8.1	CG	0.00		0.00
40	Hexatoma spp.	DO	4.7	P	0.00		0.00
41	Limonia spp.	DO	10	SH	0.00		0.00
42	Simulium spp.	DO	4.4	CF	0.00		0.00
43	Tipula spp.	DO	7.7	SH	0.00		0.00
44	Cricotopus/Ortho spp.	DOR	8.8	CG	0.00		0.00
45	Parametriocnemus sp.	DOR	3.7	CG	0.00		0.00
46	Rheocricotopus spp.	DOR	7.3	CG	7.30	1	0.36
47	Thienemanniella spp.	DOR	6	CG	0.00		0.00
48	Xylopus par	DOR	6.6	SH	0.00		0.00
49	Ablabesmyia spp.	DTA	6.4	P	19.20	3	1.09
50	Apsectrotanypus johnsoni	DTA	0	P	0.00		0.00
51	Clinotanypus pinguis	DTA	9.1	P	0.00		0.00
52	Conchapelopia spp.	DTA	8.7	P	0.00		0.00
53	Labrundinia spp.	DTA	6	P	0.00		0.00
54	Nilotanypus spp.	DTA	4	P	0.00		0.00
55	Pentaneura inconspicua	DTA	4.6	P	13.80	3	1.09
56	Procladius spp.	DTA	9.3	P	0.00		0.00
57	Corynoneura spp.	DTY	6.2	CG	0.00		0.00
58	Rheotanytarsus spp.	DTY	6.4	CF	0.00		0.00

Station 14. Beaver Dam Creek at Metal Walkway. RBP III. 21 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	26.80	4	1.46
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	102.60	19	6.93
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	0.00		0.00
67	Eurylophella spp.	EP	3	CG	3.00	1	0.36
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	340.00	100	36.50
74	Tricorythodes spp.	EP	5.4	CG	351.00	65	23.72
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	10.00	2	0.73
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	7.70	1	0.36
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	13.80	2	0.73
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P			0.00
89	Argia spp.	OD	8.7	P	60.90	7	2.55
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	16.60	2	0.73
92	Enallagma spp.	OD	9	P	99.00	11	4.01
93	Gomphus spp.	OD	6.2	P	0.00		0.00
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neurocordulia spp.	OD	5.8	P	5.80	1	0.36
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	8.70	1	0.36
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	2.80	1	0.36
106	Hydropsyche spp.	TR	4	CF	8.00	2	0.73
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	0.00		0.00
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	0.00		0.00
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	14.10	3	1.09
116	Turbellaria	TU	7.5	P	7.50	1	0.36

Station 14. Beaver Dam Creek at Metal Walkway. RBP III. 21 September 1994

Beaver Dam Creek atMetal Walkway	Station 14
Taxa Richness	28
Number of Specimens	274
EPT Index	7
EPT Abunance	191
Chironomidae Taxa	8
Chironomidae Abundance	18
EPT/Chironomidae Abundance	10.61
North Carolina Biotic Index	5.31
Percent Collector-Filterers	1.46
Percent Collector-Gatherers	44.53
Percent Predators	11.31
Percent Herbivores	2.92
Percent Scrapers	37.23
Percent Shredders	2.55
Scraper/Scraper & Collector Filterers	0.96
Shredders/Total	0.03
Percent Dominant Taxon	36.50
Number Of Dominant Taxa	4
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 14. Beaver Dam Creek at Metal Walkway. RBP III. 21 September 1994

Table Size:	116	Total Orgs:	274	SC/CF:	25.50
Number of Samples:	1	Taxa Richness:	28	EPT:	7
Sample Sorted:	100%	Biotic Index:	5.31		

Taxa	Number Taxa	Number Orgs	Rel Abunance
AHC	0	0	0.00
AM	0	0	0.00
ANH	1	1	0.36
ANO	1	25	9.12
CO	1	5	1.82
DG	1	6	2.19
DCC	4	7	2.55
DG	0	0	0.00
DOR	1	1	0.36
DTA	2	6	2.19
DTY	1	4	1.46
EP	4	185	67.52
HT	0	0	0.00
LEP	1	2	0.73
MB	1	1	0.36
ME	0	0	0.00
MG	1	2	0.73
NA	0	0	0.00
OD	5	22	8.03
PL	0	0	0.00
TR	3	6	2.19
TU	1	1	0.36

Functional Group	Number Taxa	Number Orgs	Rel Abunance
P	10	31	11.31
CG	8	122	44.53
SH	3	7	2.55
SC	2	102	37.23
H	2	8	2.92
CF	3	4	1.46

Functional Group CPOM SAMPLE Sample Sorted 50%			
P		13	4.69
CG		76	27.44
SH		4	1.44
SC		55	19.86
H		0	0
CF		129	46.57

Rapid Bioassessment Protocol III

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST (Indicate Relative Abundance R = Rare, C = Common, A = Abundant, D = Dominant)

Porifera	Anisoptera	Chironomidae
Hydrozoa	Zygoptera	Plecoptera
Platyhelminthes	Hemiptera	Ephemeroptera
Turbellaria	Coleoptera	Trichoptera
Hirudinea	Lepidoptera	Other
Oligochaeta	Sialidae	
Isopoda	Corydalidae	
Amphipoda	Tipulidae	
Decapoda	Empididae	
Gastropoda	Simulidae	
Bivalvia	Tabanidae	
	Culicidae	

Rare < 3 Common 3–9 Abundant > 10 Dominant > 50 (Estimate)

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample

Observations

Figure 6.3-1. Biosurvey Field Data Sheet for use with Rapid Bioassessment Protocol III.

dure consists of evenly distributing the composite sample in a gridded pan with a light-colored bottom. As grids are randomly selected, all organisms within those grids are removed, until at least 100 organisms have been selected from the sample. This method of subsampling provides a representative estimate of the benthic fauna as well as a consistent unit of effort. A more detailed description of this technique may be found in Appendix B. Although pilot study results (Section 6.4.6) indicated that a 100-organism subsample is sufficient, a 200- or 300-organism subsample may be preferred, depending on investigator preference, budget constraints, and individual sample characteristics. Some agencies may prefer to expend additional resources to process whole samples instead of subsampling.

All benthic macroinvertebrates in the subsample (or sample) should be identified to the lowest positively identified taxonomic level (generally genus or species), enumerated, and recorded on the Laboratory Bench Sheet (Figure 6.3-2). Based on the taxonomic identifications, Functional Feeding Group classifications can be assigned for most aquatic insects using a reference such as Merritt and Cummins (1984). Once a Functional Feeding Group classification list has been established, it can be incorporated into the computer analysis for computation of the metrics. Care should be taken to note the presence of early instars which may represent different Functional Feeding Groups from later instars. The Scraper and Filtering Collector Functional Groups are considered the important indicators in the riffle/run community; if this metric is not calculated using a computer program, numbers of individuals representing each of these two groups are recorded on the Laboratory Bench Sheet (Figure 6.3-2).

6.3.3 Data Analysis Techniques

Based on observations made in assessing habitat, water quality, physical characteristics, and the qualitative biosurvey, the investigator makes a preliminary judgment on the presence or absence of biological impairment and an estimation of probable cause and source on the Impairment Assessment Sheet (Figure 6.1-2).

The integrated benthic data analysis is performed as follows. Using the raw benthic data, a numerical value is calculated for each metric. Calculated values are then compared to values derived from either an unimpaired reference site within the same region or a suitable control station on the same stream. Each metric is then assigned a score according to the comparability (percent similarity) of calculated and reference values. Scores for the eight metrics are then totaled and compared to the total metric score for the reference station. The percent comparison between the total scores provides a final evaluation of biological condition.

Criteria to be used for scoring the eight metrics were derived from an evaluation of pilot study results (Section 6.4), certain project compliance monitoring requirements now in use (Vermont Department of Environmental Conservation 1987), and discussions with various aquatic biologists regarding the level of detection considered dependable for certain metrics. However, it is envisioned that these *criteria may need to be adjusted for use in particular regions.*

Inherent variability in each metric was considered in establishing percent comparability criteria. The metrics based on taxa richness, HBI, and EPT indices have low variability (Resh 1988). This variability is accounted for in the criteria for characterization of biological condition (Figure 6.2-3) based on existing data. For metrics based on standard taxa richness and HBI and EPT Indices, differences of 10–20 percent relative to the reference condition would be considered nominal, and the station being assessed would receive the maximum metric score. Because increasing HBI values denote worsening biological condition, percent difference for this metric is calculated by dividing the reference value by the value for the station of comparison.

Metrics that utilize ratios will fluctuate more widely, however, and comparing percent differences between ratios (ratios of ratios) will compound the variability. Scoring increments are therefore set at broad intervals of 25 percent or greater. For metrics based on Functional Feeding Group ratios, Cummins (1987, personal communication) contends that differences as great as 50 percent from the reference may be acceptable, but differences in the range of 50–100 percent are not only important but discriminate degrees of impact more clearly.

The percent contribution of the dominant taxon to total abundance is a simple estimator of evenness. Scoring criteria are based on theoretical considerations rather than direct comparison with a reference.

The Community Loss Index already incorporates comparison with a reference. Therefore, actual index values are used in scoring.

Analysis of the benthic data combines several community population and functional parameters. An integrated assessment is used, based on eight metrics (Table 6.3-1). Each metric has a different range of sensitivity measuring a slightly different component of community structure (Figure 8.2-1). The data collected in the 100-organism riffle/run subsample and the CPOM sample are summarized according to the information required for each metric and entered on the

TABLE 6.3-1 CRITERIA[a] FOR CHARACTERIZATION OF BIOLOGICAL CONDITION FOR RAPID BIOASSESSMENT PROTOCOL III

Metric	Biological Condition			
	Non-Impaired	Slightly Impaired	Moderately Impaired	Severely Impaired
1. Taxa Richness	Comparable to the best situation to be expected within an ecoregion. Balanced trophic structure. Optimum community structure (composition and dominance) for stream size and habitat quality.	Community structure less than expected. Composition (species richness) lower than expected due to loss of some intolerant forms. Percent contribution of tolerant forms increases.	Fewer species due to loss of most intolerant forms. Reduction in EPT index.	Few species present. If high densities of organisms, then dominated by one or two taxa. Only tolerant organisms present.
2. Hilsenhoff Biotic Index (modified)				
3. Ratio of Scrapers/Filtering Collectors[b]				
4. Ratio of EPT and Chironomid Abundances				
5. % Contribution of Dominant Taxon				
6. EPT Index				
7. Community Similarity Index[c]				
8. Ratio of Shredders/Total[b]				

(a) Scoring criteria are generally based on percent comparability to the reference station.
(b) Determination of Functional Feeding Group is independent of taxonomic grouping.
(c) Community Similarity Indices are used in comparison to a reference station.

DATA SUMMARY SHEET

Station No.								
Station Location								
Taxa Richness								
FBI (modified)								
Functional Feeding Groups								
Riffle Community								
Scrapers/Filt. Collect.								
CPOM Community								
Shredders/Total								
EPT/Chironomidae								
% Contribution (dom. family)								
EPT Index								
Community Similarity Index								
Comments:								

Figure 6.3-3. Data Summary Sheet suggested for use in recording benthic data utilized in Rapid Bioassessment Protocol III.

Metric 6. EPT Index

The EPT Index generally increases with increasing water quality. The EPT Index is the total number of distinct taxa within the orders Ephemeroptera, Plecoptera, and Trichoptera. This value summarizes taxa richness within the insect orders that are generally considered to be pollution sensitive.

Headwater streams which are naturally unproductive may experience an increase in taxa (including EPT taxa) in response to organic enrichment. In this situation, a "missing genera" approach may be more valuable. Shackleford (1988) uses a "missing genera" metric to evaluate the loss of EPT taxa from upstream to downstream to avoid the complication in data interpretation resulting from the addition or replacement of genera.

Metric 7. Community Similarity Indices

Community Similarity Indices are used in situations where reference communities exist. The reference community can be derived through sampling or prediction for a region using a reference database. Data sources or ecological data files may be available to establish a reference community for comparison. The combined information provided through a regional analysis and EPA's ERAPT ecological database (Dawson and Hellenthal 1986) may be useful for this analysis. Three of the many similarity indices available are discussed below:

- Community Loss Index—Measures the loss of benthic species between a reference station and the station of comparison. The Community Loss Index was developed by Courtemanch and Davies (1987) and is an index of dissimilarity with values increasing as the degree of dissimilarity from the reference station increases. Values range from 0 to "infinity." Based on preliminary data analysis, this index provides greater discrimination than the following two community similarity indices.
- Jaccard Coefficient of Community—Measures the degree of similarity in taxonomic composition between two stations in terms of taxon presence or absence. The Jaccard Coefficient discriminates between highly similar collections. Coefficient values, ranging from 0 to 1.0, increase as the degree of similarity with the reference station increases. See Jaccard (1912), Boesch (1977), and U.S. EPA (1983) for more detail. The formulae for the Community Loss Index and the Jaccard Coefficient are

$$\text{Community Loss} = \frac{d-a}{e}$$

$$\text{Jaccard Coefficient} = \frac{a}{a+b+c}$$

where

a = number of species common to both samples
b = number of species present in Sample B but not A
c = number of species present in Sample A but not B
d = total number of species present in Sample A
e = total number of species present in Sample B

Sample A = reference station
Sample B = station of comparison

- Pinkham and Pearson Community Similarity Index—Measures the degree of similarity in taxonomic composition in terms of taxon abundances and can be calculated with either percentages or numbers. A weighting factor can be added that assigns more significance to dominant species. See Pinkham and Pearson (1976) and U.S. EPA (1983) for more detail. The formula is

$$S.I._{ab.} = \Sigma \frac{\min (x_{ia}, x_{ib})}{\max (x_{ia}, x_{ib})} \left[\frac{x_{ia}}{x_a} \cdot \frac{x_{ib}}{x_b} / 2\right]$$

weighting factor

where

x_{ia}, x_{ib} = number of individuals in the i^{th} species in Sample A or B

Other community similarity indices suggested by reviewers of this document include Spearman's Rank Correlation

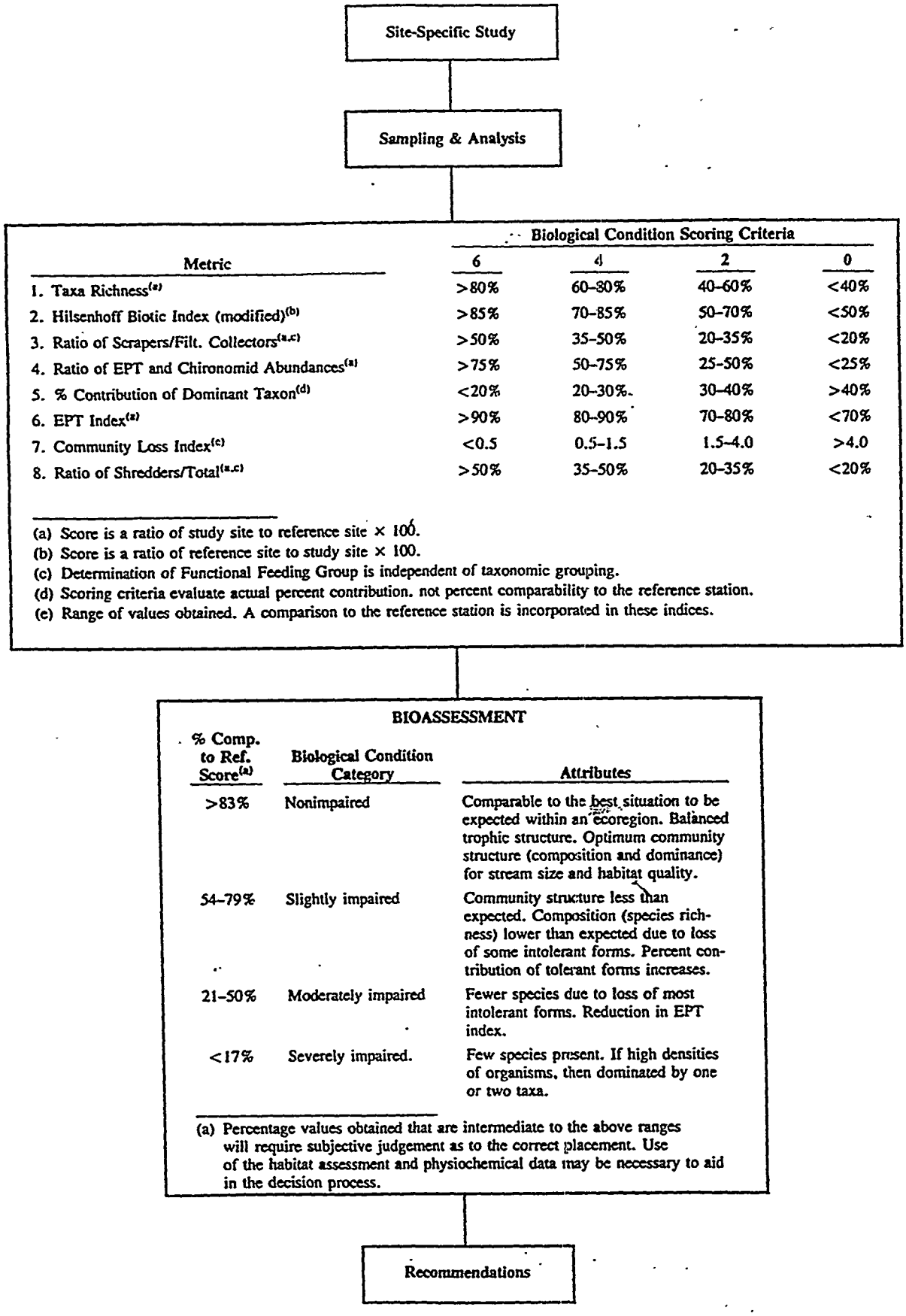


Figure 6.3-4. Flowchart of bioassessment approach advocated for Rapid Bioassessment Protocol III.

Station 14. Beaver Dam Creek at Metal Walkway. RBP III. 21 September 1994

Taxa List
Hirudinea
Oligochaeta
Stenelmis spp.
Cambaridae
Cryptochironomus spp.
Polypedilum spp.
Stenochironomus sp.
Xestochironomus sp.
Rheocricotopus spp.
Atlabesmyia spp.
Pentaneura inconspicua
Tanytarsus spp.
Baetis spp.
Euryophella spp.
Stenonema spp.
Tricorythodes spp.
Pyralidae
Sphaerium spp.
Ferrissia sp.
Argia spp.
Calopteryx spp.
Enallagma spp.
Neurocordulia spp.
Progomphus spp.
Chimarra spp.
Hydropsyche spp.
Triaenodes tardus
Turbellaria

Station 15. Four Mile Creek at Road 13.2. RBP III. 21 September 1994

59	Stempellinella spp.	DTY	5.3	CG	0.00		0.00
60	Tanytarsus spp.	DTY	6.7	CG	569.50	85	25.84
61	Acentrella ampla	EP	3.6	CG	0.00		0.00
62	Acerpenna pygmaeus	EP	3.7	CG	0.00		0.00
63	Acerpenna spp.	EP	3.7	CG	0.00		0.00
64	Baetis spp.	EP	5.4	CG	81.00	15	4.56
65	Caenis spp.	EP	7.6	CG	0.00		0.00
66	Callibaetis spp.	EP	9.3	CG	27.90	3	0.91
67	Eurylophella spp.	EP	3	CG	0.00		0.00
68	Hexagenia spp.	EP	4.7	CG	0.00		0.00
69	Isonychia spp.	EP	3.8	CF	0.00		0.00
70	Neoephemera youngi	EP	2.1	CG	0.00		0.00
71	Paraleptophlebia spp.	EP	1.2	CG	0.00		0.00
72	Siphlonurus sp.	EP	2.6	CG	0.00		0.00
73	Stenonema spp.	EP	3.4	SC	3.40	1	0.30
74	Tricorythodes spp.	EP	5.4	CG	27.00	5	1.52
75	Belostoma sp.	HT	9.8	P	0.00		0.00
76	Hesperocorixa sp.	HT	9	H	0.00		0.00
77	Pyralidae	LEP	5	H	5.00	1	0.30
78	Corbicula sp.	MB	6.3	CF	0.00		0.00
79	Eliptio spp.	MB	3.4	CF	0.00		0.00
80	Sphaerium spp.	MB	7.7	CF	53.90	7	2.13
81	Nigronia serricornis	ME	5.5	P	0.00		0.00
82	Sialis spp.	ME	7.7	P	0.00		0.00
83	Campeloma sp.	MG	6.7	SC	0.00		0.00
84	Ferrissia sp.	MG	6.9	SC	0.00		0.00
85	Hydrobiidae	MG		SC			0.00
86	Physella spp.	MG	9.1	SC	0.00		0.00
87	Planorbidae	MG	6.5	SC	0.00		0.00
88	Nemertea	NA		P		3	0.91
89	Argia spp.	OD	8.7	P	60.90	7	2.13
90	Boyeria vinosa	OD	6.3	P	0.00		0.00
91	Calopteryx spp.	OD	8.3	P	0.00		0.00
92	Enallagma spp.	OD	9	P	27.00	3	0.91
93	Gomphus spp.	OD	6.2	P	6.20	1	0.30
94	Macromia spp.	OD	6.7	P	0.00		0.00
95	Neurocordulia spp.	OD	5.8	P	5.80	1	0.30
96	Pachydiplax longipennis	OD	9.6	P	0.00		0.00
97	Progomphus spp.	OD	8.7	P	0.00		0.00
98	Acroneuria spp.	PL	1.4	P	0.00		0.00
99	Allocapnia spp.	PL	2.8	SH	0.00		0.00
100	Leuctra spp.	PL	0.7	SH	0.00		0.00
101	Perlinella spp.	PL	0	P	0.00		0.00
102	Anisocentropus pyraloides	TR	0.8	SH	0.00		0.00
103	Brachycentrus numerosus	TR	1.8	CF	0.00		0.00
104	Cheumatopsyche spp.	TR	6.6	CF	0.00		0.00
105	Chimarra spp.	TR	2.8	CF	0.00		0.00
106	Hydropsyche spp.	TR	4	CF	0.00		0.00
107	Hydroptila spp.	TR	6.2	H	0.00		0.00
108	Lepidostoma spp.	TR	1	SH	0.00		0.00
109	Nectopsyche exquisita	TR	4.1	SH	8.20	2	0.61
110	Oecetis spp.	TR	5.7	P	0.00		0.00
111	Oxyethira spp.	TR	6.2	H	37.20	6	1.82
112	Phylocentropus spp.	TR	5.6	CF	0.00		0.00
113	Polycentropus spp.	TR	3.5	CF	0.00		0.00
114	Pycnopsyche spp.	TR	2.3	SH	0.00		0.00
115	Triaenodes tardus	TR	4.7	SH	9.40	2	0.61
116	Turbellaria	TU	7.5	P	97.50	13	3.95

Station 15. Four Mile Creek at Road 13.2. RBP III. 21 September 1994

Four Mile Creek ar Road 13.2	Station 15
Taxa Richness	29
Number of Specimens	329
EPT Index	7
EPT Abunance	34
Chironomidae Taxa	9
Chironomidae Abundance	143
EPT/Chironomidae Abundance	0.24
North Carolina Biotic Index	7.16
Percent Collector-Filterers	3.04
Percent Collector-Gatherers	74.47
Percent Predators	18.24
Percent Herbivores	2.74
Percent Scrapers	0.30
Percent Shredders	1.22
Scraper/Scraper & Collector Filterers	0.09
Shredders/Total	0.01
Percent Dominant Taxon	25.84
Number Of Dominant Taxa	5
Dominants In Common	
Community Loss Index	
Jaccard Coefficient Of Similarity	

Station 15. Four Mile Creek at Road 13.2. RBP III. 21 September 1994

Taxa List
Hydracarina
Amphipoda
Oligochaeta
Cambaridae
Cladopelma sp.
Dicrotendipes spp.
Polypedilum spp.
Ceratopogonidae
Corynoneura spp.
Cricotopus/Ortho spp.
Ablabesmyia spp.
Labrundinia spp.
Rheotanytarsus spp.
Tanytarsus spp.
Baetis spp.
Callibaetis spp.
Stenonema spp.
Tricorythodes spp.
Pyralidae
Sphaerium spp.
Nemertea
Argia spp.
Enallagma spp.
Gomphus spp.
Neurocordulia spp.
Nectopsyche exquisita
Oxyethira spp.
Triaenodes tardus
Turbellaria

Rosemary Creek Downstream of Williston WWTP. 17 December 1994. RBP III.

Seq	Taxon	TAXC	NCBI	FG	For BI	A	Rel Abd
1	Hydracarina	AHC	5.7	P	0.00		0.00
2	Amphipoda	AM	8	CG	8.00	1	0.41
3	Oligocnaeta	ANO	8.4	CG	8.40	1	0.41
4	Hydra spp.	CN		P			0.00
5	Ancyronyx variegatus	CO	7.1	CG	0.00		0.00
6	Dubiraphia bivattata	CO	6.6	CG	0.00		0.00
7	Ectopria nervosa	CO	4.5	SC	4.50	1	0.41
8	Macronychus glabratus	CO	4.9	CG	0.00		0.00
9	Stenelmis sp.	CO	5.6	CG	5.60	1	0.41
10	Cambaridae	DC	9	H	36.00	4	1.64
11	Palaemonetes paludosus	DC	6.9	CG	41.40	6	2.46
12	Chironomus spp.	DCC	10	CG	0.00		0.00
13	Cryptochironomus spp.	DCC	7.5	P	0.00		0.00
14	Cryptotendipes spp.	DCC	6.3	CG	0.00		0.00
15	Dicrotendipes spp.	DCC	8.1	CG	0.00		0.00
16	Microtendipes rydalensis	DCC	6.4	CG	0.00		0.00
17	Microtendipes spp.	DCC	6.4	CG	0.00		0.00
18	Nilothauma babiyi	DCC	5.7	CG	0.00		0.00
19	Phaenopsectra flavipes	DCC	8.7	CG	0.00		0.00
20	Polypedilum fallax	DCC	6.9	SH	0.00		0.00
21	Polypedilum spp.	DCC	7.1	CG	142.00	20	8.20
22	Robackia sp.	DCC	3.5	CG	0.00		0.00
23	Stelechomyia perpulchra	DCC	4.8	SH	0.00		0.00
24	Stenochironomus sp.	DCC	6.6	SH	0.00		0.00
25	Tribelos jucundum	DCC	6.8	CG	6.80	1	0.41
26	Xestochironomus sp.	DCC		SH			0.00
27	Potthastia longmana	DD	7.6	CG	0.00		0.00
28	Atherix lantha	DO	2.3	P	0.00		0.00
29	Ceratopogonidae	DO	6.7	P	0.00		0.00
30	Hemerodromia spp.	DO	8.3	CG	0.00		0.00
31	Simulium spp.	DO	4.6	CF	27.60	6	2.46
32	Tipula abdominalis	DO	7.9	SH	7.90	1	0.41
33	Brilla flavifrons	DOR	5.4	SH	0.00		0.00
34	Corynoneura spp.	DOR	6.4	CG	32.00	5	2.05
35	Cricotopus/Ortho spp.	DOR	9	CG	18.00	2	0.82
36	Eukiefferiella spp.	DOR	5.9	CG	0.00		0.00
37	Lopescladius spp.	DOR	2.2	CG	0.00		0.00
38	Nanocladius spp.	DOR	7.4	CG	0.00		0.00
39	Parakiefferiella sp.1	DOR	6.1	CG	0.00		0.00
40	Parametriocnemus sp.	DOR	3.9	CG	3.90	1	0.41
41	Rheocricotopus spp.	DOR	7.5	CG	105.00	14	5.74
42	Synorthocladius semivirens	DOR	4.9	CG	0.00		0.00
43	Thienemanniella spp.	DOR	6.2	CG	12.40	2	0.82
44	Tvetenia spp.	DOR	4.2	CG	37.80	9	3.69
45	Xylopus par	DOR	6.8	SH	0.00		0.00
46	Ablabesmyia spp.	DTA	6.6	P	13.20	2	0.82
47	Conchapelopia spp.	DTA	8.9	P	26.70	3	1.23
48	Labrundinia spp.	DTA	6.2	P	6.20	1	0.41
49	Larsia spp.	DTA	8.5	P	8.50	1	0.41
50	Nilotanypus spp.	DTA	4.2	P	0.00		0.00
51	Paramerina sp.	DTA	3	P	0.00		0.00
52	Pentaneura inconspicua	DTA	4.8	P	0.00		0.00
53	Procladius spp.	DTA	9.5	P	0.00		0.00
54	Rheotanytarsus spp.	DTY	6.6	CF	191.40	29	11.89
55	Stempellinella spp.	DTY	5.5	CG	5.50	1	0.41
56	Tanytarsus spp.	DTY	6.9	CG	200.10	29	11.89
57	Acerpenna pygmaeus	EP	3.9	CG	0.00		0.00
58	Baetis spp.	EP	5.6	CG	84.00	15	6.15

Rosemary Creek Downstream of Williston WWTP. 17 December 1994. RBP III.

Rosemary Creek Downstream Williston WWTP. RBP III.	Station 1
Taxa Richness	40
Number of Specimens	244
EPT Index	12
EPT Abundance	93
Chironomidae Taxa	15
Chironomidae Abundance	120
EPT/Chironomidae Abundance	0.78
North Carolina Biotic Index	5.95
Percent Collector-Filterers	26.64
Percent Collector-Gatherers	51.64
Percent Predators	11.89
Percent Herbivores	1.64
Percent Scrapers	5.33
Percent Shredders	2.87
Scraper/Scraper & Collector Filterers	0.17
Shredders/Total	0.03
Percent Dominant Taxon	11.89
Number Of Dominant Taxa	8

Rosemary Creek Downstream of Williston WWTP. 17 December 1994. RBP III.

Taxa List
Amphipoda
Oligochaeta
Ectopria nervosa
Stenelmis sp.
Cambaridae
Palaemonetes paludosus
Polypedilum spp.
Tribelos jucundum
Simulium spp.
Tipula abdominalis
Corynoneura spp.
Cricotopus/Ortho spp.
Parametriocnemus sp.
Rheocricotopus spp.
Thienemanniella spp.
Tvetenia spp.
Ablabesmyia spp.
Conchapelopia spp.
Labrundinia spp.
Larsia spp.
Rheotanytarsus spp.
Stempellinella spp.
Tanytarsus spp.
Baetis spp.
Caenis spp.
Ephemerella sp.
Stenonema spp.
Corbicula sp.
Spiraerium spp.
Nemertea
Argia sp.
Calopteryx sp.
Cloperla clio
Perlesta spp.
Taeniopteryx sp.
Cheumatopsyche spp.
Chimarra spp.
Hydatophylax argus
Micrasema spp.
Triaenodes tardus

APPENDIX B

EPA RAPID BIOASSESSMENT PROTOCOL METHODS

6. BENTHIC MACROINVERTEBRATE BIOSURVEY AND DATA ANALYSIS

The biosurvey and data analysis components of the three benthic bioassessment protocols are presented below. All three protocols have common biosurvey and data analysis elements. Common elements and discussions are repeated in each protocol to maintain discrete protocol integrity.

Examples of field and laboratory data sheets referred to in this chapter are presented for guidance. The example data sheets do not include headers for documenting identifier information, and may be modified for the needs of different agencies. Descriptive guidance for use with each data sheet is found in Appendix A.

The three protocols consist of three basic components: water quality/physical characteristics (Figure 5.1-1), habitat assessment (Figure 5.2-1), and a biosurvey (Figures 6.1-1, 6.2-1, and 6.3-1). The overall habitat assessment evaluates habitat quality using the key environmental parameters described in Chapter 5. If a degraded community is found from the results of the biosurvey, habitat information will aid interpretation of effects relative to the biotic potential of a site. The water quality and physical characterizations provide data on stream habitat quality as well as potential sources and/or causes of impairment.

6.1 RAPID BIOASSESSMENT PROTOCOL I—Benthic Macroinvertebrates

Rapid Bioassessment Protocol I (RBP I) is a screening or reconnaissance assessment that involves systematic documentation of specific visual observations made in the field by a trained professional. RBP I is used to discriminate obviously impacted and non-impacted areas from potentially affected areas requiring further investigation. Use of RBP I allows rapid screening of a large number of sites. Areas identified for further study can then be rigorously evaluated using RBPs II, III, and V; quantitative fish or benthic surveys; or ambient toxicity studies.

Because RBP I involves limited data generation, its effectiveness depends largely on the experience ("best professional judgment") of the professional biologist performing the assessment. The biologist conducting RBP I should have professional impact assessment experience with a knowledge of aquatic ecology and basic expertise in benthic macroinvertebrate taxonomy.

6.1.1 Field Methods

The biosurvey component of RBP I focuses on qualitative sampling of benthic macroinvertebrates, supplemented by a preliminary field examination of other aquatic biota (periphyton, macrophytes, slimes, and fish). Qualitative benthic samples are collected from all available habitats using a dip net or kick net, or by hand. Benthic macroinvertebrate orders/families (e.g., families for Megaloptera and Diptera) collected are listed on the Biosurvey Field Data Sheet (Figure 6.1-1), with an estimate of their relative abundance in the sampling area. Each State agency should develop its own definitions for abundance categories. Lower levels of identification, if they are easily determined, can enhance the assessment. Any observations on the relative abundance of other aquatic biota are also noted; these observations provide additional information on the presence or absence of impact.

6.1.2 Data Analysis Techniques

Impairment may be indicated by the absence of generally pollution-sensitive benthic macroinvertebrate taxa such as Ephemeroptera, Plecoptera, and Trichoptera (EPT); dominance of generally pollution-tolerant groups such as Oligochaeta or Chironomidae; or overall low benthic abundance or taxa richness. Benthic abundance or taxa richness indicative of impairment is variable and must be evaluated with respect to the waterbody being evaluated. Some headwater streams are naturally unproductive and will be characterized by low benthic abundance and taxa richness in their pristine state. Impairment may also be indicated by an overabundance of slimes or filamentous algae in the area or an absence of expected fish populations.

On the basis of the observations made on habitat, water quality, physical characteristics, and the qualitative biosurvey, the investigator determines whether impairment is detected. The determination of impairment requires the judgment of an *experienced professional*. If impairment is detected, the investigator provides an estimation of the probable cause and source on the Impairment Assessment Sheet (Figure 6.1-2). The aquatic biota that indicated an impair-

IMPAIRMENT ASSESSMENT SHEET

1. Detection of impairment: Impairment detected (Complete items 2-6) No impairment detected (Stop here)

2. Biological impairment indicator:

Benthic macroinvertebrates	Other aquatic communities
____ absence of EPT taxa	____ Periphyton
____ dominance of tolerant groups	____ filamentous
____ low benthic abundance	____ other
____ low taxa richness	____ Macrophytes
____ other	____ Slimes
	____ Fish

3. Brief description of problem: _____

Year and date of previous surveys: _____

Survey data available in: _____

4. Cause: (indicate major cause) organic enrichment toxicants flow habitat limitations other _____

5. Estimated areal extent of problem (m^2) and length of stream reach affected (m), where applicable: _____

6. Suspected source(s) of problem:

____ point source discharge (name, type of facility, location)
____ construction site runoff
____ combined sewer outfall
____ silviculture runoff
____ animal feedlot
____ agricultural runoff
____ urban runoff
____ ground water
____ other
____ unknown

Briefly explain:

Figure 6.1-2. Impairment Assessment Sheet for use with macroinvertebrate Rapid Bioassessment Protocols.

Kick net sampling in riffle area.

The CPOM sample is processed separately from the riffle/run sample and used only for characterizing the Functional Feeding Group representation. Sampling the CPOM component requires a composite collection of various plant parts such as leaves, needles, twigs, bark, or their fragments. Potential sample sources include leaf packs, shorezones, and other depositional areas where CPOM may accumulate. Only the upper surface of litter accumulation in depositional areas should be sampled to ensure that they are from the aerobic zone. For the Shredder community analysis, several handfuls of material should be adequate. A variety of CPOM forms should be collected if available. CPOM collected may be washed in a dip net or a sieve bucket.

Shredder abundance is maximum when the CPOM is about 50 percent decomposed (Cummins et al. 1989). Care must be taken to *avoid* collecting recent or fully decomposed leaf litter to optimize collection of the Shredder community. For this CPOM collection technique, seasonality may have an important influence on Shredder abundance data. For instance, fast-processing litter (e.g., basswood, alder, maples, birch) would have the highest Shredder representation in the winter (Cummins et al. 1989). The slow-processing litter (e.g., oaks, rhododendrons, beech, conifers) would have the highest Shredder representation in the summer.

6.2.1.2 Sample Sorting and Identification

Riffle/Run Sample

Sorting and enumeration in the field to obtain a 100-count organism subsample is recommended for the riffle/run sample. After processing in the field, the organisms and sample residue should be preserved for archiving. Thus, a re-analysis (quality control) or more thorough processing (e.g., larger counts, more detailed taxonomy) would be possible. The subsampling method described in this protocol is based on Hilsenhoff's Improved Biotic Index (Hilsenhoff 1987b) and is similar to that used by New York DEC (Bode 1988). This subsampling technique provides for a consistent unit of effort and a representative estimate of the benthic fauna.

The subsampling procedure consists of evenly distributing the composite sample into a gridded pan with a light colored bottom. Grids are randomly selected and all organisms within those grids are removed until approximately 100 organisms are picked out. Because this subsampling technique is being applied to samples with live organisms, narcotization using club soda or tobacco is recommended. A more detailed description of this technique may be found in Appendix B.

An alternative method of subsampling live samples in the field is to simply sort 100 organisms in a random manner. Narcotization to slow the organisms is less important with this subsampling technique. To lessen sampling bias, the investigator should pick smaller, cryptic organisms, as well as the larger, more obvious organisms.

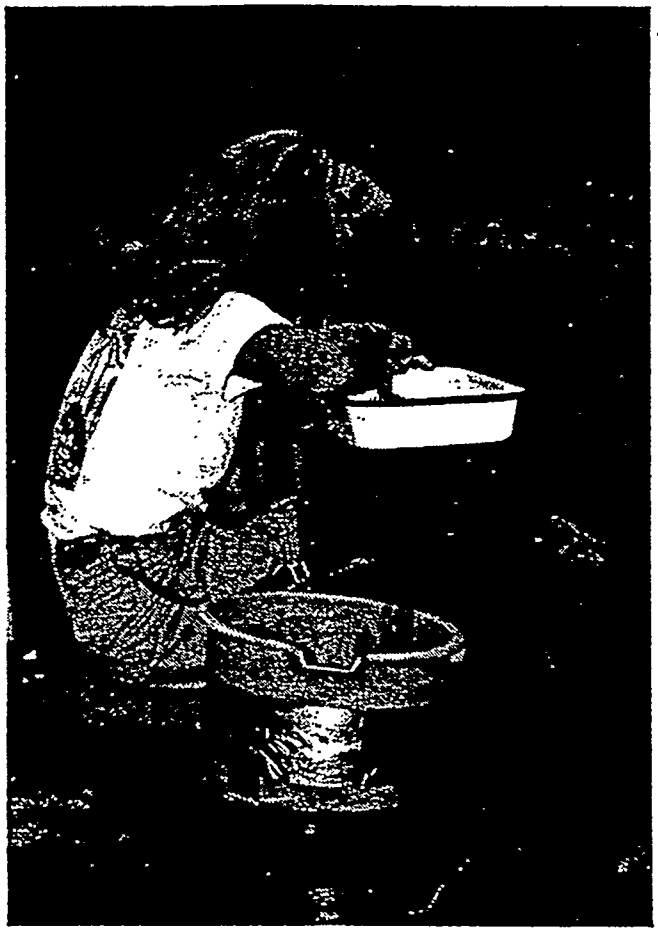
All organisms in the subsample should be classified according to Functional Feeding Group. Field classification is important because many families comprise genera and species representing a variety of functional groups. Knowing the family-level identification of the organisms will generally be insufficient for categorization by Functional Feeding Group. Functional Feeding Group classification can be done in the field, on the basis of morphological and behavioral features, using Cummins and Wilzbach (1985). Care should be taken in noting early instars, which may constitute different Functional Feeding Groups from the later instars.

The Scraper and Filtering Collector Functional Groups are the most important indicators in the riffle/run community. Numbers of individuals representing each of these two groups are recorded on the Biosurvey Field Data Sheet (Figure 6.2-1). All organisms in the subsample should be identified to family or order, enumerated, and recorded, along with any observations on abundance of other aquatic biota, on the Biosurvey Field Data Sheet. A summary of all benthic data to be used in the final analysis will be recorded on the Data Summary Sheet (Figure 6.2-2) upon return to the laboratory.

The use of family-level identification in this protocol is based on Hilsenhoff's Family Biotic Index which uses higher taxonomic levels of identification (Hilsenhoff 1988). Tolerance characterizations for the Family Biotic Index (FBI) and excerpts from Hilsenhoff's paper describing the index are included in Appendix C. Assessment based on family-level identifications has been used successfully by the States of Virginia and Illinois.

CPOM Sample

Organisms collected in the supplemental CPOM sample are classified as Shredders or Non-Shredders. Taxonomic identification is not necessary for this component. The composited CPOM sample may be field sorted in a small pan with a light colored bottom or in the net or sieve through which it was rinsed. (If a large number of benthic macroinvertebrates have been collected, a representative subsampling of 20–60 organisms may be removed for Functional Feeding Group classification.) Numbers of individuals representing the Shredder Functional Group, as well



Field sorting of benthic macroinvertebrate samples for Rapid Bioassessment Protocol II.

TABLE 6.2-1 CRITERIA[a] FOR CHARACTERIZATION OF BIOLOGICAL CONDITION FOR RAPID BIOASSESSMENT PROTOCOL II

Metric	Biological Condition		
	Non-Impaired	Moderately Impaired	Severely Impaired
1. Taxa Richness	Comparable to the best situation to be expected within an ecoregion. Balanced trophic structure. Optimum community structure (composition and dominance) for stream size and habitat quality.	Fewer taxa due to loss of most intolerant forms. Reduction in EPT index.	Few taxa present. If high densities of organisms, then dominated by one or two taxa. Only tolerant organisms present.
2. Family Biotic Index (modified)			
3. Ratio of Scrapers/Filtering Collectors[b]			
4. Ratio of EPT and Chironomid Abundances			
5. % Contribution of Dominant Family			
6. EPT Index			
7. Community Similarity Index[c]			
8. Ratio of Shredders/Total[b]			

(a) Scoring criteria are generally based on percent comparability to the reference station.
(b) Determination of Functional Feeding Group is independent of taxonomic grouping.
(c) Community Similarity Indices are used in comparison to a reference station.

Riffle/Run Sample

Metric 1. Taxa Richness

Reflects health of the community through a measurement of the variety of taxa (total number of families) present. Generally increases with increasing water quality, habitat diversity, and habitat suitability. Sampling of highly similar habitats will reduce the variability in this metric attributable to factors such as current speed and substrate type. Some pristine headwater streams may be naturally unproductive, supporting only a very limited number of taxa. In these situations, organic enrichment may result in an increased number of taxa (including EPT taxa).

Metric 2. Modified Family Biotic Index

Tolerance values range from 0 to 10 for families and increase as water quality decreases. The index was developed by Hilsenhoff (Hilsenhoff 1988) to summarize the various tolerances of the benthic arthropod community with a single value. The Modified Family Biotic Index was developed to detect organic pollution and is based on the original species-level index (Hilsenhoff 1982). Tolerance values for each family were developed by weighting species according to their relative abundance in the State of Wisconsin.

The family-level index has been modified for this document to include organisms other than just arthropods using the genus and species-level biotic index developed by the State of New York (Bode 1988). The formula for calculating the Family Biotic Index is:

$$FBI = \Sigma \frac{x_i t_i}{n}$$

where

x_i = number of individuals within a taxon

t_i = tolerance value of a taxon

n = total number of organisms in the sample

Hilsenhoff's family-level *tolerance values may require modification for some regions.* Alternative tolerance classifications and biotic indices have been developed by some State agencies (Appendix C). Additional biotic indices are listed in U.S. EPA (1983).

Although the FBI may be applicable for toxic pollutants, it has only been evaluated for organic pollutants. The State of Wisconsin is conducting a study to evaluate the ability of Hilsenhoff's index to detect non-organic effects.

Metric 3. Ratio of Scraper and Filtering Collector Functional Feeding Groups

The Scraper and Filtering Collector metric reflects the riffle/run community food-base. When compared to a reference site, shifts in the dominance of a particular feeding type indicate a community responding to an overabundance of a particular food source. The predominant feeding strategy reflects the type of impact detected. Assignment of individuals to Functional Feeding Groups is independent of taxonomy, with some families representing several functional groups.

A description of the Functional Feeding Group concept can be found in Cummins (1973) and Merritt and Cummins (1984). Functional Feeding Group designations for most aquatic insect families may be found in Merritt and Cummins (1984). Most aquatic insects can also be classified to Functional Feeding Group in the field, on the basis of morphological and behavioral features, using Cummins and Wilzbach (1985).

The relative abundance of Scrapers and Filtering Collectors in the riffle/run habitat is an indication of the periphyton community composition, availability of suspended Fine Particulate Organic Material (FPOM), and availability of attachment sites for filtering. Scrapers increase with increased diatom abundance and decrease as filamentous algae and aquatic mosses (which scrapers cannot efficiently harvest) increase. However, filamentous algae and aquatic mosses provide good attachment sites for Filtering Collectors, and the organic enrichment often responsible for overabundance of filamentous algae can also provide FPOM that is utilized by the Filterers.

Filtering Collectors are also sensitive to toxicants bound to fine particles and should be the first group to decrease when exposed

- Community Loss Index—Measures the loss of benthic taxa between a reference station and the station of comparison. The Community Loss Index was developed by Courtemanch and Davies (1987) and is an index of compositional dissimilarity, with values increasing as the degree of dissimilarity with the reference station increases. Values range from 0 to "infinity." Based on preliminary data analysis, this index provides greater discrimination than either of the following two community similarity indices.

- Jaccard Coefficient of Community Similarity—Measures the degree of similarity in taxonomic composition between two stations in terms of taxon presence or absence. The Jaccard Coefficient discriminates between highly similar collections. Coefficient values, ranging from 0 to 1.0, increase as the degree of similarity with the reference station increases. See Jaccard (1912), Boesch (1977), and U.S. EPA (1983) for more detail. The formulae for the Community Loss Index and the Jaccard Coefficient are

$$\text{Community Loss} = \frac{d-a}{e}$$

$$\text{Jaccard Coefficient} = \frac{a}{a+b+c}$$

where

a = number of taxa common to both samples
b = number of taxa present in Sample B but not A
c = number of taxa present in Sample A but not B
d = total number of taxa present in Sample A
e = total number of taxa present in Sample B

Sample A = reference station (or mean of reference database)
Sample B = station of comparison

- Pinkham and Pearson Community Similarity Index—Incorporates abundance and compositional information and can be calculated with either percentages or numbers. A weighting factor can be added that assigns more significance to dominant taxa. See Pinkham and Pearson (1976) and U.S. EPA (1983) for more detail. The formula is

$$S.I._{ab} = \sum \frac{\min (x_{ia}, x_{ib})}{\max (x_{ia}, x_{ib})} \left[\frac{x_{ia}}{x_a} \cdot \frac{x_{ib}}{x_b} / 2 \right]$$

weighting factor

where

x_{ia}, x_{ib} = number of individuals in the i^{th} taxon in Sample A or B

Other community similarity indices suggested by reviewers of this document include Spearman's Rank Correlation (Snedecor and Cochran 1967), Morisita's Index (Morisita 1959), Biotic Condition Index (Winget and Mangum 1979), and Bray-Curtis Index (Bray and Curtis 1957, Whittaker 1952). Calculation of a chi-square "goodness of fit" (Cochran 1952) may also be appropriate.

CPOM Sample

Metric 8. Ratio of Shredder Functional Feeding Group and Total Number of Individuals Collected

Also based on the Functional Feeding Group concept, the abundance of the Shredder Functional Group relative to the abundance of all other Functional Groups allows evaluation of potential impairment as indicated by the CPOM-based Shredder community. Shredders are sensitive to riparian zone impacts and are particularly good indicators of toxic effects when the toxicants involved are readily adsorbed to the CPOM and either affect microbial communities colonizing the CPOM or the Shredders directly (Cummins 1987, personal communication).

The degree of toxicant effects on Shredders versus Filterers depends on the nature of the toxicants and the organic particle adsorption efficiency. Generally, as the size of the particle decreases, the adsorption efficiency increases as a function of the increased surface to volume ratio (Hargrove 1972). Because water-borne toxicants are readily adsorbed to FPOM, toxicants of a