

State of New Jersey  
Christine Todd Whitman, Governor

**AMBIENT BIOMONITORING NETWORK**  
**Watershed Management Areas 1, 2, and 11**  
**Upper Delaware Region**  
**1998 Benthic Macroinvertebrate Data**



New Jersey Department of Environmental Protection  
Robert C. Shinn, JR., Commissioner

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December 1999

# **AMBIENT BIOMONITORING NETWORK**

## **Watershed Management Areas 1, 2, and 11**

### **Upper Delaware Region**

### **1998 Benthic Macroinvertebrate Data**

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# **Ambient Biomonitoring Network Watershed Management Areas 1, 2, and 11**

## **Upper Delaware Region**

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#### **INTRODUCTION**

##### **Historical Perspective**

Since the early 1970s the New Jersey Department of Environmental Protection (NJDEP) has conducted biological monitoring of the state's water bodies. These biomonitoring studies, currently conducted by the Bureau of Freshwater and Biological Monitoring (BFWM), have included both long-term ambient monitoring and short-term intensive surveys. The information gathered contributes significantly to State water quality management and pollution mitigation efforts. The United States Environmental Protection Agency (USEPA) has recognized that a thorough program of monitoring aquatic biota can be a cost-efficient means of gauging the quality of water and watershed areas [1, 2]. Because flora and fauna of various trophic levels can integrate the effects of water quality or habitat changes over time, they become very effective pollution indicators. For lotic (running water) systems, analysis of benthic macroinvertebrate communities provides the principal means of achieving this, particularly since macroinvertebrates are more stationary than fish, and less temporal than periphytic, or attached microscopic communities.

New Jersey's initial long-term ambient biological stream monitoring program, in the mid 1970s, included only a limited number (31) of "fixed stations," many of which proved later to be either inaccessible or in degraded condition. In 1991, however, the BFWM received numerous requests from the Office of Regulatory Policy to reinstate or upgrade long-term monitoring of benthic macroinvertebrate communities; the data obtained would be most beneficial in the generation of the 305b (Water Quality Inventory) biennial report [3], in the updating the 303d List (of water quality limited stream segments). Thus, the present Ambient Biomonitoring Network (AMNET) program was developed to provide NJDEP with the greater resolution of baseline data now necessary to support sound policy decisions in water quality/watershed management, and to direct regulatory, or "permit," activities. Initiated in 1992, AMNET samples over 800 stream sites statewide, with approximately 200 sites in each of five major drainage basins (upper and lower Delaware, greater Passaic, Raritan and Atlantic) once every five years. This ambitious project is facilitated by the use of Rapid Bioassessment Protocol II (RBPII) methods, devised by the USEPA, which provide an expedient tool for site ranking, screening and trend monitoring [2]. The present report, on the upper Delaware River basin, marks the start of the second round of AMNET.

## **Rationale for Biological Monitoring**

Biological monitoring, as referenced in this report, pertains to the collection and analysis of stream macroinvertebrate communities as indicators of water or habitat quality. Macroinvertebrates are larger-than-microscopic, primarily benthic (bottom-dwelling) fauna, which are generally ubiquitous in freshwater and estuarine environments, and play an integral role in the aquatic food web. Insects (largely immature forms) are especially characteristic of freshwaters; other major groups include worms, mollusks (snails, clams) and crustaceans (scuds, shrimp, water fleas, etc.). They are more readily collected and quantified than either fish or periphyton communities. Species comprising the in-stream community occupy various niches, based on functional adaptation or feeding mode (e.g. predators, filter or detritus feeders, scavengers); their presence and relative abundance is governed by environmental conditions (which may determine available food supply), and by pollution tolerance levels of the respective species. The overall community thus is holistically reflective of conditions in its environment. Assessments of ambient water and habitat quality can then be made based upon standardized procedures, which can show perturbations measured as changes or differences in community structure [2, 4].

## **STUDY DESIGN**

### **Data Quality Objectives**

The major goal of AMNET is to establish a network of stream sites that would adequately represent New Jersey's major drainage basins and NJDEP's Watershed Management Areas (WMA). Twenty WMAs have recently been delineated within New Jersey's five basins. Each basin constitutes a "Water Region." Within each WMA are several sub-basins, delineated by the United States Geological Survey (USGS) as "hydrologic units," scale 11 (HUC11). The study area of the present report includes WMAs 1, 2, and 11 (see Maps 1 – 7). The sampling frequency reflects a realistic temporal lag between cessation of an environmental perturbation and recovery of the impacted biological community. The 305b Water Quality Inventory [3], which reexamines changes in New Jersey's stream systems on a two-year cycle, has indicated that five years is an optimum period for long-term biomonitoring. An ample network of stations is required for the creation of a long-term database, which in turn, is necessary for trend analysis and operation of water quality predictive models.

Another program goal is to monitor a complete basin's complement of stations within a fiscal year (beginning July 1), giving our modelers and planners a snapshot of ambient biological impacts during that particular year. Monitoring will be rotated to a different basin each new fiscal year.

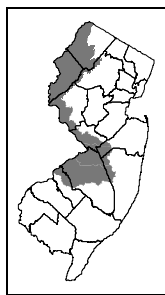
The spatial distribution of stations is adequate to provide biological impact data on a long-term, basin-wide or statewide scale. It is likely not sufficient, however, to assess the biological impact(s) of any one point source of pollution, as this would be better served by a site-specific or intensive survey of the stream segment in question.

Biological monitoring cannot replace chemical monitoring, toxicity testing, and other standard environmental measurements. Each of these tools provides the analyst with specific information available only through its respective methodology.

## Site Selection

For the first round of AMNET, a total of 192 stations had been established in the upper Delaware basin from 1992–1993 [5]. This area (shown in Figure 1) included all sub-basins that drain to the Delaware River from its upper tidal portion at Cooper River (Camden County) northward to Clove Brook near the New Jersey/New York border (Sussex County). On the smallest tributaries, sampling sites were located as closely as to headwaters as practical. To ensure enough flow for sampling, sites on "first-order" streams were situated at least three miles downstream of headwaters (first order streams are those with no tributaries). Since most streams at this level have very little, or only intermittent, flow, most of our sites were situated on second-order streams (with only first-order streams as tributaries) and higher (with a greater hierarchy of tributaries). All sites were located in reasonably accessible and primarily wadable segments, proceeding downstream to just above the confluence with the Delaware River. The Delaware River main stem was not monitored, since this was presumably being done by the Delaware River Basin Commission (DRBC).

For the second round of AMNET (FY98), the original study area was divided into two segments in conformance with the boundary between the newly established Water Regions. The lower portion (WMA #19 & 20), which drains to the upper tidal Delaware River, was deleted from the present study, and the results of that study are to be included as a separate supplemental report. In the Upper Delaware Region (WMA #1 & 11), seven new sites were added and one site was relocated for better access; also, the Wallkill River drainage basin (WMA 2) and its 16 AMNET sites, plus one new site, were included (Figure 2). During the initial AMNET survey in 1993, the Wallkill sub-basin had been included with the greater Passaic, or northeast basin [6]. These additions brought the total number of sampling sites in the Upper Delaware Region to 142, although three of these (AN013, 023, 034) were not sampled due to low flow conditions.



**Figure 1**

Map of 1992 – '93 study area

To maximize data correlation, AMNET, wherever possible, incorporated existing stations of the ambient Surface Water Chemical Monitoring Network, which is administered jointly by NJDEP and the USGS [7]. Furthermore, so as to gauge the effects of major tributaries and larger lakes, many AMNET sites were located near their confluence or outlet. Also considered when selecting sites were known sources of contamination (e.g. point-source discharges, agricultural operations) and significant natural features such as wetlands, parks or wildlife management areas.



**Figure 2**

Map of 1997 – '98 study area

Exact AMNET site locations were determined via the Global Positioning System (GPS) using Trimble Pathfinder units and the appropriate correction sources utilized by NJDEP. All positions were logged into the Geographical Information System (GIS) (see Maps 1 – 7, Appendix A).

## FIELD & LABORATORY METHODS

Benthic macroinvertebrate sampling and analyses were performed in accordance with the NJDEP Field Procedures Manual [8], Rapid Bioassessment (RBP) Protocol II guidelines of the USEPA [2] and Standard Operating Procedures (SOP) of the BFWM Aquatic Biomonitoring Laboratory [9].

## **Field Collection**

Because the low gradient of the southern regions precludes streams from having dominant riffle areas (the preferred sampling habitat) we modified the RBP field methods for New Jersey streams by collecting multi-habitat sampling. This type of sampling includes both riffle and run areas, with various types of substrate (e.g. fine sediment, gravel/rocks, woody debris, stream and bank vegetation), plus coarse particulate matter or leaf litter (CPOM). This would minimize habitat or substrate variation between stations, and include all likely functional groups of macroinvertebrates. Samples were collected in semi-quantitative fashion either with a Surber Sampler, kick net, Petite Ponar dredge, or by hand picking. During the field investigation, semi-qualitative observations of habitat, surrounding land use, potential pollution sources, and other aquatic biota were recorded, although these did not figure into the final numerical rating. At each site, the entire sample was sieved through a standard #30 mesh device, put into wide-mouth glass jars, and preserved with 5 to 10% formalin (to 20% in cases of excessive organic loading).

## **Sample Sorting & Identification**

In the laboratory, subsamples of 100 individuals were taken by first evenly distributing the composited sample on a grid in a light-colored pan, then removing all organisms from randomly-selected grids until a total of at least 100 organisms was obtained. The macroinvertebrates were identified to species (where possible), or at least to family level, and counted using 7 to 30X stereozoom and 40 to 400X compound magnification. A comprehensive collection of taxonomic keys and other references, including functional (or niche) descriptions and pollution tolerance classifications for most species, is maintained in the laboratory. An indexed list of these is given in the Laboratory SOP [9]. Consultation with other scientists in the field provides added assistance and confirmation, when needed.

## **DATA ANALYSIS**

Biological impairment may be caused by several major factors such as organic enrichment, habitat degradation, or toxicological effects. It may be manifested in several aspects of the benthic macroinvertebrate community; these include absence of pollution-sensitive taxa, especially the EPT group, i.e. Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies); in excessive dominance of pollution-tolerant taxa such as Chironomidae (midges) and Oligochaeta (worms); in low overall taxa numbers, or with other perceptible differences in community structure relative to a reference condition.

## Benthic Community Analysis

The data analysis is an important part of the RBP protocol, developed under USEPA auspices as an expedient and cost-effective monitoring tool. It recognizes a multiple approach, utilizing several "biometrics," that measure different components of community structure, including population and functional parameters, each with a different range of sensitivity to pollution stresses [2, 4]. The use of a variety of biometrics assures a more robust or valid assessment; therefore, an anomaly in any one metric is less likely to invalidate the study findings. The results are integrated through common scoring criteria, derived from an established comparable database, to determine a final numerical rating and consequent biological condition category (see Table 1). This provides the analyst with an easily communicated evaluation of relative impairment, referred to in this report as the "bioassessment rating." For RBP II protocols, results are based on 100 organism sub-samples, and scoring criteria are validated for family level taxonomy, giving three final rating categories (non-impaired, moderately impaired, and severely impaired).

The biometrics we employ are modified from RBP II methods, having been statistically validated for New Jersey based upon data from 200 stream sites throughout the state [10]. The final numerical rating is referred to as the "New Jersey impairment score" (NJIS). The scoring criteria and rating categories are presented in Table 1. The metrics from which the NJIS is derived are explained below:

1. **Total Taxa or Taxa Richness** (# families) — an index of community diversity; the number usually increases with increasing water or habitat quality.
2. **Percent Contribution of the Dominant Family** (to the total # families) — dominance by relatively few species/families would indicate environmental stress.
3. **# EPT Families** — the number of families represented within the orders Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies), which are generally pollution-sensitive.
4. **Percent EPT** (of the total # individuals) — would increase with increasing water quality.
5. **Hilsenhoff (Family) Biotic Index** — tolerance values of 0 - 10 assigned to individual families increase as water quality decreases; summarizes the overall pollution tolerance of the entire benthic macroinvertebrate community with a single value.

## Comparison with 1992 — 1993 Results

In evaluating the 1997–1998 upper Delaware data against that for 1992–1993, a significant improvement or decline was considered to have occurred when the score (NJIS) changed the bioassessment rating. A complete list of site-by-site comparisons is presented in Table 2, where a (+) indicates a significant improvement, a (-) indicates a significant decline, and a (/) indicates no change in rating; a slash may have a (+) or a (-) indicating that the score improved or declined, but the bioassessment rating did not.

## **Morphological Abnormalities**

Occasionally, morphological abnormalities have been found in individual macroinvertebrates recovered in our AMNET collections. These deformities have been most readily detected in the Chironomidae (midges), where they occur primarily in the head appendages (antennae) and mouth parts (mentum and mandibles). While the incidence has been most frequent in the chironomids, especially those species categorized as detritivores, herbivores or periphyton feeders, abnormalities have also been observed in individuals of other taxonomic groups. Although this is not a factor in the NJIS data analysis, such features are noted, as they may signify possible contaminants or stressful conditions in the respective drainages.

In the course of identification, chironomid larvae were examined for abnormalities. These results are summarized by sample site in Table 3. For chironomidae, the data is displayed as (# of chironomids with abnormalities / # of chironomids examined). For all other taxa, just the number of individuals with abnormalities is presented. Deformities found in greater than five percent (> 5%) of chironomids examined were considered to be significant (personal communication — R. Bode, New York Department of Environmental Conservation; J. Kurtz, NJDEP). Abnormalities were considered to be "chronic" at a particular station if that site yielded > 5% abnormalities for both the 1992-1993 and 1997-1998 sampling periods (see Table 3). Photographic examples of abnormalities in midge larvae and amphipods (scuds), plus maps of the sites where these were found, are contained in Appendix B. AMNET sites found with significant and chronic abnormalities in chironomids are also indicated in Maps 1-7.

## **SUPPLEMENTAL ANALYSIS / EVALUATION**

### **Habitat Assessment**

The physical attributes of habitat play an integral role in the health of the macroinvertebrate community. Where stations are physically comparable, detected impacts can be attributed to water quality factors; however, habitat degradation alone can account for biological impairment in a stream [2]. Parameters we evaluated included in-stream substrate, channel morphology, bank structural features, and riparian vegetation. The area evaluated included the sample site and its immediate surroundings (usually within a 100 – 200 foot radius).

The qualitative habitat assessment involves four condition categories, rating each parameter as optimal, suboptimal, marginal or poor based on recently revised USEPA criteria [11]. Habitat assessments may be temporarily downgraded by adverse weather conditions, such as excessive rainfall or prolonged drought (which existed during this study period). It should also be noted that habitat assessments are performed independently of the macroinvertebrate community analysis; thus they do not factor into the final impairment score, but are used primarily as supplementary information. For each parameter, the range of conditions and the numerical rating scale are presented for high and low gradient streams, respectively, in Table 4. Comparisons of these final scores against the respective NJIS scores and relative trends, are shown in **Appendix C**.



All streams in the northern portion of New Jersey, i.e. the Piedmont, Valley/Ridge and Highlands regions, are considered to be “high gradient” streams, having substrates of rock and cobble of various sizes, and with relatively swift flow. Those in the Coastal Plain region of southern New Jersey are considered as “low gradient” streams, having slower flow and more homogeneous substrates, primarily of sand or gravel and finer sediments. These major physiographic subregions are illustrated in the New Jersey State EcoMap [12]. The transition from high gradient to low gradient is marked by the “Fall Line,” a geologic/topographic feature that bisects New Jersey in a southwest–northeasterly direction from the Delaware River at Trenton through the lower Raritan River near New Brunswick. The trajectory of the Fall Line is superficially traced by the lower Assunpink Creek at the southwest juncture (see Map # 6), and its alignment with Lawrence Brook to the northeast in the Raritan River drainage. Administratively, the Assunpink sub-basin forms the southern boundary of the Upper Delaware Water Region, the area of the present study, with terrain principally of high gradient.

### **Sediment Toxicity Testing**

To supplement the results of the benthic macroinvertebrate sampling, the BFWM from 1996 to 1998 performed acute sediment toxicity tests on several AMNET sites that exhibited “severely impaired” biological conditions in the earlier upper Delaware survey. The methods conformed to standardized USEPA protocols as reflected in our laboratory Standard Operating Procedures [9]. The amphipod, *Hyalella azteca*, was used as the test organism in the 10-day tests that measured effects on both survival and growth. Results from the test sites were compared to the responses observed in reference sediment from non-impaired AMNET sites that were similar in morphology or habitat features. One site in Warren County (AN0042, Map 3), found to be severely impaired in the 1992–1993 sampling, was tested. The test site and corresponding reference site is as follows:

<b>Test Site</b>	<b>Reference Site Used</b>
AN0042 Furnace Brook	AN0045 Beaver Bk

## RESULTS AND DISCUSSION

Overall, bioassessment ratings developed for each of the monitoring stations were used as the basis for evaluating the degree of biological impairment within the coincident stream segments. The estimated bioassessment ratings for each stream segment are presented as color-coded highlighted segments on the GIS maps # 1-7. In each WMA, starting from the AMNET station farthest downstream, estimated bioassessment ratings were assigned to the stream segments by interpolating from the downstream station to the next contiguous upstream station. These ratings are best estimates of the in-stream biological impairment based upon the available data. For any given segment, however, the actual in-situ conditions may vary due to unknown differences in habitat or sources of degradation. Detailed taxonomic and statistical data, bioassessment ratings, habitat assessment scores and observations, are given in Appendix D.

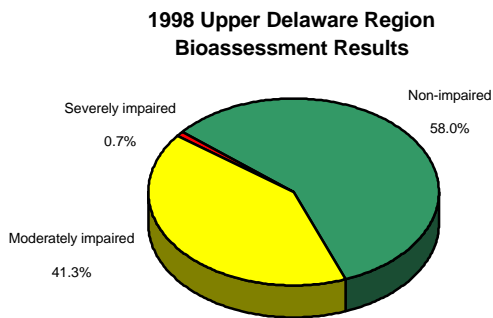


Figure 3

Overall, out of 139 monitoring stations sampled during this study period, 80 or **58%** were rated as **NON-IMPAIRED**, 57 or **41.3%** were rated as **MODERATELY IMPAIRED**, and one site (**0.7%**) was rated as **SEVERELY IMPAIRED** (see Figure 3).

For comparison, Figure 4 depicts the results of 127 monitoring sites within the same Watershed Management Areas that were sampled during the 1993 study period.

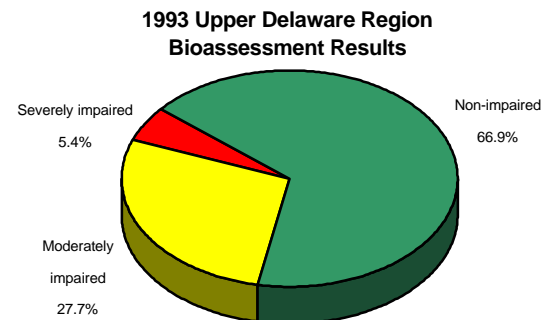


Figure 4

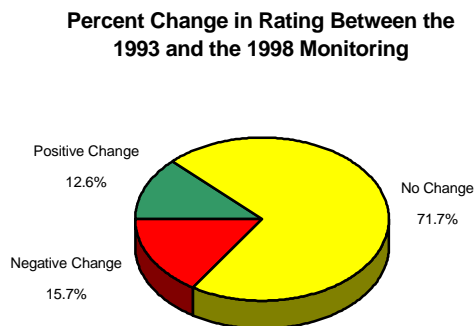


Figure 5

Figure 5 displays the percentage of change in rating that has occurred for the 127 sites that were sampled during both the 1993 and 1998 monitorings. The green indicates a positive change, yellow indicates no change, and red indicates a change for the worse (see Table 2). Notably, fewer severely impaired sites were found in 1998 than in 1993; however, the 1998 data also revealed more moderately impaired sites and fewer non-impaired sites (Figures 3 & 4).

In the upper Delaware Water Region, the majority of NJIS scores (58%) are high and fall within the "non-impaired" range; less than half are "moderately impaired" and only one site (AN0117) is rated as "severely impaired" (from Table 2 and Appendix D). The entire Upper Delaware Region is situated north of the "Fall Line" and superimposes on portions of the Ridge and Valley, Highlands, Reading Prong and Piedmont physiographic sub-regions [12]. Significantly, 52 of the 80 non-impaired sites (65%) are located within the Ridge and Valley and Reading Prong sub-regions in the northernmost sector of the Delaware drainage basin, which constitutes a major portion of WMA #1. This area features forested uplands and high gradient terrain. Of the moderately impaired sites, 35 of 57 (61.4%) are located within the Wallkill sub-basin (WMA #2), which drains northwestward to the Hudson River in New York and the Piedmont sub-region in the southern portion of the upper Delaware drainage (WMA #11). The latter two regions feature somewhat lower relief, with agricultural areas throughout and with greater urbanization (e.g. Trenton) in the southernmost portion. Thus, impacts of an anthropogenic nature are reflected in the biotic integrity of our stream systems. The Assunpink Creek drainage in WMA #11 constitutes the southern boundary of the Upper Delaware Water Region, and its main stem marks the "Fall Line" that separates this region from the low-gradient terrain of the Atlantic Coastal Plain.

### **Macroinvertebrate Abnormalities**

Locations of all AMNET sites yielding macroinvertebrate abnormalities are shown in Appendix B, while only those sites with "significant" (> 5% of the individuals examined) and "chronic" (> 5% in both 1992-1993 and 1997-1998) abnormalities are shown in Maps 1-7. In the current samples, 50 of the 138 AMNET sites in the Upper Delaware Water Region (36%) exhibited morphological abnormalities in at least one individual examined; 29 sites (21%) exhibited significant numbers of abnormalities (75%); only seven sites (5%) yielded chronic abnormalities. The occurrence of chronic abnormalities at a given site signifies the presence of chronic environmental stressor(s), possibly from toxicants, in the vicinity, therefore indicating that these areas should be more intensely investigated. Such locations found in the current upper Delaware AMNET sampling included three in the Pequest River and Musconetcong River/Pohatcong Creek sub-basins (Maps 3 and 4, WMA 1), and one in Moores Creek (Map 5, WMA 11).

### **Habitat Assessment vs. Biological Condition**

Habitat assessment scores and corresponding NJIS scores (Appendix D) for each station in the upper Delaware AMNET area are plotted along a spatial gradient, north to south/upstream to downstream, in Appendix C. In this scenario, paralleling of the trend lines, in some degree (which is seen in much of the data), would reflect a direct relationship or positive correlation between the two parameters. In the northernmost regions (WMA 1 and, to a lesser extent, WMA 2), spatial trends are seen to parallel each other closely, with both at high levels, thus reflecting favorable habitat and water quality. Southward from here (WMA 11), we see a rather abrupt decline in NJIS scores relative to habitat scores; therefore, the influence of other factors (e.g. physiochemical conditions) is indicated, as the more urban and agricultural areas are approached.

In a few situations, a non-impaired biological community was found where habitat appeared to be impaired. Conversely, in some cases of optimal habitat, an impaired biological community was found; therefore, water quality or other physiochemical factors likely were involved. Habitat assessments were not performed in the earlier (1992-1993) AMNET surveys [5, 6]; thus, no temporal comparisons could be made. Further assessments and statistical analyses relating habitats assessments to biological condition should be conducted in order to reveal possible trends and correlations.

## **Sediment Toxicity Test Results**

Acute toxicity, as measured by mortality, was not demonstrated in the test performed, as none of the survival responses observed were significantly different from those observed in the controls. Growth responses (average dry weights) also were not significantly different from those of the control, thus indicating no chronic effects in this regard over the 10-day test period. Since the test site results largely showed no significant difference from the control results, the severe impairment levels previously found were likely due to other causes, such as habitat alteration or various physiochemical factors. This also does not preclude the presence of toxic substances at low, but chronically toxic, levels undetectable by the present methodology, or which may have been introduced into the stream episodically, rather than continuously. Therefore, it is advisable based on these study results that supplemental sampling be performed for target analytes such as fertilizer nutrients (usually forms of nitrogen and phosphorus), pesticides, or other suspected toxic compounds.

## **Causes and Conditions of Impairment**

Biological impairment, as determined through RBP analysis, is manifested by alterations or differences in macroinvertebrate community structure, compared to a reference or "ideal" condition. In an impaired situation, species of pollution-tolerant groups (such as worms and midges) tend to dominate over pollution-intolerant forms (e.g. mayflies, stoneflies, etc.), with an overall depression in species diversity. Such discrepancies are typically due to degraded instream environmental conditions, which may be caused by various human activities or land-uses and, in some cases, by natural features or events. Environmental factors that may adversely affect stream biology, including both chemical and physical parameters, are listed below:

1. Lack of dissolved oxygen
2. Higher than normal temperature
3. Excessive turbidity
4. Presence of toxicants (in various chemical forms)
5. Eutrophication (= excessive nutrients promoting undesirable vegetation or algal blooms, and increased turbidity)
6. Degraded habitat (see Table 4)
  - a. lack of bank vegetation/canopy (= poor bank stability, lack of shade)
  - b. excessive sedimentation (= poor substrate and water clarity)
  - c. lack of streamflow (= low dissolved oxygen, possible sedimentation, undesirable vegetation)

Inter-related human activities or practices, land uses, and natural features or events contributing to degraded stream quality:

1. Deforestation/development/construction (largely via runoff from non-point sources)
2. Urbanization/industrialization (largely via runoff from non-point sources)
3. Agricultural operations (largely via runoff from non-point sources)
4. Municipal or industrial wastewater discharge (point source)
5. Artificial channelization or habitat alteration
6. Upstream impoundment, lake or pond
7. Drought conditions

As reflected in the present study results, human land uses and practices, superimposed on the physical terrain, play a major role in controlling the degree of pollution or degradation in a stream system.

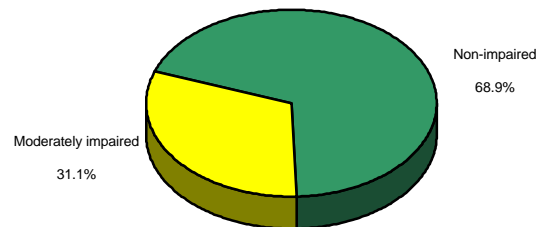
Levels of benthic community impairment (or lack of it) have been statistically related to different physiographic land types, corresponding land uses and other anthropogenic factors, on a statewide scale using data generated from the AMNET program [13].

The following section discusses observed impairment of AMNET sites within each Water Management Area of the Upper Delaware Water Region, and possible contributing factors.

## Evaluation by WMA

**Watershed Management Area #1** extends from Clove Brook in the northernmost corner of New Jersey, to the Musconetcong River, with a total of 74 AMNET sites sampled (see Maps 1, 2, 3, & 4). Figure 6 shows that the majority of the sites (68.9%) were rated as non-impaired while the remaining 31.1% were rated as moderately impaired. No sites were found to be severely impaired. A significant improvement over the earlier results was seen at seven sites, and a significant decline at eight sites (see Table 2). Figure 7 depicts the results of the 1993 survey for comparison. While the

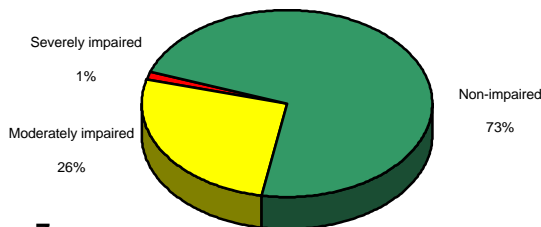
**Watershed Management Area 1  
1997 Bioassessment Results**



**Figure 6**

While the

**Watershed Management Area 1  
1993 Bioassessment Results**



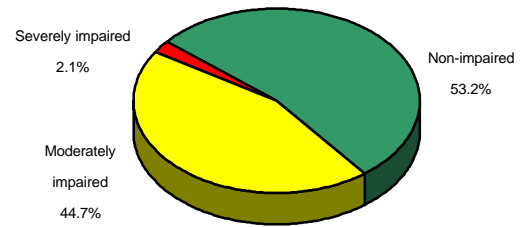
**Figure 7**

current samples, abnormalities in chironomid larvae were found to be chronic at eight sites (AN0039, AN0041, AN0045, AN0052, AN0055, AN0065, AN0070, and AN0072); eleven additional sites, although without chronic abnormalities, exhibited significant levels of abnormalities in both chironomid larvae and other invertebrates (see Table 3).

Musconetcong River drainage has exhibited a slight increase in NJIS scores over those of the earlier (1992, 93) study, WMA 1 is otherwise unchanged. Habitat scores are fairly evenly split between "optimal" and "suboptimal," indicating that physiochemical conditions are optimal, even where habitat is less than optimal. Overall, suboptimal habitat is a possible contributing factor in 72% of impaired sites; water quality or physiochemical conditions may be involved in 58% of impaired sites, including 8% from lakes situated upstream of the sampling site. In the

**Watershed Management Area #11** extends from Hakihokoke Creek in northern Hunterdon County to the Assunpink Creek in Trenton, with a total of 47 AMNET sites sampled (see Maps 5, & 6). Figure 8 shows that 53.2% of the sites were rated non-impaired, 44.7% were rated as moderately impaired, and only one site (2.1%) was rated as severely impaired. A significant improvement was seen at nine sites, and a significant decline at four sites (see Table 2). Figure 9 depicts the results of the earlier (1993) survey for comparison. increase in NJIS scores over those of the previous study, especially in the Assunpink Creek drainage.

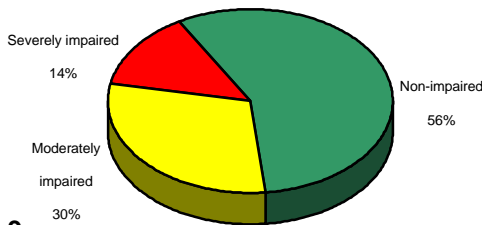
**Watershed Management Area 11  
1997 Bioassessment Results**



**Figure 8**

Overall, WMA #11 exhibited a slight degree of biological impairment in the Assunpink, however, is generally greater than in the smaller drainages to the north. Habitat scores from WMA #11 sites are favorable, except in the lower Assunpink creek (which flows through the urban Trenton area), thus it appears that physiochemical conditions are having the greater influence on impairment levels. Physiochemical conditions appear to be factors in 52% of impaired sites, and suboptimal habitat in 41%. Agriculture is a possible source of degraded (physiochemical or habitat) conditions

**Watershed Management Area 11  
1993 Bioassessment Results**

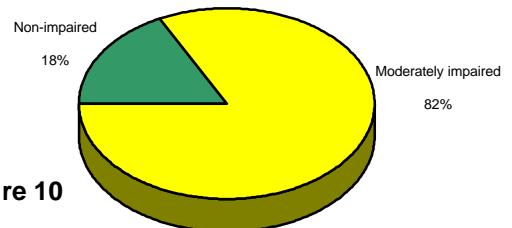


**Figure 9**

in 34% of impaired sites. In the current study, abnormalities in chironomid larvae were found to be chronic at three sites (AN0100, AN0106, and AN0113), while nine additional sites, although without chronic abnormalities, exhibited significant levels of abnormalities in chironomid larvae (see Table 3).

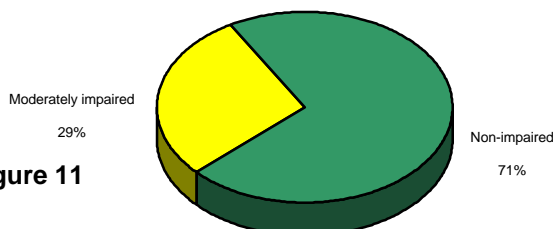
**Watershed Management Area #2** encompasses the Walkkill River and its tributaries, with 17 AMNET sites sampled (see Map 7). As shown in Figure 10, a non-impaired rating was given to 17.6% of the sites, while the remaining 82.4% were given a moderately impaired rating. No site was found to be severely impaired, yet no sites were found to be significantly improved. A significant decline was seen at eight sites (see Table 2). Figure 11 depicts the results of the 1993 survey for comparison. Since it was first studied under the AMNET program [6], there has been a general decline in NJIS scores in the Walkkill area. Biological impairment is largely attributed to physiochemical conditions, although suboptimal habitat may be a factor in 64% of impaired sites. Agriculture appears to be contributing to degraded conditions at 71% of impaired sites. No abnormalities in chironomid larvae or other invertebrates were found in WMA #2 during the current sampling period (see Table 3).

**Watershed Management Area 2  
1997 Bioassessment Results**



**Figure 10**

**Watershed Management Area 2  
1993 Bioassessment Results**



**Figure 11**

## REFERENCES

1. U.S. Environmental Protection Agency. 1977 and 1985. Basic water monitoring program. EPA 440/9-76-025. USEPA. Washington, D.C. 25 pp. and appendices.
2. Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross and R.M. Hughes, 1989. Rapid bioassessment protocols for use in streams and rivers—benthic macroinvertebrates and fish. EPA/44/4-89-002. US Environmental Protection Agency. Washington, D.C. 143pp. and appendices.
3. New Jersey Department of Environmental Protection. 1997. 1996 State water quality inventory report. Office of Land and Water Planning. Trenton, N.J. 468pp.
4. Klemm, D.J., P.A. Lewis, F. Fulk and J.M. Lazorchak. 1990. Macroinvertebrate field and laboratory methods for evaluating the biological integrity of surface waters. EPA/600/4-90/030. U.S. Environmental Protection Agency. Cincinnati, OH. 206pp. and appendices.
5. New Jersey Department of Environmental Protection. Data report, 1994. Ambient biomonitoring network, upper Delaware drainage basin. Bureau of Water Monitoring. Trenton. 8pp. and maps and appendices.
6. New Jersey Department of Environmental Protection. Data report, 1994. Ambient biomonitoring network, Arthur Kill, Passaic, Hackensack, and Wallkill River drainage basins. Bureau of Water Monitoring. Trenton, NJ. 10pp. and maps and appendices.
7. New Jersey Department of Environmental Protection. Data report, 1998. New Jersey's modernized ambient chemical monitoring network. Division of Watershed Management. Trenton. 12pp.
8. New Jersey Department of Environmental Protection. 1992. Field sampling procedures manual. NJDEP. Trenton, NJ 360pp.
9. New Jersey Department of Environmental Protection. Unpublished report, 1998. Standard operating procedures for the aquatic biomonitoring laboratory. Bureau of Freshwater & Biological Monitoring. Trenton.
10. Kurtenbach, J. 1990. A method for rapid bioassessment of streams in New Jersey using benthic macroinvertebrates. Bull. N. Am. Benth. Soc. 8(1):129.
11. Barbour, M.T., J. Gerritson, B.D. Snyder and J.B. Stribling. 1997. Revision to rapid bioassessment protocols for use in streams and rivers: periphyton, benthic macroinvertebrates, and fish. USEPA 841-D-97-002. Chp. 1-11 and appendices.
12. New Jersey Department of Environmental Protection. 1996. New Jersey State ECOMAP. State Forestry Services. Trenton.
13. U.S. Geological Survey. 1998. Relation of benthic macroinvertebrate community impairment to basin characteristics in New Jersey streams. Fact Sheet FS-057-98. USGS. West Trenton, NJ.

# TABLE 1

## BIOLOGICAL CRITERIA FOR SCREENING WATER QUALITY IN NEW JERSEY FRESHWATER STREAMS\*

### Scoring Criteria for Rapid Bioassessments<sup>1</sup>

Biometrics	6	3	0
Taxa Richness (total Families)	> 10	10-5	4-0
E+ P+ T Index <sup>2</sup> (EPT)	> 5	5-3	2-0
Percent Dominance <sup>3</sup> (%CDF)	< 40	40-60	> 60
Percent EPT <sup>4</sup> (%EPT)	> 35	35-10	< 10
Modified Family Biotic Index <sup>5</sup> (FBI)	< 5	5-7	> 7

NOTE: The previous AMNET reports (1994-1996) contained incorrect number ranges for Modified Family Biotic Index. Using the incorrect numbers could lower the biological assessment on 9% of the sites evaluated. The numbers now presented in this table are correct and scores from previous reports were calculated using these ranges. No incorrect biological assessments exist in the previous reports.

Biological Assessment	Total Score
Non-impaired	24-30
Moderately Impaired	9-21
Severely Impaired	0-6

### Attributes

**Non-impaired:** benthic community comparable to other undisturbed streams within the region; community characterized by a maximum taxa richness, balanced taxa groups, and good representation of intolerant individuals.

**Moderately Impaired:** macroinvertebrate richness reduced, in particular EPT taxa; reduced community balance and numbers of intolerant taxa.

**Severely Impaired:** benthic community dramatically different from those in less impaired situations; macroinvertebrates dominated by a few taxa, but with many individuals; only tolerant individuals present.

\*From Kurtenbach, 1991, based on RBP II protocols.  
<sup>1</sup> Follows RBP Protocol II; using 100 organism subsample, family level taxonomy  
<sup>2</sup> Ephemeroptera, Plecoptera, Trichoptera  
<sup>3</sup> % contribution of the dominant family  
<sup>4</sup> Including the hydropsychid family  
<sup>5</sup> Also known as the Hilsenhoff Biotic Index



**Table 2**

Comparative Scores / Ratings (see notes)

Watershed Management Areas 1, 2, and 11

Station	NJ Impairment Score		Change in Rating	Habitat Score		Station	NJ Impairment Score		Change in Rating	Habitat Score		Station	NJ Impairment Score		Change in Rating	Habitat Score
	92 / 93	97 / 98					92 / 93	97 / 98					92 / 93	97 / 98		
001	9	9	/	97		040	24	21	—	155		081	27	30	/+	165
002	18	21	/+	140		040A	-	18		162		082	30	30	/	171
003	30	24	/-	167		041	30	30	/	156		083	24	30	/+	148
004	30	30	/	194		042	0	21	+	98		084	21	21	/	144
005	27	30	/+	162		043	30	27	/-	148		085	24	18	—	136
005A	-	30		143		044	15	15	/	146		086	21	30	+	151
006	30	30	/	170		045	30	30	/	113		087	27	24	/-	146
007	30	30	/	184		046	30	24	/-	133		088	24	30	/+	148
008	30	30	/	177		047	27	30	/+	165		089	30	30	/	138
009	30	30	/	182		048	27	30	/+	163		090	9	15	/+	168
010	-	30		196		049	30	30	/	147		091	24	21	—	165
011	30	27	/-	183		050	30	30	/	159		092	21	21	/	163
012	30	30	/	163		051	30	30	/	156		093	27	9	—	170
013	-	-		-		052	27	24	/-	97		094	30	30	/	168
014	21	30	+	146		053	9	24	+	116		095	30	24	/-	168
015	18	15	/-	141		054	30	30	/	180		096	27	27	/	166
016	27	15	—	147		055	12	15	/+	133		097	24	24	/	166
017	18	24	+	107		056	30	30	/	147		098	30	30	/	166
018	18	18	/	105		057	21	21	/	121		099	21	18	/-	141
019	27	18	—	118		058	27	27	/	158		100	27	24	/-	144
020	24	-		-		059	15	30	+	156		101	18	27	+	166
021	30	30	/	171		060	30	30	/	146		102	24	27	/+	170
022	15	18	/+	168		061	30	24	/-	120		103	18	30	+	166
023	21	-		-		062	18	21	/+	124		104	9	18	/+	162
023A	-	30		186		063	18	30	+	170		105	30	24	/-	166
024	30	30	/	140		064	27	30	/+	181		106	24	24	/	140
025	30	27	/-	144		065	24	27	/+	177		107	24	24	/	145
026	24	27	/+	98		066	27	27	/	173		108	6	9	+	158
027	21	30	+	87		067	24	30	/+	107		109	24	9	—	167
028	30	30	/	182		068	24	21	—	123		109A	-	12		155
029	30	30	/	146		069	30	30	/	148		109B	-	15		152
030	15	21	/+	95		070	18	15	/-	165		110	6	12	+	147
031	30	30	/	142		071	27	30	/+	159		111	6	12	+	128
032	27	18	—	185		072	27	15	—	176		112	6	12	+	127
032A	-	30		155		073	24	30	/+	185		113	3	15	+	132
033	30	27	/-	155		074	30	27	/-	184		114	15	18	/+	121
034	30	-		-		075	30	30	/	174		115	12	15	/+	92
035	18	12	/-	127		076	30	30	/	176		115A	-	18		131
036	24	9	—	126		077	27	30	/+	85		116	15	15	/	122
037	30	30	/	164		078	30	30	/	171		117	0	6	/+	139
038	24	21	—	144		079	21	30	+	146		118	12	9	/-	104
039	27	27	/	149		080	30	30	/	180		294	30	21	—	164

NOTES:

Comparison of NJ impairment score with earlier study results:

- + indicates positive change in rating
- indicates negative change in rating
- / indicates no change in rating
- /+ or /- indicates change in score, but not in rating (see Table 1)

<u>NJ Impairment Score</u>	<u>Value</u>	<u>Habitat Score</u>	<u>Value</u>
Non-Impaired	24 - 30	Optimal	160 - 200
Moderately Impaired	9 - 21	Sub-optimal	110 - 159
Severely Impaired	0 - 6	Marginal	60 - 109
		Poor	< 60



**Table 3**

## Macroinvertebrate Abnormalities (see notes)

## Watershed Management Areas 1, 2, and 11

Station	1992 / 93	1997 / 98	Station	1992 / 93	1997 / 98	Station	1992 / 93	1997 / 98
003	2/12 *		085		3/54 *			
004		1/9 *	089		1/22			
007		1/26	091	3/30 *				
014		4/15 *	093		1/62			
019		1/8 *	096	1/16 *				
027		2/16 *	099		3/24 *			
028		1/11 + 1 *	100	2/31 *	3/22 *			
031		2/6 *	101		+ 1			
035		4/27 *	104		+ 3			
038		1/44	105		3/24 *			
039	3/15 *	4/11 *	106	1/30	4/18 + 1 *			
041	1/16 *	2/12 *	107	1/5 *				
042		3/9 + 10 *	109		+ 1			
043		1/30	109A		+ 3			
045	1/6 *	4/20 *	109B		1/15 *			
052	3/30 *	1/43	111		3/24 *			
054		1/13 *	112		2/21 *			
055	1/12 *	1/12 *	113	1/34	1/39			
057	2/28 *		114		1/33			
058		3/8 *	115		+ 1			
059	1/32		115A		1/26			
060	1/32		118		+ 13			
061		1/10 + 1 *	294	1/8 *				
062	3/24 *		302	1/10 *				
064	1/23	+ 1	305	1/9 *				
065	2/10 *	3/9 + 1 *	308	2/22 *				
066	4/19 *		309	1/45				
067		1/36						
068	1/3 *							
069	2/14 *	+ 1						
070	1/31	2/46						
072	1/14 *	2/29 + 2 *						
073		+ 1						
075		1/9 *						
076		1/25						
078		1/16 *						
079		1/13 *						
080		2/33 *						
083	5/35 *							
084	2/61							

## NOTES:

# chironomids with deformities / # chironomids examined

+ — indicates the number of non-chironomids having abnormalities.

\* — indicates significant levels (> 5%), although not statistically evaluated.

abnormalities considered chronic if they appear in both the 1992 / 1993 and the 1997 / 1998 columns.

Table 4 — HABITAT ASSESSMENT FOR HIGH GRADIENT STREAMS

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>1. Epifaunal Substrate/Available Cover</b>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>2. Embeddedness</b>	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>3. Riffle Quality</b>	Well-developed riffle and run; riffle is as wide as stream and length extends two times the width of stream; abundance of cobble. (Boulders prevalent in headwater streams).	Riffle is as wide as stream but length is less than two times width; abundance of cobble; boulders and gravel common.	Run area may be lacking; riffle not as wide as stream and its length is less than 2 times the stream width; gravel or bedrock prevalent; some cobble present.	Riffles or runs virtually nonexistent; bedrock prevalent; cobble lacking
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>4. Sediment Deposition</b>	Little or no enlargement of islands or point bars and less than 5% (< 20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>5. Channel Flow Status</b>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>6. Channel Alteration</b>	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yrs.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>7. Frequency of Riffles (or bends)</b>	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream < 7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. All 4 velocity/depth patterns present.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15. Only 3 of 4 velocity/depth patterns present (i.e. slow [ $< 0.3$ m/s]-deep [ $> 0.5$ m]; slow-shallow; fast-deep; fast-shallow).	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25. May be only 2 velocity/depth patterns present; usually lacking deep areas.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of > 25. Dominated by one velocity/depth pattern.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>8. Bank Stability (score each bank)</b> Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
<b>9. Bank Vegetative Protection (score each bank)</b>	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, under story shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
<b>10. Riparian Vegetative Zone Width (score each bank riparian zone)</b>	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

HABITAT SCORES	VALUE
OPTIMAL	160 C 200
SUB-OPTIMAL	110 C 159
MARGINAL	60 C 109
POOR	< 60

Table 4 (cont.) — HABITAT ASSESSMENT FOR *LOW GRADIENT STREAMS*

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>1. Epifaunal Substrate/Available Cover</b>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>2. Pool Substrate Characterization</b>	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>3. Pool Variability</b>	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>4. Sediment Deposition</b>	Little or no enlargement of islands or point bars and less than 5% < 20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>5. Channel Flow Status</b>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>6. Channel Alteration</b>	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yrs.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>7. Channel Sinuosity</b>	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>8. Bank Stability</b> (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
<b>9. Bank Vegetative Protection</b> (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, under story shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
<b>10. Riparian Vegetative Zone Width</b> (score each bank riparian zone)	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

HABITAT SCORES	VALUE
OPTIMAL	160 C 200
SUB-OPTIMAL	110 C 159
MARGINAL	60 C 109
POOR	< 60

# **MAPS**

## **1998 Upper Delaware AMNET Study WMAs 1, 2, & 11**

AMNET site locations and their respective biological ratings, for each major sub-basin, are shown in maps 1-7. Also identified are sites that exhibited significant and chronic macroinvertebrate abnormalities.

## Appendix A — Station Numbers and Locations for the 1998 Upper Delaware Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0001	Clove Bk	41 18'53.373"N 74 40'07.154"W	1
AN0002	Clove Bk	41 21'06.335"N 74 41'10.161"W	1
AN0003	Shimers Bk	41 18'46.731"N 74 46'43.451"W	1
AN0004	Little Flat Bk	41 17'02.719"N 74 45'29.275"W	1
AN0005	Little Flat Bk	41 15'45.716"N 74 47'33.516"W	1
AN0005A	Little Flat Bk	41 11'54.521"N 74 50'08.747"W	1
AN0006	Big Flat Bk	41 12'00.054"N 74 48'55.832"W	1
AN0007	Flat Bk	41 09'25.965"N 74 52'38.074"W	1
AN0008	Flat Bk	41 06'05.606"N 74 57'43.855"W	1
AN0009	Van Campens Bk	41 05'43.209"N 74 55'45.708"W	1
AN0010	Van Campens Bk	41 04'22.070"N 74 57'45.202"W	1
AN0011	Van Campens Bk	41 03'27.651"N 75 00'11.308"W	1
AN0012	Dunnfield Ck	40 58'14.065"N 75 07'34.898"W	1
AN0013	Stony Bk	40 56'22.413"N 75 06'13.117"W	1
AN0014	UNT to Paulins Kill	41 04'00.778"N 74 41'15.963"W	1
AN0015	Paulins Kill	41 05'07.878"N 74 41'57.964"W	1
AN0016	UNT to Paulins Kill	41 06'21.295"N 74 40'56.237"W	1
AN0017	Culvers Ck	41 10'05.657"N 74 47'30.702"W	1
AN0018	Culvers Ck	41 09'21.025"N 74 46'57.541"W	1
AN0019	Dry Bk	41 10'09.042"N 74 44'10.326"W	1
AN0020	Dry Bk	41 08'36.840"N 74 44'43.274"W	1
AN0021	Paulins Kill	41 06'13.513"N 74 45'29.351"W	1
AN0022	Paulins Kill	41 03'08.907"N 74 49'40.505"W	1
AN0023	Troy Bk	41 03'33.471"N 74 51'11.835"W	1
AN0023A	Troy Bk	41 05'05.510"N 74 49'37.287"W	1
AN0024	Trout Bk	41 03'20.519"N 74 51'41.591"W	1
AN0025	Paulins Kill	40 58'52.121"N 74 57'12.460"W	1
AN0025A	Blair Ck	41 04'19.874"N 74 55'13.513"W	1
AN0026	Blair Ck	41 03'00.829"N 74 56'40.113"W	1
AN0027	Blair Ck	40 58'54.804"N 74 57'35.356"W	1
AN0028	Jacksonburg Ck	41 02'20.775"N 74 57'53.670"W	1
AN0029	Jacksonburg Ck	40 59'14.684"N	1

Site	Stream	Latitude Longitude	Watershed Management Area
		74 58'43.178"W	
AN0030	Yards Ck	40 59'43.000"N 75 01'55.902"W	1
AN0031	Yards Ck	40 57'23.847"N 75 03'34.777"W	1
AN0032	Paulins Kill	40 55'15.243"N 75 05'17.479"W	1
AN0032A	Paulins Kill	40 58'00.450"N 75 01'14.763"W	1
AN0033	Delawanna Ck	40 53'52.815"N 75 04'19.347"W	1
AN0034	Ramseysburg Ck	40 53'05.044"N 75 03'36.520"W	1
AN0035	Pequest R	41 00'51.811"N 74 45'59.931"W	1
AN0036	UNT to Pequest R	40 59'07.663"N 74 45'52.968"W	1
AN0037	Pequest R	40 58'50.814"N 74 46'35.360"W	1
AN0038	Trout Bk	40 55'48.127"N 74 49'08.167"W	1
AN0039	Pequest R	40 55'17.022"N 74 50'25.852"W	1
AN0040	Bear Ck	40 55'48.566"N 74 53'05.961"W	1
AN0040A	Bear Ck	40 58'30.344"N 74 50'57.831"W	1
AN0041	Pequest R	40 51'58.398"N 74 54'19.347"W	1
AN0042	Furnace Bk	40 49'21.769"N 74 59'06.341"W	1
AN0043	Pequest R	40 49'49.847"N 74 58'39.953"W	1
AN0044	Mountain Lake Bk	40 51'10.847"N 74 59'07.246"W	1
AN0045	Beaver Bk	40 56'33.270"N 74 56'32.780"W	1
AN0046	Honey Run	40 53'33.971"N 74 58'40.558"W	1
AN0047	Beaver Bk	40 50'36.857"N 75 02'46.374"W	1
AN0048	Pequest R	40 49'45.841"N 75 04'55.768"W	1
AN0049	Pophandusing Bk	40 49'20.221"N 75 04'50.983"W	1
AN0050	Buck Horn Ck	40 46'17.971"N 75 07'50.883"W	1
AN0051	Lopatcong Ck	40 44'24.624"N 75 07'15.934"W	1
AN0052	Lopatcong Ck	40 42'07.878"N 75 08'12.891"W	1
AN0053	Lopatcong Ck	40 40'38.350"N 75 10'01.855"W	1
AN0054	Pohatcong Ck	40 50'18.689"N 74 53'59.968"W	1
AN0055	Pohatcong Ck	40 47'06.111"N 74 57'41.175"W	1
AN0056	Brass Castle Ck	40 45'53.533"N 75 00'43.295"W	1
AN0057	Pohatcong Ck	40 44'41.365"N 75 00'49.018"W	1
AN0058	Pohatcong Ck	40 42'57.959"N 75 04'18.230"W	1

## Appendix A — Station Numbers and Locations for the 1998 Upper Delaware Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0059	Merrill Ck	40 45'00.107"N 75 05'06.940"W	1
AN0060	Merrill Ck	40 41'11.491"N 75 06'29.268"W	1
AN0061	Pohatcong Ck	40 37'29.855"N 75 11'08.755"W	1
AN0062	Musconetcong R	40 55'01.431"N 74 39'56.687"W	1
AN0063	Musconetcong R	40 54'08.398"N 74 42'48.549"W	1
AN0064	Musconetcong R	40 55'15.877"N 74 43'54.037"W	1
AN0065	Lubbers Run	40 57'51.270"N 74 40'28.210"W	1
AN0066	Lubbers Run	40 55'35.979"N 74 43'07.086"W	1
AN0067	Mine Brook	40 49'58.240"N 74 49'22.029"W	1
AN0068	Trout Brook	40 49'46.217"N 74 49'52.241"W	1
AN0069	Musconetcong R	40 48'46.767"N 74 50'29.995"W	1
AN0070	Hances Brook	40 48'16.140"N 74 51'37.606"W	1
AN0071	UNT to Musconetcong R	40 47'00.267"N 74 54'02.633"W	1
AN0072	Musconetcong R	40 43'22.996"N 74 57'35.801"W	1
AN0073	Musconetcong R	40 39'19.616"N 75 05'19.716"W	1
AN0074	Musconetcong R	40 35'33.407"N 75 11'17.230"W	1
AN0075	Hakihokake Ck	40 37'42.344"N 75 05'04.447"W	11
AN0076	Hakihokake Ck	40 35'02.591"N 75 05'07.655"W	11
AN0077	Hakihokake Ck	40 34'06.359"N 75 05'42.610"W	11
AN0078	Harihokake Ck	40 36'00.393"N 75 01'50.641"W	11
AN0079	Harihokake Ck	40 32'53.072"N 75 04'07.766"W	11
AN0080	Nishisakawick Ck	40 35'20.651"N 75 00'34.071"W	11
AN0081	Nishisakawick Ck	40 32'56.275"N 75 02'03.953"W	11
AN0082	Nishisakawick Ck	40 31'38.526"N 75 03'32.940"W	11
AN0083	Little Nishisakawick Ck	40 31'22.623"N 75 03'41.890"W	11
AN0084	Copper Ck	40 30'39.544"N 75 02'43.388"W	11
AN0085	Warford Ck	40 28'09.916"N 75 03'43.655"W	11
AN0086	Lockatong Ck	40 32'02.357"N 74 57'11.604"W	11
AN0087	Lockatong Ck	40 31'01.719"N 74 59'30.835"W	11
AN0088	Lockatong Ck	40 28'16.532"N 75 01'16.150"W	11
AN0089	Lockatong Ck	40 24'28.293"N 75 00'50.967"W	11
AN0090	Wickecheoke Ck	40 30'34.613"N	11

Site	Stream	Latitude Longitude	Watershed Management Area
		74 55'49.813"W	
AN0091	Wickecheoke Ck	40 29'08.865"N 74 58'13.799"W	11
AN0092	Plum Brook	40 29'46.410"N 74 55'40.768"W	11
AN0093	Plum Brook	40 27'49.932"N 74 58'04.041"W	11
AN0094	Wickecheoke Ck	40 26'38.138"N 74 57'57.999"W	11
AN0095	Wickecheoke Ck	40 24'41.329"N 74 59'11.194"W	11
AN0096	Alexauken Ck	40 22'49.353"N 74 54'10.197"W	11
AN0097	UNT to Alexauken Ck	40 24'22.175"N 74 55'10.615"W	11
AN0098	Alexauken Ck	40 22'50.158"N 74 56'52.659"W	11
AN0099	Swan Ck	40 21'50.273"N 74 56'42.853"W	11
AN0100	Moores Ck	40 20'39.621"N 74 53'08.715"W	11
AN0101	Moores Ck	40 19'26.394"N 74 55'01.395"W	11
AN0102	Jacobs Ck	40 20'29.374"N 74 50'18.357"W	11
AN0103	Airport Br of Jacobs Ck	40 17'24.047"N 74 50'26.702"W	11
AN0104	Woolseys Bk	40 18'27.419"N 74 49'35.358"W	11
AN0105	Jacobs Ck	40 18'25.937"N 74 50'01.804"W	11
AN0106	Jacobs Ck	40 16'42.298"N 74 51'12.939"W	11
AN0107	Gold Run	40 14'34.962"N 74 49'19.588"W	11
AN0108	Assunpink Ck	40 12'43.204"N 74 28'37.300"W	11
AN0109	Assunpink Ck	40 15'29.782"N 74 37'03.130"W	11
AN0109A	Assunpink Ck	40 13'06.002"N 74 33'37.024"W	11
AN0109B	New Sharon Br	40 12'59.755"N 74 33'38.479"W	11
AN0110	UNT to Shipetaukin Ck	40 19'11.335"N 74 43'30.882"W	11
AN0111	Shipetaukin Ck	40 17'46.003"N 74 42'17.453"W	11
AN0112	Little Shabakunk Ck	40 16'44.226"N 74 43'03.763"W	11
AN0113	Shabakunk Ck	40 17'06.648"N 74 45'59.203"W	11
AN0114	Shabakunk Ck	40 15'13.579"N 74 44'31.498"W	11
AN0115	Miry Run	40 14'49.546"N 74 41'13.758"W	11
AN0115A	Miry Run	40 14'04.950"N 74 37'35.147"W	11
AN0116	Assunpink Ck	40 14'08.450"N 74 44'19.749"W	11
AN0117	Pond Run	40 12'56.316"N 74 41'25.388"W	11
AN0118	Assunpink Ck	40 13'01.939"N 74 45'58.939"W	11



## Appendix A — Station Numbers and Locations for the 1998 Upper Delaware Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0294	Lake Lookout Bk	41 11'31.864"N 74 24'58.251"W	2
AN0295	Wawayanda Ck	41 13'40.705"N 74 28'02.504"W	2
AN0296	Black Ck	41 13'22.080"N 74 28'32.078"W	2
AN0297	Wallkill R	41 02'20.323"N 74 37'48.469"W	2
AN0298	Wallkill R	41 05'12.932"N 74 35'41.539"W	2
AN0299	Wallkill R	41 08'00.210"N 74 34'43.645"W	2
AN0300	Wallkill R	41 09'09.255"N 74 34'54.492"W	2
AN0301	Beaver Run	41 10'49.311"N 74 35'33.715"W	2
AN0302	Wallkill R	41 11'38.230"N 74 34'30.320"W	2
AN0303	Papakating Ck	41 09'59.891"N 74 43'37.885"W	2
AN0304	Papakating Ck	41 09'45.418"N 74 40'31.047"W	2
AN0305	W Br Papakating Ck	41 13'05.916"N 74 40'16.315"W	2
AN0306	W Br Papakating Ck	41 11'49.793"N 74 37'53.861"W	2
AN0307	Papakating Ck	41 11'38.765"N 74 37'17.144"W	2
AN0308	UNT to Clove Bk	41 15'41.160"N 74 37'25.749"W	2
AN0309	Clove Bk	41 12'28.256"N 74 36'33.133"W	2
AN0309A	Clove Bk	41 15'43.069"N 74 37'48.196"W	2

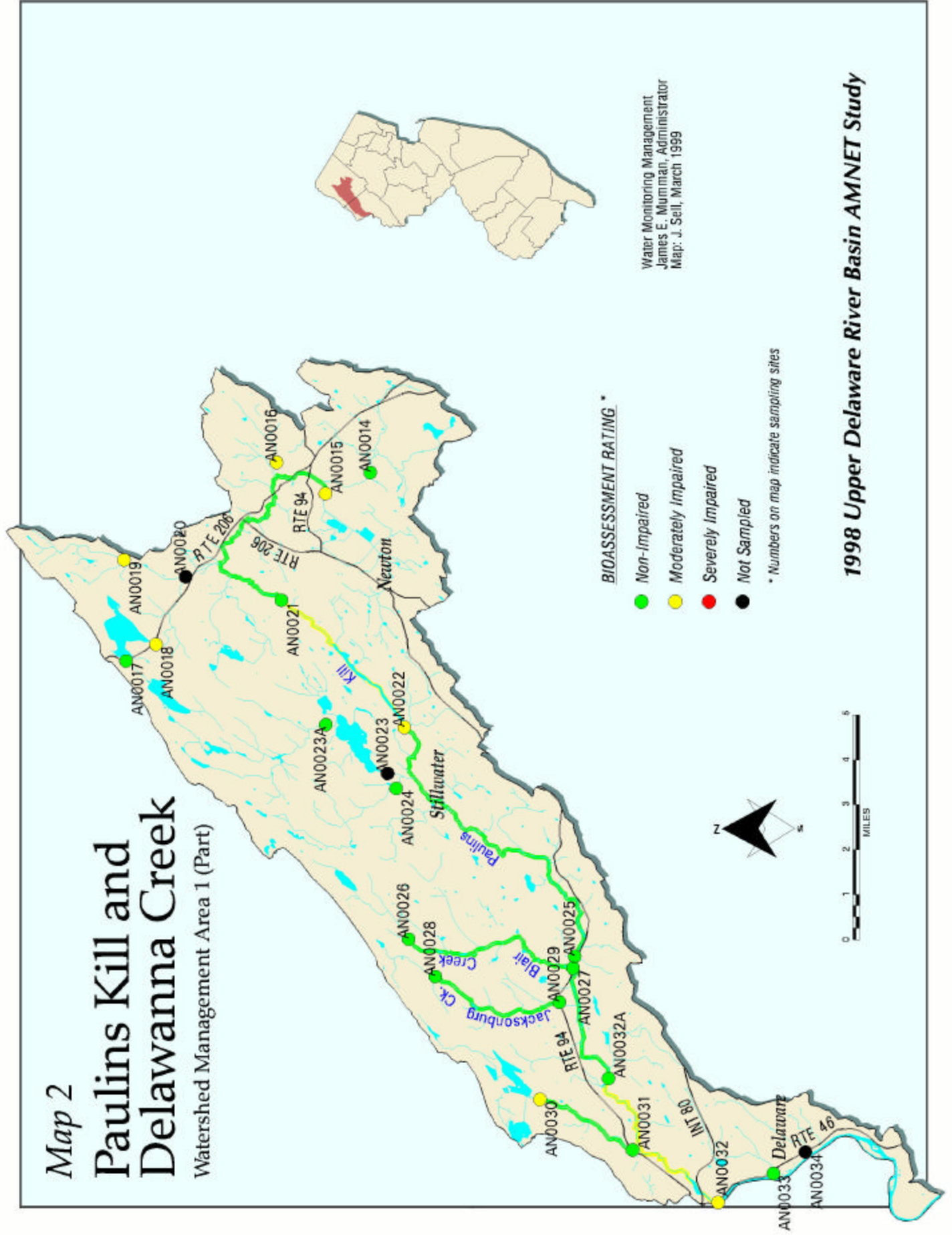
# Map 1

## Flat, Shimers and Van Campens Brooks

Watershed Management Area 1 (Part)



# Map 2 Paulins Kill and Delawanna Creek Watershed Management Area 1 (Part)

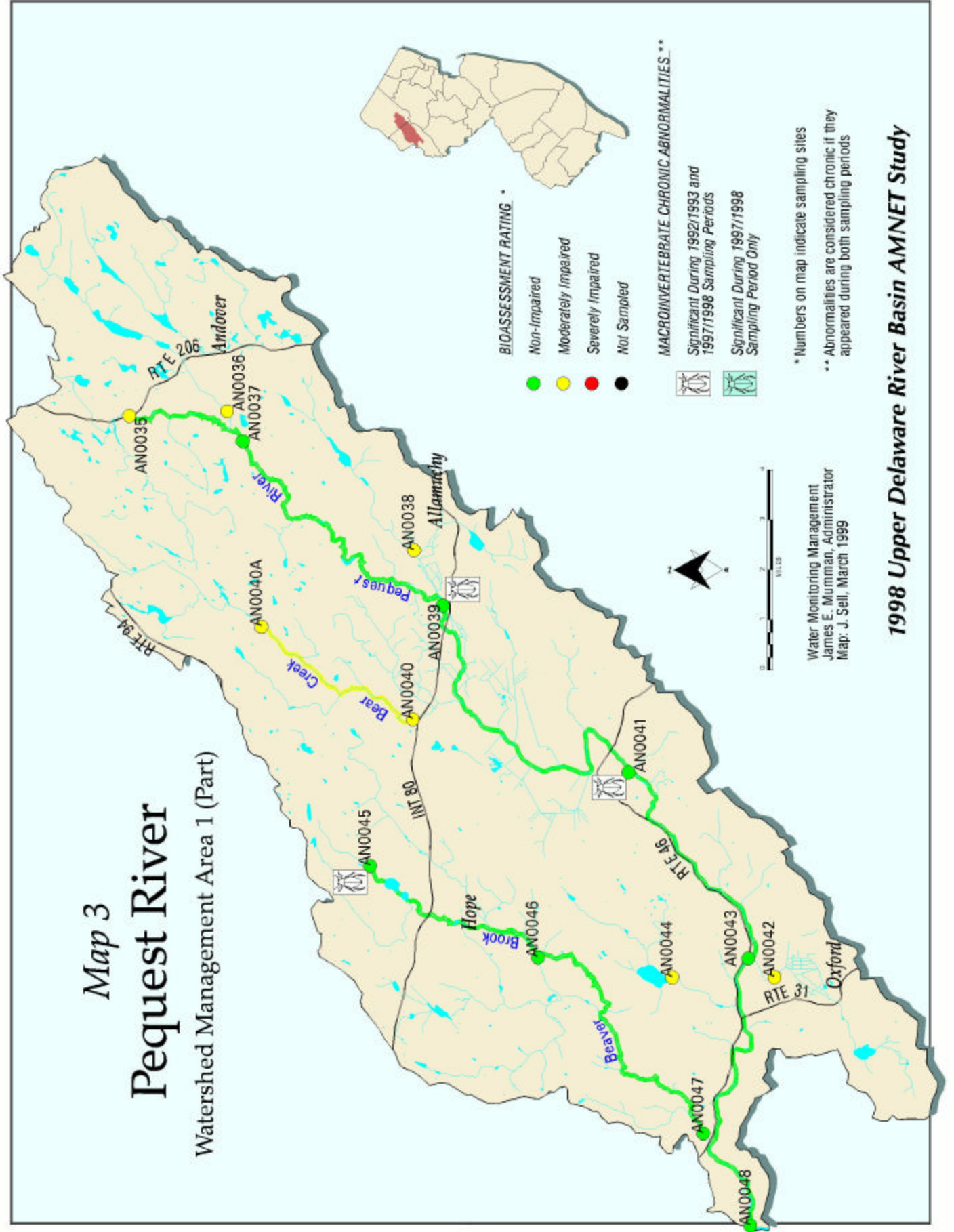


Water Monitoring Management  
James E. Mumman, Administrator  
Map: J. Sell, March 1999

**1998 Upper Delaware River Basin AMNET Study**

# Map 3 Pequest River

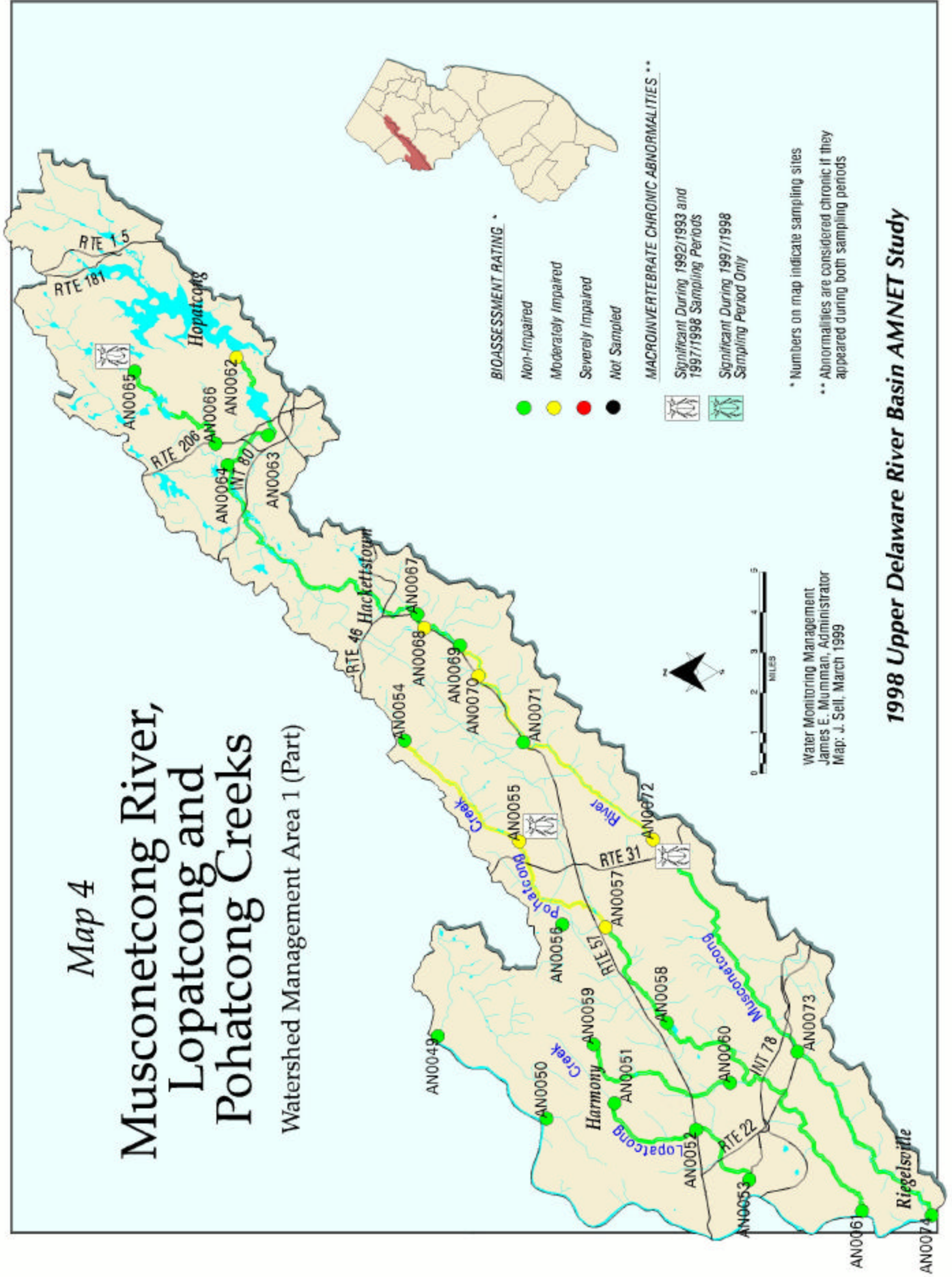
Watershed Management Area 1 (Part)





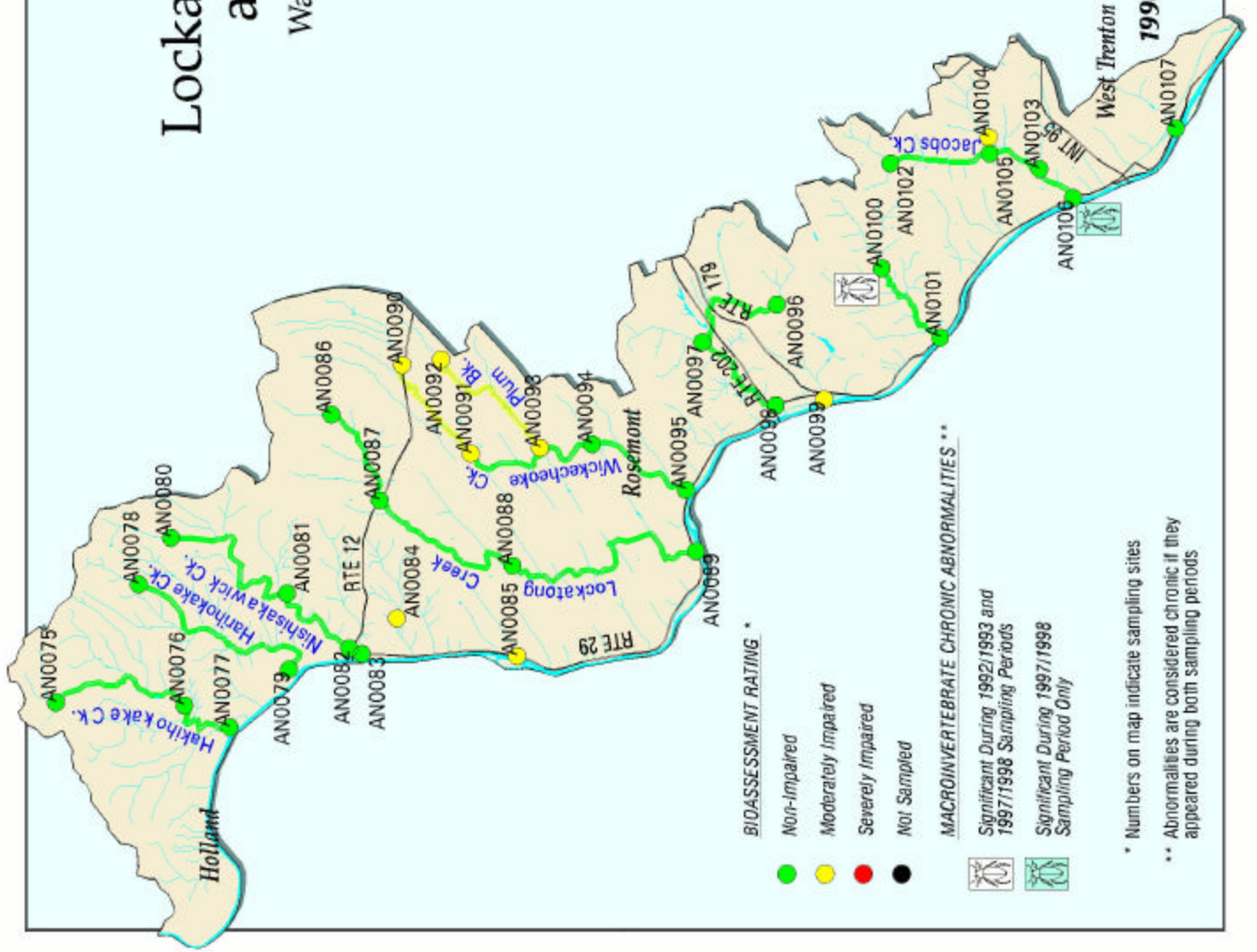
# Map 4 Musconetcong River, Lopatcong and Pohatcong Creeks

Watershed Management Area 1 (Part)



# Map 5 Lockatong, Alexauken, Moore and Jacobs Creek, etc.

Watershed Management Area 11 (Part)



**BIOASSESSMENT RATING \***

- Non-Impaired
- Moderately Impaired
- Severely Impaired
- Not Sampled

**MACROINVERTEBRATE CHRONIC ABNORMALITIES \*\***

- Significant During 1992/1993 and 1997/1998 Sampling Periods
- Significant During 1997/1998 Sampling Period Only

\* Numbers on map indicate sampling sites

\*\* Abnormalities are considered chronic if they appeared during both sampling periods



Water Monitoring Management  
James E. Mumman, Administrator  
Map: J. Sell, March 1999

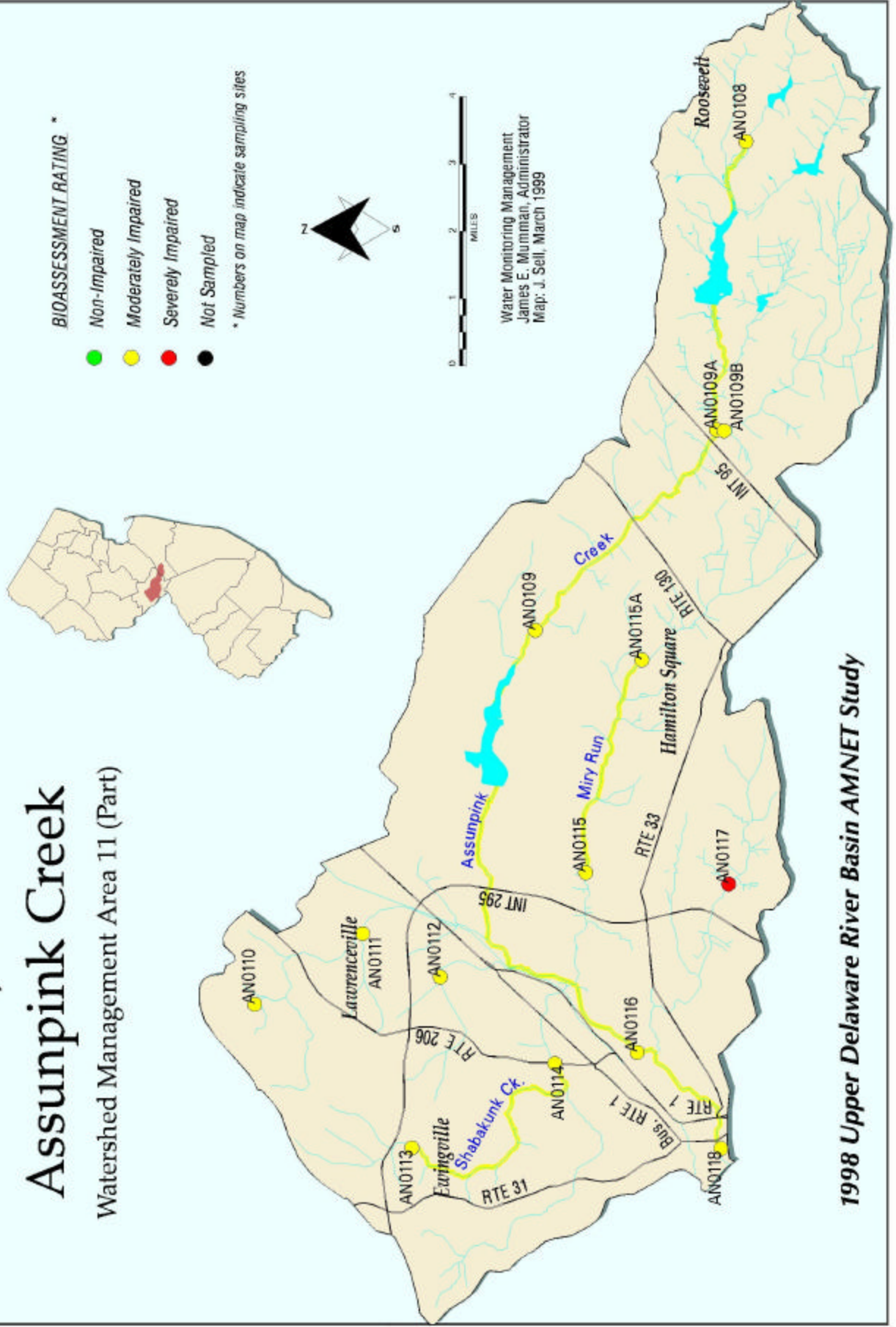
1998 Upper Delaware River Basin AMNET Study



# Map 6

## Assumpink Creek

Watershed Management Area 11 (Part)



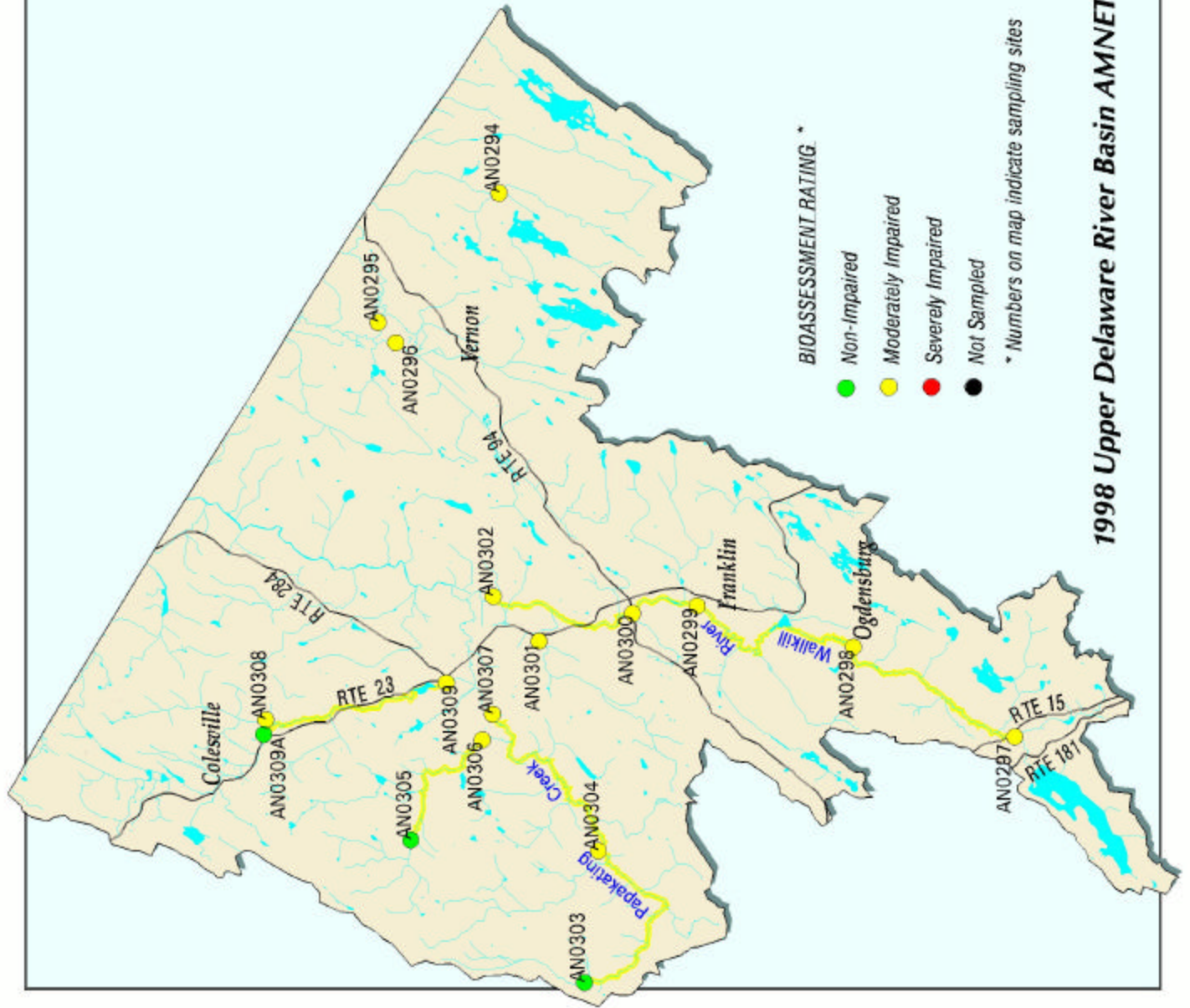
# Map 7

## Walkkill River, Papakating and Pochuck Creeks

### Watershed Management Area 2



Water Monitoring Management  
James E. Mumman, Administrator  
Map: J. Sell, March 1999



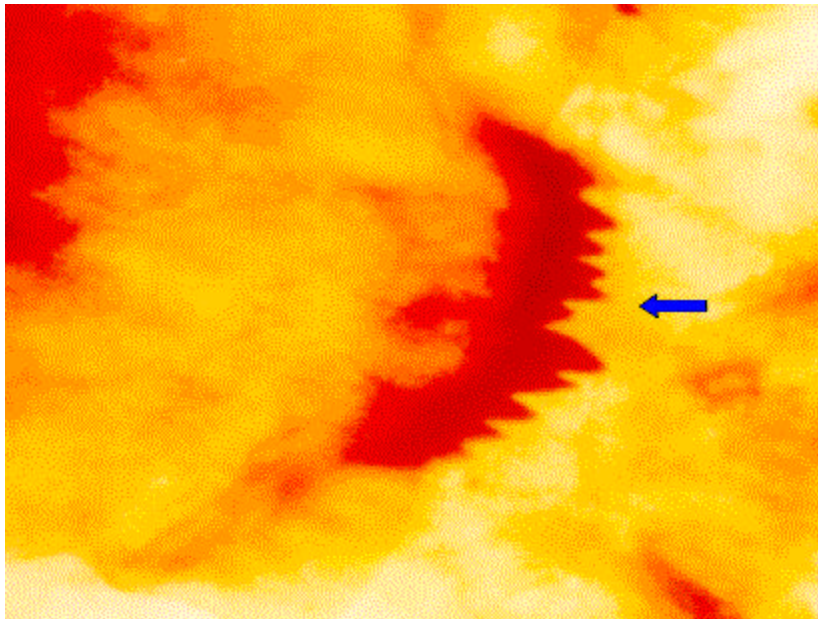
1998 Upper Delaware River Basin AMNET Study



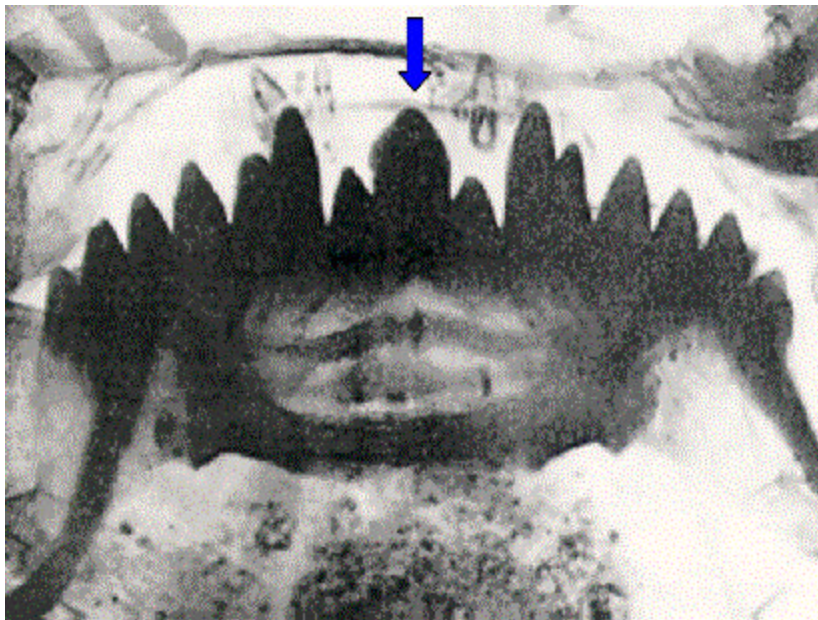
## **APPENDIX B**

Pictures and Site Locations of Morphological Abnormalities in  
Larval Chironomidae and Amphipoda Recovered in the 1998  
Upper Delaware AMNET Study

*Chironomus riparius* — Note the abnormal teeth in the top picture and the normal teeth in the bottom picture.



ABNORMAL\*

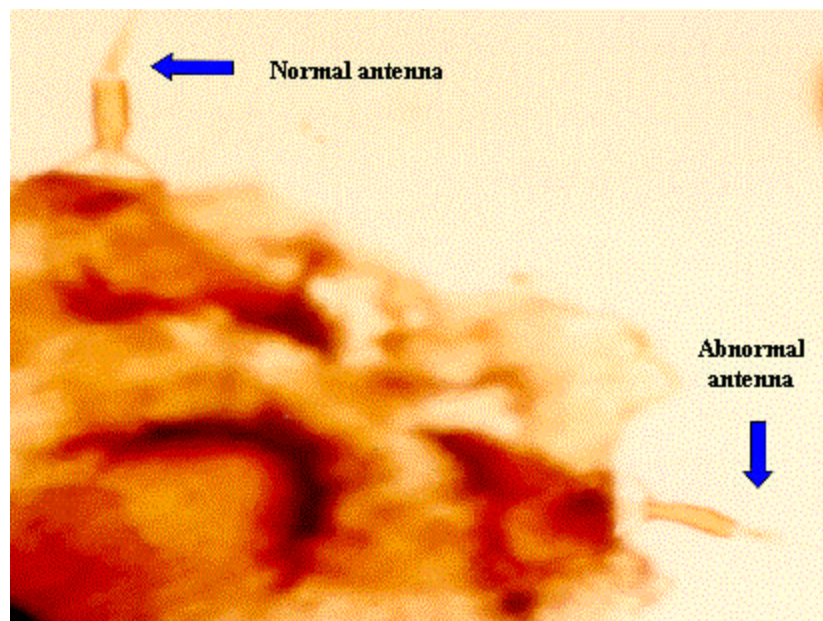


NORMAL\*\*

\* Photograph taken by J. Kurtz, NJDEP.

\*\* From: *A Key to Some Larvae of Chironomidae (Diptera) From the Mackenzie & Porcupine River Watersheds*, D.R. Oliver, D. McClymont, & M.E. Roussel, 1978, Fisheries & Marine Service Technical Report # 791.

*Dicrotendipes nervosus* — Note that the antenna on the right is abnormal. The antennae on the left and in the bottom picture are normal.



Antenna\*

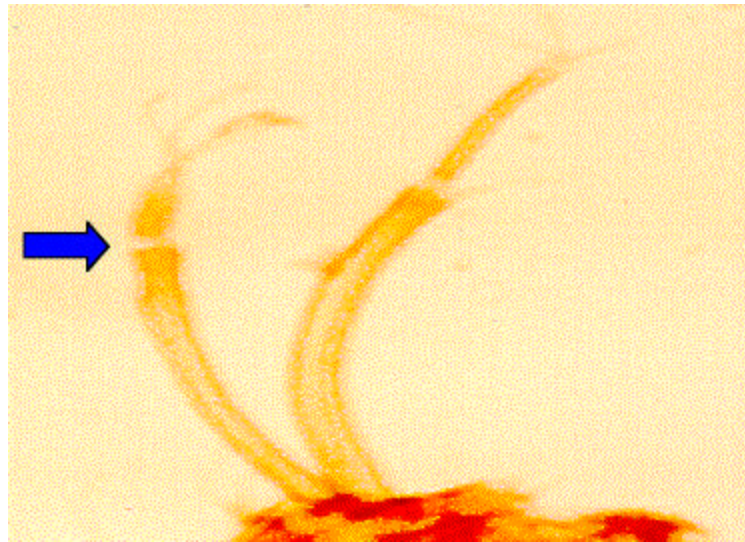


NORMAL antenna\*\*

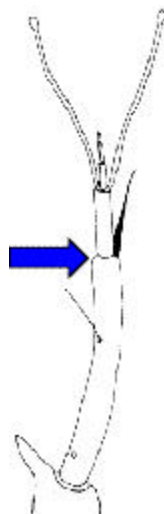
\* Photograph taken by J. Kurtz, NJDEP.

\*\* From: *An Introduction to the Aquatic Insects of North America*, second edition, R.W. Merritt & K.W. Cummins, 1988, Kendall/Hunt Publ. Co.

*Micropsectra deflecta*—In the top picture note the left antenna is abnormal as compared to the normal antenna in the bottom picture.



ABNORMAL\*



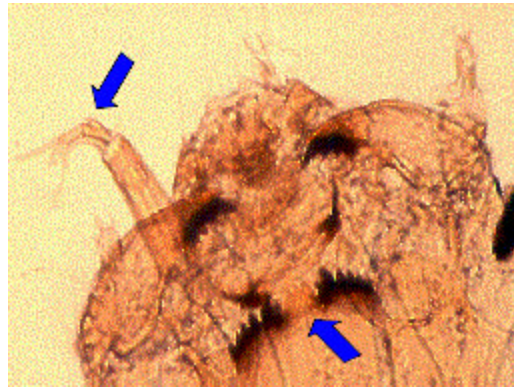
NORMAL\*\*

\* Photograph taken by J. Kurtz, NJDEP.

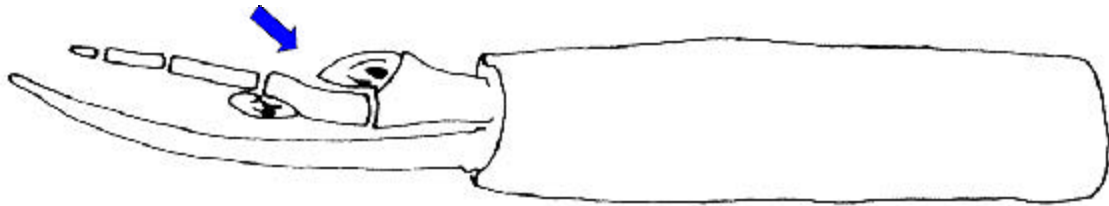
\*\* From: *An Introduction to the Aquatic Insects of North America*, second edition, R.W. Merritt & K.W. Cummins, 1988, Kendall/Hunt Publ. Co.



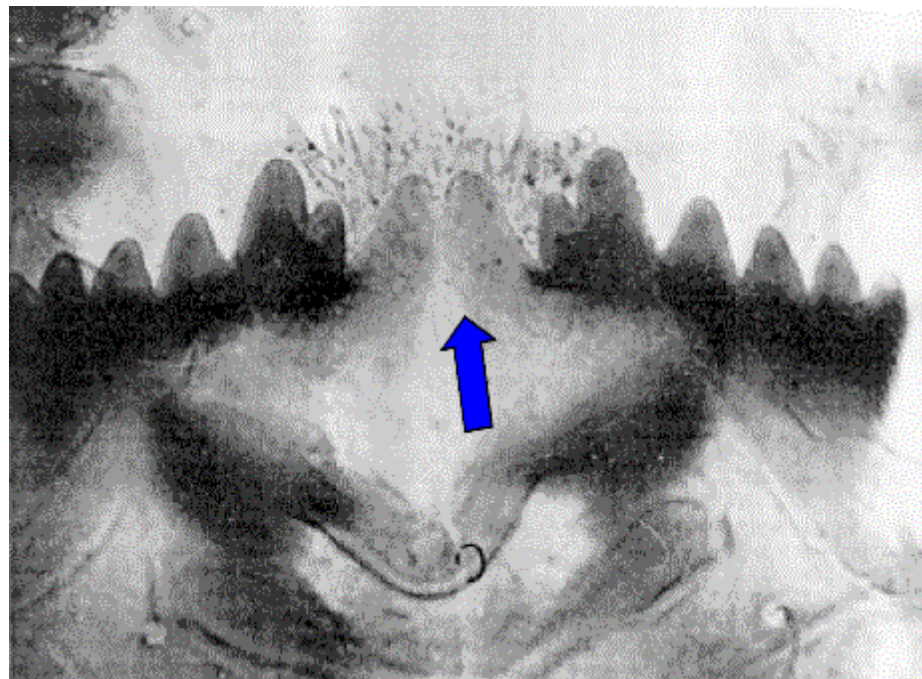
*Microtendipes sp.* — Note the abnormal teeth and antenna in the top picture compared to the bottom pictures, which depict normal antenna and teeth. The normal pictures on the bottom are magnified to show detail.



ABNORMAL\*



NORMAL antenna\*\*



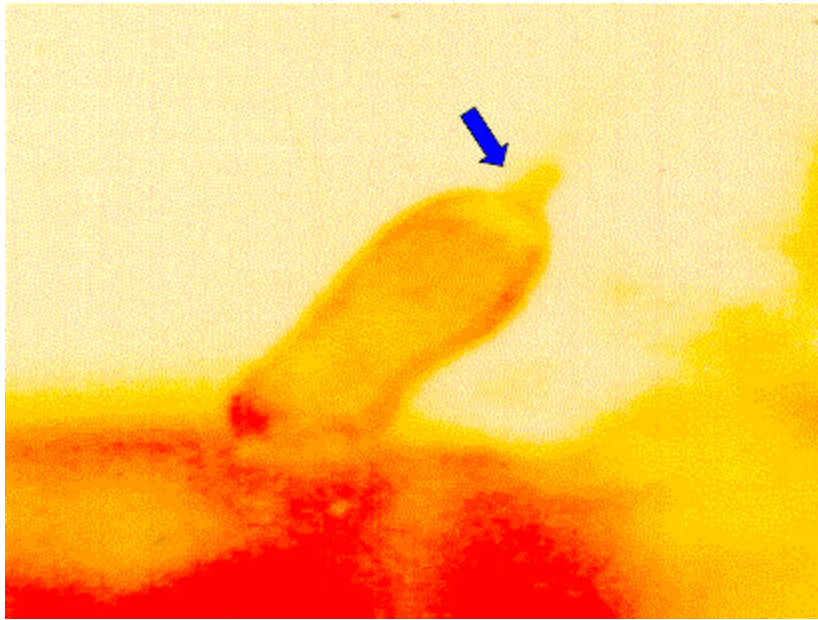
NORMAL teeth\*\*\*

\* Photograph taken by J. Kurtz, NJDEP.

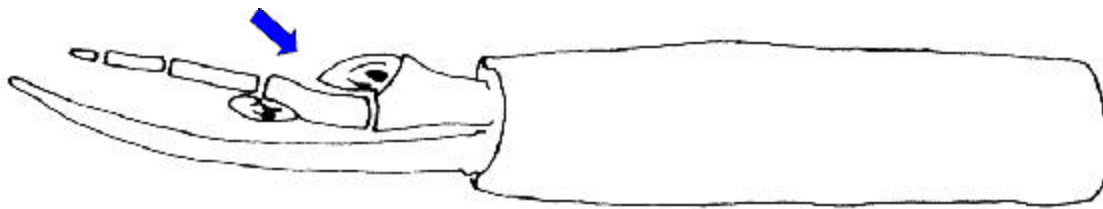
\*\* From: *An Introduction to the Aquatic Insects of North America*, second edition, R.W. Merritt & K.W. Cummins, 1988, Kendall/Hunt Publ. Co.

\*\*\* From: *A Key to Some Larvae of Chironomidae (Diptera) From the Mackenzie & Porcupine River Watersheds*, D.R. Oliver, D. McClymont, & M.E. Roussel, 1978, Fisheries & Marine Service Technical Report # 791.

*Microtendipes caducus* — Note the abnormal antenna in the top picture and compare to the lower picture, which depicts a normal antenna.



ABNORMAL antenna \*

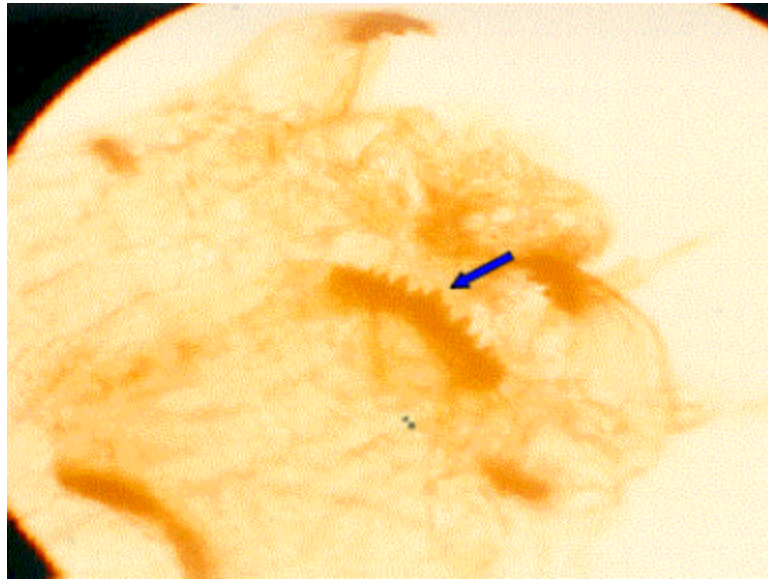


NORMAL antenna\*\*

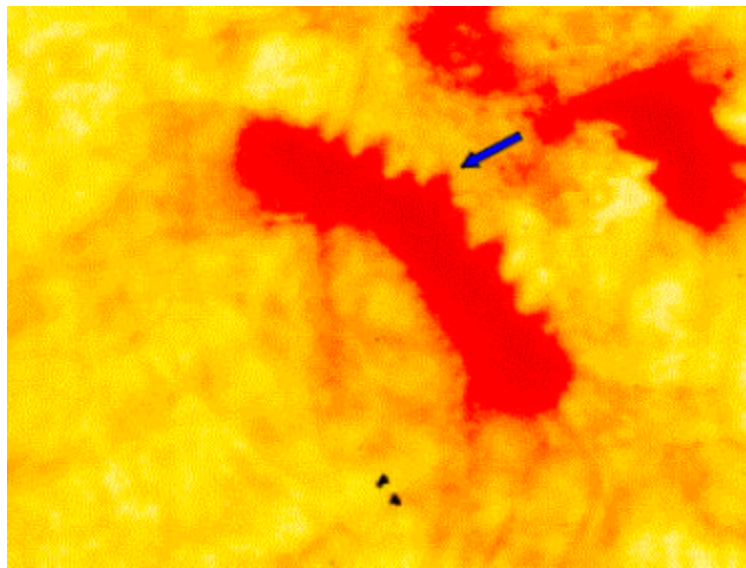
\* Photograph taken by J. Kurtz, NJDEP.

\*\* From: *An Introduction to the Aquatic Insects of North America*, second edition, R.W. Merritt & K.W. Cummins, 1988, Kendall/Hunt Publ. Co.

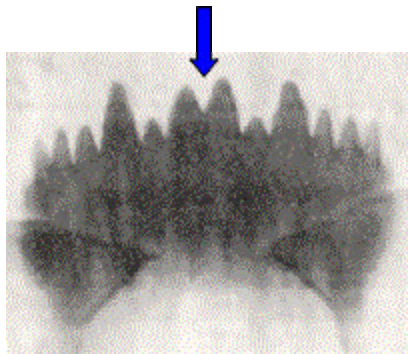
*Polypedilum convictum* — The first two pictures show abnormal teeth as compared to the normal teeth depicted in the picture below. The second picture is a higher magnification of the first one.



ABNORMAL\*



ABNORMAL\*



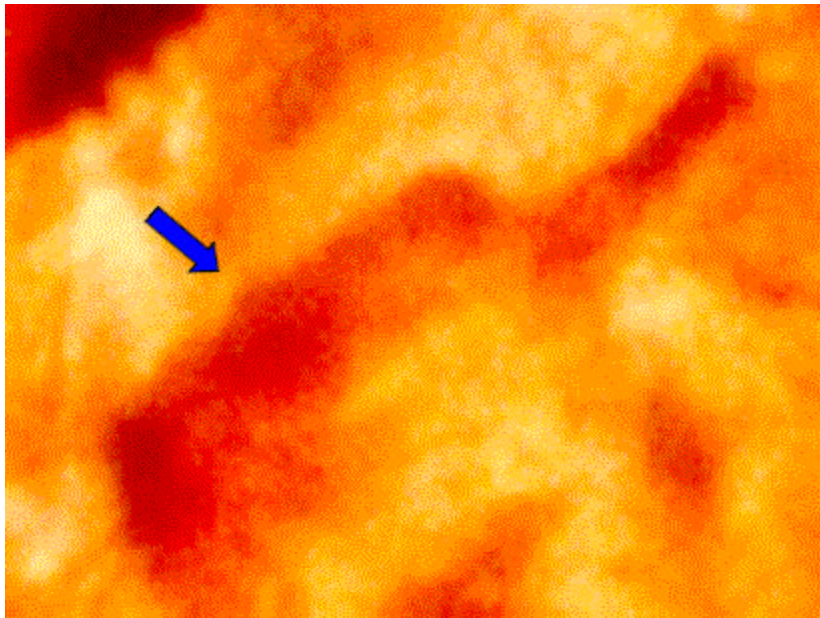
NORMAL\*\*

\* Photograph taken by J. Kurtz, NJDEP.

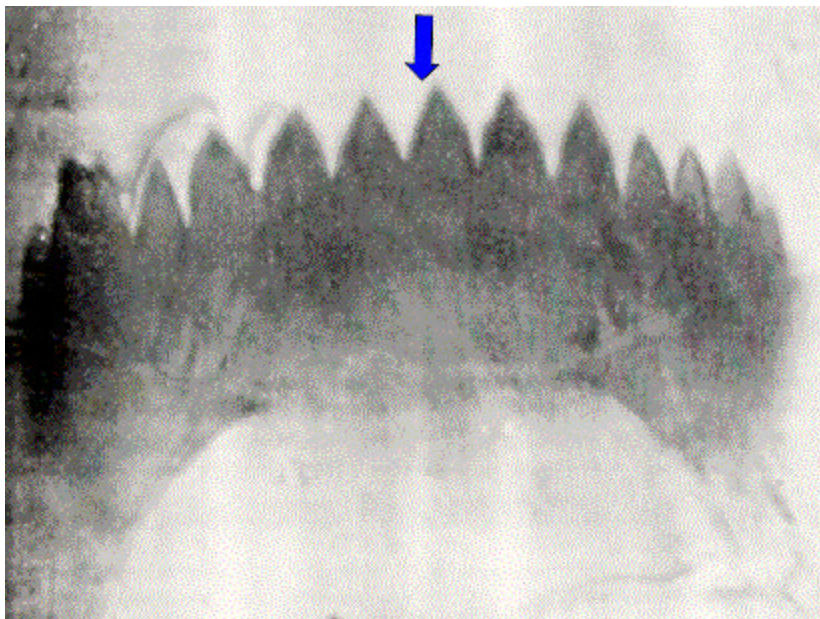
\*\* From *A Key to Some Larvae of Chironomidae (Diptera) From the Mackenzie & Porcupine River Watersheds*, D.R. Oliver, D. McClymont, & M.E. Roussel, 1978, Fisheries & Marine Service Technical Report # 791.



*Polypedilum fallax* — Note that in the top picture the teeth are absent or abnormal. Compare with the lower picture that shows a normal tooth pattern.



ABNORMAL\*



NORMAL\*\*

\* Photograph taken by J. Kurtz, NJDEP.

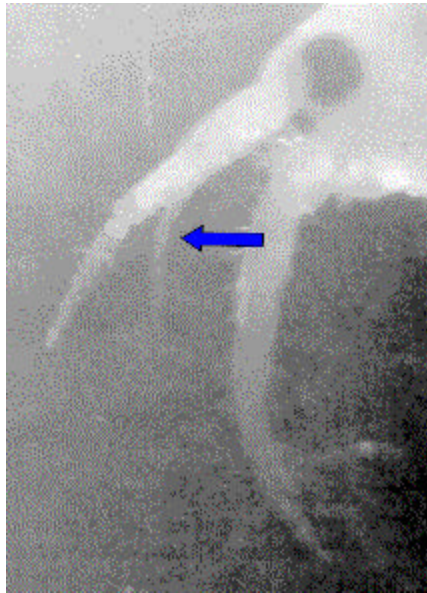
\*\* From: *A Key to Some Larvae of Chironomidae (Diptera) From the Mackenzie & Porcupine River Watersheds*, D.R. Oliver, D. McClymont, & M.E. Rousset, 1978, Fisheries & Marine Service Technical Report # 791.



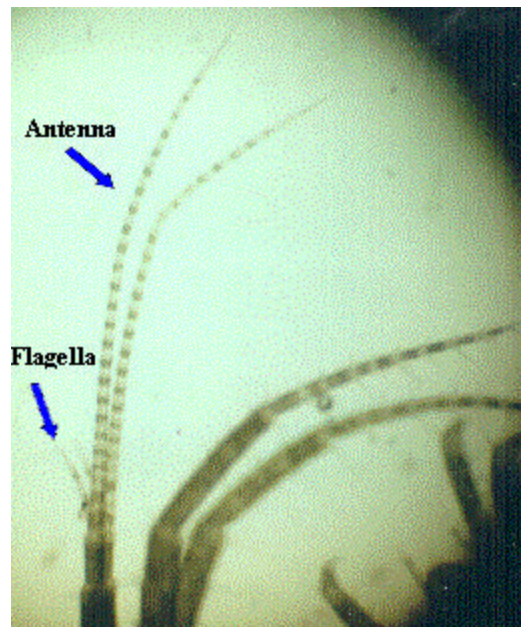
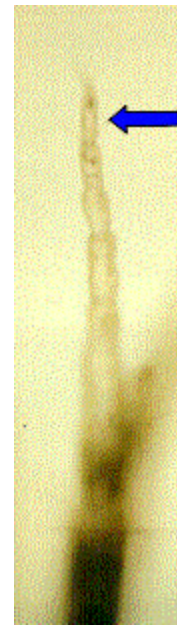
*Gammarus fasciatus* — Note in the first three pictures that the left 1<sup>st</sup> antenna and flagella are deformed and reduced. The right 1<sup>st</sup> antenna is broken. The fourth picture shows normal flagella and antennae.



Close-up of flagella on abnormal 1<sup>st</sup> antenna



Close-up of last segment on abnormal 1<sup>st</sup> antenna with normal setae.



Normal 1<sup>st</sup> antennae and flagella

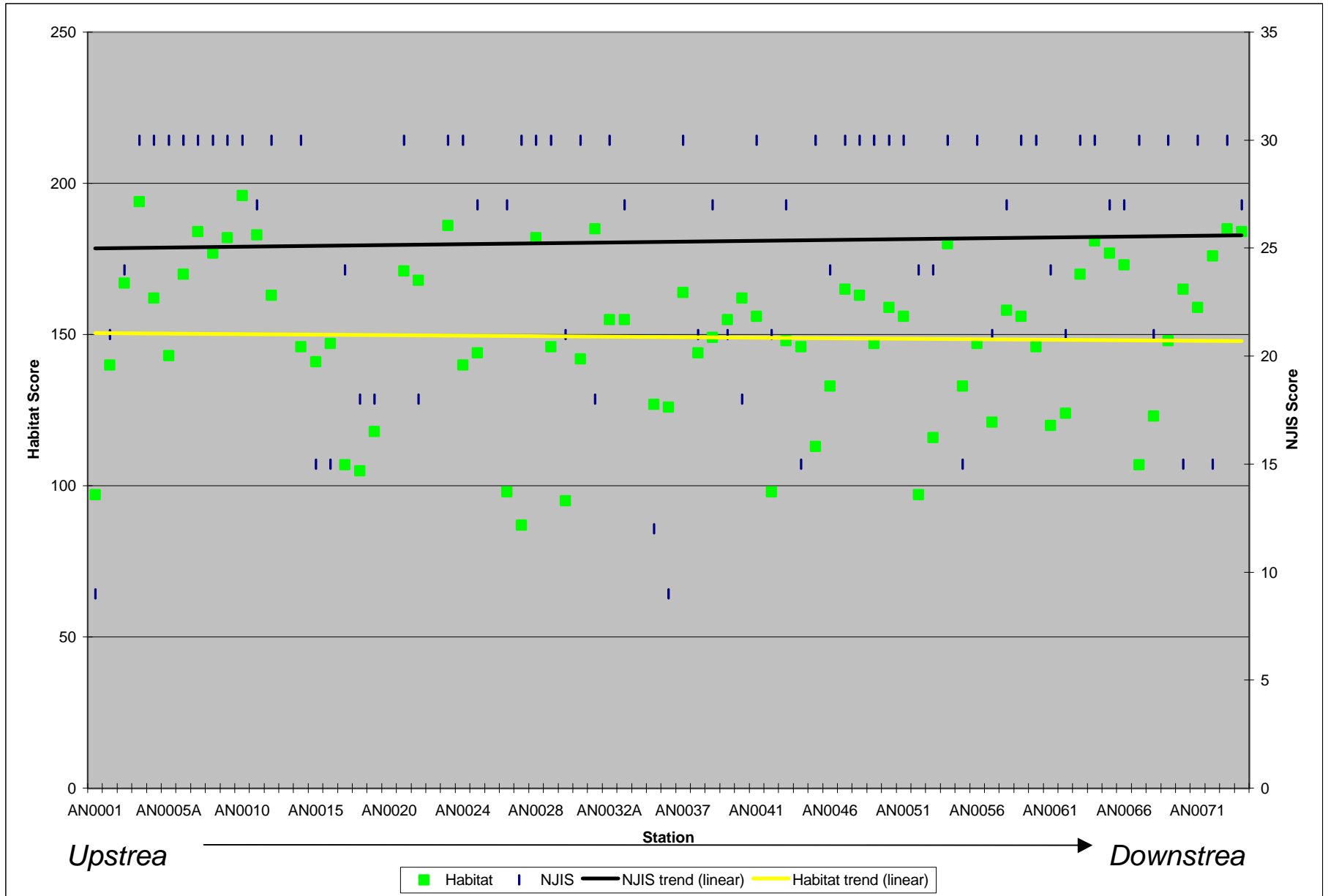
# **APPENDIX C**

Graphical Comparison of Habitat Assessment Scores and New Jersey Impairment Scores from the 1998 Upper Delaware AMNET Study

# HABITAT vs. NJIS

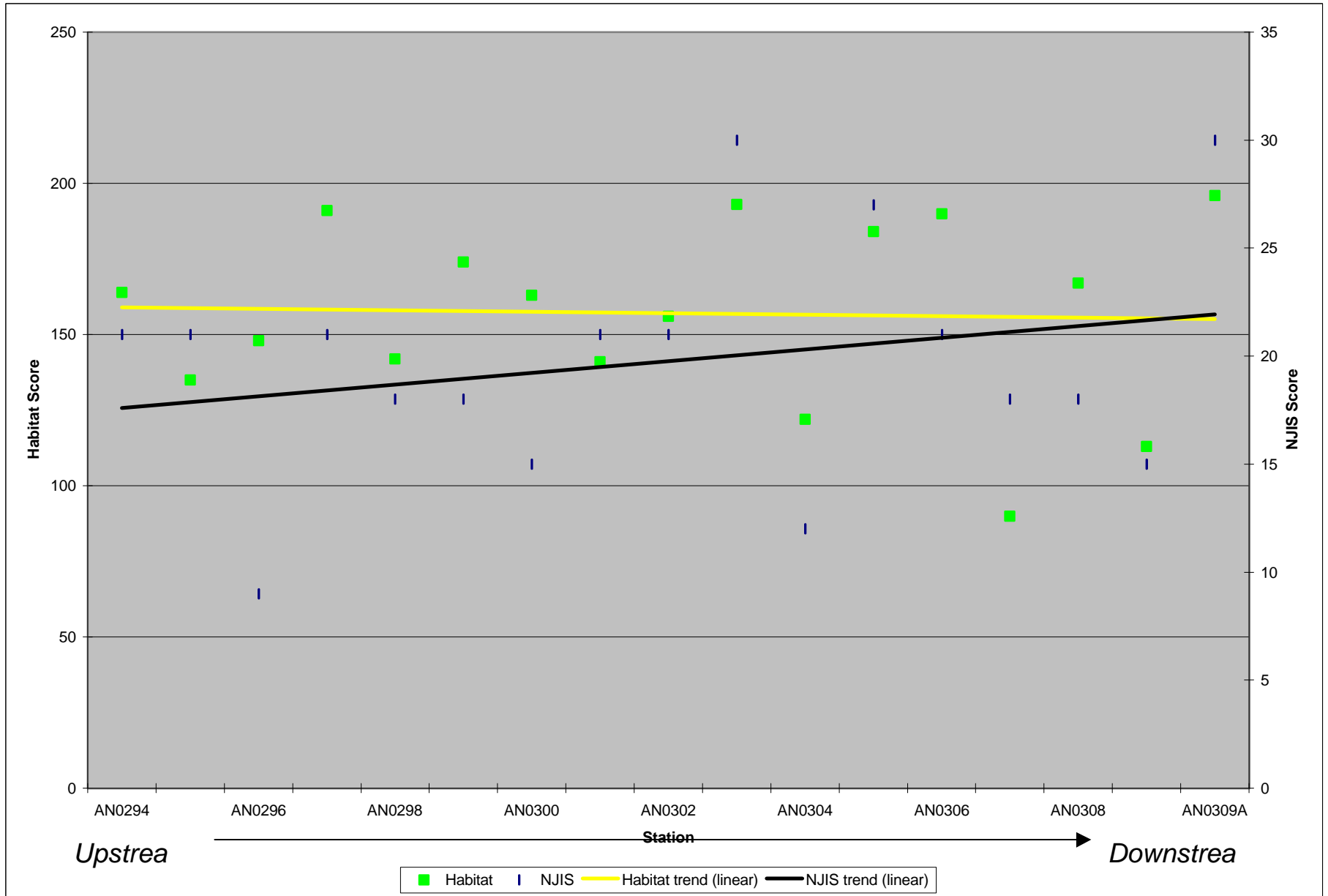
WMA 1

1997 to 1998



# HABITAT vs. NJIS

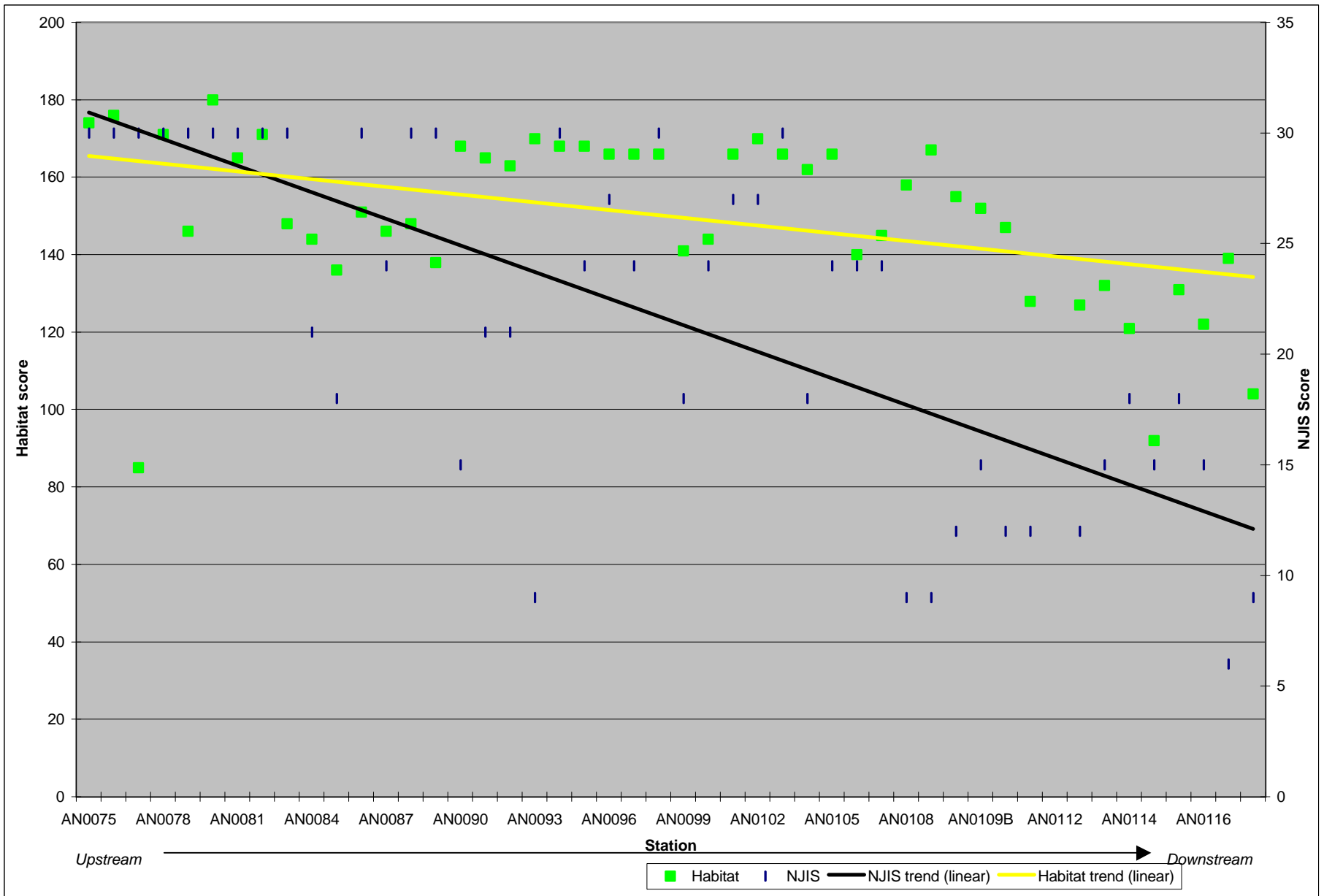
WMA 2  
1997 to 1998



# HABITAT vs. NJIS

WMA 11

1997 to 1998

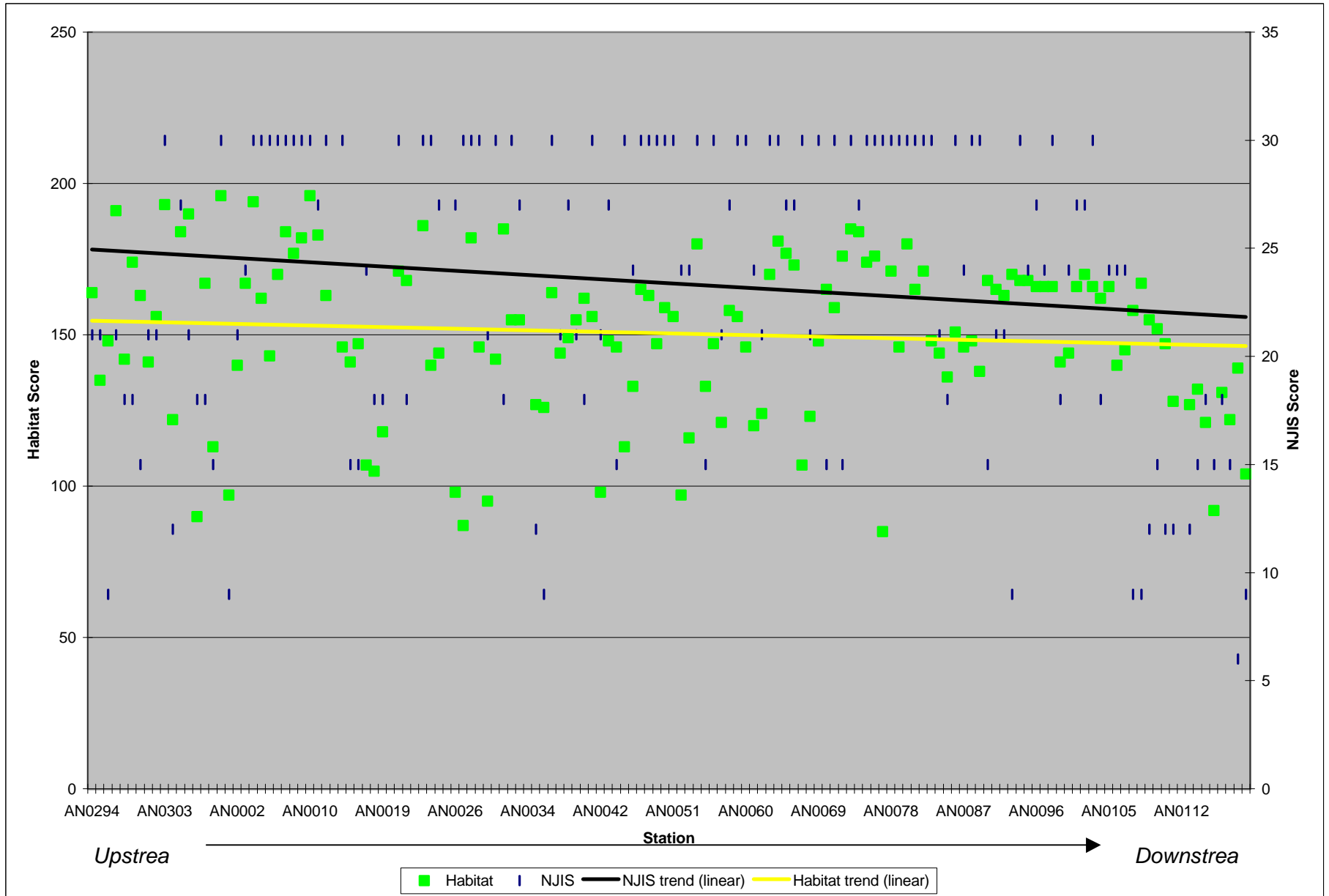


# HABITAT vs. NJIS

COMBINED

WMA 1, 2, 11

1997 to 1998



# APPENDIX D

## Taxonomic and Statistical Data, NJIS Scores\*, Habitat Assessment Scores and Observations from the 1998 Upper Delaware AMNET Study

\* Statistical data includes those biometric results that are applied to the NJIS rating. We also include certain biometrics that are utilized in standard RBPII (and RBPIII) analyses [2], but not for the NJIS.

Not employed in the NJIS analysis are certain ratios of pollution-sensitive to pollution-tolerant types, or relative abundance of different feeding types. These can be indicative of environmental stress caused by organic enrichment and/or the presence of toxicants in the stream system:

1. *Scraper/Filtering Collector Ratio* — dominance of filtering collectors indicates organic enrichment; however, if toxicants are present in the system, their adsorption on macrophytes and fine particulate organics can affect the abundance of filtering collectors.
2. *Shredder/Total Ratio* — considering their diet of coarse particulate organic matter (CPOM), a lack of shredders may indicate the presence of toxicants, particularly from terrestrial sources (e.g. pesticides), as these are readily adsorbed to the CPOM.
3. *EPT/Chironomid Ratio* — even distribution among the major groups, with strong representation in the pollution-sensitive taxa, reflects a good biotic condition; dominance of chironomids reflects environmental stress.

Station: AN0001  
Clove Bk, Off Rt 23, Montague Twp, Sussex County  
Port Jervis S USGS Quadrangle  
Date Sampled: 01/06/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Simuliidae	6	66
Chironomidae	6	33
Leuctridae	0	3
Capniidae	1	1
Lepidostomatidae	1	1
Lumbriculidae	8	1
Nemouridae	2	1
Planariidae	4	1
Physidae	7	1

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#### Statistical Analysis

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Number of Taxa: 9  
Total Number of Individuals: 108  
% Contribution of Dominant Family: 61.11 % ( Simuliidae )  
Family Biotic Index: 5.71  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.06  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
% EPT: 5.56  
EPT/C: 0.17  
NJIS Rating: 9  
Biological Condition: Moderately Impaired  
Habitat Analysis: 97  
Deficiency(s) noted: Simuliidae Family Overwhelmingly Dominant  
Paucity of Clean Water Organisms

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#### Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 2/1  
Substrate: Cobbles....StreamBank Vegetation/Stability: Grasses/Stable  
Canopy: Mostly Open....Other: Forested/Lake upstream/picnic area/snow making operation nearby; Water temp.3.6 /pH 7.1 /DO 10.8 /Cond.250

---



Station: AN0002  
 Clove Bk, Rt 23,Duttonville, Sussex County  
 Port Jervis S USGS Quadrangle  
 Date Sampled: 01/06/98

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	45
Taeniopterygidae	2	13
Ephemerellidae	1	7
Physidae	7	7
Enchytraeidae	10	3
Simuliidae	6	3
Heptageniidae	4	3
Hydropsychidae	4	2
BloodRed Chironomidae	8	2
Tipulidae	3	2
Oligoneuriidae	2	2
Capniidae	1	1
Limnephilidae	4	1
Baetidae	4	1
Elmidae	4	1
Planorbidae	6	1
Talitridae	8	1
Plagiostomidae	4	1
Naididae	7	1
Sphaeriidae	8	1
Tetrastemmatidae	7	1
Tabanidae	6	1

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Statistical Analysis

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Number of Taxa: 22  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 45.00 % ( Chironomidae )  
 Family Biotic Index: 5.05  
 Scraper/Filterer Collector Ratio: 0.75  
 Shredder/Total Ratio: 0.14  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 30.00  
 EPT/C: 0.64  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 140

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 17/2  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Forested upstream/Commerical area; Water temp.3.4 /pH 7.7  
 /DO 12.9 /Cond.195

---

Station: AN0003  
 Shimers Bk, Rt 521 ,Millville, Sussex County  
 Milford USGS Quadrangle  
 Date Sampled: 01/06/98

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	28
Lumbriculidae	8	18
Ephemerellidae	1	14
Sphaeriidae	8	10
Talitridae	8	5
Hydropsychidae	4	4
Perlidae	1	3
Limnephilidae	4	3
Heptageniidae	4	3
Corydalidae	0	2
Rhyacophilidae	0	2
Tipulidae	3	1
Dolichopodidae	4	1
Philopotamidae	3	1
Hydrophilidae	5	1
Gomphidae	1	1
Leuctridae	0	1
Lumbricidae	10	1
Elmidae	4	1
Polycentropodidae	6	1
Simuliidae	6	1
Psephenidae	4	1
Ceratopogonidae	6	1

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Statistical Analysis

---

Number of Taxa: 23  
 Total Number of Individuals: 104  
 % Contribution of Dominant Family: 26.92 % ( Chironomidae )  
 Family Biotic Index: 5.20  
 Scraper/Filterer Collector Ratio: 1.29  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 9  
 % EPT: 30.77  
 EPT/C: 1.10  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 167

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 13/2  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees/shrubs/Stable  
 Canopy: Mostly Open....Other: Boulder reinforcement; Water temp.4.5/pH 8.7/DO 12.5/Cond. 205

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Station: AN0004  
 Little Flat Bk, Deckertown Tnpk { Rt 650 } Four Corners, Sussex County  
 Milford USGS Quadrangle  
 Date Sampled: 01/05/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Simuliidae	6	15
Chironomidae	6	15
Ephemerelellidae	1	12
Limnephilidae	4	9
Siphonuridae	7	7
Brachycentridae	1	7
Taeniopterygidae	2	6
Hydropsychidae	4	5
Leuctridae	0	4
Leptophlebiidae	2	4
Lepidostomatidae	1	4
Rhyacophilidae	0	2
Astacidae	7	1
Gomphidae	1	1
Chloroperlidae	1	1
Hydroptilidae	4	1
Perlodidae	2	1
Lumbriculidae	8	1
Psychomyiidae	2	1
Molannidae	6	1
Family	5	1
Corduliidae	5	1

---

Statistical Analysis

---

Number of Taxa: 22  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 15.00 % ( Simuliidae & Chironomidae )  
 Family Biotic Index: 3.69  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.25  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 15  
 % EPT: 65.00  
 EPT/C: 4.33  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 194

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 4/< 1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested; Water temp.3.7/pH 7.9 /DO 12.7 /Cond.62

---

Station: AN0005  
 Little Flat Bk, Degroat Rd , Hainesville, Sussex County  
 Milford USGS Quadrangle  
 Date Sampled: 01/05/98

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Simuliidae	6	34
Ephemerellidae	1	13
Chironomidae	6	11
Limnephilidae	4	7
Hydropsychidae	4	7
Sphaeriidae	8	6
Taeniopterygidae	2	4
Protoneuridae	9	3
Tubificidae	10	2
Philopotamidae	3	2
Hydroptilidae	4	2
Psephenidae	4	2
Heptageniidae	4	2
Baetidae	4	1
Leptophlebiidae	2	1
Leptoceridae	4	1
Corydalidae	0	1
Tipulidae	3	1

---

Statistical Analysis

---

Number of Taxa: 18  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 34.00 % ( Simuliidae )  
 Family Biotic Index: 4.85  
 Scraper/Filterer Collector Ratio: 0.27  
 Shredder/Total Ratio: 0.05  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 10  
 % EPT: 40.00  
 EPT/C: 3.64  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 162

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/<1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Weeds/Stable  
 Canopy: Mostly Open....Other: Forested,Agriculture,Livestock; Water temp.3.5/pH 7.5/DO 12.1/Cond.230

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Station: AN0005A  
 Little Flat Bk, Rt 615 Sandyston Twp, Sussex County  
 Culvers Gap USGS Quadrangle  
 Date Sampled: 01/07/98

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	24
Ephemerelellidae	1	15
Hydropsychidae	4	11
Nemouridae	2	10
Taeniopterygidae	2	8
Lumbriculidae	8	5
Helicopsychidae	3	4
Elmidae	4	4
Simulidae	6	4
Philopotamidae	3	2
Heptageniidae	4	2
Limnephilidae	4	1
Planariidae	4	1
Hydroptilidae	4	1
Oligoneuriidae	2	1
Lumbricidae	10	1
Brachycentridae	1	1
Nematoda	6	1
Psephenidae	4	1
Odontoceridae	0	1
Rhyacophilidae	0	1
Ceratopogonidae	6	1

---

Statistical Analysis

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Number of Taxa: 22  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 24.00 % ( Chironomidae )  
 Family Biotic Index: 3.86  
 Scraper/Filterer Collector Ratio: 0.78  
 Shredder/Total Ratio: 0.19  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 13  
 % EPT: 58.00  
 EPT/C: 2.42  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 143

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Observations

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Streamwater: Slightly Turbid....Flow: Fast....Width/Depth (ft): 22/2  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Forested,Rural;

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Station: AN0006  
 Big Flat Bk, Rt 560, Tuttle's Corner, Sussex County  
 Clvers Gap USGS Quadrangle  
 Date Sampled: 01/05/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Ephemerellidae	1	30
Heptageniidae	4	12
Chironomidae	6	12
Hydropsychidae	4	10
Lumbriculidae	8	7
Leptophlebiidae	2	7
Hydroptilidae	4	6
Nemouridae	2	4
Taeniopterygidae	2	3
Limnephilidae	4	2
Planorbidae	6	2
Helicopsychidae	3	2
Athericidae	2	1
Glossosomatidae	0	1
Oligoneuriidae	2	1
Corydalidae	0	1
Elmidae	4	1
Physidae	7	1
Simuliidae	6	1
Psephenidae	4	1

---

Statistical Analysis

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Number of Taxa: 20  
 Total Number of Individuals: 105  
 % Contribution of Dominant Family: 28.57 % ( Ephemerellidae )  
 Family Biotic Index: 3.32  
 Scraper/Filterer Collector Ratio: 1.25  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 10  
 % EPT: 71.43  
 EPT/C: 5.95  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 170

---

Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 40/2  
 Substrate: Cobbles, gravel, sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Open....Other: Forested, Rural; Water temp. 2.5/pH 8.7/DO 14.8/Cond. 51

---

Station: AN0007  
 Flat Bk, Rt 615 Walpack Center, Sussex County  
 Lk Maskenozha USGS Quadrangle  
 Date Sampled: 01/05/98

Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	27
Ephemerelellidae	1	10
Hydropsychidae	4	7
Lumbriculidae	8	7
Elmidae	4	6
Taeniopterygidae	2	5
Heptageniidae	4	5
Helicopsychidae	3	4
Planariidae	4	4
Limnephilidae	4	3
Brachycentridae	1	3
Leptoceridae	4	3
Nematoda	6	3
Capniidae	1	2
Rhyacophilidae	0	2
BloodRed Chironomidae	8	1
Planorbidae	6	1
Oligoneuriidae	2	1
Lepidostomatidae	1	1
Corydalidae	0	1
Sphaeriidae	8	1
Simuliidae	6	1
Tetrastemmatidae	7	1
Lymnaeidae	6	1

Statistical Analysis

Number of Taxa: 24  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 27.00 % ( Chironomidae )  
 Family Biotic Index: 4.29  
 Scraper/Filterer Collector Ratio: 0.51  
 Shredder/Total Ratio: 0.06  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 46.00  
 EPT/C: 1.64  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 184

Observations

Streamwater: Clear....Flow: Fast....Width/Depth (ft): 40/3  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Open....Other: Forested/Rural; Water temp.3.0 /pH 7.0 /DO 13.3 /Cond.110

Station: AN0008  
Flat Bk, Rt 615 Flatbrookville, Sussex County  
Flatbrookville USGS Quadrangle  
Date Sampled: 11/18/97

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Ephemerellidae	1	29
Hydropsychidae	4	24
Heptageniidae	4	18
Limnephilidae	4	12
Oligoneuriidae	2	7
Elmidae	4	4
Philopotamidae	3	2
Helicopsychidae	3	2
Lepidostomatidae	1	2
Polycentropodidae	6	2
Taeniopterygidae	2	2
Planorbidae	6	1
Hydroptilidae	4	1
Tubificidae	10	1
Corydalidae	0	1
Chironomidae	6	1
Rhyacophilidae	0	1

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Statistical Analysis

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Number of Taxa: 17  
Total Number of Individuals: 110  
% Contribution of Dominant Family: 26.36 % ( Ephemerellidae )  
Family Biotic Index: 3.01  
Scraper/Filterer Collector Ratio: 2.43  
Shredder/Total Ratio: 0.04  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
% EPT: 92.73  
EPT/C: 92.73  
NJIS Rating: 30  
Biological Condition: Nonimpaired  
Habitat Analysis: 177

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Observations

---

Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 35/2  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Open....Other: Forested; Water temp.1.3 /pH 8.8 /DO 13.7 /Cond.206

---



Station: AN0009  
 Van Campens Bk, Flatbrookville-Middleville Rd , Walpack Twp, Sussex County  
 Flatbrookville USGS Quadrangle  
 Date Sampled: 11/18/97

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Taeniopterygidae	2	19
Leuctridae	0	16
Brachycentridae	1	12
Chironomidae	6	12
Hydropsychidae	4	10
Rhyacophilidae	0	9
Ephemerellidae	1	8
Naididae	7	4
Elmidae	4	4
Simuliidae	6	3
Tipulidae	3	3
BloodRed Chironomidae	8	2
Lumbriculidae	8	1
Molannidae	6	1
Corydalidae	0	1
Limnephilidae	4	1
Sialidae	4	1
Heptageniidae	4	1
Philopotamidae	3	1

---

Statistical Analysis

---

Number of Taxa: 19  
 Total Number of Individuals: 109  
 % Contribution of Dominant Family: 17.43 % ( Taeniopterygidae )  
 Family Biotic Index: 2.62  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.47  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 10  
 % EPT: 71.56  
 EPT/C: 5.11  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 182

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Observations

---

Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 4/<1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Closed....Other: Forested; Water temp.3.2 /pH 6.5 /DO 11.4 /Cond.33

---

Station: AN0010  
Van Campens Bk, Mill Rd , Millbrook, Warren County  
Flatbrookville USGS Quadrangle  
Date Sampled: 11/13/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Heptageniidae	4	35
Leptophlebiidae	2	14
Brachycentridae	1	9
Perlidae	1	5
Philopotamidae	3	5
Rhyacophilidae	0	5
Taeniopterygidae	2	5
Hydropsychidae	4	4
Chironomidae	6	4
Tipulidae	3	2
Ephemerellidae	1	2
Leuctridae	0	2
Pteronarcidae	0	2
Peltoperlidae	1	2
Glossosomatidae	0	1
Chloroperlidae	1	1
Elmidae	4	1
Baetidae	4	1

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#### Statistical Analysis

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Number of Taxa: 18  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 35.00 % ( Heptageniidae )  
Family Biotic Index: 2.66  
Scraper/Filterer Collector Ratio: 4.56  
Shredder/Total Ratio: 0.20  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 15  
% EPT: 93.00  
EPT/C: 23.25  
NJIS Rating: 30  
Biological Condition: Nonimpaired  
Habitat Analysis: 196

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#### Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 10/1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Open....Other: Forested; Water temp.4.0 /pH 7.3 /DO - /Cond.62

---

Station: AN0011  
Van Campens Bk, Old Mine Rd , Pahaquarry Twp, Warren County  
Bushkill USGS Quadrangle  
Date Sampled: 11/18/97

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Heptageniidae	4	53
Ephemerellidae	1	17
Leptophlebiidae	2	7
Taeniopterygidae	2	4
Limnephilidae	4	3
Odontoceridae	0	3
Perlidae	1	2
Chloroperlidae	1	2
Elmidae	4	2
Tipulidae	3	1
Lepidostomatidae	1	1
Leuctridae	0	1
Lumbriculidae	8	1
Chironomidae	6	1
Rhyacophilidae	0	1
Hydropsychidae	4	1

---

#### Statistical Analysis

---

Number of Taxa: 16  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 53.00 % ( Heptageniidae )  
Family Biotic Index: 2.97  
Scraper/Filterer Collector Ratio: 78.00  
Shredder/Total Ratio: 0.06  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
% EPT: 95.00  
EPT/C: 95.00  
NJIS Rating: 27  
Biological Condition: Nonimpaired  
Habitat Analysis: 183

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#### Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 13/1  
Substrate: Cobbles....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
Canopy: Mostly Closed....Other: Forested; Water temp.2.4 /pH 7.7 /DO 12.3 /Cond.82

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Station: AN0012  
 Dunfield Ck, River Rd, { Off Rt 80 } Pahaquarry Twp, Warren County  
 Portland/Stroudsburg USGS Quadrangle  
 Date Sampled: 11/20/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Heptageniidae	4	37
Ephemerellidae	1	17
Hydropsychidae	4	11
Lumbriculidae	8	8
Capniidae	1	8
Perlidae	1	4
Tipulidae	3	2
Chloroperlidae	1	2
Philopotamidae	3	2
Psephenidae	4	1
Enchytraeidae	10	1
Leptophlebiidae	2	1
Gomphidae	1	1
Planariidae	4	1
Elmidae	4	1
Tetrastemmatidae	7	1
Rhyacophilidae	0	1
Taeniopterygidae	2	1

---

Statistical Analysis

---

Number of Taxa: 18  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 37.00 % ( Heptageniidae )  
 Family Biotic Index: 3.33  
 Scraper/Filterer Collector Ratio: 4.38  
 Shredder/Total Ratio: 0.09  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 10  
 % EPT: 84.00  
 EPT/C: 0.00  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 163

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 7/<1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Forested/Rt 80 upstream; Water temp.3.2 /pH 6.3 /DO 13.3  
 /Cond.36

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Station: AN0013  
Stony Bk, Rt I-80 (N Of Columbia), Knowlton Twp, Warren County  
Portland USGS Quadrangle  
Date Sampled: NOT SAMPLED

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Limestone area, under extreme low flow conditions the stream goes subsurface

Station: AN0014  
 Paulins Kill Trib, Rt 623 ,W Of Sparta Junction, Sussex County  
 Newton E USGS Quadrangle  
 Date Sampled: 10/16/97

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	31
Hydropsychidae	4	29
Chironomidae	6	13
Elmidae	4	9
Tubificidae	10	3
Helicopsychidae	3	3
Ephemerellidae	1	2
Limnephilidae	4	2
Sphaeriidae	8	2
Simuliidae	6	2
Brachycentridae	1	1
Nematoda	6	1
Physidae	7	1
Heptageniidae	4	1

---

Statistical Analysis

---

Number of Taxa: 14  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 31.00 % ( Gammaridae )  
 Family Biotic Index: 4.49  
 Scraper/Filterer Collector Ratio: 0.36  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 6  
 % EPT: 38.00  
 EPT/C: 2.92  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 146

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 11/2  
 Substrate: Gravel....StreamBank Vegetation/Stability: Shrubs,small trees/Stable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.11.7 /pH 7.9 /DO 5.6 /Cond.703

---

Station: AN0015  
 Paulins Kill, Rt 663, Warbasse, Sussex County  
 Newton E USGS Quadrangle  
 Date Sampled: 10/16/97

---

Family	Family Tolerance Value (FTV)	Number of Individuals
Elmidae	4	27
Tubificidae	10	17
Gammaridae	4	9
Talitridae	8	8
Asellidae	8	6
Chironomidae	6	6
Planariidae	4	6
Hydrobiidae	8	6
Protoneuridae	9	4
BloodRed Chironomidae	8	3
Sphaeriidae	8	3
Simuliidae	6	3
Hydropsychidae	4	1
Chydoridae	4	1
Pyralidae	5	1
Sialidae	4	1
Corixidae	9	1

---

Statistical Analysis

---

Number of Taxa: 17  
 Total Number of Individuals: 103  
 % Contribution of Dominant Family: 26.21 % ( Elmidae )  
 Family Biotic Index: 6.43  
 Scraper/Filterer Collector Ratio: 3.86  
 Shredder/Total Ratio: 0.01  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
 % EPT: 0.97  
 EPT/C: 0.11  
 NJIS Rating: 15  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 141  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 17/2  
 Substrate: Gravel,silt....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Forested/Agricultural; Water temp.12.2 /pH 7.9 /DO 4.5  
 /Cond.653

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Station: AN0016  
Paulins Kill Trib, Lafayette Meadows Rd , Lafayette Twp, Sussex County  
Newton E USGS Quadrangle  
Date Sampled: 10/16/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	50
Sphaeriidae	8	11
Chironomidae	6	10
Elmidae	4	8
Tubificidae	10	5
Asellidae	8	4
Psephenidae	4	3
Hydropsychidae	4	2
BloodRed Chironomidae	8	2
Planorbidae	6	1
Lepidostomatidae	1	1
Ceratopogonidae	6	1
Limnephilidae	4	1
Simuliidae	6	1

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Statistical Analysis

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Number of Taxa: 14  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 50.00 % ( Gammaridae )  
Family Biotic Index: 5.21  
Scraper/Filterer Collector Ratio: 0.50  
Shredder/Total Ratio: 0.06  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
% EPT: 4.00  
EPT/C: 0.33  
NJIS Rating: 15  
Biological Condition: Moderately Impaired  
Habitat Analysis: 147  
Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 7/1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
Canopy: Mostly Closed....Other: Forested/Agricultural; Water temp.11.4 /pH 7.8 /DO 6.8  
/Cond.853

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Station: AN0017  
 Culvers Ck, Rt 206 , Frankford Twp, Sussex County  
 Culvers Gap USGS Quadrangle  
 Date Sampled: 10/14/97

Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	53
Philopotamidae	3	14
Simuliidae	6	10
Gammaridae	4	5
Asellidae	8	4
Tetrastemmatidae	7	4
Elmidae	4	4
Heptageniidae	4	4
Chironomidae	6	3
Lumbriculidae	8	2
Planorbidae	6	1
Lumbricidae	10	1
Sphaeriidae	8	1

Statistical Analysis

Number of Taxa: 13  
 Total Number of Individuals: 106  
 % Contribution of Dominant Family: 50.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.57  
 Scraper/Filterer Collector Ratio: 0.12  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
 % EPT: 66.98  
 EPT/C: 22.33  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 107

Observations

Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 6/1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Weeds/Stable  
 Canopy: Open....Other: Forested/Suburban/Septic systems/Wetlands upstream; Water temp.14.6  
 /pH 6.9 /DO 6.7 /Cond.143

Station: AN0018  
 Culvers Ck, Long Bridge Rd , Frankford Twp, Sussex County  
 Culvers Gap USGS Quadrangle  
 Date Sampled: 10/14/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Plagiostomidae	4	19
Planorbidae	6	13
Protoneuridae	9	9
BloodRed Chironomidae	8	8
Gammaridae	4	7
Dytiscidae	5	7
Paludicellidae	7	7
Chironomidae	6	5
Hydropsychidae	4	4
Gomphidae	1	2
Tubificidae	10	2
Psychodidae	10	2
Corydalidae	0	2
Physidae	7	2
Glossiphoniidae	8	1
Leptoceridae	4	1
Talitridae	8	1
Lumbricidae	10	1
Nematoda	6	1
Leptophlebiidae	2	1
Sphaeriidae	8	1
Tetrastemmatidae	7	1
Phryganeidae	4	1
Simuliidae	6	1
Ceratopogonidae	6	1

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Statistical Analysis

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Number of Taxa: 25  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 19.00 % ( Plagiostomidae )  
 Family Biotic Index: 5.82  
 Scraper/Filterer Collector Ratio: 1.36  
 Shredder/Total Ratio: 0.01  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 7.00  
 EPT/C: 0.54  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 105  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 8/1  
 Substrate: Cobbles,gravel,mud....StreamBank Vegetation/Stability: Shrubs,trees/Unstable  
 Canopy: Mostly Closed....Other: Forested/Rural; Water temp.14.6 /pH 7.0 /DO 1.9 /Cond.370

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Station: AN0019  
 Dry Bk, Rt 519 , Frankford Twp, Sussex County  
 Branchville USGS Quadrangle  
 Date Sampled: 10/14/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Sphaeriidae	8	17
Chironomidae	6	16
Elmidae	4	12
Tubificidae	10	11
Naididae	7	8
Psychodidae	10	5
Baetidae	4	4
Planorbidae	6	4
Hydridae	5	4
Protoneuridae	9	3
Daphnidae	4	3
Gomphidae	1	2
Tabanidae	6	2
Calopterygidae	5	1
Caenidae	7	1
Planariidae	4	1
Chydoridae	4	1
Leptophlebiidae	2	1
Physidae	7	1
Tetrastemmatidae	7	1
Ephemerellidae	1	1
Simuliidae	6	1

---

Statistical Analysis

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Number of Taxa: 22  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 17.00 % ( Sphaeriidae )  
 Family Biotic Index: 6.52  
 Scraper/Filterer Collector Ratio: 0.89  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 7.00  
 EPT/C: 0.44  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 118  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 8/1  
 Substrate: Cobbles,gravel,silt....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Agricultural/Rural; Water temp.13.8 /pH 7.6 /DO 5.1  
 /Cond.275

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Station: AN0020  
Dry Bk, Mill Rd, Branchville, Sussex County  
Branchville USGS Quadrangle  
Date Sampled: NOT SAMPLED

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No Water

Limestone area, under extreme low flow conditions the stream goes subsurface

Station: AN0021  
 Paulins Kill, Rt 626 , Balesville, Sussex County  
 Newton W USGS Quadrangle  
 Date Sampled: 10/09/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	24
Hydropsychidae	4	23
Baetidae	4	11
Ephemerellidae	1	7
Gammaridae	4	5
Elmidae	4	5
Philopotamidae	3	4
Planariidae	4	4
Simuliidae	6	3
Planorbidae	6	2
Hydroptilidae	4	2
Nematoda	6	2
Protoneuridae	9	1
Oligoneuriidae	2	1
Naididae	7	1
Physidae	7	1
Psephenidae	4	1
Veliidae	9	1
Lymnaeidae	6	1
Heptageniidae	4	1

---

Statistical Analysis

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Number of Taxa: 20  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 24.00 % ( Chironomidae )  
 Family Biotic Index: 4.53  
 Scraper/Filterer Collector Ratio: 0.71  
 Shredder/Total Ratio: 0.24  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
 % EPT: 49.00  
 EPT/C: 2.04  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 171

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 30/1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.17.2 /pH 8.6 /DO 11.6 /Cond.508

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Station: AN0022  
 Paulins Kill, Rt 614 , Blw Paulins Kill Lk , Stillwater Twp, Sussex County  
 Newton W USGS Quadrangle  
 Date Sampled: 10/09/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Paludicellidae	7	39
Hydropsychidae	4	14
Gammaridae	4	12
Simuliidae	6	11
Planariidae	4	6
BloodRed Chironomidae	8	6
Chironomidae	6	3
Philopotamidae	3	2
Pyralidae	5	2
Planorbidae	6	1
Glossiphoniidae	8	1
Hydridae	5	1
Plagiostomidae	4	1
Sphaeriidae	8	1

---

Statistical Analysis

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Number of Taxa: 14  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 39.00 % ( Paludicellidae )  
 Family Biotic Index: 5.80  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.08  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 16.00  
 EPT/C: 1.78  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 168  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 40/<1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Grasses/Stable  
 Canopy: Open....Other: Forested/Rural; Water temp.18.1 /pH 9.3 /DO 10.8 /Cond.485

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Station: AN0023  
Troy Bk, Blw Swartswood Lk, Stillwater Twp, Sussex County  
Newton W USGS Quadrangle  
Date Sampled: NOT SAMPLED

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NO WATER

Limestone area, under extreme low flow conditions and high lake evaporation the stream does not flow below Swartswood Lake dam.

Station: AN0023A  
 Troy Bk, Swartswood Rd , Stillwater Twp, Sussex County  
 Newton W USGS Quadrangle  
 Date Sampled: 10/09/97

Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	25
Simuliidae	6	8
Philopotamidae	3	5
Tetrastemmatidae	7	5
Sphaeriidae	8	5
Chironomidae	6	4
Planorbidae	6	4
Taeniopterygidae	2	4
Perlidae	1	3
Glossosomatidae	0	3
Limnephilidae	4	2
Helicopsychidae	3	2
Calopterygidae	5	2
Physidae	7	2
Elmidae	4	2
Baetidae	4	2
Aeshnidae	3	1
Ephemerellidae	1	1
Gammaridae	4	1
Lumbricidae	10	1

Statistical Analysis

Number of Taxa: 20  
 Total Number of Individuals: 82  
 % Contribution of Dominant Family: 30.49 % ( Hydropsychidae )  
 Family Biotic Index: 4.50  
 Scraper/Filterer Collector Ratio: 0.37  
 Shredder/Total Ratio: 0.05  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 9  
 % EPT: 57.32  
 EPT/C: 14.33  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 186

Observations

Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 8/1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural; Water temp.14.8 /pH 8.3 /DO 9.3 /Cond.162



Station: AN0024  
 Trout Bk, Pond Brook Rd {Rt 612 } Middleville, Sussex County  
 Newton W USGS Quadrangle  
 Date Sampled: 10/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Helicopsychidae	3	18
Ephemerelellidae	1	14
Psephenidae	4	10
Hydropsychidae	4	9
Leptophlebiidae	2	8
Sphaeriidae	8	6
Heptageniidae	4	5
Chironomidae	6	5
Baetidae	4	4
Perlidae	1	3
Lumbriculidae	8	3
Elmidae	4	3
Philopotamidae	3	2
Rhyacophilidae	0	2
BloodRed Chironomidae	8	2
Planariidae	4	1
Tipulidae	3	1
Lepidostomatidae	1	1
Leptoceridae	4	1
Ceratopogonidae	6	1
Pteronarcidae	0	1

---

Statistical Analysis

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Number of Taxa: 21  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 18.00 % ( Helicopsychidae )  
 Family Biotic Index: 3.53  
 Scraper/Filterer Collector Ratio: 1.82  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 68.00  
 EPT/C: 9.71  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 140

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 5/<1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Rural/Agricultural livestock; Water temp.15.9 /pH 7.9 /DO 8.7 /Cond.150

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Station: AN0025  
 Paulins Kill, Sunset Hill Rd , Blairstown, Warren County  
 Blairstown USGS Quadrangle  
 Date Sampled: 11/13/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Caenidae	7	21
Sphaeriidae	8	12
Elmidae	4	9
Ephemerellidae	1	8
Gammaridae	4	8
Hydropsychidae	4	7
Hydrobiidae	8	7
Brachycentridae	1	5
Simulidae	6	5
Planorbidae	6	3
Limnephilidae	4	2
Chironomidae	6	2
Heptageniidae	4	2
Taeniopterygidae	2	2
Protoneuridae	9	1
Lebertiidae	4	1
Lumbriculidae	8	1
Leptoceridae	4	1
Nematoda	6	1
Psephenidae	4	1
Sialidae	4	1

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Statistical Analysis

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Number of Taxa: 21  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 21.00 % ( Caenidae )  
 Family Biotic Index: 5.27  
 Scraper/Filterer Collector Ratio: 1.04  
 Shredder/Total Ratio: 0.09  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 48.00  
 EPT/C: 24.00  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 144

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 80/2  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Open....Other: Suburban; Water temp.4.8 /pH 8.4 /DO - /Cond.480

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Station: AN0025A  
Blair Ck, Blw Fairview Lk, Hardwick Twp, Sussex County  
Flatbrookville USGS Quadrangle  
Date Sampled: NOT SAMPLED

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ECOREGION DATA ONLY

Private property

Station: AN0026  
 Blair Ck, Shannon Rd , Hardwick Twp, Warren County  
 Flatbrookville USGS Quadrangle  
 Date Sampled: 10/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	39
Hydropsychidae	4	24
Planariidae	4	10
Tetrastemmatidae	7	4
Philopotamidae	3	3
Polycentropodidae	6	3
Tipulidae	3	3
Brachycentridae	1	2
Veliidae	9	2
Nematoda	6	2
Elmidae	4	2
Protoneuridae	9	1
Gyrinidae	3	1
Gomphidae	1	1
Ephemerellidae	1	1
Hydroptilidae	4	1
Oligoneuriidae	2	1

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Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 39.00 % ( Chironomidae )  
 Family Biotic Index: 4.94  
 Scraper/Filterer Collector Ratio: 0.13  
 Shredder/Total Ratio: 0.05  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
 % EPT: 35.00  
 EPT/C: 0.90  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 98

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 8/<1  
 Substrate: Cobbles,gravel,silt....StreamBank Vegetation/Stability: Shrubs/Stable  
 Canopy: Open....Other: Forested/Agricultural; Water temp.17.2 /pH - /DO 7.9 /Cond.101

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Station: AN0027  
 Blair Ck, Rt 94 , Blairstown, Warren County  
 Blairstown USGS Quadrangle  
 Date Sampled: 11/13/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Ephemerellidae	1	19
Chironomidae	6	16
Elmidae	4	13
Limnephilidae	4	10
Gammaridae	4	9
Psephenidae	4	9
Philopotamidae	3	3
Helicopsychidae	3	3
Tetrastemmatidae	7	3
Hydropsychidae	4	2
Lepidostomatidae	1	2
Naididae	7	2
Taeniopterygidae	2	2
Protoneuridae	9	1
Caenidae	7	1
Brachycentridae	1	1
Leptophlebiidae	2	1
Sphaeriidae	8	1
Heptageniidae	4	1
Tricorythidae	4	1

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Statistical Analysis

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Number of Taxa: 20  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 19.00 % ( Ephemerellidae )  
 Family Biotic Index: 3.81  
 Scraper/Filterer Collector Ratio: 9.17  
 Shredder/Total Ratio: 0.05  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 46.00  
 EPT/C: 2.88  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 87

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Urban; Water temp.6.7 /pH 8.6 /DO - /Cond.290

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Station: AN0028  
 Jacksonburg Ck, Rt 602 , Hardwick Twp, Warren County  
 Flatbrookville USGS Quadrangle  
 Date Sampled: 11/13/97

Family	Family Tolerance Value (FTV)	Number of Individuals
Taeniopterygidae	2	13
Chironomidae	6	12
Leptophlebiidae	2	10
Sphaeriidae	8	9
Brachycentridae	1	7
Tubificidae	10	6
Hydropsychidae	4	5
Sialidae	4	5
Elmidae	4	4
Protoneuridae	9	3
Aeshnidae	3	3
Polycentropodidae	6	3
Philopotamidae	3	2
Ephemerellidae	1	2
BloodRed Chironomidae	8	2
Odontoceridae	0	2
Rhyacophilidae	0	2
Heptageniidae	4	2
Perlidae	1	1
Calopterygidae	5	1
Cordulegastridae	3	1
Planariidae	4	1
Oligoneuriidae	2	1
Lumbricidae	10	1
Molannidae	6	1
Pteronarcidae	0	1

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 Statistical Analysis  
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Number of Taxa: 26  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 13.00 % ( Taeniopterygidae )  
 Family Biotic Index: 4.30  
 Scraper/Filterer Collector Ratio: 0.55  
 Shredder/Total Ratio: 0.21  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 14  
 % EPT: 52.00  
 EPT/C: 3.71  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 182

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 Observations  
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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Suburban; Water temp.4.7 /pH 6.7 /DO - /Cond.57  
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Station: AN0029  
 Jacksonburg Ck, Rt 94 , Jacksonburg, Warren County  
 Blairstown USGS Quadrangle  
 Date Sampled: 11/13/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Ephemerellidae	1	29
Heptageniidae	4	17
Limnephilidae	4	12
Hydropsychidae	4	12
Lumbricidae	10	7
Oligoneuriidae	2	4
Leptophlebiidae	2	4
Chironomidae	6	3
Psephenidae	4	3
Taeniopterygidae	2	3
Gammaridae	4	1
Lepidostomatidae	1	1
Leuctridae	0	1
Leptoceridae	4	1
Psychomyiidae	2	1
Sperchonidae	2	1

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Statistical Analysis

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Number of Taxa: 16  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 29.00 % ( Ephemerellidae )  
 Family Biotic Index: 3.28  
 Scraper/Filterer Collector Ratio: 3.81  
 Shredder/Total Ratio: 0.08  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 11  
 % EPT: 85.00  
 EPT/C: 28.33  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 146

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Unstable  
 Canopy: Mostly Open....Other: Urban; Water temp.5.0 /pH 8.1 /DO - /Cond.144

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Station: AN0030  
 Yards Ck, Mt Vernon Rd , Mt Vernon, Warren County  
 Portland USGS Quadrangle  
 Date Sampled: 11/06/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	23
Sphaeriidae	8	21
Talitridae	8	13
Hydroptilidae	4	9
Asellidae	8	6
Physidae	7	6
Tubificidae	10	5
Hydropsychidae	4	4
Planorbidae	6	4
Caenidae	7	3
Protoneuridae	9	3
BloodRed Chironomidae	8	2
Libellulidae	9	2
Simuliidae	6	2
Naididae	7	1
Elmidae	4	1
Hydrobiidae	8	1
Pyralidae	5	1
Tipulidae	3	1
Phryganeidae	4	1
Limnephilidae	4	1

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Statistical Analysis

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Number of Taxa: 21  
 Total Number of Individuals: 110  
 % Contribution of Dominant Family: 20.91 % ( Chironomidae )  
 Family Biotic Index: 6.86  
 Scraper/Filterer Collector Ratio: 0.52  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 16.36  
 EPT/C: 0.65  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 95

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 10/1  
 Substrate: Mud,silt....StreamBank Vegetation/Stability: Shrubs/Stable  
 Canopy: Open....Other: Forested/Rural/Reservoir upstream; Water temp.10.5 /pH 6.7 /DO - /Cond.66

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Station: AN0031  
 Yards Ck, Rt 94 , Hainesburg, Warren County  
 Portland USGS Quadrangle  
 Date Sampled: 11/06/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	17
Elmidae	4	17
Ephemerellidae	1	15
Philopotamidae	3	8
Limnephilidae	4	7
Chironomidae	6	6
Tubificidae	10	5
Helicopsychidae	3	4
Taeniopterygidae	2	3
Corixidae	9	2
Perlidae	1	2
Polycentropodidae	6	2
Rhyacophilidae	0	2
Calopterygidae	5	1
Tipulidae	3	1
Asellidae	8	1
Planariidae	4	1
Empididae	6	1
Curculionidae	7	1
Lumbricidae	10	1
Ceratopogonidae	6	1
Psephenidae	4	1
Simuliidae	6	1

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Statistical Analysis

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Number of Taxa: 23  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 17.00 % ( Hydropsychidae & Elmidae )  
 Family Biotic Index: 3.98  
 Scraper/Filterer Collector Ratio: 1.29  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 9  
 % EPT: 60.00  
 EPT/C: 10.00  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 142

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 15/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Grasses/Stable  
 Canopy: Open....Other: Forested/Rural/Agricultural livestock; Water temp.7.5 /pH 8.1 /DO  
 - /Cond.134

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Station: AN0032  
Paulins Kill, Rt 46 , Columbia, Warren County  
Portland USGS Quadrangle  
Date Sampled: 11/06/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Spongillidae	5	65
Fredericellidae	2	14
Taeniopterygidae	2	5
Gammaridae	4	4
Ephemerellidae	1	3
Hydropsychidae	4	2
Elmidae	4	2
Physidae	7	2
Planariidae	4	1
Chironomidae	6	1
Heptageniidae	4	1

---

Statistical Analysis

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Number of Taxa: 11  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 65.00 % ( Spongillidae )  
Family Biotic Index: 4.26  
Scraper/Filterer Collector Ratio: 1.50  
Shredder/Total Ratio: 0.05  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
% EPT: 11.00  
EPT/C: 11.00  
NJIS Rating: 18  
Biological Condition: Moderately Impaired  
Habitat Analysis: 185  
Deficiency(s) noted: Spongillidae Family Overwhelmingly Dominant

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 30/2  
Substrate: Cobbles....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Open....Other: Rural; Water temp.9.6 /pH 8.6 /DO -- /Cond.494

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Station: AN0032A  
 Paulins Kill, Vail Rd , Vail, Warren County  
 Portland USGS Quadrangle  
 Date Sampled: 11/06/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydrobiidae	8	15
Helicopsychidae	3	12
Elmidae	4	12
Hydropsychidae	4	11
Limnephilidae	4	8
Lepidostomatidae	1	8
Gammaridae	4	6
Ephemerellidae	1	5
Psephenidae	4	4
Protoneuridae	9	3
Sphaeriidae	8	3
Planariidae	4	2
Heptageniidae	4	2
Taeniopterygidae	2	2
Empididae	6	1
Brachycentridae	1	1
Chironomidae	6	1
Nematoda	6	1
Pyralidae	5	1
Pleuroceridae	6	1
Sialidae	4	1

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Statistical Analysis

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Number of Taxa: 21  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 15.00 % ( Hydrobiidae )  
 Family Biotic Index: 4.38  
 Scraper/Filterer Collector Ratio: 2.79  
 Shredder/Total Ratio: 0.12  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 49.00  
 EPT/C: 49.00  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 155

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 100/4  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Rural/Agricultural livestock; Water temp.8.8 /pH  
 8.1 /DO - /Cond.453

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Station: AN0033  
Delawanna Ck, Rt 46 , Delaware, Warren County  
Portland USGS Quadrangle  
Date Sampled: 11/06/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Ephemerellidae	1	40
Heptageniidae	4	18
Philopotamidae	3	8
Leuctridae	0	6
Asellidae	8	4
Elmidae	4	4
Spongillidae	5	3
Lumbricidae	10	3
Limnephilidae	4	2
Hydropsychidae	4	2
Planariidae	4	2
Gammaridae	4	2
Psephenidae	4	2
Gyrinidae	3	1
Chironomidae	6	1
Rhyacophilidae	0	1
Taeniopterygidae	2	1

---

Statistical Analysis

---

Number of Taxa: 17  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 40.00 % ( Ephemerellidae )  
Family Biotic Index: 2.80  
Scraper/Filterer Collector Ratio: 6.60  
Shredder/Total Ratio: 0.11  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
% EPT: 78.00  
EPT/C: 78.00  
NJIS Rating: 27  
Biological Condition: Nonimpaired  
Habitat Analysis: 155

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 15/1  
Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Open....Other: Forested/Rural/Large parking area and gas station adjacent;  
Water temp.8.3 /pH 8.6 /DO - /Cond.404

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Station: AN0034  
Ramseysburg Ck, Rt 46, Ramseysburg, Warren County  
Portland USGS Quadrangle  
Date Sampled: NOT SAMPLED

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NO WATER

Limestone area, under extreme low flow conditions the stream goes underground

Station: AN0035  
 Pequest R, Rt 206 , Springdale, Sussex County  
 Newton W USGS Quadrangle  
 Date Sampled: 09/25/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Protoneuridae	9	53
Chironomidae	6	10
Tubificidae	10	6
Planorbidae	6	5
Planariidae	4	4
Physidae	7	4
Elmidae	4	3
BloodRed Chironomidae	8	2
Naididae	7	2
Aeshnidae	3	1
Caenidae	7	1
Gammaridae	4	1
Hydropsychidae	4	1
Baetidae	4	1
Tetrastemmatidae	7	1
Psephenidae	4	1
Lymnaeidae	6	1
Phryganeidae	4	1
Simuliidae	6	1
Ceratopogonidae	6	1

---

Statistical Analysis

---

Number of Taxa: 20  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 53.00 % ( Protoneuridae )  
 Family Biotic Index: 7.68  
 Scraper/Filterer Collector Ratio: 4.50  
 Shredder/Total Ratio: 0.01  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 4.00  
 EPT/C: 0.33  
 NJIS Rating: 12  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 127  
 Deficiency(s) noted: Significant Organic Pollution  
 Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 15/1  
 Substrate: Cobbles,gravel,mud,silt....StreamBank Vegetation/Stability: Weeds/Unstable  
 Canopy: Mostly Open....Other: Forested/Rural/Agricultural; Water temp.10.9 /pH 9.0 /DO 8.0  
 /Cond.549

---

Station: AN0036  
Pequest R Trib, Brighton Rd , Brighton, Sussex County  
Tranquility USGS Quadrangle  
Date Sampled: 09/25/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	69
Physidae	7	9
Hydrobiidae	8	8
Elmidae	4	5
Corixidae	9	4
Blood Red Chironomidae	8	1
Helicopsychidae	3	1
Protoneuridae	9	1
Tubificidae	10	1
Sphaeriidae	8	1

---

Statistical Analysis

---

Number of Taxa: 10  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 69.00 % ( Gammaridae )  
Family Biotic Index: 4.97  
Scraper/Filterer Collector Ratio: 6.00  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
% EPT: 1.00  
EPT/C: 1.00  
NJIS Rating: 9  
Biological Condition: Moderately Impaired  
Habitat Analysis: 126  
Deficiency(s) noted: Gammaridae Family Overwhelmingly Dominant  
Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly turbid....Flow: Slow....Width/Depth (ft): 25/4  
Substrate: Cobbles,gravel,silt....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Open....Other: Forested /Rural; Water temp.11.6 /pH 8.1 /DO 7.5 /Cond.522

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Station: AN0037  
Pequest R, Pequest Rd , Huntsville, Sussex County  
Tranquility USGS Quadrangle  
Date Sampled: 09/23/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Elmidae	4	25
Hydropsychidae	4	13
Psephenidae	4	12
Simuliidae	6	10
Heptageniidae	4	7
Planariidae	4	6
Ephemerellidae	1	6
Gammaridae	4	4
Baetidae	4	3
Philopotamidae	3	3
Corydalidae	0	3
Chironomidae	6	2
Brachycentridae	1	2
Perlidae	1	2
Hydrobiidae	8	1
Tipulidae	3	1

---

Statistical Analysis

---

Number of Taxa: 16  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 25.00 % ( Elmidae )  
Family Biotic Index: 3.82  
Scraper/Filterer Collector Ratio: 1.69  
Shredder/Total Ratio: 0.03  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
% EPT: 36.00  
EPT/C: 18.00  
NJIS Rating: 30  
Biological Condition: Nonimpaired  
Habitat Analysis: 164

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 25/1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Closed....Other: Urban/Agricultural; Water temp.13.8 /pH 8.3 /DO 9.7  
/Cond.558

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Station: AN0038  
Trout Bk, Rt 612 , Allamuchy, Warren County  
Tranquility USGS Quadrangle  
Date Sampled: 12/18/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	44
Limnephilidae	4	26
Ephemerellidae	1	16
Gammaridae	4	14
Elmidae	4	5
Sphaeriidae	8	2
Taeniopterygidae	2	1
Nematoda	6	1
Ceratopogonidae	6	1

---

Statistical Analysis

---

Number of Taxa: 9  
Total Number of Individuals: 110  
% Contribution of Dominant Family: 40.00 % ( Chironomidae )  
Family Biotic Index: 4.45  
Scraper/Filterer Collector Ratio: 2.50  
Shredder/Total Ratio: 0.24  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
% EPT: 39.09  
EPT/C: 0.89  
NJIS Rating: 21  
Biological Condition: Moderately Impaired  
Habitat Analysis: 144

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 13/2  
Substrate: Mud,silt....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Closed....Other: Forested/Agricultural; Water temp.5.3 /pH 8.6 /DO 11.8 /Cond.570

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Station: AN0039  
 Pequest R, Rt 615 , Long Bridge, Warren County  
 Tranquility USGS Quadrangle  
 Date Sampled: 09/18/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	38
Elmidae	4	15
Corixidae	9	12
Chironomidae	6	10
Heptageniidae	4	7
Gammaridae	4	6
BloodRed Chironomidae	8	4
Tipulidae	3	2
Philopotamidae	3	2
Fredericellidae	2	2
Baetidae	4	2
Corydalidae	0	1
Perlidae	1	1
Tabanidae	6	1
Gerridae	8	1

---

Statistical Analysis

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Number of Taxa: 15  
 Total Number of Individuals: 104  
 % Contribution of Dominant Family: 36.54 % ( Hydropsychidae )  
 Family Biotic Index: 4.84  
 Scraper/Filterer Collector Ratio: 0.55  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 48.08  
 EPT/C: 3.43  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 149

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 19/2  
 Substrate: Cobbles,gravel,sand,snags....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Rural/Agricultural; Water temp.18.8 /pH 8.1 /DO 9.2  
 /Cond.532

---

Station: AN0040  
 Bear Ck, Shades Of Death Rd , {Nr Alphano } Independence Twp, Warren County  
 Blainstown USGS Quadrangle  
 Date Sampled: 09/23/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	56
Elmidae	4	8
Hydropsychidae	4	7
Physidae	7	7
Chironomidae	6	4
Baetidae	4	4
Planariidae	4	3
Hydrobiidae	8	2
Sphaeriidae	8	2
Corixidae	9	2
Asellidae	8	1
Tubificidae	10	1
Philopotamidae	3	1
Empididae	6	1
Psephenidae	4	1

---

Statistical Analysis

---

Number of Taxa: 15  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 56.00 % ( Gammaridae )  
 Family Biotic Index: 4.66  
 Scraper/Filterer Collector Ratio: 0.93  
 Shredder/Total Ratio: 0.01  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
 % EPT: 12.00  
 EPT/C: 3.00  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 155

---

Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 13/1  
 Substrate: Cobbls,mud,silt....StreamBank Vegetation/Stability: Shrubs,grasses/Stable  
 Canopy: Mostly Open....Other: Forested/Rural/Agricultural/Beaver dam upstream; Water temp.12.6 /pH 8.5 /DO 8.3 /Cond.500

---

Station: AN0040A  
Bear Ck, Dark Moon Rd , Frelinghuysen Twp, Warren County  
Tranquility USGS Quadrangle  
Date Sampled: 09/23/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	71
Elmidae	4	12
Ephemerellidae	1	5
Hydropsychidae	4	2
Limnephilidae	4	2
Astacidae	7	1
Planariidae	4	1
Lumbricidae	10	1
Baetidae	4	1
Dendrocoelidae	4	1
Sialidae	4	1
Simuliidae	6	1
Tabanidae	6	1

---

#### Statistical Analysis

---

Number of Taxa: 13  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 71.00 % ( Gammaridae )  
Family Biotic Index: 3.98  
Scraper/Filterer Collector Ratio: 5.67  
Shredder/Total Ratio: 0.03  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
% EPT: 10.00  
EPT/C: 0.00  
NJIS Rating: 18  
Biological Condition: Moderately Impaired  
Habitat Analysis: 162  
Deficiency(s) noted: Gammaridae Family Overwhelmingly Dominant

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#### Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 4/<1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Grasses,shrubs/Stable  
Canopy: Mostly Open....Other: Rural/Agriculture cropland and livestock; Water temp.13.3  
/pH 8.4 /DO 9.8 /Cond.510

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Station: AN0041  
Pequest R, Cemetery Rd , Vienna, Warren County  
Washington USGS Quadrangle  
Date Sampled: 09/18/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	30
Gammaridae	4	12
Chironomidae	6	11
Corixidae	9	10
Elmidae	4	9
Heptageniidae	4	9
Veliidae	9	4
Tipulidae	3	3
Brachycentridae	1	2
Baetidae	4	2
Asellidae	8	1
Gomphidae	1	1
Lepidostomatidae	1	1
Perlidae	1	1
BloodRed Chironomidae	8	1
Sphaeriidae	8	1
Psephenidae	4	1
Limnephilidae	4	1

---

Statistical Analysis

---

Number of Taxa: 18  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 30.00 % ( Hydropsychidae )  
Family Biotic Index: 4.86  
Scraper/Filterer Collector Ratio: 0.67  
Shredder/Total Ratio: 0.14  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
% EPT: 46.00  
EPT/C: 3.83  
NJIS Rating: 30  
Biological Condition: Nonimpaired  
Habitat Analysis: 156

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 33/2  
Substrate: Cobbles,gravel,snags....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Closed....Other: Forested/Rural/Agricultural; Water temp.18.8 /pH 8.1 /DO 8.7 /Cond.515

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Station: AN0042  
 Furnace Bk, Pequest Rd , Oxford, Warren County  
 Washington USGS Quadrangle  
 Date Sampled: 10/02/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	32
Elmidae	4	16
Asellidae	8	10
Corixidae	9	9
Chironomidae	6	7
Planorbidae	6	6
Protoneuridae	9	6
Gammaridae	4	3
Caenidae	7	2
BloodRed Chironomidae	8	2
Planariidae	4	1
Helicopsychidae	3	1
Talitridae	8	1
Naididae	7	1
Gomphidae	1	1
Sphaeriidae	8	1
Tubificidae	10	1

---

Statistical Analysis

---

Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 32.00 % ( Hydropsychidae )  
 Family Biotic Index: 5.68  
 Scraper/Filterer Collector Ratio: 0.70  
 Shredder/Total Ratio: 0.10  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
 % EPT: 35.00  
 EPT/C: 3.89  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 98

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 9/1  
 Substrate: Cobbles,gravel,silt....StreamBank Vegetation/Stability: Shrubs/Stable  
 Canopy: Open....Other: Forested/Rural/Channelized in past; Water temp.11.4 /pH 7.6 /DO 8.8  
 /Cond.223

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Station: AN0043  
Pequest R, Pequest Rd , Pequest, Warren County  
Washington USGS Quadrangle  
Date Sampled: 10/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	38
Ephemerelellidae	1	14
Gammaridae	4	13
Tipulidae	3	7
Elmidae	4	7
Heptageniidae	4	5
Baetidae	4	4
Rhyacophilidae	0	4
Lumbriculidae	8	3
Hydropsychidae	4	3
Nematoda	6	2
Asellidae	8	1
Brachycentridae	1	1
Naididae	7	1
Tetrastemmatidae	7	1
Psephenidae	4	1
Odontoceridae	0	1
Limnephilidae	4	1

---

#### Statistical Analysis

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Number of Taxa: 18  
Total Number of Individuals: 107  
% Contribution of Dominant Family: 35.51 % ( Chironomidae )  
Family Biotic Index: 4.28  
Scraper/Filterer Collector Ratio: 9.33  
Shredder/Total Ratio: 0.02  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
% EPT: 30.84  
EPT/C: 0.81  
NJIS Rating: 27  
Biological Condition: Nonimpaired  
Habitat Analysis: 148

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#### Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 30/1  
Substrate: Gravel,silt....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Open....Other: Forested/Rural; Water temp.13.7 /pH 8.9 /DO 9.8 /Cond.471

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Station: AN0044  
 Mountain Lake Bk, Tamarack Rd , {Blw Mt. Lk } Liberty Twp, Warren County  
 Washington USGS Quadrangle  
 Date Sampled: 10/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Protoneuridae	9	39
BloodRed Chironomidae	8	14
Caenidae	7	11
Gammaridae	4	9
Paludicellidae	7	8
Chironomidae	6	5
Planorbidae	6	3
Asellidae	8	2
Gomphidae	1	2
Chydoridae	4	2
Hydrobiidae	8	2
Spongillidae	5	2
Tetrastemmatidae	7	2
Elmidae	4	2
Gerridae	8	1
Nepidae	8	1

---

Statistical Analysis

---

Number of Taxa: 16  
 Total Number of Individuals: 105  
 % Contribution of Dominant Family: 37.14 % ( Protoneuridae )  
 Family Biotic Index: 7.33  
 Scraper/Filterer Collector Ratio: 0.24  
 Shredder/Total Ratio: 0.15  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
 % EPT: 10.48  
 EPT/C: 0.55  
 NJIS Rating: 15  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 146  
 Deficiency(s) noted: Significant Organic Pollution  
 Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 20/2  
 Substrate: Cobbles,silt....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural/Lake upstream; Water temp.18.2 /pH 8.1 /DO 4.7 /Cond.253

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Station: AN0045  
 Beaver Bk, Ridgeway Ave , Hope Twp, Warren County  
 Blairstown USGS Quadrangle  
 Date Sampled: 09/16/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	19
Psephenidae	4	18
Gomphidae	1	9
Leptophlebiidae	2	8
Elmidae	4	8
Heptageniidae	4	7
Odontoceridae	0	6
Hydropsychidae	4	4
Ephemerellidae	1	3
Corydalidae	0	3
Asellidae	8	2
Leptoceridae	4	2
Limnephilidae	4	2
Perlidae	1	1
Philopotamidae	3	1
Gammaridae	4	1
Empididae	6	1
Lumbricidae	10	1
BloodRed Chironomidae	8	1
Polycentropodidae	6	1
Tetrastemmatidae	7	1
Phryganeidae	4	1

---

Statistical Analysis

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Number of Taxa: 22  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 19.00 % ( Chironomidae )  
 Family Biotic Index: 3.71  
 Scraper/Filterer Collector Ratio: 2.44  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 11  
 % EPT: 36.00  
 EPT/C: 1.80  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 113

---

Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 8/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural; Water temp.18.9 /pH 7.8 /DO 5.7 /Cond.293

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Station: AN0046  
 Honey Run, Rt 519 , Hope Twp, Warren County  
 Blairstown USGS Quadrangle  
 Date Sampled: 09/16/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Elmidae	4	26
Chironomidae	6	24
Hydropsychidae	4	13
Gammaridae	4	7
Fredericellidae	2	5
Philopotamidae	3	3
Tubificidae	10	3
Limnephilidae	4	3
Hydrobiidae	8	2
Psephenidae	4	2
Tipulidae	3	1
Asellidae	8	1
Aeshnidae	3	1
Planariidae	4	1
Dryopidae	5	1
Helicopsychidae	3	1
Hydridae	5	1
Protoneuridae	9	1
Veliidae	9	1
Heptageniidae	4	1
Tabanidae	6	1
Valvatidae	4	1

---

Statistical Analysis

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Number of Taxa: 22  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 26.00 % ( Elmidae )  
 Family Biotic Index: 4.76  
 Scraper/Filterer Collector Ratio: 0.80  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 21.00  
 EPT/C: 0.88  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 133

---

Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Weeds/Stable  
 Canopy: Mostly Open....Other: Rural/Agricultural cropland and livestock; Water temp.17.2  
 /pH 7.8 /DO 6.9 /Cond.374

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Station: AN0047  
 Beaver Bk, Sarepta Rd , Sarepta, Warren County  
 Belvidere USGS Quadrangle  
 Date Sampled: 10/02/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	15
Ephemerellidae	1	15
Helicopsychidae	3	15
Gammaridae	4	13
Chironomidae	6	5
Tipulidae	3	4
Brachycentridae	1	4
Elmidae	4	4
Odontoceridae	0	4
Asellidae	8	3
Heptageniidae	4	3
Perlidae	1	2
Planariidae	4	2
Psephenidae	4	2
Caenidae	7	1
Hydrobiidae	8	1
Oligoneuriidae	2	1
Lepidostomatidae	1	1
Tubificidae	10	1
Baetidae	4	1
Limnephilidae	4	1
Sialidae	4	1
Sphaeriidae	8	1

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Statistical Analysis

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Number of Taxa: 23  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 15.00 % ( Hydropsychidae & Ephemerellidae & Helicopsychidae )  
 Family Biotic Index: 3.36  
 Scraper/Filterer Collector Ratio: 2.53  
 Shredder/Total Ratio: 0.06  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 63.00  
 EPT/C: 12.60  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 165

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 17/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural; Water temp.11.4 /pH 8.6 /DO 11.4 /Cond.470

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Station: AN0048  
 Pequest R, Water St , Belvidere, Warren County  
 Belvidere USGS Quadrangle  
 Date Sampled: 10/02/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	27
Baetidae	4	16
Ephemerellidae	1	10
Simuliidae	6	10
Elmidae	4	7
Heptageniidae	4	6
Tipulidae	3	4
Chironomidae	6	4
Gammaridae	4	3
Lumbriculidae	8	3
Philopotamidae	3	2
Planariidae	4	2
Polycentropodidae	6	2
Brachycentridae	1	1
Helicopsychidae	3	1
Tetrastemmatidae	7	1
Veliidae	9	1

---

Statistical Analysis

---

Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 27.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.12  
 Scraper/Filterer Collector Ratio: 0.33  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 65.00  
 EPT/C: 16.25  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 163

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 35/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Urban/Impoundment upstream; Water temp.10.2 /pH 8.4 /DO 11.8 /Cond.508

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Station: AN0049  
 Pophandusing Bk, Spring St , Belvidere, Warren County  
 Belvidere USGS Quadrangle  
 Date Sampled: 10/02/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Ephemerellidae	1	13
Chironomidae	6	10
Elmidae	4	10
Psephenidae	4	9
Philopotamidae	3	8
Hydropsychidae	4	6
BloodRed Chironomidae	8	6
Baetidae	4	5
Planariidae	4	4
Glossosomatidae	0	4
Tetrastemmatidae	7	4
Tubificidae	10	3
Psychomyiidae	2	3
Heptageniidae	4	3
Leptoceridae	4	2
Naididae	7	2
Psychodidae	10	2
Simuliidae	6	2
Perlidae	1	1
Enchytraeidae	10	1
Corydalidae	0	1
Veliidae	9	1

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Statistical Analysis

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Number of Taxa: 22  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 13.00 % ( Ephemerellidae )  
 Family Biotic Index: 4.31  
 Scraper/Filterer Collector Ratio: 2.44  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 9  
 % EPT: 45.00  
 EPT/C: 2.81  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 147

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 5/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Grasses,shrubs,trees/Stable  
 Canopy: Mostly Closed....Other: Suburban; Water temp.9.3 /pH 8.3 /DO 11.6 /Cond.270

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Station: AN0050  
 Buckhorn Ck, Hutchinson Station Rd , Hutchinson, Warren County  
 Belvidere/Bangore USGS Quadrangle  
 Date Sampled: 10/02/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	33
Planariidae	4	9
Glossosomatidae	0	8
Elmidae	4	8
Helicopsychidae	3	5
Ephemerellidae	1	4
Gammaridae	4	4
Psephenidae	4	4
Rhyacophilidae	0	4
Chironomidae	6	4
Philopotamidae	3	3
Limnephilidae	4	3
Baetidae	4	2
Heptageniidae	4	2
Tipulidae	3	1
Lumbricidae	10	1
Lumbriculidae	8	1
Veliidae	9	1
Nematoda	6	1
Perlidae	1	1
Psychomyiidae	2	1

---

Statistical Analysis

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Number of Taxa: 21  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 33.00 % ( Hydropsychidae )  
 Family Biotic Index: 3.51  
 Scraper/Filterer Collector Ratio: 0.94  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 11  
 % EPT: 66.00  
 EPT/C: 16.50  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 159

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 14/<1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Grasses,shrubs,trees/Stable  
 Canopy: Mostly Closed....Other: Rural/Agricultural cropland and livestock; Water temp.11.3  
 /pH 8.2 /DO 10.3 /Cond.309

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Station: AN0051  
 Lopatcong Ck, Montana Mountain Rd , Allens Mills, Warren County  
 Bloomsbury USGS Quadrangle  
 Date Sampled: 09/18/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Ephemerellidae	1	20
Chironomidae	6	13
Baetidae	4	10
Lumbriculidae	8	9
Heptageniidae	4	8
Hydropsychidae	4	6
Gammaridae	4	5
Oligoneuriidae	2	5
Elmidae	4	4
Tipulidae	3	3
Lumbricidae	10	3
Peltoperlidae	1	3
Limnephilidae	4	2
Leuctridae	0	2
Cordulegastridae	3	1
Glossosomatidae	0	1
Molannidae	6	1
Diplopoda	5	1
Ceratopogonidae	6	1
Tabanidae	6	1
Philopotamidae	3	1

---

Statistical Analysis

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Number of Taxa: 21  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 20.00 % ( Ephemerellidae )  
 Family Biotic Index: 3.91  
 Scraper/Filterer Collector Ratio: 3.00  
 Shredder/Total Ratio: 0.06  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 11  
 % EPT: 59.00  
 EPT/C: 4.54  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 156

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 11/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Rural; Water temp.16.0 /pH 7.5 /DO 9.4 /Cond.160

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Station: AN0052  
 Lopatcong Ck, Rt 57 , Port Warren, Warren County  
 Easton USGS Quadrangle  
 Date Sampled: 09/09/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	38
Hydropsychidae	4	12
Elmidae	4	9
Psephenidae	4	9
Heptageniidae	4	5
Philopotamidae	3	4
Nematoda	6	4
Baetidae	4	4
BloodRed Chironomidae	8	4
Simuliidae	6	4
Oligoneuriidae	2	3
Veliidae	9	2
Blood Red Chironomidae	8	1
Gammaridae	4	1
Leptoceridae	4	1
Naididae	7	1
Diplopoda	5	1
Ceratopogonidae	6	1

---

Statistical Analysis

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Number of Taxa: 18  
 Total Number of Individuals: 104  
 % Contribution of Dominant Family: 36.54 % ( Chironomidae )  
 Family Biotic Index: 5.13  
 Scraper/Filterer Collector Ratio: 1.07  
 Shredder/Total Ratio: 0.01  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 6  
 % EPT: 27.88  
 EPT/C: 0.65  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 97

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Shrubs/Stable  
 Canopy: Mostly Open....Other: Suburban/Industrial/Agricultural/Channelized;

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Station: AN0053  
 Lopatcong Ck, Old Rt 22 , Alpha, Warren County  
 Easton USGS Quadrangle  
 Date Sampled: 09/09/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	37
Chironomidae	6	17
Baetidae	4	11
Lumbriculidae	8	10
Hydroptilidae	4	4
BloodRed Chironomidae	8	4
Asellidae	8	2
Planariidae	4	2
Tubificidae	10	2
Elmidae	4	2
Simuliidae	6	2
Blood Red Chironomidae	8	1
Glossosomatidae	0	1
Empididae	6	1
Heptageniidae	4	1
Naididae	7	1
Rhyacophilidae	0	1
Hydropsychidae	4	1

---

Statistical Analysis

---

Number of Taxa: 18  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 37.00 % ( Gammaridae )  
 Family Biotic Index: 5.15  
 Scraper/Filterer Collector Ratio: 1.45  
 Shredder/Total Ratio: 0.02  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 6  
 % EPT: 19.00  
 EPT/C: 0.86  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 116

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 15/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Grasses/Unstable  
 Canopy: Mostly Open....Other: Urban/Channelized;

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Station: AN0054  
 Pohatcong Ck, Janes Chapel Rd , Nr Mt Bethel, Warren County  
 Washington USGS Quadrangle  
 Date Sampled: 08/19/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Heptageniidae	4	20
Elmidae	4	16
Chironomidae	6	13
Tipulidae	3	7
Baetidae	4	5
Hydropsychidae	4	5
Philopotamidae	3	3
Empididae	6	3
Corydalidae	0	3
Psychomyiidae	2	3
Rhyacophilidae	0	3
Naididae	7	2
Peltoperlidae	1	2
BloodRed Chironomidae	8	2
Psephenidae	4	2
Veliidae	9	2
Calopterygidae	5	1
Ephemerelellidae	1	1
Glossosomatidae	0	1
Limnephilidae	4	1
Oligoneuriidae	2	1
Lepidostomatidae	1	1
Leuctridae	0	1
Leptoceridae	4	1
Sphaeriidae	8	1
Tetrastemmatidae	7	1
Pteronarcidae	0	1
Simuliidae	6	1

---

Statistical Analysis

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Number of Taxa: 28  
 Total Number of Individuals: 103  
 % Contribution of Dominant Family: 19.42 % ( Heptageniidae )  
 Family Biotic Index: 4.00  
 Scraper/Filterer Collector Ratio: 1.75  
 Shredder/Total Ratio: 0.05  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 15  
 % EPT: 47.57  
 EPT/C: 3.17  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 180

---

Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 15/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Closed....Other: Forested/Rural; Water temp.20.0 /pH 7.6 /DO 9.3 /Cond.121

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Station: AN0055  
 Pohatcong Ck, Tunnel Hill Rd , Washington Twp, Warren County  
 Washington USGS Quadrangle  
 Date Sampled: 08/19/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Paludicellidae	7	62
Fredericellidae	2	7
Chironomidae	6	7
Heptageniidae	4	6
Elmidae	4	5
Hydropsychidae	4	4
Empididae	6	2
Tipulidae	3	1
Blood Red Chironomidae	8	1
Lumbriculidae	8	1
Baetidae	4	1
Limnephilidae	4	1
Tetrastemmatidae	7	1
Ephemerellidae	1	1

---

Statistical Analysis

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Number of Taxa: 14  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 62.00 % ( Paludicellidae )  
 Family Biotic Index: 5.97  
 Scraper/Filterer Collector Ratio: 1.09  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 13.00  
 EPT/C: 1.63  
 NJIS Rating: 15  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 133  
 Deficiency(s) noted: Paludicellidae Family Overwhelmingly Dominant

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Observations

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Streamwater: Slightly turbid....Flow: Moderate....Width/Depth (ft): 15/2  
 Substrate: Cobbles,silt....StreamBank Vegetation/Stability: Trees /Stable  
 Canopy: Mostly Closed....Other: Rural/Agricultural; Water temp.21.4 /pH 7.7 /DO 7.5  
 /Cond.115

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Station: AN0056  
 Brass Castle Ck, Brass Castle Rd , Washington Twp, Warren County  
 Belvidere USGS Quadrangle  
 Date Sampled: 09/16/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	36
Baetidae	4	13
Lumbriculidae	8	9
Elmidae	4	7
Glossosomatidae	0	6
Peltoperlidae	1	5
Perlidae	1	4
Limnephilidae	4	4
Pteronarcidae	0	3
Philopotamidae	3	2
Chironomidae	6	2
Astacidae	7	1
Tipulidae	3	1
Heptageniidae	4	1
Ephemerellidae	1	1
Gammaridae	4	1
Helicopsychidae	3	1
Leuctridae	0	1
Psephenidae	4	1
Simuliidae	6	1

---

Statistical Analysis

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Number of Taxa: 20  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 36.00 % ( Hydropsychidae )  
 Family Biotic Index: 3.71  
 Scraper/Filterer Collector Ratio: 0.36  
 Shredder/Total Ratio: 0.10  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 77.00  
 EPT/C: 38.50  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 147

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/1  
 Substrate: Cobbles,gravel,sand,snags....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Suburban; Water temp.15.6 /pH 7.9 /DO 9.9  
 /Cond.191

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Station: AN0057  
 Pohatcong Ck, Buttermilk Bridge Rd , Pleasant Valley, Warren County  
 Bloomsbury USGS Quadrangle  
 Date Sampled: 08/19/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	42
Chironomidae	6	25
Asellidae	8	8
Elmidae	4	7
Hydroptilidae	4	3
Baetidae	4	3
BloodRed Chironomidae	8	3
Planariidae	4	2
Empididae	6	2
Tubificidae	10	2
Tipulidae	3	1
Brachycentridae	1	1
Nematoda	6	1

---

Statistical Analysis

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Number of Taxa: 13  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 42.00 % ( Hydropsychidae )  
 Family Biotic Index: 5.08  
 Scraper/Filterer Collector Ratio: 0.19  
 Shredder/Total Ratio: 0.09  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 49.00  
 EPT/C: 1.75  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 121

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 25/1  
 Substrate: Gravel,sand....StreamBank Vegetation/Stability: Grasses/Stable  
 Canopy: Open....Other: Rural/Construction upstream/Wetlands upstream; Sewage odor  
 Water temp.22.6 /pH 7.6 /DO 8.2 /Cond.237;

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Station: AN0058  
Pohatcong Ck, Edison Rd , New Village, Warren County  
Bloomsbury USGS Quadrangle  
Date Sampled: 08/21/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Spongillidae	5	33
Hydropsychidae	4	17
Ephemerellidae	1	10
Elmidae	4	8
Philopotamidae	3	7
Chironomidae	6	7
Baetidae	4	4
Paludicellidae	7	3
Planariidae	4	2
Psephenidae	4	2
Heptageniidae	4	2
Asellidae	8	1
Gammaridae	4	1
Ephydriidae	6	1
Tetrastemmatidae	7	1
BloodRed Chironomidae	8	1

---

Statistical Analysis

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Number of Taxa: 16  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 33.00 % ( Spongillidae )  
Family Biotic Index: 4.32  
Scraper/Filterer Collector Ratio: 0.50  
Shredder/Total Ratio: 0.01  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
% EPT: 40.00  
EPT/C: 5.00  
NJIS Rating: 27  
Biological Condition: Nonimpaired  
Habitat Analysis: 158

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Observations

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Streamwater: Turbid....Flow: Moderate....Width/Depth (ft): 40/1  
Substrate: Cobbles....StreamBank Vegetation/Stability: Weeds,trees/Stable  
Canopy: Mostly Closed....Other: Rural/Agricultural; Water temp.17.0 /pH 7.9 /DO 9.0  
/Cond.181

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Station: AN0059  
 Merrill Ck, Merrill Creek Rd , Harmony Twp, Warren County  
 Bloomsbury USGS Quadrangle  
 Date Sampled: 08/21/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	36
Hydropsychidae	4	30
Tipulidae	3	6
Calopterygidae	5	4
Baetidae	4	4
Philopotamidae	3	4
Heptageniidae	4	4
Caenidae	7	2
Elmidae	4	2
Blood Red Chironomidae	8	1
Limnephilidae	4	1
Gomphidae	1	1
Empididae	6	1
Leuctridae	0	1
Corydalidae	0	1
Psychomyiidae	2	1
Tabanidae	6	1

---

Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 36.00 % ( Chironomidae )  
 Family Biotic Index: 4.67  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.01  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 47.00  
 EPT/C: 1.27  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 156

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 6/1  
 Substrate: Cobbles.gravel,sand....StreamBank Vegetation/Stability:  
 Trees,shrubs,weeds/Stable  
 Canopy: Mostly Closed....Other: Forested; Water temp.16.2 /pH 6.9 /DO 8.6 /Cond.127

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Station: AN0060  
 Merrill Ck, Farm Rd Blw Stewardsville, Warren County  
 Bloomsbury USGS Quadrangle  
 Date Sampled: 08/21/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Elmidae	4	40
Baetidae	4	19
Philopotamidae	3	8
Heptageniidae	4	7
Hydropsychidae	4	5
Gammaridae	4	5
Chironomidae	6	4
Leuctridae	0	3
Tipulidae	3	2
Lumbriculidae	8	2
Rhyacophilidae	0	2
Ephemerellidae	1	1
Glossosomatidae	0	1
Empididae	6	1
Perlodidae	2	1
Lumbricidae	10	1
Simulidae	6	1

---

Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 103  
 % Contribution of Dominant Family: 38.83 % ( Elmidae )  
 Family Biotic Index: 3.87  
 Scraper/Filterer Collector Ratio: 2.72  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 9  
 % EPT: 45.63  
 EPT/C: 11.41  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 146

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 6/<1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Shrubs,weeds,corn/Stable  
 Canopy: Open....Other: Rural/Agricultural cropland and livestock; Water temp.14.2 /pH 7.9  
 /DO 10.8 /Cond.146

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Station: AN0061  
Pohatcong Ck, Carpentersville Rd , Carpentersville, Warren County  
Easton/Reigelsville USGS Quadrangle  
Date Sampled: 09/09/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	46
Lumbriculidae	8	8
BloodRed Chironomidae	8	8
Elmidae	4	8
Hydropsychidae	4	5
Glossosomatidae	0	5
Baetidae	4	4
Tubificidae	10	3
Ephemerellidae	1	3
Planariidae	4	2
Heptageniidae	4	2
Lepidostomatidae	1	2
Asellidae	8	1
Chironomidae	6	1
Leptoceridae	4	1
Pyralidae	5	1

---

Statistical Analysis

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Number of Taxa: 16  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 46.00 % ( Gammaridae )  
Family Biotic Index: 4.54  
Scraper/Filterer Collector Ratio: 4.17  
Shredder/Total Ratio: 0.04  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
% EPT: 22.00  
EPT/C: 2.44  
NJIS Rating: 24  
Biological Condition: Nonimpaired  
Habitat Analysis: 120

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 30/1  
Substrate: Cobbles,gravel,sand,silt....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Open....Other: Forested/Rural/Agricultural; Water temp.16.1 /pH 6.9 /DO 9.9  
/Cond.382

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Station: AN0062  
Musconetcong R, Blw Lk Hopatcong , Roxbury Twp, Morris County  
Stanhope USGS Quadrangle  
Date Sampled: 08/12/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	38
Chironomidae	6	34
Planariidae	4	18
Tubificidae	10	3
Baetidae	4	2
Asellidae	8	1
Gammaridae	4	1
Empididae	6	1
BloodRed Chironomidae	8	1
Tetrastemmatidae	7	1

---

Statistical Analysis

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Number of Taxa: 10  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 38.00 % ( Hydropsychidae )  
Family Biotic Index: 4.99  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.35  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
% EPT: 40.00  
EPT/C: 1.14  
NJIS Rating: 21  
Biological Condition: Moderately Impaired  
Habitat Analysis: 124  
Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 30/1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Grasses/Stable  
Canopy: Mostly Open....Other: Recreation area; Water temp.25.8 /pH 8.1 /DO 8.1 /Cond.309

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Station: AN0063  
 Musconetcong R, Blw Lk Musconetcong , Stanhope, Morris/Sussex County  
 Stanhope USGS Quadrangle  
 Date Sampled: 08/12/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	24
Baetidae	4	19
Philopotamidae	3	11
Ephemerellidae	1	9
Gammaridae	4	6
Chironomidae	6	6
Elmidae	4	5
Planariidae	4	4
Glossosomatidae	0	4
Corydalidae	0	3
Perlidae	1	3
Tetrastemmatidae	7	2
Asellidae	8	1
Leptoceridae	4	1
Simuliidae	6	1
Heptageniidae	4	1

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Statistical Analysis

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Number of Taxa: 16  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 24.00 % ( Hydropsychidae )  
 Family Biotic Index: 3.49  
 Scraper/Filterer Collector Ratio: 0.81  
 Shredder/Total Ratio: 0.12  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 72.00  
 EPT/C: 12.00  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 170

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 17/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrus/Stable  
 Canopy: Mostly Open....Other: Forested/Urban area upstream; Water temp.24.8 /pH 7.8 /DO 7.7 /Cond.365

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Station: AN0064  
 Musconetcong R, Off Rt 604 , Lockwood, Morris/Sussex County  
 Stanhope USGS Quadrangle  
 Date Sampled: 08/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	31
Gammaridae	4	21
Glossosomatidae	0	15
Chironomidae	6	12
Elmidae	4	4
Limnephilidae	4	3
Brachycentridae	1	3
Baetidae	4	3
Pleuroceridae	6	2
Tetrastemmatidae	7	2
Philopotamidae	3	1
Planariidae	4	1
Empididae	6	1
Lepidostomatidae	1	1
Lumbricidae	10	1
Ephemerebellidae	1	1

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Statistical Analysis

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Number of Taxa: 16  
 Total Number of Individuals: 102  
 % Contribution of Dominant Family: 30.39 % ( Hydropsychidae )  
 Family Biotic Index: 3.67  
 Scraper/Filterer Collector Ratio: 0.75  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 56.86  
 EPT/C: 4.74  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 181

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 17/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Closed....Other: Forested; Water temp.22.1 /pH 8.3 /DO 8.6 /Cond.483

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Station: AN0065  
Lubbers Run, Rt 607 , Hopatcong, Sussex County  
Stanhope USGS Quadrangle  
Date Sampled: 08/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	49
Oligoneuriidae	2	26
Chironomidae	6	9
Elmidae	4	5
Perlidae	1	4
Philopotamidae	3	3
Corydalidae	0	3
Psephenidae	4	3
Tipulidae	3	1
Empididae	6	1
Gomphidae	1	1
Leuctridae	0	1
Baetidae	4	1
Heptageniidae	4	1

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Statistical Analysis

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Number of Taxa: 14  
Total Number of Individuals: 108  
% Contribution of Dominant Family: 45.37 % ( Hydropsychidae )  
Family Biotic Index: 3.38  
Scraper/Filterer Collector Ratio: 0.10  
Shredder/Total Ratio: 0.01  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
% EPT: 78.70  
EPT/C: 8.74  
NJIS Rating: 27  
Biological Condition: Nonimpaired  
Habitat Analysis: 177

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 16/1  
Substrate: Cobbles gravel,sand....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
Canopy: Mostly Closed....Other: Suburban; Water temp.19.4 /pH 8.2 /DO 9.7 /Cond.312

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Station: AN0066  
 Lubbers Run, Rt 206 , Lockwood, Sussex County  
 Stanhope USGS Quadrangle  
 Date Sampled: 08/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	25
Elmidae	4	25
Chironomidae	6	18
Tetrastemmatidae	7	5
Limnephilidae	4	4
Tipulidae	3	3
Hydropsychidae	4	3
Brachycentridae	1	2
Baetidae	4	2
Sphaeriidae	8	2
Protoneuridae	9	1
Blood Red Chironomidae	8	1
Planorbidae	6	1
Empididae	6	1
Gomphidae	1	1
Asellidae	8	1
Lumbricidae	10	1
Lumbriculidae	8	1
Polycentropodidae	6	1
Glossosomatidae	0	1
Psychomyiidae	2	1
Rhyacophilidae	0	1

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Statistical Analysis

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Number of Taxa: 22  
 Total Number of Individuals: 101  
 % Contribution of Dominant Family: 24.75 % ( Gammaridae & Elmidae )  
 Family Biotic Index: 4.65  
 Scraper/Filterer Collector Ratio: 1.13  
 Shredder/Total Ratio: 0.06  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 14.85  
 EPT/C: 0.78  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 173

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 17/1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Suburban; Water temp.19.1 /pH 8.0 /DO 8.4  
 /Cond.312

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Station: AN0067  
 Mine Bk, Rt 517 , Mansfield Twp, Morris County  
 Hackettstown USGS Quadrangle  
 Date Sampled: 08/05/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	29
Hydropsychidae	4	24
Philopotamidae	3	11
Naididae	7	7
Heptageniidae	4	5
Elmidae	4	4
Gammaridae	4	3
Baetidae	4	3
Diplopoda	5	3
Lepidostomatidae	1	2
Perlidae	1	1
Planariidae	4	1
Hydrobiidae	8	1
Leuctridae	0	1
Lumbriculidae	8	1
Veliidae	9	1
Pteronarcidae	0	1
Ephemerebellidae	1	1
Simuliidae	6	1

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Statistical Analysis

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Number of Taxa: 19  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 29.00 % ( Chironomidae )  
 Family Biotic Index: 4.66  
 Scraper/Filterer Collector Ratio: 0.25  
 Shredder/Total Ratio: 0.36  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 9  
 % EPT: 49.00  
 EPT/C: 1.69  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 107

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 6/1  
 Substrate: Cobles,gravel,silt,snags....StreamBank Vegetation/Stability:  
 Trees,shrubs,weeds/Stable  
 Canopy: Mostly Open....Other: Forested/Golf course upstream; Water temp.24.3 /pH 8.1 /DO  
 7.6 /Cond.127

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Station: AN0068  
Trout Bk, Rt 57 , Hackettstown, Warren County  
Hackettstown USGS Quadrangle  
Date Sampled: 08/05/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Asellidae	8	38
Hydropsychidae	4	25
Paludicellidae	7	8
Chironomidae	6	7
Planariidae	4	6
Elmidae	4	6
Philopotamidae	3	3
Gammaridae	4	2
Empididae	6	1
Baetidae	4	1
Perlidae	1	1
Tetrastemmatidae	7	1
Psychomyiidae	2	1

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Statistical Analysis

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Number of Taxa: 13  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 38.00 % ( Asellidae )  
Family Biotic Index: 5.87  
Scraper/Filterer Collector Ratio: 0.21  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
% EPT: 31.00  
EPT/C: 4.43  
NJIS Rating: 21  
Biological Condition: Moderately Impaired  
Habitat Analysis: 123

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Observations

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Streamwater: Slightly Turbid....Flow: Moderate....Width/Depth (ft): 25/1  
Substrate: Cobbles, gravel, sand, silt....StreamBank Vegetation/Stability: Trees/Unstable  
Canopy: Mostly Closed....Other: Forested/Suburban; Wate temp.21.1 /pH 8.0 /DO 7.8  
/Cond.500

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Station: AN0069  
 Musconetcong R, Kings Hwy , Beattystown, Morris/Warren County  
 Hackettstown USGS Quadrangle  
 Date Sampled: 08/05/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	24
Baetidae	4	18
Ephemerellidae	1	13
Lumbriculidae	8	8
Brachycentridae	1	7
Helicopsychidae	3	5
Chironomidae	6	5
Lepidostomatidae	1	3
Elmidae	4	3
Simuliidae	6	3
Philopotamidae	3	2
Oligoneuriidae	2	2
Perlidae	1	1
Hydroptilidae	4	1
Corydalidae	0	1
Gammaridae	4	1
Nematoda	6	1
Pleuroceridae	6	1
Glossosomatidae	0	1

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Statistical Analysis

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Number of Taxa: 19  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 24.00 % ( Hydropsychidae )  
 Family Biotic Index: 3.61  
 Scraper/Filterer Collector Ratio: 0.90  
 Shredder/Total Ratio: 0.10  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 11  
 % EPT: 77.00  
 EPT/C: 15.40  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 148

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 50/1.5  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Weeds/Unstable  
 Canopy: Open....Other: Forested/Suburban; Water temp.18.8 /pH 8.2 /DO 9.3 /Cond.480

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Station: AN0070  
Hances Bk, Rt 57 , Beattystown, Warren County  
Hackettstown USGS Quadrangle  
Date Sampled: 08/05/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	50
Hydropsychidae	4	27
Spongillidae	5	6
Elmidae	4	4
Empididae	6	3
Naididae	7	2
Tipulidae	3	2
BloodRed Chironomidae	8	2
Glossosomatidae	0	1
Lumbricidae	10	1
Lumbriculidae	8	1
Physidae	7	1

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#### Statistical Analysis

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Number of Taxa: 12  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 50.00 % ( Chironomidae )  
Family Biotic Index: 5.33  
Scraper/Filterer Collector Ratio: 0.19  
Shredder/Total Ratio: 0.52  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
% EPT: 28.00  
EPT/C: 0.54  
NJIS Rating: 15  
Biological Condition: Moderately Impaired  
Habitat Analysis: 165  
Deficiency(s) noted: Paucity of Clean Water Organisms

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#### Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 8/1  
Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Closed....Other: Forested/Rural; Water temp.17.4 /pH 7.6 /DO 8.6 /Cond.213

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Station: AN0071  
 Musconetcong R Trib, Rt 57 , Penwell, Warren County  
 Washington USGS Quadrangle  
 Date Sampled: 08/12/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	29
Hydropsychidae	4	22
Baetidae	4	12
Gammaridae	4	11
Lumbriculidae	8	8
Nematoda	6	6
Leuctridae	0	3
Elmidae	4	3
Peltoperlidae	1	3
Glossosomatidae	0	2
Oligoneuriidae	2	2
BloodRed Chironomidae	8	2
Physidae	7	2
Heptageniidae	4	2
Tipulidae	3	1
Empididae	6	1
Perlidae	1	1

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Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 110  
 % Contribution of Dominant Family: 26.36 % ( Chironomidae )  
 Family Biotic Index: 4.74  
 Scraper/Filterer Collector Ratio: 0.17  
 Shredder/Total Ratio: 0.05  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 42.73  
 EPT/C: 1.38  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 159

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 7/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Closed....Other: Rural/Agricultural cropland and livestock; Water temp.17.1  
 /pH 8.3 /DO 10.6 /Cond.215

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Station: AN0072  
Musconetcong R, New Hampton Rd , New Hampton, Hunterdon/Warren County  
High Bridge USGS Quadrangle  
Date Sampled: 07/08/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
BloodRed Chironomidae	8	38
Tubificidae	10	36
Lumbriculidae	8	10
Sphaeriidae	8	7
Brachycentridae	1	2
Gammaridae	4	2
Chironomidae	6	1
Corixidae	9	1
Baetidae	4	1
Physidae	7	1
Tricorythidae	4	1

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#### Statistical Analysis

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Number of Taxa: 11  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 38.00 % ( BloodRed Chironomidae )  
Family Biotic Index: 8.40  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
% EPT: 4.00  
EPT/C: 0.10  
NJIS Rating: 15  
Biological Condition: Moderately Impaired  
Habitat Analysis: 176  
Deficiency(s) noted: Significant Organic Pollution  
Paucity of Clean Water Organisms

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#### Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 50/1  
Substrate: Cobbles,gravel,silt....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Open....Other: Forested/Rural;

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Station: AN0073  
Musconetcong R, Rt 579 , Bloomsbury, Hunterdon/Warren County  
Bloomsbury USGS Quadrangle  
Date Sampled: 07/08/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Tricorythidae	4	15
Hydropsychidae	4	14
Elmidae	4	12
Gammaridae	4	10
Hydroptilidae	4	9
Caenidae	7	7
Planariidae	4	7
Ephemerellidae	1	6
Chironomidae	6	5
Baetidae	4	5
Leptoceridae	4	2
Perlidae	1	2
Brachycentridae	1	1
Philopotamidae	3	1
Polymitarcyidae	2	1
Lumbriculidae	8	1
Physidae	7	1
Heptageniidae	4	1

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Statistical Analysis

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Number of Taxa: 18  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 15.00 % ( Tricorythidae )  
Family Biotic Index: 4.08  
Scraper/Filterer Collector Ratio: 1.38  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
% EPT: 64.00  
EPT/C: 12.80  
NJIS Rating: 30  
Biological Condition: Nonimpaired  
Habitat Analysis: 185

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 35/<1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Open....Other: Rural/Impoundment upstream;

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Station: AN0074  
 Musconetcong R, River Rd , Reigelsville, Hunterdon/Warren County  
 Reigelsville USGS Quadrangle  
 Date Sampled: 07/08/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	47
Chironomidae	6	10
Baetidae	4	9
Polymitarcyidae	2	8
Perlidae	1	3
Caenidae	7	3
Gammaridae	4	3
Elmidae	4	3
Naididae	7	3
Philopotamidae	3	2
Ephemerellidae	1	2
Ephydriidae	6	1
Glossosomatidae	0	1
Nematoda	6	1
BloodRed Chironomidae	8	1
Tetrastemmatidae	7	1
Simuliidae	6	1
Tricorythidae	4	1

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Statistical Analysis

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Number of Taxa: 18  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 47.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.14  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.14  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 9  
 % EPT: 76.00  
 EPT/C: 6.91  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 184

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 30/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.21.6 /pH 8.1 /DO 7.4 /Cond.383

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Station: AN0075  
 Hakiokake Ck, Mylar Rd , Nr Little York, Hunterdon County  
 Bloomsbury USGS Quadrangle  
 Date Sampled: 07/08/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	18
Leuctridae	0	13
Elmidae	4	10
Chironomidae	6	7
Baetidae	4	6
Tipulidae	3	6
Lumbriculidae	8	5
Veliidae	9	5
Perlidae	1	4
BloodRed Chironomidae	8	3
Philopotamidae	3	3
Ephemerellidae	1	3
Glossosomatidae	0	3
Chloroperlidae	1	2
Perlodidae	2	2
Peltoperlidae	1	2
Heptageniidae	4	1
Oligoneuriidae	2	1
Gomphidae	1	1
Leptophlebiidae	2	1
Limnephilidae	4	1
Gerridae	8	1
Simuliidae	6	1
Hydropsychidae	4	1

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Statistical Analysis

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Number of Taxa: 24  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 18.00 % ( Gammaridae )  
 Family Biotic Index: 3.60  
 Scraper/Filterer Collector Ratio: 1.23  
 Shredder/Total Ratio: 0.16  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 14  
 % EPT: 43.00  
 EPT/C: 4.30  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 174

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/<1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural;

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Station: AN0076  
 Hakiokake Ck, Miller Park Rd , Holland Twp, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/10/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	22
Philopotamidae	3	21
Hydropsychidae	4	19
Perlidae	1	7
Heptageniidae	4	4
Ephemerellidae	1	4
Glossosomatidae	0	3
Tipulidae	3	3
Leuctridae	0	3
Psephenidae	4	3
Rhyacophilidae	0	3
Lumbriculidae	8	2
Elmidae	4	2
Caenidae	7	1
Oligoneuriidae	2	1
Lumbricidae	10	1
Baetidae	4	1

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Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 22.00 % ( Chironomidae )  
 Family Biotic Index: 3.66  
 Scraper/Filterer Collector Ratio: 0.24  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 11  
 % EPT: 67.00  
 EPT/C: 3.05  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 176

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 30/1.5  
 Substrate: Cobbles,gravel,sand,snags....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested; Water temp.22.9 /pH 8.1 /DO 8.8 /Cond.142

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Station: AN0077  
 Hakiokake Ck, Bridge St , Milford, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/10/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Tricorythidae	4	25
Chironomidae	6	15
Ephemerellidae	1	9
Caenidae	7	7
Hydropsychidae	4	7
Perlidae	1	7
Heptageniidae	4	5
Baetidae	4	4
BloodRed Chironomidae	8	4
Glossosomatidae	0	4
Lepidostomatidae	1	3
Philopotamidae	3	2
Lumbriculidae	8	2
Elmidae	4	2
Polycentropodidae	6	2
Leptoceridae	4	1
Tetrastemmatidae	7	1

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Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 25.00 % ( Tricorythidae )  
 Family Biotic Index: 4.07  
 Scraper/Filterer Collector Ratio: 0.58  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 76.00  
 EPT/C: 4.00  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 85

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 20/1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees,grass/Unstable  
 Canopy: Open....Other: Urban; Water temp.22.1 /pH 8.4 /DO 9.8 /Cond.200

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Station: AN0078  
 Harihokake Ck, Hartpence Rd , Alexandria, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/10/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Philopotamidae	3	20
Hydropsychidae	4	18
Chironomidae	6	12
Glossosomatidae	0	9
Lumbriculidae	8	7
Perlidae	1	5
Tipulidae	3	4
Baetidae	4	4
Ephemerellidae	1	3
Limnephilidae	4	3
Caenidae	7	2
Heptageniidae	4	2
Leuctridae	0	2
Elmidae	4	2
Astacidae	7	1
Oligoneuriidae	2	1
Lumbricidae	10	1
Tetrastemmatidae	7	1
Psephenidae	4	1
Rhyacophilidae	0	1
Simuliidae	6	1

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Statistical Analysis

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Number of Taxa: 21  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 20.00 % ( Philopotamidae )  
 Family Biotic Index: 3.74  
 Scraper/Filterer Collector Ratio: 0.50  
 Shredder/Total Ratio: 0.02  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 70.00  
 EPT/C: 5.83  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 171

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 7/<1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,vines,weeds/Stable  
 Canopy: Closed....Other: Forested; Water temp.25.0 /pH 7.7 /DO 8.9 /Cond.64

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Station: AN0079  
 Harihokake Ck, River Rd , Abv Frenchtown, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/10/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	15
Heptageniidae	4	15
Chironomidae	6	13
Oligoneuriidae	2	10
Baetidae	4	9
Physidae	7	8
Glossosomatidae	0	5
Perlidae	1	3
Philopotamidae	3	3
Gammaridae	4	3
Tricorythidae	4	3
Psephenidae	4	2
Ephemerellidae	1	2
Tipulidae	3	2
Asellidae	8	1
Leptoceridae	4	1
Caenidae	7	1
Helicopsychidae	3	1
Lepidostomatidae	1	1
Leptophlebiidae	2	1
Elmidae	4	1

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Statistical Analysis

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Number of Taxa: 21  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 15.00 % ( Hydropsychidae & Heptageniidae )  
 Family Biotic Index: 3.91  
 Scraper/Filterer Collector Ratio: 0.86  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 14  
 % EPT: 70.00  
 EPT/C: 5.38  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 146

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Observations

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Streamwater: Slightly Turbid....Flow: Fast....Width/Depth (ft): 20/<1  
 Substrate: Cobbles, gravel, sand....StreamBank Vegetation/Stability:  
 Trees, shrubs, weeds/Stable  
 Canopy: Closed....Other: Forested/Suburban; Water temp.21.6 /pH 7.9 /DO 8.3 /Cond.135

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Station: AN0080  
 Nishisakawick Ck, Airport Rd , Alexandria Twp, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/22/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	23
Hydropsychidae	4	12
Elmidae	4	7
BloodRed Chironomidae	8	7
Perlidae	1	6
Sphaeriidae	8	5
Heptageniidae	4	5
Caenidae	7	4
Tipulidae	3	3
Lepidostomatidae	1	3
Leuctridae	0	3
Lumbricidae	10	3
Aeshnidae	3	2
Blood Red Chironomidae	8	2
Planorbidae	6	2
Sialidae	4	2
Baetidae	4	1
Philopotamidae	3	1
Glossosomatidae	0	1
Empididae	6	1
Hydrophilidae	5	1
Gomphidae	1	1
Tubificidae	10	1
Limnephilidae	4	1
Physidae	7	1
Polycentropodidae	6	1
Phryganeidae	4	1

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Statistical Analysis

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Number of Taxa: 27  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 23.00 % ( Chironomidae )  
 Family Biotic Index: 4.98  
 Scraper/Filterer Collector Ratio: 1.10  
 Shredder/Total Ratio: 0.14  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 39.00  
 EPT/C: 1.22  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 180

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 4/<1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Closed....Other: Forested; Water temp.21.6 /pH 7.6 /DO 8.2 /Cond.105

---

Station: AN0081  
 Nishisakawick Ck, Off Creek Rd Blw Everittstown, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/22/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	27
Hydropsychidae	4	25
Baetidae	4	11
Heptageniidae	4	6
Tipulidae	3	4
Corixidae	9	3
Caenidae	7	2
Philopotamidae	3	2
Elmidae	4	2
Empididae	6	2
Oligoneuriidae	2	2
Leptoceridae	4	2
Naididae	7	2
BloodRed Chironomidae	8	2
Physidae	7	2
Perlidae	1	1
Lepidostomatidae	1	1
Lumbriculidae	8	1
Leptophlebiidae	2	1
Sphaeriidae	8	1
Psephenidae	4	1
Odontoceridae	0	1
Sialidae	4	1

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Statistical Analysis

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Number of Taxa: 23  
 Total Number of Individuals: 102  
 % Contribution of Dominant Family: 26.47 % ( Chironomidae )  
 Family Biotic Index: 4.83  
 Scraper/Filterer Collector Ratio: 0.36  
 Shredder/Total Ratio: 0.31  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 11  
 % EPT: 52.94  
 EPT/C: 1.83  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 165

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Observations

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Streamwater: Turbid....Flow: Moderate....Width/Depth (ft): 17/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Forested/Agricultural livestock; Water temp.20.3 /pH 7.9 /DO  
 8.1 /Cond.159

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Station: AN0082  
 Nishisakawick Ck, Creek Rd , Frenchtown, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/22/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	24
Heptageniidae	4	18
Baetidae	4	15
Lepidostomatidae	1	14
Physidae	7	7
Leptoceridae	4	4
Hydropsychidae	4	3
BloodRed Chironomidae	8	3
Caenidae	7	2
Lumbricidae	10	2
Tipulidae	3	2
Philopotamidae	3	1
Erpobdellidae	8	1
Helicopsychidae	3	1
Empididae	6	1
Oligoneuriidae	2	1
Leuctridae	0	1
Brachycentridae	1	1
Polycentropodidae	6	1
Tetrastemmatidae	7	1
Psephenidae	4	1
Odontoceridae	0	1
Veliidae	9	1
Lymnaeidae	6	1

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Statistical Analysis

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Number of Taxa: 24  
 Total Number of Individuals: 107  
 % Contribution of Dominant Family: 22.43 % ( Chironomidae )  
 Family Biotic Index: 4.54  
 Scraper/Filterer Collector Ratio: 0.80  
 Shredder/Total Ratio: 0.17  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 13  
 % EPT: 58.88  
 EPT/C: 2.18  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 171

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Observations

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Streamwater: Slightly Turbid....Flow: Moderate....Width/Depth (ft): 30/1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Forested; Water temp.20.4 /pH 8.0 /DO 8.7 /Cond.175

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Station: AN0083  
 Little Nishisakawick Ck, Rt 29 , Frenchtown, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/10/97

Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	14
Psephenidae	4	13
Philopotamidae	3	12
Lepidostomatidae	1	10
Chironomidae	6	10
Baetidae	4	9
Glossosomatidae	0	7
Hydroptilidae	4	7
Physidae	7	3
Heptageniidae	4	2
Erpobdellidae	8	2
Veliidae	9	2
Gerridae	8	2
Limnephilidae	4	1
Caenidae	7	1
Tipulidae	3	1
Lumbriculidae	8	1
Leptoceridae	4	1
Naididae	7	1
Perlidae	1	1

Statistical Analysis

Number of Taxa: 20  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 14.00 % ( Hydropsychidae )  
 Family Biotic Index: 3.91  
 Scraper/Filterer Collector Ratio: 1.15  
 Shredder/Total Ratio: 0.10  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 11  
 % EPT: 65.00  
 EPT/C: 6.50  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 148

Observations

Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 6/<1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs,weeds/Stable  
 Canopy: Mostly Closed....Other: Suburban; Water temp.21.0 /pH 7.8 /DO 7.5 /Cond.226

Station: AN0084  
 Copper Ck, Horseshoe Bend Rd , Kingwood Twp, Hunterdon County  
 Frenchtown USGS Quadrangle  
 Date Sampled: 07/15/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
BloodRed Chironomidae	8	36
Chironomidae	6	33
Leptoceridae	4	14
Naididae	7	3
Psephenidae	4	3
Blood Red Chironomidae	8	2
Leptophlebiidae	2	2
Sialidae	4	2
Hydropsychidae	4	2
Baetidae	4	1
Veliidae	9	1
Elmidae	4	1

---

Statistical Analysis

---

Number of Taxa: 12  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 36.00 % ( BloodRed Chironomidae )  
 Family Biotic Index: 6.28  
 Scraper/Filterer Collector Ratio: 2.09  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 19.00  
 EPT/C: 0.27  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 144

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 4/<1  
 Substrate: Bedrock....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Agricultural; Water temp.21.9 /pH 7.2 /DO 7.9 /Cond.183

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Station: AN0085  
 Warford Ck, Rt 29 , Kingwood Station, Hunterdon County  
 Lumberville USGS Quadrangle  
 Date Sampled: 07/15/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	66
BloodRed Chironomidae	8	19
Leptoceridae	4	6
Sialidae	4	6
Hydropsychidae	4	3
Leuctridae	0	2
Perlidae	1	1
Dolichopodidae	4	1
Philopotamidae	3	1
Tubificidae	10	1
Lumbriculidae	8	1
Baetidae	4	1
Gerridae	8	1

---

Statistical Analysis

---

Number of Taxa: 13  
 Total Number of Individuals: 109  
 % Contribution of Dominant Family: 60.55 % ( Chironomidae )  
 Family Biotic Index: 5.93  
 Scraper/Filterer Collector Ratio: 1.23  
 Shredder/Total Ratio: 0.02  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 6  
 % EPT: 12.84  
 EPT/C: 0.15  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 136  
 Deficiency(s) noted: Chironomidae Family Overwhelmingly Dominant

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 2/<1  
 Substrate: Gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Closed....Other: Forested; Water temp.23.2 /pH 7.6 /DO 8.3 /Cond.174

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Station: AN0086  
 Lockatong Ck, Oak Grove Rd , Oak Grove, Hunterdon County  
 Pittstown USGS Quadrangle  
 Date Sampled: 07/15/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	23
Elmidae	4	23
Chironomidae	6	13
Sphaeriidae	8	9
Gomphidae	1	5
Leptoceridae	4	5
Philopotamidae	3	4
Baetidae	4	3
Heptageniidae	4	3
Tipulidae	3	3
Planorbidae	6	2
Limnephilidae	4	1
Astacidae	7	1
Lampyridae	6	1
Lepidostomatidae	1	1
Psephenidae	4	1
Simuliidae	6	1
BloodRed Chironomidae	8	1

---

Statistical Analysis

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Number of Taxa: 18  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 23.00 % ( Hydropsychidae & Elmidae )  
 Family Biotic Index: 4.52  
 Scraper/Filterer Collector Ratio: 0.81  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
 % EPT: 40.00  
 EPT/C: 2.86  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 151

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 13/<1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Closed....Other: Forested/Agricultural; Water temp.23.8 /pH 7.2 /DO 7.9  
 /Cond.174

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Station: AN0087  
 Lockatong Ck, Rt 12 , Baptistown, Hunterdon County  
 Pittstown USGS Quadrangle  
 Date Sampled: 07/15/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	56
Elmidae	4	15
Philopotamidae	3	8
Leptoceridae	4	6
Chironomidae	6	5
Psephenidae	4	3
Athericidae	2	1
Empididae	6	1
Gomphidae	1	1
Lepidostomatidae	1	1
Veliidae	9	1
Tipulidae	3	1
Dytiscidae	5	1

---

Statistical Analysis

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Number of Taxa: 13  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 56.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.01  
 Scraper/Filterer Collector Ratio: 0.28  
 Shredder/Total Ratio: 0.07  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 71.00  
 EPT/C: 14.20  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 146

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 30/1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Rural/Agricultural; Water temp.24.0 /pH7.3 /DO 5.8 /Cond.176

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Station: AN0088  
 Lockatong Ck, Rt 519 , Kingwood Twp, Hunterdon County  
 Lumberville USGS Quadrangle  
 Date Sampled: 07/15/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	31
Elmidae	4	14
Philopotamidae	3	10
Psephenidae	4	7
Baetidae	4	5
Lepidostomatidae	1	4
Chironomidae	6	4
Leptoceridae	4	4
Heptageniidae	4	4
Planariidae	4	3
Oligoneuriidae	2	3
Veliidae	9	3
Helicopsychidae	3	2
Tipulidae	3	1
Athericidae	2	1
Erpobdellidae	8	1
Diplopoda	5	1
Sperchonidae	2	1
Sphaeriidae	8	1

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Statistical Analysis

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Number of Taxa: 19  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 31.00 % ( Hydropsychidae )  
 Family Biotic Index: 3.97  
 Scraper/Filterer Collector Ratio: 0.60  
 Shredder/Total Ratio: 0.09  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 8  
 % EPT: 63.00  
 EPT/C: 15.75  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 148

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 30/1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural; Water temp.23.9 /pH 7.3 /DO 6.0 /Cond.192

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Station: AN0089  
 Lockatong Ck, Rt 29 , Raven Rock, Hunterdon County  
 Lumberville USGS Quadrangle  
 Date Sampled: 07/15/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	24
Baetidae	4	21
Chironomidae	6	15
Philopotamidae	3	11
Elmidae	4	8
Naididae	7	4
Nematoda	6	3
Tipulidae	3	2
Lepidostomatidae	1	2
Lumbriculidae	8	2
Psephenidae	4	2
Corydalidae	0	1
Lumbricidae	10	1
Brachycentridae	1	1
Physidae	7	1
Veliidae	9	1
Heptageniidae	4	1

---

Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 24.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.44  
 Scraper/Filterer Collector Ratio: 0.31  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 6  
 % EPT: 60.00  
 EPT/C: 4.00  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 138

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 11/1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Forested; Water temp.25.5 /pH 8.7 /DO - /Cond.150

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Station: AN0090  
 Wickecheoke Ck, Rt 579 , Croton, Hunterdon County  
 Pittstown USGS Quadrangle  
 Date Sampled: 06/02/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	30
Chironomidae	6	21
Naididae	7	18
Physidae	7	10
Asellidae	8	8
Baetidae	4	7
Tubificidae	10	3
Planorbidae	6	2
Erpobdellidae	8	2
Elmidae	4	2
Gerridae	8	2
Dytiscidae	5	1
Nemouridae	2	1
Culicidae	8	1
BloodRed Chironomidae	8	1
Corixidae	9	1

---

Statistical Analysis

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Number of Taxa: 16  
 Total Number of Individuals: 110  
 % Contribution of Dominant Family: 27.27 % ( Gammaridae )  
 Family Biotic Index: 5.89  
 Scraper/Filterer Collector Ratio: 4.00  
 Shredder/Total Ratio: 0.01  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 7.27  
 EPT/C: 0.33  
 NJIS Rating: 15  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 168  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 9/1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees,shrubs,grasses/Stable  
 Canopy: Mostly Open....Other: Rural; Water temp.16.7 /pH 6.6 /DO 7.0 /Cond.159

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Station: AN0091  
 Wickecheoke Ck, Locktown-Sergeantsville Rd , Locktown, Hunterdon County  
 Stockton USGS Quadrangle  
 Date Sampled: 07/16/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	36
Corixidae	9	20
Heptageniidae	4	7
Glossiphoniidae	8	6
Psephenidae	4	6
Baetidae	4	5
Chironomidae	6	5
Physidae	7	4
Leptoceridae	4	3
Planorbidae	6	2
Asellidae	8	1
Aeshnidae	3	1
Protoneuridae	9	1
Lumbriculidae	8	1
Sialidae	4	1
Dytiscidae	5	1

---

Statistical Analysis

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Number of Taxa: 16  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 36.00 % ( Gammaridae )  
 Family Biotic Index: 5.63  
 Scraper/Filterer Collector Ratio: 2.60  
 Shredder/Total Ratio: 0.01  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
 % EPT: 15.00  
 EPT/C: 3.00  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 165

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 60/1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.18.8 /pH 7.4 /DO 6.6 /Cond.167

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Station: AN0092  
 Plum Bk, Rt 579 , Nr Croton, Hunterdon County  
 Stockton USGS Quadrangle  
 Date Sampled: 06/02/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	24
Physidae	7	19
Corixidae	9	13
Baetidae	4	10
Leptophlebiidae	2	7
Naididae	7	5
Planorbidae	6	4
Perlodidae	2	4
Gerridae	8	4
Lumbricidae	10	3
Nemouridae	2	2
Dytiscidae	5	2
Lepidostomatidae	1	1
BloodRed Chironomidae	8	1
Lymnaeidae	6	1

---

Statistical Analysis

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Number of Taxa: 15  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 24.00 % ( Chironomidae )  
 Family Biotic Index: 6.06  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.27  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 24.00  
 EPT/C: 0.96  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 163

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 5/<1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees,shrubs,grasses/Stable  
 Canopy: Mostly Open....Other: Rural/Agricultural cropland; Water temp.15.5 /pH 7.0 /DO 7.6  
 /Cond.171

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Station: AN0093  
Plum Bk, Pine Hill Rd , Delaware Twp, Hunterdon County  
Stockton USGS Quadrangle  
Date Sampled: 07/16/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	66
BloodRed Chironomidae	8	16
Leptophlebiidae	2	5
Heptageniidae	4	5
Tubificidae	10	2
Sialidae	4	2
Elmidae	4	1
Gomphidae	1	1
Physidae	7	1
Psephenidae	4	1

---

Statistical Analysis

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Number of Taxa: 10  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 66.00 % ( Chironomidae )  
Family Biotic Index: 5.98  
Scraper/Filterer Collector Ratio: 0.35  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
% EPT: 10.00  
EPT/C: 0.12  
NJIS Rating: 9  
Biological Condition: Moderately Impaired  
Habitat Analysis: 170  
Deficiency(s) noted: Chironomidae Family Overwhelmingly Dominant  
Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 50/1  
Substrate: Cobbles....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Closed....Other: Forested/Rural; Water temp.16.7/pH 7.0 /DO 7.3 /Cond.157

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Station: AN0094  
 Wickechoke Ck, Sergeantsville Rd , Sergeantsville, Hunterdon County  
 Stockton USGS Quadrangle  
 Date Sampled: 07/15/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	36
Chironomidae	6	21
Elmidae	4	7
Gammaridae	4	6
Tipulidae	3	5
Empididae	6	5
Philopotamidae	3	3
Baetidae	4	2
Hydroptilidae	4	2
Simuliidae	6	2
Heptageniidae	4	2
Glossosomatidae	0	1
Hydridae	5	1
Tubificidae	10	1
Leptoceridae	4	1
Perlidae	1	1
Polycentropodidae	6	1
Psephenidae	4	1
Psychomyiidae	2	1
Naididae	7	1

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Statistical Analysis

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Number of Taxa: 20  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 36.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.51  
 Scraper/Filterer Collector Ratio: 0.21  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 10  
 % EPT: 50.00  
 EPT/C: 2.38  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 168

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 50/1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Open....Other: Forested/Rural; Water temp.17.8 /pH 7.7 /DO 7.3 /Cond.177

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Station: AN0095  
 Wickecheoke Ck, Rt 29 , Prallsville, Hunterdon County  
 Stockton USGS Quadrangle  
 Date Sampled: 07/15/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	53
Hydropsychidae	4	15
Heptageniidae	4	9
Baetidae	4	6
Naididae	7	4
Empididae	6	3
Tipulidae	3	2
Lepidostomatidae	1	2
Polycentropodidae	6	2
Hydroptilidae	4	1
Lumbricidae	10	1
Lumbriculidae	8	1
Brachycentridae	1	1

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Statistical Analysis

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Number of Taxa: 13  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 53.00 % ( Chironomidae )  
 Family Biotic Index: 5.27  
 Scraper/Filterer Collector Ratio: 0.14  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
 % EPT: 36.00  
 EPT/C: 0.68  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 168

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 50/<1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.17.5 /pH 7.7 /DO 6.2 /Cond.202

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Station: AN0096  
 Alexauken Ck, Lambertville Rd , W Amwell Twp, Hunterdon County  
 Stockton USGS Quadrangle  
 Date Sampled: 07/14/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	25
Philopotamidae	3	16
Elmidae	4	16
Chironomidae	6	14
Sphaeriidae	8	8
Planariidae	4	7
Baetidae	4	6
Helicopsychidae	3	2
Heptageniidae	4	2
Naididae	7	1
Nematoda	6	1
Tetrastemmatidae	7	1
Simuliidae	6	1

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Statistical Analysis

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Number of Taxa: 13  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 25.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.52  
 Scraper/Filterer Collector Ratio: 0.40  
 Shredder/Total Ratio: 0.14  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 51.00  
 EPT/C: 3.64  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 166

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 15/1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees,weeds/Stable  
 Canopy: Mostly Open....Other: Forested/Rural/; Water temp.11.9 /pH 6.9 /DO 8.0 /Cond.278

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Station: AN0097  
 Alexauken Ck Trib, Queen Rd And Alexauken Ck Rd , Mt Airy, Hunterdon County  
 Stockton USGS Quadrangle  
 Date Sampled: 07/14/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	22
Psephenidae	4	20
BloodRed Chironomidae	8	14
Planariidae	4	9
Chironomidae	6	8
Philopotamidae	3	8
Elmidae	4	6
Tipulidae	3	5
Glossosomatidae	0	2
Athericidae	2	1
Veliidae	9	1
Notonectidae	9	1
Peltoperlidae	1	1
Heptageniidae	4	1
Tabanidae	6	1

---

Statistical Analysis

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Number of Taxa: 15  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 22.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.58  
 Scraper/Filterer Collector Ratio: 0.97  
 Shredder/Total Ratio: 0.15  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 34.00  
 EPT/C: 1.55  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 166

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 20/<1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural/Agricultural cropland and livestock; Water temp.12.7 /pH 6.2 /DO 9.6 /Cond.373

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Station: AN0098  
Alexauken Ck, Rt 29 , Lambertville, Hunterdon County  
Stockton USGS Quadrangle  
Date Sampled: 07/09/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Baetidae	4	29
Hydropsychidae	4	28
Chironomidae	6	22
Heptageniidae	4	5
Philopotamidae	3	3
Empididae	6	3
Naididae	7	3
Tipulidae	3	1
Planariidae	4	1
Hydroptilidae	4	1
Lepidostomatidae	1	1
Nematoda	6	1
Tetrastemmatidae	7	1
Veliidae	9	1

---

Statistical Analysis

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Number of Taxa: 14  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 29.00 % ( Baetidae )  
Family Biotic Index: 4.62  
Scraper/Filterer Collector Ratio: 0.19  
Shredder/Total Ratio: 0.01  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 6  
% EPT: 67.00  
EPT/C: 3.05  
NJIS Rating: 30  
Biological Condition: Nonimpaired  
Habitat Analysis: 166

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 30/<1  
Substrate: Cobbles....StreamBank Vegetation/Stability: Trees,weeds/Stable  
Canopy: Open....Other: Forested/Rural; Water temp.20.3 /pH 8.1 /DO 8.6 /Cond.306

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Station: AN0099  
 Swan Ck, Swan St , Lambertville, Hunterdon County  
 Lambertville USGS Quadrangle  
 Date Sampled: 07/09/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	29
Simuliidae	6	19
Hydropsychidae	4	14
Gammaridae	4	12
Baetidae	4	7
Psephenidae	4	6
Elmidae	4	5
Asellidae	8	2
Planorbidae	6	2
Empididae	6	1
Erpobdellidae	8	1
Naididae	7	1
Nematoda	6	1

---

Statistical Analysis

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Number of Taxa: 13  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 29.00 % ( Chironomidae )  
 Family Biotic Index: 5.19  
 Scraper/Filterer Collector Ratio: 0.39  
 Shredder/Total Ratio: 0.02  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 21.00  
 EPT/C: 0.72  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 141  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow...Width/Depth (ft): 17/<1  
 Substrate: Cobbles....StreamBank Vegetation/Stability: Trees/Unstable  
 Canopy: Mostly Open....Other: Urban; Water temp.19.9 /pH 7.7 /DO 5.2 /Cond.389

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Station: AN0100  
 Moores Ck, Barry Rd , W Amwell Twp, Hunterdon County  
 Lambertville USGS Quadrangle  
 Date Sampled: 07/08/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	42
Chironomidae	6	26
Baetidae	4	10
Empididae	6	7
Tipulidae	3	6
Hydroptilidae	4	3
Elmidae	4	3
Perlidae	1	2
Psephenidae	4	2
Philopotamidae	3	1
Planariidae	4	1
Sphaeriidae	8	1

---

Statistical Analysis

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Number of Taxa: 12  
 Total Number of Individuals: 104  
 % Contribution of Dominant Family: 40.38 % ( Hydropsychidae )  
 Family Biotic Index: 4.55  
 Scraper/Filterer Collector Ratio: 0.11  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 55.77  
 EPT/C: 2.14  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 144

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 30/<1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Unstable  
 Canopy: Mostly Open....Other: Forested/Rural/Agricultural cropland and livestock; Water temp.18.0 /pH 7.2 /DO 5.6 /Cond.221

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Station: AN0101  
 Moores Ck, Rt 29 , Hopewell Twp, Mercer County  
 Lambertville USGS Quadrangle  
 Date Sampled: 07/08/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	34
Chironomidae	6	27
Baetidae	4	22
Hydroptilidae	4	4
Empididae	6	3
Gammaridae	4	2
Nematoda	6	2
Glossosomatidae	0	1
Tipulidae	3	1
Elmidae	4	1
Psephenidae	4	1
Lymnaeidae	6	1
Heptageniidae	4	1

---

Statistical Analysis

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Number of Taxa: 13  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 34.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.61  
 Scraper/Filterer Collector Ratio: 0.24  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 62.00  
 EPT/C: 2.30  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 166

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 50/<1  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees,shrubs,weeds/Unstable  
 Canopy: Open....Other: Forested/Rural; Water temp.18.9 /pH 7.6 /DO 6.1 /Cond.364

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Station: AN0102  
 Jacobs Ck, Woosamonsa Rd , Hopewell Twp, Mercer County  
 Pennington USGS Quadrangle  
 Date Sampled: 07/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Psephenidae	4	21
Hydropsychidae	4	16
Chironomidae	6	13
Elmidae	4	11
Tipulidae	3	10
Leptophlebiidae	2	7
Perlidae	1	3
Hydrophilidae	5	3
Empididae	6	2
Baetidae	4	2
BloodRed Chironomidae	8	2
Heptageniidae	4	2
Ptilodactylidae	1	1
Astacidae	7	1
Philopotamidae	3	1
Planorbidae	6	1
Dryopidae	5	1
Hydroptilidae	4	1
Gomphidae	1	1
Veliidae	9	1

---

Statistical Analysis

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Number of Taxa: 20  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 21.00 % ( Psephenidae )  
 Family Biotic Index: 4.12  
 Scraper/Filterer Collector Ratio: 1.30  
 Shredder/Total Ratio: 0.02  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
 % EPT: 32.00  
 EPT/C: 2.13  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 170

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 15/<1  
 Substrate: Cobbles,gravel,silt....StreamBank Vegetation/Stability: Trees,weeds/Stable  
 Canopy: Mostly Open....Other: Forested/Rural/Agricultural cropland and livestock; Water  
 temp.17.0 /pH 7.4 /DO 8.1 /Cond.210

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Station: AN0103  
Ewing Ck {Airport Br}, Rt 579 , Hopewell Twp, Mercer County  
Pennington USGS Quadrangle  
Date Sampled: 07/02/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	30
Psephenidae	4	12
Elmidae	4	12
Chironomidae	6	11
Asellidae	8	9
Baetidae	4	8
Tipulidae	3	5
Hydroptilidae	4	2
Heptageniidae	4	2
Tubificidae	10	1
Hydrophilidae	5	1
Astacidae	7	1
Philopotamidae	3	1
Planariidae	4	1
Perlidae	1	1
Polycentropodidae	6	1
Naididae	7	1
Sphaeriidae	8	1

---

Statistical Analysis

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Number of Taxa: 18  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 30.00 % ( Hydropsychidae )  
Family Biotic Index: 4.68  
Scraper/Filterer Collector Ratio: 0.85  
Shredder/Total Ratio: 0.09  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
% EPT: 45.00  
EPT/C: 4.09  
NJIS Rating: 30  
Biological Condition: Nonimpaired  
Habitat Analysis: 166

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 17/<1  
Substrate: Cobbles,silt,snags....StreamBank Vegetation/Stability: Trees/Unstable  
Canopy: Mostly Closed....Other: Forested/Suburban; Water temp.18.1 /pH 7.5 /DO 8.7  
/Cond.499

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Station: AN0104  
 Woolseys Bk, Rt 546 , Hopewell Twp, Mercer County  
 Pennington USGS Quadrangle  
 Date Sampled: 07/02/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	30
Asellidae	8	19
Fredericellidae	2	8
Paludicellidae	7	8
Chironomidae	6	7
Elmidae	4	7
Leptoceridae	4	4
Planariidae	4	3
BloodRed Chironomidae	8	3
Psephenidae	4	3
Tubificidae	10	2
Hydropsychidae	4	1
Veliidae	9	1
Corixidae	9	1
Naididae	7	1
Sphaeriidae	8	1
Heptageniidae	4	1

---

Statistical Analysis

---

Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 30.00 % ( Gammaridae )  
 Family Biotic Index: 5.39  
 Scraper/Filterer Collector Ratio: 1.22  
 Shredder/Total Ratio: 0.19  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
 % EPT: 6.00  
 EPT/C: 0.60  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 162  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 20/<1  
 Substrate: Cobbles,silt,snags....StreamBank Vegetation/Stability: Trees,weeds/Unstable  
 Canopy: Mostly Open....Other: Rural/Agricultural; Water temp.18.7 /pH 7.4 /DO 8.2  
 /Cond.358

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Station: AN0105  
 Jacobs Ck, Rt 546 , Hopewell Twp, Mercer County  
 Pennington USGS Quadrangle  
 Date Sampled: 07/07/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	47
Chironomidae	6	21
Elmidae	4	5
Gammaridae	4	4
Psephenidae	4	4
Leptoceridae	4	3
Tetrastemmatidae	7	2
Heptageniidae	4	2
BloodRed Chironomidae	8	2
Tipulidae	3	1
Protoneuridae	9	1
Staphylinidae	4	1
Empididae	6	1
Hygrobatidae	2	1
Lumbricidae	10	1
Veliidae	9	1
Leptophlebiidae	2	1
Physidae	7	1
Sialidae	4	1

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Statistical Analysis

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Number of Taxa: 19  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 47.00 % ( Hydropsychidae )  
 Family Biotic Index: 4.72  
 Scraper/Filterer Collector Ratio: 0.16  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 53.00  
 EPT/C: 2.30  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 166

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 40/<1  
 Substrate: Cobbles,gravel,silt....StreamBank Vegetation/Stability: Trees/Unstable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.17.2 /pH 7.7 /DO 6.5 /Cond.316

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Station: AN0106  
Jacobs Ck, Rt 29 , Hopewell Twp, Mercer County  
Pennington USGS Quadrangle  
Date Sampled: 07/01/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	56
Chironomidae	6	24
Baetidae	4	5
Gammaridae	4	4
Naididae	7	3
Philopotamidae	3	2
Lepidostomatidae	1	2
Asellidae	8	1
Heptageniidae	4	1
Tetrastemmatidae	7	1
Simuliidae	6	1

---

Statistical Analysis

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Number of Taxa: 11  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 56.00 % ( Hydropsychidae )  
Family Biotic Index: 4.58  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.03  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
% EPT: 66.00  
EPT/C: 2.75  
NJIS Rating: 24  
Biological Condition: Nonimpaired  
Habitat Analysis: 140

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 15/<1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Unstable  
Canopy: Mostly Open....Other: Suburban; Water temp.19.0 /pH 8.5 /DO 10.3 /Cond.351

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Station: AN0107  
 Gold Run, Rt 29 And Lower Ferry Rd , Wilburtha, Mercer County  
 Pennington/Trenton W USGS Quadrangle  
 Date Sampled: 07/01/97

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	22
Chironomidae	6	19
Asellidae	8	12
Hydropsychidae	4	12
Planariidae	4	11
Philopotamidae	3	8
Baetidae	4	6
Simuliidae	6	3
Psephenidae	4	2
Elmidae	4	2
Empididae	6	1
Hydroptilidae	4	1
Hygrobatidae	2	1

---

Statistical Analysis

---

Number of Taxa: 13  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 22.00 % ( Gammaridae )  
 Family Biotic Index: 4.84  
 Scraper/Filterer Collector Ratio: 0.22  
 Shredder/Total Ratio: 0.12  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 27.00  
 EPT/C: 1.42  
 NJIS Rating: 24  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 145

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 10/<1  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Open....Other: Urban/Impoundment upstream/Construction upstream; Water temp.19.3  
 /pH 8.0 /DO 9.3 /Cond.229

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Station: AN0108  
 Assunpink Ck, Roosevelt Rd , Roosevelt, Monmouth County  
 Roosevelt USGS Quadrangle  
 Date Sampled: 03/04/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Simuliidae	6	61
Sphaeriidae	8	15
Chironomidae	6	13
Tubificidae	10	2
BloodRed Chironomidae	8	2
Cypridae	6	1
Lumbriculidae	8	1
Elmidae	4	1
Hydrophilidae	5	1
Phryganeidae	4	1
Limnephilidae	4	1
Sialidae	4	1

---

Statistical Analysis

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Number of Taxa: 12  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 61.00 % ( Simuliidae )  
 Family Biotic Index: 6.35  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 2.00  
 EPT/C: 0.13  
 NJIS Rating: 9  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 158  
 Deficiency(s) noted: Simuliidae Family Overwhelmingly Dominant  
 Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 8/2  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees,shrubs/Unstable  
 Canopy: Mostly Closed....Other: Forested/Suburban; Water temp.8.8 /pH 7.0 /DO 10.0/Cond.66

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Station: AN0109  
Assunpink Ck, Rt 535 , Edinburg, Mercer County  
Hightstown USGS Quadrangle  
Date Sampled: 03/04/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Simuliidae	6	92
Hydropsychidae	4	2
Chironomidae	6	2
Elmidae	4	2
Leptoceridae	4	1
Heptageniidae	4	1

---

Statistical Analysis

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Number of Taxa: 6  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 92.00 % ( Simuliidae )  
Family Biotic Index: 5.88  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.02  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
% EPT: 4.00  
EPT/C: 2.00  
NJIS Rating: 9  
Biological Condition: Moderately Impaired  
Habitat Analysis: 167  
Deficiency(s) noted: Simuliidae Family Overwhelmingly Dominant  
Paucity of Clean Water Organisms

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Observations

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Streamwater: Turbid....Flow: Moderate....Width/Depth (ft): 30/1  
Substrate: Cobbles,gravel,mud....StreamBank Vegetation/Stability: Trees,shrubs/Unstable  
Canopy: Mostly Open....Other: Forested/Suburban; Water temp.8.4 /pH 7.0 /DO 9.3 /Cond.133

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Station: AN0109A  
 Assunpink Ck, Windsor Rd , Carsons Mills, Mercer County  
 Allentown USGS Quadrangle  
 Date Sampled: 03/04/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	55
BloodRed Chironomidae	8	12
Gammaridae	4	9
Hydridae	5	7
Plagiostomidae	4	4
Asellidae	8	3
Cypridae	6	1
Hydrophilidae	5	1
Belostomatidae	9	1
Cambaridae	5	1
Sphaeriidae	8	1
Polycentropodidae	6	1
Astacidae	7	1
Simuliidae	6	1
Phryganeidae	4	1
Naididae	7	1

---

Statistical Analysis

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Number of Taxa: 16  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 55.00 % ( Chironomidae )  
 Family Biotic Index: 6.00  
 Scraper/Filterer Collector Ratio: 4.00  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 2.00  
 EPT/C: 0.03  
 NJIS Rating: 12  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 155  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Turbid....Flow: Slow....Width/Depth (ft): 35/3  
 Substrate: Cobbles,mud....StreamBank Vegetation/Stability: Trees,shrubs/Unstable  
 Canopy: Mostly Open....Other: Forested/Suburban; Water temp.8.5 /pH 6.5 /DO 10.3 /Cond.106

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Station: AN0109B  
 New Sharon Br, Sharon Rd , Carsons Mills, Mercer County  
 Allentown USGS Quadrangle  
 Date Sampled: 03/04/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	27
Gammaridae	4	25
Asellidae	8	15
Limnephilidae	4	8
Plagiostomidae	4	4
Simuliidae	6	3
Dytiscidae	5	3
Tubificidae	10	3
Sphaeriidae	8	3
Notonectidae	9	2
Sialidae	4	2
BloodRed Chironomidae	8	1
Haliplidae	5	1
Physidae	7	1
Tetrastemmatidae	7	1
Phryganeidae	4	1

---

Statistical Analysis

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Number of Taxa: 16  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 27.00 % ( Chironomidae )  
 Family Biotic Index: 5.74  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.25  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 9.00  
 EPT/C: 0.32  
 NJIS Rating: 15  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 152  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly Turbid....Flow: Moderate....Width/Depth (ft): 35/3  
 Substrate: Cobbles,mud....StreamBank Vegetation/Stability: Trees,shrubs/Unstable  
 Canopy: Mostly Open....Other: Forested/Suburban; Water temp.9.4 /pH 6.5 /DO 9.8 /Cond.160

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Station: AN0110  
Shipetauken Ck, Van Kirk Rd , Lawrence Twp, Mercer County  
Princeton USGS Quadrangle  
Date Sampled: 03/03/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Simuliidae	6	74
Chironomidae	6	10
Philopotamidae	3	3
Capniidae	1	2
Asellidae	8	2
Planariidae	4	2
Tipulidae	3	2
Dytiscidae	5	1
Nemouridae	2	1
Sialidae	4	1
Naididae	7	1
Heptageniidae	4	1

---

Statistical Analysis

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Number of Taxa: 12  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 74.00 % ( Simuliidae )  
Family Biotic Index: 5.67  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.05  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
% EPT: 7.00  
EPT/C: 0.70  
NJIS Rating: 12  
Biological Condition: Moderately Impaired  
Habitat Analysis: 147  
Deficiency(s) noted: Simuliidae Family Overwhelmingly Dominant -  
Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly turbid....Flow: Moderate....Width/Depth (ft): 5/1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
Canopy: Mostly Open....Other: Suburban/Agricultural cropland; Water temp.8.2 /pH 7.3 /DO  
11.2 /Cond.231

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Station: AN0111  
 Shipetauken Ck, Rt 583 , Lawrence Twp, Mercer County  
 Princeton USGS Quadrangle  
 Date Sampled: 03/03/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Tubificidae	10	38
Chironomidae	6	29
Gammaridae	4	19
Viviparidae	6	4
Corixidae	9	4
Sphaeriidae	8	3
Asellidae	8	2
BloodRed Chironomidae	8	2
Plagiostomidae	4	2
Lumbriculidae	8	2
Tabanidae	6	2
Baetidae	4	1
Planorbidae	6	1

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Statistical Analysis

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Number of Taxa: 13  
 Total Number of Individuals: 109  
 % Contribution of Dominant Family: 34.86 % ( Tubificidae )  
 Family Biotic Index: 7.27  
 Scraper/Filterer Collector Ratio: 1.67  
 Shredder/Total Ratio: 0.02  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
 % EPT: 0.92  
 EPT/C: 0.03  
 NJIS Rating: 12  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 128  
 Deficiency(s) noted: Significant Organic Pollution  
 Paucity of Clean Water Organisms

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Observations

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Streamwater: Turbid....Flow: Slow....Width/Depth (ft): 13/2  
 Substrate: Mud....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.8.6 /pH 7.3 /DO 11.1 /Cond.241

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Station: AN0112  
Little Shabakunk Ck, Rt 583 , Franklin Corner, Mercer County  
Princeton USGS Quadrangle  
Date Sampled: 03/03/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Tubificidae	10	23
BloodRed Chironomidae	8	22
Chironomidae	6	7
Heptageniidae	4	4
Elmidae	4	3
Planorbidae	6	2
Lymnaeidae	6	2
Hydrophilidae	5	1
Enchytraeidae	10	1
Hydrobiidae	8	1
Lumbriculidae	8	1

---

Statistical Analysis

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Number of Taxa: 11  
Total Number of Individuals: 67  
% Contribution of Dominant Family: 34.33 % ( Tubificidae )  
Family Biotic Index: 7.93  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
% EPT: 5.97  
EPT/C: 0.21  
NJIS Rating: 12  
Biological Condition: Moderately Impaired  
Habitat Analysis: 127  
Deficiency(s) noted: Significant Organic Pollution  
Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly Turbid...Flow: Slow...Width/Depth (ft): 11/2  
Substrate: Sand...StreamBank Vegetation/Stability: Trees,shrubs/Stable  
Canopy: Mostly Open...Other: Suburban; Water temp.9.1 /pH 7.5 /DO 10.6 /Cond.189

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Station: AN0113  
 Shabakunk Ck, Bull Run Rd , Ewing Twp, Mercer County  
 Pennington USGS Quadrangle  
 Date Sampled: 03/05/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	41
Tubificidae	10	19
Hydropsychidae	4	11
BloodRed Chironomidae	8	7
Naididae	7	6
Gammaridae	4	4
Planorbidae	6	2
Haliplidae	5	2
Physidae	7	2
Asellidae	8	1
Simulidae	6	1
Protoneuridae	9	1
Lumbriculidae	8	1
Heptageniidae	4	1
Elmidae	4	1

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Statistical Analysis

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Number of Taxa: 15  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 41.00 % ( Chironomidae )  
 Family Biotic Index: 6.69  
 Scraper/Filterer Collector Ratio: 0.92  
 Shredder/Total Ratio: 0.43  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 12.00  
 EPT/C: 0.25  
 NJIS Rating: 15  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 132  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 30/1  
 Substrate: Cobbles,gravel,silt....StreamBank Vegetation/Stability: Trees/Unstable  
 Canopy: Mostly Open....Other: Suburban; Water temp.5.7 /pH 7.4 /DO 13.6 /Cond.298

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Station: AN0114  
 Shabakunk Ck, Rt 206 , Lawrence Twp, Mercer County  
 Princeton USGS Quadrangle  
 Date Sampled: 03/03/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	30
Hydropsychidae	4	13
Elmidae	4	11
Spongillidae	5	9
Tubificidae	10	7
Corbiculidae	8	6
Gammaridae	4	5
Paludicellidae	7	5
BloodRed Chironomidae	8	4
Planorbidae	6	4
Lumbriculidae	8	3
Tetrastemmatidae	7	3
Tipulidae	3	3
Empididae	6	2
Calopterygidae	5	1
Planariidae	4	1
Lebertiidae	4	1
Lumbricidae	10	1
Nematoda	6	1

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Statistical Analysis

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Number of Taxa: 19  
 Total Number of Individuals: 110  
 % Contribution of Dominant Family: 27.27 % ( Chironomidae )  
 Family Biotic Index: 5.87  
 Scraper/Filterer Collector Ratio: 1.15  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
 % EPT: 11.82  
 EPT/C: 0.35  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 121  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Turbid....Flow: Moderate....Width/Depth (ft): 20/2  
 Substrate: Gravel,sand....StreamBank Vegetation/Stability: Trees/Unstable  
 Canopy: Mostly Open....Other: Suburban; Water temp.8.7 /pH 7.7 /DO 11.6 /Cond.215

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Station: AN0115  
 Miry Run, Rt 533 , Hamilton Twp, Mercer County  
 Trenton E USGS Quadrangle  
 Date Sampled: 03/05/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	17
Sphaeriidae	8	17
Simuliidae	6	14
Tubificidae	10	13
Chironomidae	6	11
Plagiostomidae	4	5
Lumbriculidae	8	4
Corixidae	9	3
Lymnaeidae	6	3
Hydropsychidae	4	2
Elmidae	4	2
Limnephilidae	4	2
Lumbricidae	10	2
Tetrastemmatidae	7	2
Glossiphoniidae	8	1
Planariidae	4	1
Macromiidae	3	1

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Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 17.00 % ( Gammaridae & Sphaeriidae )  
 Family Biotic Index: 6.54  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.02  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 4.00  
 EPT/C: 0.36  
 NJIS Rating: 15  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 92  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly Turbid....Flow: Moderate....Width/Depth (ft): 20/1  
 Substrate: Gravel,sand,mud....StreamBank Vegetation/Stability: Trees/Unstable  
 Canopy: Mostly Open....Other: Urban/Channelized; Water temp.7.5 /pH 6.8 /DO 9.9 /Cond.141

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Station: AN0115A  
 Miry Run, Pond Rd , Washington Twp, Mercer County  
 Trenton E USGS Quadrangle  
 Date Sampled: 03/05/98

Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	41
Simuliidae	6	11
Elmidae	4	11
Nemouridae	2	10
Hydropsychidae	4	9
Planariidae	4	3
Fredericellidae	2	3
Protoneuridae	9	3
Aeshnidae	3	2
Physidae	7	2
Tubificidae	10	1
Ephemerellidae	1	1
Gammaridae	4	1
Ceratopogonidae	6	1
Hydrophilidae	5	1

Statistical Analysis

Number of Taxa: 15  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 41.00 % ( Chironomidae )  
 Family Biotic Index: 5.03  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.51  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
 % EPT: 20.00  
 EPT/C: 0.49  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 131

Observations

Streamwater: Slightly Turbid....Flow: Moderate....Width/Depth (ft): 13/2  
 Substrate: Gravel,sand,mud....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Open....Other: Forested/Suburban; Water temp.6.6 /pH 7.3 /DO 10.7 /Cond.160

Station: AN0116  
 Assunpink Ck, Mulberry St , Trenton, Mercer County  
 Trenton E USGS Quadrangle  
 Date Sampled: 03/05/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	38
Gammaridae	4	15
Paludicellidae	7	12
Hydropsychidae	4	6
Tubificidae	10	6
Cypridae	6	5
Asellidae	8	3
Plagiostomidae	4	3
Physidae	7	3
Sphaeriidae	8	3
Protoneuridae	9	2
Planorbidae	6	1
Lumbriculidae	8	1
Simuliidae	6	1
Valvatidae	4	1

---

Statistical Analysis

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Number of Taxa: 15  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 38.00 % ( Chironomidae )  
 Family Biotic Index: 6.09  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.00  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
 % EPT: 6.00  
 EPT/C: 0.16  
 NJIS Rating: 15  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 122  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly Turbid....Flow: Moderate....Width/Depth (ft): 60/3  
 Substrate: Cobbles, gravel, mud....StreamBank Vegetation/Stability: Weeds/Unstable  
 Canopy: Open....Other: Urban/Industrial; Water temp.8.0 /pH 7.4 /DO 9.6 /Cond.217

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Station: AN0117  
 Pond Run, Rt 533 , Hamilton Twp, Mercer County  
 Trenton E USGS Quadrangle  
 Date Sampled: 03/05/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Tubificidae	10	81
Sphaeriidae	8	9
Chironomidae	6	5
BloodRed Chironomidae	8	2
Cyclopidae	4	1
Cypridae	6	1
Enchytraeidae	10	1
Plagiostomidae	4	1
Limnephilidae	4	1
Naididae	7	1
Physidae	7	1
Tetrastemmatidae	7	1

---

Statistical Analysis

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Number of Taxa: 12  
 Total Number of Individuals: 105  
 % Contribution of Dominant Family: 77.14 % ( Tubificidae )  
 Family Biotic Index: 9.30  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.06  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
 % EPT: 0.95  
 EPT/C: 0.14  
 NJIS Rating: 6  
 Biological Condition: Severely Impaired  
 Habitat Analysis: 139  
 Deficiency(s) noted: Tubificidae Family Overwhelmingly Dominant - Significant Organic Pollution - Paucity of Clean Water Organisms

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Observations

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Streamwater: Turbid....Flow: Moderate....Width/Depth (ft): 9/2  
 Substrate: Gravel,mud....StreamBank Vegetation/Stability: Trees,shrubs/Unstable  
 Canopy: Mostly Closed....Other: Forested/Urban; Water temp.7.3 /pH 7.0 /DO 10.2 /Cond.174

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Station: AN0118  
Assunpink Ck, Willow St , Trenton, Mercer County  
Trenton W USGS Quadrangle  
Date Sampled: 03/05/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	88
Fredericellidae	2	5
Corixidae	9	1
Cypridae	6	1
Enchytraeidae	10	1
Chironomidae	6	1
Psychodidae	10	1
Sphaeriidae	8	1
Lymnaeidae	6	1

---

Statistical Analysis

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Number of Taxa: 9  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 88.00 % ( Gammaridae )  
Family Biotic Index: 4.17  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 0  
% EPT: 0.00  
EPT/C: 0.00  
NJIS Rating: 9  
Biological Condition: Moderately Impaired  
Habitat Analysis: 104  
Deficiency(s) noted: Gammaridae Family Overwhelmingly Dominant  
Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly Turbid....Flow: Moderate....Width/Depth (ft): 55/5  
Substrate: Cobbles,sand,mud....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Open....Other: Urban/Channelized; Water temp.7.9 /pH 7.1 /DO 11.6/Cond.225

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Station: AN0294  
Lake Lookout Bk, Wawayanda St Pk , Wawayanda, Sussex County  
Wawayanda USGS Quadrangle  
Date Sampled: 06/09/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	47
Hydropsychidae	4	18
Chironomidae	6	15
Baetidae	4	7
Tetrastemmatidae	7	3
Simuliidae	6	3
Lumbricidae	10	2
Elmidae	4	2
Tipulidae	3	1
Planariidae	4	1
Brachycentridae	1	1

---

Statistical Analysis

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Number of Taxa: 11  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 47.00 % ( Gammaridae )  
Family Biotic Index: 4.53  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.01  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
% EPT: 26.00  
EPT/C: 1.73  
NJIS Rating: 21  
Biological Condition: Moderately Impaired  
Habitat Analysis: 164

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 11/1  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
Canopy: Mostly Open....Other: Forested; Water temp.15.7 /pH 7.4 /DO 7.9 /Cond.145

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Station: AN0295  
 Wawayanda Bk, Canal Rd , Maple Grange, Sussex County  
 Wawayanda USGS Quadrangle  
 Date Sampled: 06/09/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	31
Gammaridae	4	22
Elmidae	4	16
Baetidae	4	11
Heptageniidae	4	4
BloodRed Chironomidae	8	3
Asellidae	8	2
Lumbriculidae	8	2
Tipulidae	3	1
Aeshnidae	3	1
Hydropsychidae	4	1
Corixidae	9	1
Gomphidae	1	1
Lumbricidae	10	1
Veliidae	9	1
Limnephilidae	4	1
Simuliidae	6	1

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Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 31.00 % ( Chironomidae )  
 Family Biotic Index: 5.03  
 Scraper/Filterer Collector Ratio: 1.55  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 17.00  
 EPT/C: 0.50  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 135

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 22/3  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability:  
 Trees,shrubs,grasses/Unstable  
 Canopy: Mostly Closed....Other: Forested/Agricultural cropland; Water temp.13.7 /pH 7.6  
 /DO 9.3 /Cond.353

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Station: AN0296  
Black Ck, Marker Rd , Maple Grange, Sussex County  
Wawayanda USGS Quadrangle  
Date Sampled: 06/10/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	48
Corixidae	9	32
Physidae	7	12
Elmidae	4	2
Planariidae	4	2
Philopotamidae	3	1
Hydridae	5	1
Tubificidae	10	1
Chironomidae	6	1

---

Statistical Analysis

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Number of Taxa: 9  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 48.00 % ( Gammaridae )  
Family Biotic Index: 6.04  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 1  
% EPT: 1.00  
EPT/C: 1.00  
NJIS Rating: 9  
Biological Condition: Moderately Impaired  
Habitat Analysis: 148  
Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly Turbid....Flow: Slow....Width/Depth (ft): 50/4  
Substrate: Mud....StreamBank Vegetation/Stability: Grass,shrubs,trees/Unstable  
Canopy: Open....Other: Rural; Water temp.15.6 /pH 7.0 /DO 7.8 /Cond.670

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Station: AN0297  
Wallkill River, Rt 15 , Sparta, Sussex County  
Newton E USGS Quadrangle  
Date Sampled: 06/16/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	30
Asellidae	8	27
Gammaridae	4	17
Planariidae	4	7
Fredericellidae	2	5
Elmidae	4	4
Baetidae	4	3
BloodRed Chironomidae	8	2
Tubificidae	10	2
Chironomidae	6	1
Psephenidae	4	1
Glossosomatidae	0	1
Naididae	7	1
Veliidae	9	1

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#### Statistical Analysis

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Number of Taxa: 14  
Total Number of Individuals: 102  
% Contribution of Dominant Family: 29.41 % ( Hydropsychidae )  
Family Biotic Index: 5.22  
Scraper/Filterer Collector Ratio: 0.19  
Shredder/Total Ratio: 0.28  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
% EPT: 33.33  
EPT/C: 11.11  
NJIS Rating: 21  
Biological Condition: Moderately Impaired  
Habitat Analysis: 191

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#### Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 20/1  
Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Stable  
Canopy: Mostly Closed....Other: Forested/Suburban; Water temp.20.4 /pH 8.4 /DO 8.6  
/Cond.558

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Station: AN0298  
 Wallkill River, Kennedy Ave , Ogdensburg, Sussex County  
 Franklin USGS Quadrangle  
 Date Sampled: 06/11/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	40
Chironomidae	6	36
Hydropsychidae	4	10
Simuliidae	6	5
Baetidae	4	4
Tipulidae	3	1
BloodRed Chironomidae	8	1
Hydroptilidae	4	1
Naididae	7	1
Nematoda	6	1

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Statistical Analysis

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Number of Taxa: 10  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 40.00 % ( Gammaridae )  
 Family Biotic Index: 4.90  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.36  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
 % EPT: 15.00  
 EPT/C: 0.41  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 142

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 13/2  
 Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Trees,shrubs,grass/Unstable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.16.5 /pH 8.4 /DO 8.5 /Cond.608

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Station: AN0299  
Wallkill River, Scott Rd , Franklin, Sussex County  
Hamburg USGS Quadrangle  
Date Sampled: 06/11/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	62
Hydropsychidae	4	14
Chironomidae	6	9
Heptageniidae	4	4
BloodRed Chironomidae	8	3
Elmidae	4	2
Tubificidae	10	2
Tipulidae	3	1
Philopotamidae	3	1
Ephemerellidae	1	1
Simuliidae	6	1

---

Statistical Analysis

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Number of Taxa: 11  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 62.00 % ( Gammaridae )  
Family Biotic Index: 4.39  
Scraper/Filterer Collector Ratio: 0.56  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
% EPT: 20.00  
EPT/C: 1.67  
NJIS Rating: 18  
Biological Condition: Moderately Impaired  
Habitat Analysis: 174  
Deficiency(s) noted: Gammaridae Family Overwhelmingly Dominant

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 23/2  
Substrate: Cobbles....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
Canopy: Mostly Closed....Other: Forested/Rural/Golf course upstream; Water temp.18.4 /pH 7.8 /DO 8.2 /Cond.558

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Station: AN0300  
Wallkill River, Rt94 , Hamburg, Sussex County  
Hamburg USGS Quadrangle  
Date Sampled: 06/11/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	63
Chironomidae	6	16
Tubificidae	10	6
Simuliidae	6	3
Psephenidae	4	2
Elmidae	4	2
BloodRed Chironomidae	8	2
Caenidae	7	1
Heptageniidae	4	1
Cambaridae	5	1
Limnephilidae	4	1
Ephemerellidae	1	1
Hydropsychidae	4	1

---

Statistical Analysis

---

Number of Taxa: 13  
Total Number of Individuals: 100  
% Contribution of Dominant Family: 63.00 % ( Gammaridae )  
Family Biotic Index: 4.83  
Scraper/Filterer Collector Ratio: 1.25  
Shredder/Total Ratio: 0.17  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
% EPT: 5.00  
EPT/C: 0.28  
NJIS Rating: 15  
Biological Condition: Moderately Impaired  
Habitat Analysis: 163  
Deficiency(s) noted: Gammaridae Family Overwhelmingly Dominant  
Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 27/2  
Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
Canopy: Mostly Closed....Other: Forested/Industrial/Regional STP & Ames Rubber upstream;  
Water temp.18.0/pH 7.5 /DO 9.4 /Cond.558

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Station: AN0301  
 Beaver Run, Cemetery Rd , Wantage Twp, Sussex County  
 Hamburg USGS Quadrangle  
 Date Sampled: 06/11/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	35
Hydropsychidae	4	28
Chironomidae	6	13
Simuliidae	6	11
Tipulidae	3	3
Baetidae	4	3
Elmidae	4	3
Asellidae	8	2
Brachycentridae	1	2

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Statistical Analysis

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Number of Taxa: 9  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 35.00 % ( Gammaridae )  
 Family Biotic Index: 4.47  
 Scraper/Filterer Collector Ratio: 0.00  
 Shredder/Total Ratio: 0.15  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
 % EPT: 33.00  
 EPT/C: 2.54  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 141

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Observations

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Streamwater: Turbid....Flow: Moderate....Width/Depth (ft): 7/1  
 Substrate: Cobbles,mud....StreamBank Vegetation/Stability: Shrubs,grasses/Stable  
 Canopy: Mostly Open....Other: Agricultural livestock; Water temp.16.7 /pH 7.7 /DO 9.5  
 /Cond.556

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Station: AN0302  
Wallkill River, Rt 565 , Sussex, Sussex County  
Hamburg USGS Quadrangle  
Date Sampled: 06/10/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Chironomidae	6	14
Baetidae	4	4
Gammaridae	4	3
Elmidae	4	2
Tubificidae	10	2
Notonectidae	9	2
Simuliidae	6	2
Sphaeriidae	8	2
Corixidae	9	2
Brachycentridae	1	1
Cambaridae	5	1
Limnephilidae	4	1

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Statistical Analysis

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Number of Taxa: 12  
Total Number of Individuals: 36  
% Contribution of Dominant Family: 38.89 % ( Chironomidae )  
Family Biotic Index: 5.94  
Scraper/Filterer Collector Ratio: 0.00  
Shredder/Total Ratio: 0.03  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
% EPT: 16.67  
EPT/C: 1.19  
NJIS Rating: 21  
Biological Condition: Moderately Impaired  
Habitat Analysis: 156

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Observations

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Streamwater: Clear....Flow: Moderate....Width/Depth (ft): 30/2  
Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Grasses,trees/Unstable  
Canopy: Open....Other: Rural/Agricultural/Ames Rubber Dischg upstream; Water temp.16.7 /pH  
7.3 /DO 8.3 /Cond.582

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Station: AN0303  
 Papakating Ck, Rt 619 & Gunn Rd , Frankford Twp, Sussex County  
 Branchville USGS Quadrangle  
 Date Sampled: 06/17/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Hydropsychidae	4	20
Chironomidae	6	20
Leuctridae	0	15
Elmidae	4	10
Perlodidae	2	9
Baetidae	4	9
Leptophlebiidae	2	3
Perlidae	1	2
Psephenidae	4	2
Odontoceridae	0	2
Tipulidae	3	1
Philopotamidae	3	1
Hydroptilidae	4	1
Lumbriculidae	8	1
Hydrophilidae	5	1
Simuliidae	6	1
Sperchonidae	2	1
Heptageniidae	4	1

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Statistical Analysis

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Number of Taxa: 18  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 20.00 % ( Hydropsychidae & Chironomidae )  
 Family Biotic Index: 3.45  
 Scraper/Filterer Collector Ratio: 0.73  
 Shredder/Total Ratio: 0.15  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 10  
 % EPT: 63.00  
 EPT/C: 3.15  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 193

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 8/<1  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees,shrubs/Stable  
 Canopy: Closed....Other: Forested/Rural/Agricultural cropland; Water temp.19.1 /pH 7.8 /DO  
 8.8 /Cond.185

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Station: AN0304  
 Papakating Ck, Rt 565 , Pellettown, Sussex County  
 Branchville USGS Quadrangle  
 Date Sampled: 06/16/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Tubificidae	10	41
Gammaridae	4	38
Enchytraeidae	10	6
Baetidae	4	3
Physidae	7	3
Chironomidae	6	3
BloodRed Chironomidae	8	2
Elmidae	4	2
Hydropsychidae	4	2
Erpobdellidae	8	2
Asellidae	8	1
Sciomyzidae	10	1
Planorbidae	6	1
Talitridae	8	1
Lumbricidae	10	1
Corixidae	9	1

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Statistical Analysis

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Number of Taxa: 16  
 Total Number of Individuals: 108  
 % Contribution of Dominant Family: 37.96 % ( Tubificidae )  
 Family Biotic Index: 7.15  
 Scraper/Filterer Collector Ratio: 0.50  
 Shredder/Total Ratio: 0.04  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 2  
 % EPT: 4.63  
 EPT/C: 0.93  
 NJIS Rating: 12  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 122  
 Deficiency(s) noted: Significant Organic Pollution  
 Paucity of Clean Water Organisms

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Observations

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Streamwater: Slightly Turbid....Flow: Moderate....Width/Depth (ft): 30/2  
 Substrate: Sand,mud....StreamBank Vegetation/Stability: Grasses/Stable  
 Canopy: Open....Other: Forested/Rural/Agricultural cropland; Water temp.17.6 /pH 9.4 /DO 9.2 /Cond.212

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Station: AN0305  
 Papakating Ck W Br, Rt 519 , Plumbsock, Sussex County  
 Branchville USGS Quadrangle  
 Date Sampled: 06/16/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Baetidae	4	13
Asellidae	8	12
Chironomidae	6	11
Hydropsychidae	4	10
Sphaeriidae	8	10
Heptageniidae	4	9
Psephenidae	4	7
Elmidae	4	7
Leptophlebiidae	2	5
Lumbriculidae	8	3
Physidae	7	3
Perlidae	1	2
Philopotamidae	3	1
Tipulidae	3	1
Planariidae	4	1
Empididae	6	1
Psychomyiidae	2	1
Cambaridae	5	1
Ceratopogonidae	6	1
Veliidae	9	1

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Statistical Analysis

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Number of Taxa: 20  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 13.00 % ( Baetidae )  
 Family Biotic Index: 5.21  
 Scraper/Filterer Collector Ratio: 1.14  
 Shredder/Total Ratio: 0.12  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 7  
 % EPT: 41.00  
 EPT/C: 3.73  
 NJIS Rating: 27  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 184

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Observations

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Streamwater: Slightly Turbid....Flow: Fast....Width/Depth (ft): 15/2  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural/Agricultural livestock; Water temp.18.5 /pH 8.1 /DO 8.8 /Cond.148

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Station: AN0306  
 Papakating Ck W Br, Rt 565 , Mccoys Corner, Sussex County  
 Branchville USGS Quadrangle  
 Date Sampled: 06/16/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	50
Baetidae	4	11
Tubificidae	10	10
Chironomidae	6	8
Physidae	7	4
Heptageniidae	4	3
BloodRed Chironomidae	8	3
Naididae	7	2
Tipulidae	3	1
Leuctridae	0	1
Lumbricidae	10	1
Cambaridae	5	1
Leptophlebiidae	2	1
Psephenidae	4	1
Limnephilidae	4	1
Lymnaeidae	6	1
Hydropsychidae	4	1

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Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 50.00 % ( Gammaridae )  
 Family Biotic Index: 5.08  
 Scraper/Filterer Collector Ratio: 0.44  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 6  
 % EPT: 18.00  
 EPT/C: 1.64  
 NJIS Rating: 21  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 190

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Observations

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Streamwater: Slightly Turbid....Flow: Fast....Width/Depth (ft): 25/3  
 Substrate: Cobbles,gravel,mud....StreamBank Vegetation/Stability: Trees,weeds/Stable  
 Canopy: Mostly Open....Other: Forested/Rural; Water temp.18.1 /pH 8.2 /DO 9.7 /Cond.158

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Station: AN0307  
 Papakating Ck , Rt 565 , Mccoys Corner, Sussex County  
 Hamburg USGS Quadrangle  
 Date Sampled: 06/10/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Gammaridae	4	34
Chironomidae	6	20
Tubificidae	10	19
BloodRed Chironomidae	8	9
Elmidae	4	5
Baetidae	4	3
Cambaridae	5	3
Asellidae	8	2
Hydropsychidae	4	2
Planorbidae	6	2
Lumbriculidae	8	2
Planariidae	4	1
Leuctridae	0	1
Limnephilidae	4	1
Psephenidae	4	1
Veliidae	9	1
Tabanidae	6	1

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Statistical Analysis

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Number of Taxa: 17  
 Total Number of Individuals: 107  
 % Contribution of Dominant Family: 31.78 % ( Gammaridae )  
 Family Biotic Index: 6.02  
 Scraper/Filterer Collector Ratio: 0.41  
 Shredder/Total Ratio: 0.03  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 4  
 % EPT: 6.54  
 EPT/C: 0.23  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 90  
 Deficiency(s) noted: Paucity of Clean Water Organisms

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 30/3  
 Substrate: Cobbles,mud....StreamBank Vegetation/Stability: Grass,trees/Unstable  
 Canopy: Open....Other: Agricultural livestock/Channelized; Water temp.18.8 /pH 7.5 /DO 10.1 /Cond.340

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Station: AN0308  
 Clove R Trib, Rose Marrow Ave , Wantage Twp, Sussex County  
 Unionville USGS Quadrangle  
 Date Sampled: 06/17/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Naididae	7	54
Baetidae	4	12
Chironomidae	6	7
BloodRed Chironomidae	8	5
Elmidae	4	4
Hydropsychidae	4	3
Lumbriculidae	8	3
Talitridae	8	2
Physidae	7	2
Ceratopogonidae	6	1
Enchytraeidae	10	1
Planorbidae	6	1
Tipulidae	3	1
Cambaridae	5	1
Hydrophilidae	5	1
Leptophlebiidae	2	1
Perlidae	1	1
Limnephilidae	4	1
Simuliidae	6	1

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Statistical Analysis

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Number of Taxa: 19  
 Total Number of Individuals: 102  
 % Contribution of Dominant Family: 52.94 % ( Naididae )  
 Family Biotic Index: 6.25  
 Scraper/Filterer Collector Ratio: 1.25  
 Shredder/Total Ratio: 0.02  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 5  
 % EPT: 17.65  
 EPT/C: 1.47  
 NJIS Rating: 18  
 Biological Condition: Moderately Impaired  
 Habitat Analysis: 167

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 10/3  
 Substrate: Cobbles,gravel,sand....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural/Agricultural cropland; Water temp.18.3 /pH  
 8.7 /DO 8.3 /Cond.121

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Station: AN0309  
Clove R, Loomis Ave , Sussex, Sussex County  
Hamburg USGS Quadrangle  
Date Sampled: 06/10/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Lumbriculidae	8	52
Chironomidae	6	22
Elmidae	4	12
Baetidae	4	6
Hydropsychidae	4	5
Veliidae	9	2
BloodRed Chironomidae	8	1
Planariidae	4	1
Glossosomatidae	0	1
Psephenidae	4	1

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Statistical Analysis

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Number of Taxa: 10  
Total Number of Individuals: 103  
% Contribution of Dominant Family: 50.49 % ( Lumbriculidae )  
Family Biotic Index: 6.54  
Scraper/Filterer Collector Ratio: 0.52  
Shredder/Total Ratio: 0.00  
E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 3  
% EPT: 11.65  
EPT/C: 0.51  
NJIS Rating: 15  
Biological Condition: Moderately Impaired  
Habitat Analysis: 113

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Observations

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Streamwater: Clear....Flow: Slow....Width/Depth (ft): 30/1  
Substrate: Cobbles,sand....StreamBank Vegetation/Stability: Shrubs,grass,trees/Stable  
Canopy: Mostly Closed....Other: Urban; Water temp.19.8 /pH 7.8 /DO 9.9 /Cond.246

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Station: AN0309A  
 Clove R, Unionville Rd , Wantage Twp, Sussex County  
 Port Jervis S USGS Quadrangle  
 Date Sampled: 06/17/98

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Family	Family Tolerance Value (FTV)	Number of Individuals
Baetidae	4	14
Chironomidae	6	14
Heptageniidae	4	10
Ephemerellidae	1	9
Hydropsychidae	4	8
Lumbriculidae	8	7
Psephenidae	4	7
Philopotamidae	3	5
Leuctridae	0	5
Leptophlebiidae	2	4
Lumbricidae	10	3
Sphaeriidae	8	3
Glossosomatidae	0	2
Caenidae	7	1
Astacidae	7	1
Tipulidae	3	1
Perlodidae	2	1
Perlidae	1	1
Tetrastemmatidae	7	1
Rhyacophilidae	0	1
Simuliidae	6	1
Elmidae	4	1

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Statistical Analysis

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Number of Taxa: 22  
 Total Number of Individuals: 100  
 % Contribution of Dominant Family: 14.00 % ( Baetidae & Chironomidae )  
 Family Biotic Index: 4.19  
 Scraper/Filterer Collector Ratio: 0.94  
 Shredder/Total Ratio: 0.05  
 E+P+T (Ephemeroptera, Plecoptera, Trichoptera): 12  
 % EPT: 61.00  
 EPT/C: 4.36  
 NJIS Rating: 30  
 Biological Condition: Nonimpaired  
 Habitat Analysis: 196

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Observations

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Streamwater: Clear....Flow: Fast....Width/Depth (ft): 25/3  
 Substrate: Cobbles,gravel....StreamBank Vegetation/Stability: Trees/Stable  
 Canopy: Mostly Closed....Other: Forested/Rural; Water temp.17.7 /pH 8.2 /DO 9.8 /Cond.100

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