NJ Department of Environmental Protection
Water Monitoring and Standards

AMBIENT BIOMONITORING NETWORK

Northwest Water Region
Upper Delaware and Wallkill River Drainages

Watershed Management Areas 1, 2, and 11
Round 4 Benthic Macroinvertebrate Data

Volume 1 of 2

December 2012

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December 2012

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[cover photo: Site AN0091, Wickecheoke Ck at Sergeantsville Rd, Hunterdon County, NJ.]

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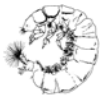

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Ambient Biomonitoring Network
Watershed Management Areas 1, 2, and 11

Northwest Water Region
Upper Delaware and Wallkill River Drainages

Round 4 Benthic Macroinvertebrate Data

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EXECUTIVE SUMMARY

Biological monitoring of freshwater systems in New Jersey provides an effective means of gauging long-term trends in surface water quality throughout the State. The Ambient Biomonitoring Network (AMNET) is one of the major ongoing monitoring programs. This statewide network of over 760 non-tidal AMNET stations employs sampling and taxonomic analysis of in-stream macroinvertebrate communities to assess the ecological condition at each station. An integrated index of "biometrics", based on community composition and pollution tolerance levels of individual taxa, is used to assign assessment ratings.

Between the start of the AMNET program (1992) up until 2004, a single statewide index, the New Jersey Impairment Score (NJIS), was used in assigning one of three assessment ratings, non-impaired, moderately impaired, and severely impaired. The NJIS was limited in that it used family level taxonomic identification for calculating scores and did not account for geographical differences in macroinvertebrate community structures. To resolve these limitations, starting with the mid 2004 data (Atlantic Region report), three indices are used for assessments; High Gradient Macroinvertebrate Index (HGMI), Coastal Plain Macroinvertebrate Index (CPMI), and Pinelands Macroinvertebrate Index (PMI). These indices account for the State's geophysically different ecoregions and use genus level taxonomic identification for calculating scores. The higher level of identification allows for more resolute and accurate results at four assessment rating levels (rather than the three previously used); "excellent", "good", "fair", and "poor". The results are considered reflective of the water and/or habitat quality at each site. This information is used by the Department, primarily in assessing progress toward the goals of the Clean Water Act via the Integrated Water Quality Monitoring and Assessment Report. AMNET data are also integral for designation of Category 1 waters, based on exceptional ecological significance.

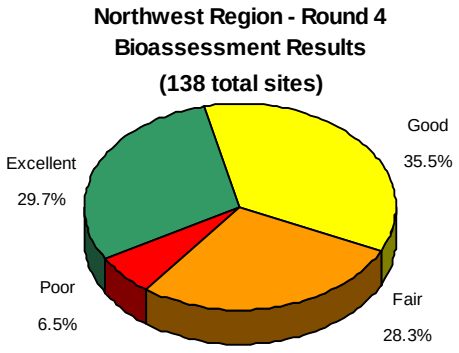


Figure 1

Results are reported separately for each of New Jersey's five major drainage basins or "Water Regions" (Lower Delaware, Upper Delaware/Northwest, Northeast, Raritan, and Atlantic), each encompassing several sub-basins ("Watershed Management Areas"). The Water Regions, with an average of 153 non-tidal AMNET sites each, are sampled in consecutive years on a five-year rotational basis. The most recent results (posted by the end of the calendar year sampling is completed for a region), and Round by Round comparisons along with raw data, can be found at:
http://www.state.nj.us/dep/wms/bfbm/amnetRnd4.html

The present study area comprises the Upper Delaware/Northwest Water Region, and includes those sub-basins that drain to the Upper Delaware River, namely: WMA #'s 1 (Upper Delaware River tributaries), 2 (Upper Wallkill River system), and 11 (Central Delaware River tributaries) . This report presents the results for the biological monitoring conducted from July 2007 - June 2008 (see Map 1, page 4). The sampling of the Upper Delaware/Northwest Water Region marks the fourth round of data collection for this basin. The results obtained in the fourth round are similar to those of the previous (third round) of sampling. Currently, of the 138 AMNET sites sampled in the Upper Delaware/Northwest Water Region, 41 (29.7%) were found to exhibit "excellent" benthic macroinvertebrate communities, with 49 (35.5%) exhibiting "good", 39 (28.3%) "fair", and 9 (6.5%) exhibiting "poor" benthic communities (See Figure 1).

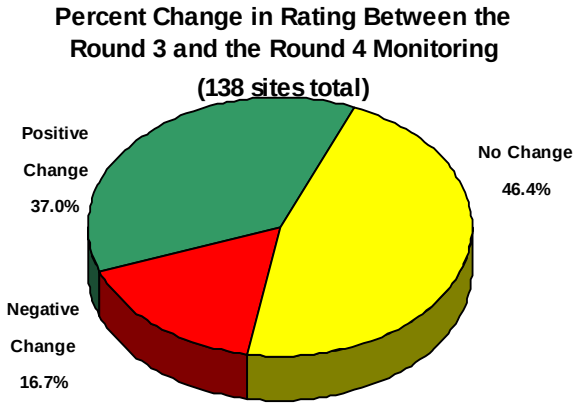


Figure 2

In order to generate trend information, results from the current (Round 4) sampling were compared to those from the same sites sampled in the earlier round (Round 3). For the purposes of comparing the two rounds, Round 3 results were re-assessed using the new indices. Of the 138 AMNET sites sampled in the Upper Delaware/Northwest Water Region, the Round 4 samplings yielded sites with more "excellent" (29.7%) and "good" (35.5%) ratings than did the third round sampling (23.2% and 34.1% respectively). Conversely, the number of "fair" (28.3%) and "poor" rated sites (6.5%) observed in the Round 4 sampling has declined since the Round 3 sampling (30.4% and 12.3% respectively). Figure 2 displays the percentage of change in rating among the same 138 AMNET sites in the Upper Delaware/Northwest Water Region that were sampled during the third round study period, and again during the current (Round 4) study period. The green indicates sites that have undergone a positive change, yellow indicates no change, and red indicates a negative change. Positive change is defined as an improved rating from the previous Round's rating, while a negative change is defined as a downgraded rating from the previous Round. Individual results and changes in each site can be found in Table 4, Volume 2.

Figure 3 compares the results of each round of sampling in the Delaware/ Northwest Region. The percentage of excellent, good, and severe results remained relatively stable from round 1 to round 4. Earlier rounds of data were recalculated using the new indices. Some sites sampled in Round 1 were collected outside of the April – November sampling period criteria specified for the newly implemented indices. Results from these samples may not have the same degree of accuracy as those collected within the sample period criteria. More robust statistical analysis will be used in the future, if necessary, to compare significant differences between Rounds.

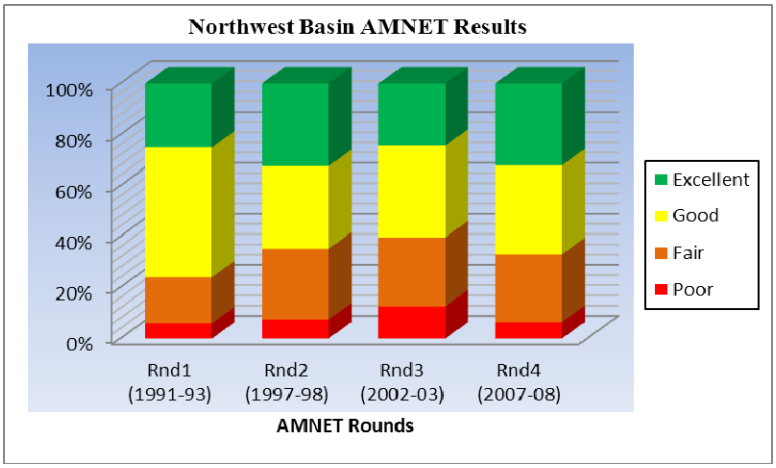


Figure 3

Assessment Rating	Round 1	Round 2	Round 3	Round 4
Excellent	22.0%	32.8%	23.4%	29.7%
Good	34.5%	31.4%	34.0%	35.5%
Fair	27.1%	29.2%	30.5%	28.3%
Poor	16.4%	6.6%	12.1%	6.5%

As reflected in the present study results, human land uses and practices, superimposed on the undisturbed physical terrain, play a major role in controlling the degree of pollution or degradation in a stream system. The relationship between benthic macroinvertebrate community impairment has been statistically related to different physiographic land types, land uses and other anthropogenic factors, on a statewide basis*. These findings concludes the following:

1) Invertebrate communities are commonly impaired in urban streams;
2) Invertebrate community impairment was related to total urban land and total wastewater flow upstream of a site;
3) Changes in aquatic community structure were statistically related to environmental variables along the urban gradient – that is to say that such things as impervious surfaces were related to a negative response in the aquatic invertebrate community.

To determine what factors are contributing to impairments, or changes in impairment ratings, the Department has established a Stressor Identification (SI) process. The purpose of the Stressor Identification (SI) process, as developed by USEPA, is to identify the principle stressor(s), including but not limited to specific pollutants, responsible for the degraded biological condition. Determining the probable cause or causes of this biological impairment, whether it be a chemical pollutant or a non-chemical stressor such as flow alteration or siltation, is the first step towards deciding whether a TMDL or other appropriate management measures will be taken to remediate the impairment. Currently, there are no SI studies in this Water Region.

Additional Information

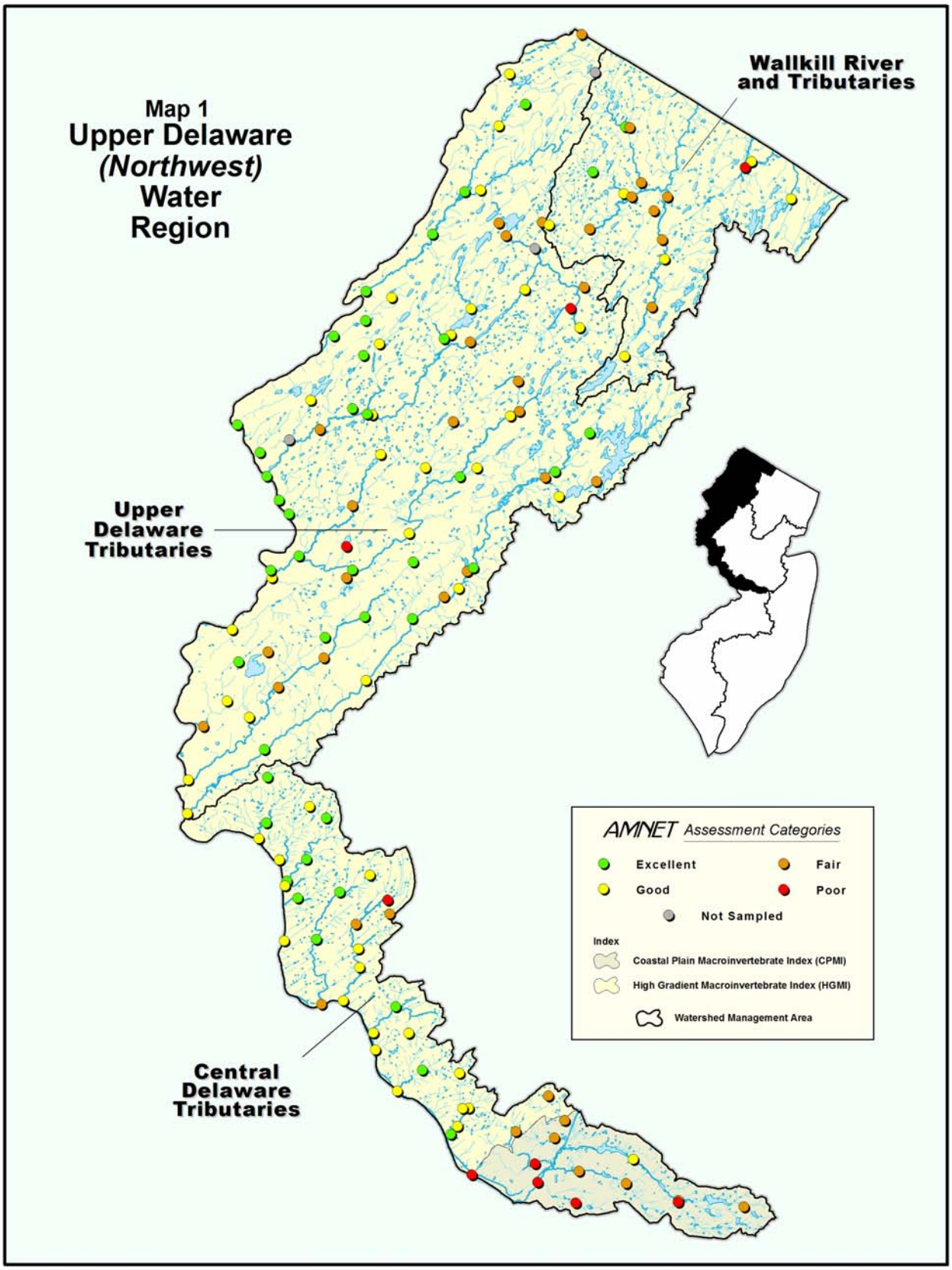
Additional Information on the AMNET program can be obtained from the WM&S' Bureau of Freshwater & Biological Monitoring by calling 609-292-0427 or visiting its website at: http://www.state.nj.us/dep/wms/bfbm

Raw data is posted on this website by the end of the calendar year that the data is received and validated. GIS shapefiles will also be available on the NJDEP web site once all data is reviewed and finalized.

Additionally, raw data is submitted to WQX as soon as the data is received and validated. WQX is USEPA's repository and framework for water quality, biological, and physical data. It is used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and many others to store data. The retrieval of the data is handled through the STORET interface and can be accessed at: http://www.epa.gov/storet

Comments are welcome and may be emailed to: bfbm@dep.state.nj.us.

* Kennen, J.G. 1998. Relation of benthic macroinvertebrate community impairment to basin characteristics in New Jersey streams. Fact Sheet FS-057-98. U.S. Geological Survey. West Trenton, NJ


Map 1
Upper Delaware
(Northwest)
Water
Region
Wallkill River
and Tributaries
Upper
Delaware
Tributaries
Central
Delaware
Tributaries
AMNET Assessment Categories
Excellent
Fair
Good
Poor
Not Sampled
Index
Coastal Plain Macroinvertebrate Index (CPMI)
High Gradient Macroinvertebrate Index (HGMI)
Watershed Management Area

INTRODUCTION

Rationale for Biological Monitoring

Biological monitoring of freshwater systems in New Jersey provides an effective means of gauging long-term trends in surface water quality throughout the State. The Ambient Biomonitoring Network (AMNET) is one of the major ongoing monitoring programs. This statewide network of over 760 AMNET stations employs sampling and taxonomic analysis of in-stream macroinvertebrate communities to assess the ecological condition at each station. An integrated index of "biometrics", based on community composition and pollution tolerance levels of individual taxa, is used to assign assessment ratings; specifically the High Gradient Macroinvertebrate Index (HGMI). 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, crayfish, 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 taxa. The overall community thus is holistically reflective of conditions in its environment. Assessments of ambient water / habitat quality can then be made based upon standardized procedures, which can show perturbations measured as changes or differences in community structure [1]. While development of a "multitrophic" approach, to include finfish and periphyton communities with invertebrates is being investigated, the primary means of assessment to date has been through macroinvertebrate community analysis.

Advantages of Using Benthic Macroinvertebrates:

1. They are good indicators of localized conditions of water quality due to their limited mobility. As such, they are well suited for the assessment of site-specific pollution impacts.
2. They are sensitive to environmental impacts from both point and non-point sources of pollution.
3. They integrate the effects of short-term environmental variations, such as oil spills and intermittent discharges.
4. Sampling is relatively easy and inexpensive.
5. They are holistic indicators of overall water quality, even for substances that may be present but at lower than detectable levels.
6. They are normally abundant in New Jersey waters as well as aquatic environments in general.
7. They serve as the primary food source for many species of commercially and recreationally important fishes.
8. Unlike chemical monitoring, where impacts to the environment tend to be by inference, not direct determination, they provide a direct measure of water quality in a manner consistent with the goals of the Clean Water Act.
9. They can be used to assess nonchemical impacts to the aquatic habitat, such as by thermal pollution, excessive sediment loading (siltation), or eutrophication.
10. To the general public, impacts to resident benthic macroinvertebrate communities are more tangible measurements of water quality than more esoteric listings of chemical test results.
11. When monitored together with relevant chemical/physical parameters, benthic macroinvertebrate communities can be used to identify sources of impairment.

Limitations of Biological Monitoring:

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.

The following illustrations provide an overview of the major macroinvertebrate indicator groups employed in making biological water quality assessments.

Benthic Macroinvertebrates Usually Indicative of Good Water Quality

Mayfly nymphs are often abundant wherever the water is clean. They are sensitive to various types of water pollution, including low dissolved oxygen, ammonia, biocides, and metals.

Stonefly nymphs are usually found only in cool, well-oxygenated waters free of pollution. Though not usually found in the numbers characteristic of mayflies, the presence of even a few stoneflies is indicative of good water quality.

Most caddisfly larvae, many of which build portable cases of stones, sticks, sand, and other detritus, are intolerant of water pollution.

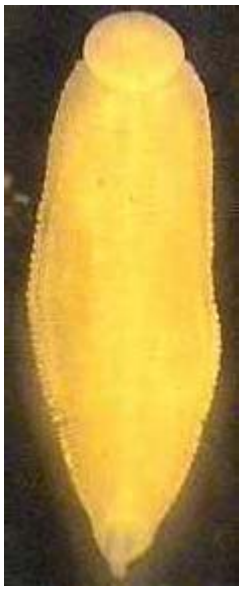
Aquatic beetles are common in well-oxygenated, swiftly running waters; many species are referred to as "riffle beetles." They are usually indicative of clean water since they are sensitive to wetting agents (soaps and detergents) and other pollutants.

All photographs taken by D.Bryson, NJDEP

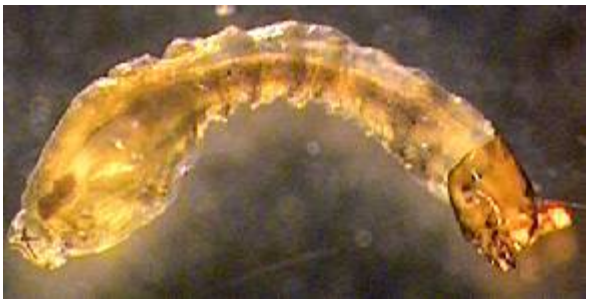
Benthic Macroinvertebrates Usually Indicative of Poor Water Quality

Midges (chironomids) are among the most common of aquatic invertebrates. They occupy a variety of aquatic habitats, including lakes, ponds, bogs, rivers, creeks, and marshes. They even exploit manmade habitats such as sewage treatment plants, water treatment plants, fish pools, irrigation ditches, and birdbaths. Many species are very tolerant of pollution.

Aquatic sowbugs, or freshwater isopods, are abundant in waters enriched with organic nutrients and low in dissolved oxygen. They are commonly observed in the recovery areas below sewage treatment plants.



Leeches and other segmented worms are very common in our lakes and streams, though not often noticed. They are tolerant of poor water quality and severe pollution.



Black fly larvae are filter feeders, capturing and ingesting plankton and bacteria from the surrounding water with specialized antennae. Some species are very tolerant of poor water quality and thus can be used as indicators of pollution.

All photographs taken by D.Bryson, NJDEP

STUDY DESIGN

Data Quality Objectives

The major goal of AMNET is to provide a long-term, cost-efficient means of gauging the quality of surface waters and watershed areas throughout the State. This is accomplished through biological sampling and analysis from a network of stream sites that adequately represents New Jersey's five major drainage basins and NJDEP's Watershed Management Areas (WMA). Administratively, a total of 21 WMA's have been delineated within New Jersey's five basins. Each major basin constitutes a "Water Region"; a major sub-basin forms each WMA. Within each WMA are several smaller sub-basins, delineated by the United States Geological Survey (USGS) as "hydrologic units," scale 11 (HUC11). The present study area comprises the Upper Delaware/Northwest Water Region, and primarily includes all New Jersey sub-basins draining to the non-tidal Delaware River, extending northward from Trenton Falls; it also includes the Wallkill River sub-basin. The region falls primarily within the Kittatinny Ridge and Valley, Reading Prong and Piedmont ecoregions, encompassing largely upland forest with high-gradient terrain. The study area of the present report includes WMA #'s 1 (Upper Delaware River tributaries), 2 (Upper Wallkill River system), and 11 (Central Delaware River tributaries) (see Maps 1 – 8, Volume 2). The standard sampling interval of five years, reflects a realistic temporal lag between cessation of an environmental perturbation and recovery of the impacted biological community. The Integrated Water Quality Monitoring and Assessment Report [2], which re-examines 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.

The AMNET program is designed to monitor a Water Region's complement of stations within a 12 to 15 month time period (depending on the size of the Water Region) giving DEP's modelers and planners a snapshot of ambient biological impacts during that continuous time interval. Sampling occurs during the months of April - November, until all of the sites of the respective Water Region are visited. Sampling is curtailed through the coldest months (December to March), because of difficulties encountered in obtaining representative samples during this period.

SITE SELECTION

Sites were selected essentially to provide representative coverage of each Water Region, as well as the entire State. To ensure enough flow for sampling, sites on "first-order" streams are 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 the AMNET sites are situated on second-order streams (with only first-order streams as tributaries) and higher (with a greater hierarchy of tributaries). All sites are located in reasonably accessible and primarily wadeable segments, proceeding downstream to the head-of-tide. Sites are numbered in approximate upstream to downstream order, from the mainstem of each major sub-basin to each adjacent tributary, and then to the next adjacent sub-basin. This is in an approximate north to south order within the Upper Delaware/Northwest Water Region.

To maximize data correlation, AMNET, wherever possible, incorporates existing stations of the Ambient Surface Water Chemical Monitoring Network, which is administered jointly by NJDEP and the USGS [3]. Furthermore, so as to gauge the effects of major tributaries and larger lakes, many AMNET sites are located near their confluence or outlet. An attempt is made when selecting sites to obtain a sample representative of the stream's total water quality. Sites are located in areas that best represent the stream, Watershed Mangaement Area (WMA) or Hydrologic Unit.
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 NJDEP's Geographical Information System (GIS) (see Maps 1 – 8, Appendix A, Volume 2).

A total of 142 stations had been established in the Upper Delaware/Northwest Region in the previous round (Round 3) [4]. Since then, one site (AN0118) was determined to be tidal and was dropped from the network. This left a total of 141 active sites the Upper Delaware/Northwest Water Region. This area (shown in Figure 4) primarily includes all New Jersey sub-basins draining to the Upper Delaware River system (WMA's #1 and 11) plus the upper Wallkill River sub-basin (WMA #2). The present Upper Delaware/Northwest study area (Figure 4) includes a total of 141 sampling sites, AN0001 – 117 and AN0294 – 309A (see Table 2, Volume 2). Three active sites were not sampled; AN0001 due to lack of flow, AN0020 due to a collection error, and AN0031 was inaccessable because of bridge construction.. This resulted in 138 sites sampled and assessed for Round 4.

Figure 4

Map of Round 4 study area

FIELD & LABORATORY METHODS

Benthic macroinvertebrate sampling and analysis is performed in accordance with the NJDEP Field Procedures Manual [5], Rapid Bioassessment Protocol (RBP) guidelines of the USEPA [6] and Standard Operating Procedures (SOP) (see http://www.state.nj.us/dep/wms/bfbm/download/AMNET_SOP.pdf) of the NJDEP Aquatic Biomonitoring Laboratory [7]. As detailed in the SOP and in the quality assurance work plan [8], a thorough quality control program, with emphasis on macroinvertebrate taxonomy, is practiced.

Sample Collection

In general, a "multi-habitat" approach is used, focusing on the more productive habitat types [6]. The usual sampling device is a D-frame kick net of 800 x 900 um mesh size and one foot width (a Ponar dredge may be employed when conditions require). In high-gradient streams, where the predominant substrate is cobble, the riffle/run area is the preferred sampling habitat; other likely habitat types are sampled when present. The kick net is held firmly against the hard bottom, and an area approximately one foot upstream of the net is disturbed using feet and/or hands. This procedure is repeated, sampling all velocity/depth regimes at the site, including at least one riffle-run-riffle sequence (if present). In the low-gradient Coastal Plain streams, bottoms generally consist of sand or mud without dominant cobble/riffle areas; therefore, a variety of stable substrates including woody debris, submerged macrophytes and portions of banks, are sampled. The "jab and sweep" method [9] is employed; a minimum of 20 jabs/sweeps are taken, proportioned approximately to the numbers of each habitat type present. In all cases, stream distance sampled approaches, but does not exceed, 100 meters. Level of effort is consistent for all sites. Where possible, sampling is done upstream of bridges, sufficiently removed from the influence of any associated channel alterations. The entire sample is sieved using a #30 mesh sieve bucket, put into wide-mouthed (1-L) jars, and preserved with 5 to 10% formalin (to 20% in cases of excessive organic loading). Both the sieve bucket and net are examined for adhering organisms. Any found are removed with forceps and placed into the sample jar. During the field operations, qualitative observations of habitat, surrounding land use, potential pollution sources, and presence of other aquatic biota are recorded (Appendix D, Volume 2); a visual-based qualitative habitat assessment [6] is also performed (see Supplemental Analyses/Evaluation Methods). These observations/evaluations, however do not factor into the final bioassessment rating.

Sample Processing and Sorting
In the laboratory, after rinsing in a #30 mesh sieve to remove the preservative, the composited sample is evenly distributed in a light-colored pan marked with grids of equal size. Using low-power magnification (6.3x), all organisms greater than 2mm in size are then removed from each randomly selected grid until a total of at least 100 organisms is obtained. Colonial groups (e.g. Bryozoa and Porifera), vertebrates, and terrestrial organisms are not included in the subsample. Organisms retained are reasonably intact to allow for accurate identification.

Macroinvertebrate Identification and Quality Control
The individuals from the subsample are identified to the lowest practicable taxonomic level, usually genus or species, using 7 to 30X stereozoom and 40 to 400X compound magnification. Leica Model MZ6 stereomicroscopes and Leica Models DMLS and DME compound microscopes are currently used. A computerized digital camera system projects and records microscope images of selected specimens to aid in their identification. A comprehensive collection of taxonomic keys and other references, including functional (or niche) descriptions and pollution tolerance classifications for most species, is maintained. An indexed list of these is given in the AMNET Program Standard Operating Procedure (SOP) [7]. Pertinent new reference material is added when available. Taxonomists confer with each other regarding species in question. The International Taxonomic Information System (ITIS) (www.itis.gov) is monitored for possible changes in nomenclature or groupings. Consultation with other scientists in the field, particularly from agencies involved in similar programs (e.g. New York Department of Environmental Conservation, USGS, USEPA), provides added assistance and confirmation when needed. For verification, 10% of the samples are sent to a qualified independent consultant for parallel identifications. A macroinvertebrate specimen reference collection is also maintained.

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); excessive dominance of pollution-tolerant taxa such as Chironomidae (midges) and Oligochaeta (worms); low overall taxa numbers, or other perceptible differences in community structure relative to a reference condition.

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 the use of community metrics and the pollution indicator concept. “Biometrics” measure different components of community structure, including population and functional parameters, each with a different range of sensitivity to pollution stresses [1, 10]. 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 assessment 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 protocols, results are based on 100 organism sub-samples. Scoring criteria for RBP protocols [1] are calibrated for genus level taxonomy, giving four final rating categories (“excellent”, “good”, “fair”, and “poor”).

Multimetric Index Development

Previously, a single statewide index, the New Jersey Impairment Score (NJIS), was used in assigning one of three assessment ratings, non-impaired, moderately impaired, and severely impaired. The NJIS was limited in that it used family level taxonomic identification for calculating scores and did not account for geographical differences in macroinvertebrate community structures. To resolve these limitations, three indices are now used for assessments; High Gradient Macroinvertebrate Index (HGMI), Coastal Plain Macroinvertebrate Index (CPMI), and Pinelands Macroinvertebrate Index (PMI). These indices account for the State's geographically different regions and use genus level taxonomic identification for calculating scores. For the Northwest Water Region assessments, HGMI & CPMI were used. The higher level of identification allows for more resolute and accurate results at four assessment rating levels (rather than the three previously used); "excellent", "good", "fair", and "poor". The results are considered reflective of the water and/or habitat quality at each site. This information is used by the Department, primarily in assessing progress toward the goals of the Clean Water Act via the Integrated Water Quality Monitoring and Assessment Report. AMNET data are also integral for designation of Category 1 waters, based on exceptional ecological significance. New Jersey's benthic macroinvertebrate communities can be statistically grouped into three distinct structures based on geographical regions: high gradient (above the Fall Line), low gradient (Coastal Plain excluding the Pinelands), and Pinelands. To accurately assess biological conditions, a multimetric index was developed using genus-level taxonomic identifications for each distinct region using guidelines outlined in USEPA *Rapid Bioassessment Protocols(RBP) for Use in Wadeable Streams and Rivers* (see http://www.epa.gov/bioindicators/html/rbps.html) [6]. All current assessments use one of the three genus level indices. Each index is described below and is used in each water region in this manner (see Figure 1A, index boundary map): Northwest Region, HGMI & CPMI; Northeast Region, HGMI; Raritan Region, HGMI & CPMI; Atlantic Region, CPMI & PMI; Lower Delaware Region, CPMI & PMI. The final index scores were derived in coordination with professional staff from Water Monitoring and Standards' Bureau of Freshwater and Biological Monitoring, Water Monitoring and Standards' Bureau of Water Quality Standards and Assessment, USEPA, United States Geological Survey (USGS), and the Delaware River Basin Commission (DRBC).

High Gradient and Low Gradient Streams

Two of the indices (see Table 1) to be employed in New Jersey, the High Gradient Macroinvertebrate Index (**HGMI**) [11] and Coastal Plain Macroinvertebrate Index (**CPMI**) [12], were developed using guidelines outlined in USEPA *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers* [6]. The resolution of index scoring thresholds was further enhanced by establishing a graphical relationship between the scores for each index and the tiers these scores represent in the context of a Biological Condition Gradient (BCG). The final index scoring thresholds serves to assess each site from two perspectives: the condition of the macroinvertebrate community and the regulatory use attainment.

For each index, four descriptive categories were established at break points along the statistical distribution of scores from reference to degraded conditions, coordinated to the BCG to increase the accuracy; "excellent", "good", "fair", and "poor" (see Table A1). "Excellent" and "good" fall into the acceptable regulatory range of fully attaining the aquatic life use. "fair" and "poor" fall below the acceptable regulatory range and are considered impaired, from a Federal Clean Water Act (CWA) perspective, and not attaining the use.

Pinelands Streams

The Pinelands Macroinvertebrate Index (**PMI**) [13] was developed using the same USEPA guidelines and professional coordination as above. However, since a BCG was not developed, and not necessary from a regulatory standpoint, a graphical relationship between index scores and the BCG tiers was not generated. As with the high and low gradient indices, four descriptive categories were established at break points

along the statistical distribution of scores from reference to degraded conditions "excellent", "good", "fair", and "poor" (see Table A1). For waters with a Surface Water Classification of "PL", "excellent" and "good" are classified as reference or natural conditions of Pineland waters and fall into the acceptable regulatory range of fully attaining the aquatic life use. "Fair" and "poor" fall below the acceptable regulatory range of PL waters and are considered impaired, from a CWA perspective, and not attaining the use.

The unique chemical, physical, and biological properties characteristic of waters contained with the Pinelands area are also present for varying distances outside this jurisdictional delineation. To assess these Pinelands-like waters outside the Pinelands boundary, the Department delineated a 5 kilometer buffer around the Pinelands Area and will apply the PMI to this region. Pinelands-like waters outside the jurisdictional delineation, however, have a Surface Water Classification of FW2 and not PL. From a regulatory standpoint FW2 waters are held to a somewhat lower level of biological expectation than the Outstanding National Resource Waters (ONRW) waters contained within the PL designated area. Because of this lower regulatory expectation for FW2 waters, the PMI category of "fair" and above will be regarded as fully attaining the aquatic life use, i.e. biologically *nonimpaired* from a regulatory perspective. FW2 waters in this buffer region assessed as "poor" will be regarded as *impaired* and not supporting the aquatic life use.

Table A1: Descriptive and regulatory thresholds for Fresh Water High Gradient (Highlands, Ridge and Valley, Piedmont), Low Gradient (Coastal Plain, Excluding Pinelands Waters) and Pinelands Waters.

High Gradient Macroinvertebrate Index (HGMI) (Highlands, Ridge and Valley, Piedmont)		
Assessment category	**Index Score**	**Regulatory Threshold**
Excellent	63 - 100	Full Attainment
Good	<63-42	Full Attainment
Fair	<42-21	Non-Attainment
Poor	< 21	Non-Attainment
Coastal Plain Macroinvertebrate Index (CPMI)		
Assessment category	**Index Score**	**Regulatory Threshold**
Excellent	22 - 30	Full Attainment
Good	20 - 12	Full Attainment
Fair	10 - 6	Non-Attainment
Poor	< 6	Non-Attainment
Pinelands Macroinvertebrate Index (PMI)		
Assessment category	**Index Score**	**Regulatory Threshold**
Excellent	63 - 100	Full Attainment
Good	<63-56	Full Attainment
Fair	<56-34	Non-Attainment(PL) Full Attainment(FW2)
Poor	< 34	Non-Attainment

Trend Analysis

In evaluating the current AMNET data against that of the previous round, a significant improvement or decline is considered to have occurred if the difference in AMNET scores have changed the bioassessment rating. A complete list of site-by-site comparisons is presented in Table 2, Volume 2 where a (+) indicates a significant improvement, a (–) indicates a significant decline, and a (/) indicates no change in rating. If a site was only sampled once in concurrent rounds, the change will have "nd" meaning there was "no data" available for a comparison.

SUPPLEMENTAL ANALYSES / EVALUATION METHODS

Morphological Abnormalities

Occasionally, morphological abnormalities have been found in individual macroinvertebrates recovered in WM&S/BFBM's 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 data analysis, such features are noted as they may signify possible contaminants or stressful conditions in the respective drainages.

Abnormalities observed in the course of identification are noted; these results are summarized by sample site in Table 3, Volume 2. For Chironomidae, the data are displayed as # of chironomids with abnormalities / # of chironomids examined. For all other taxa, just the number of individuals with abnormalities is presented. Photographic examples of abnormalities in midge larvae and amphipods (scuds) are presented in Appendix B, Volume 2.

Habitat Assessment

The physical attributes of habitat play an integral role in the health of the macroinvertebrate community. Where stations are physically comparable, differences in impairment can be attributed to water quality factors; however, physical habitat degradation alone can account for biological impairment in a stream [1]. Parameters evaluated include in-stream substrate, channel morphology, bank structural features, and riparian vegetation. The area evaluated includes the sample site and its immediate surroundings, particularly upstream, usually within a 100 – 200 foot radius. The visual-based qualitative habitat assessment results in one of four condition categories: optimal, suboptimal, marginal or poor, as outlined in the revised USEPA criteria [6].

The habitat assessment is separated into two basic approaches; one designed for high gradient streams and one designed for low gradient streams [6]. Examples of assessment forms for each approach can be found in Appendix C, Volume 2. Streams in the northern regions of New Jersey are generally 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 and Pinelands regions 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. Habitat assessments may be temporarily downgraded by adverse weather conditions, such as excessive rainfall or prolonged drought. 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.

Chemical Monitoring

The Bureau of Freshwater and Biological Monitoring (BFBM) has various chemical monitoring networks throughout the State. These networks emphasize emerging state and federal strategies to more realistically assess the success of State and Federal Clean Water Act Programs. The sampling stations include surfacewater as well as groundwater monitoring.

Chemical data and results from these networks are integrated with results from the BFBM's biological networks, such as AMNET, for water quality assessments reported through the New Jersey Integrated Water Quality Monitoring and Assessment Report (Integrated Report).

The Bureau of Water Quality Standards and Assessment (BWQSA) is responsible preparing the biennial Integrated Report and coordinating water quality assessments of all waters of the State, including assessment of data collected by non-departmental entities (e.g., regional and local government agencies and volunteer monitoring organizations). BWQSA is also responsible for the development, adoption, and administration of New Jersey's Surface Water Quality Standards and Ground Water Quality Standards.

The federal Clean Water Act mandates that states submit biennial reports to USEPA describing the quality of their waters. The biennial "Statewide Water Quality Inventory Report" or "305(b) Report" must include the status of principal waters in terms of overall water quality and support of designated uses, as well as strategies to maintain and improve water quality. The 305(b) reports are used by Congress and USEPA to establish program priorities and funding for federal and state water resource management programs. This report is also referred to as the "Integrated List of Waters" (Integrated List). The biennial List of Water Quality Limited Waters or "303(d) List" identifies waters that are not attaining designated uses because they do not meet surface water quality standards despite the implementation of technology-based effluent limits. States must prioritize waters on the 303(d) List of Water Quality Limited Waters for Total Maximum Daily Load (TMDL) development and identify those high priority waters for which they anticipate establishing TMDLs in the next two years.

The New Jersey Integrated Water Quality Monitoring and Assessment Reports (Integrated Reports) are intended to provide effective tools for maintaining high quality waters and improving the quality of waters that do not attain their designated uses. The Integrated Reports describe attainment of the designated uses specified in New Jersey's Surface Water Quality Standards (N.J.A.C. 7:9B), which include: aquatic life; recreation; drinking, industrial, and agricultural water supply; fish consumption; and shellfish harvest for consumption.

The Integrated Report process begins with the solicitation of water quality-related data to support the development of the 303(d) List. The Department then updates the Integrated Water Quality Monitoring and Assessment Methods Document (Methods Document), as needed**.** This document includes a description of quality assurance and other data requirements, as well as the scientific methods to be used to assess water quality and use support. The Methods Document also explains the rationale for placing waters on the 303(d) List, delisting waters from the 303(d) List, and ranking the priority of 303(d)-Listed waters for TMDL development. A notice of availability for public review of the draft Methods Document is published in the New Jersey Register and a thirty-day comment period is provided. After review and consideration of comments received on the proposed Methods Document, the Department finalizes the Methods Document and publishes it on the Department's Web site along with the agency responses to public comments received.

After the Methods Document is finalized, the Department compiles all readily available data that meets quality requirements and assesses the data to determine designated use support and compliance with surface water quality standards. The results of these assessments are presented in the Integrated List and the 303(d) List. The Department prepares these Lists as part of the Integrated Report, along with a

discussion of the assessment results, water quality trends, other water quality assessments, descriptions of water quality programs and actions taken and planned to restore water quality, including TMDL schedules, as well as monitoring needs and schedules, and makes it available for public review. The draft 303(d) List is submitted to USEPA for approval along with the two-year TMDL schedule and priority ranking.

The Department will attempt to identify the potential sources of impairment using the Stressor Identification (SI) process. The purpose of the Stressor Identification (SI) process is to identify the principle stressor(s), including but not limited to specific pollutants, responsible for the degraded biological condition. Identifying whether the principal stressor(s) is a *pollutant** or due to more generic landscape changes caused by human activities, is the first step towards deciding whether a pollutant(s) specific TMDL or other appropriate management measures will be taken to remediate the impairment. At present, no sites have been targeted in this Region for the SI process.

RESULTS AND DISCUSSION

Summary of Statewide AMNET Data

The current study marks the fourth round of sampling for the Upper Delaware/Northwest Region AMNET study. For the purpose of comparing Rounds, Round 3 results were re-assessed using the new indices. The Upper Delaware/Northwest Region has shown considerable changes since the previous rounds by virtue of using the more geographically specific assessment. The number of "excellent" and "good" sites has shown a slight increase, while the number of "fair" and "poor" sites has shown a slight decline. The table below presents the proportions of "excellent", "good", "fair", and "poor" AMNET sites for all New Jersey Water Regions in the third AMNET round, plus the fourth round for the Upper Delaware/Northwest Water Region.

Region	**Number of sites**				
Fourth round	**Excellent**	**Good**	**Fair**	**Poor**	**Total sites**
Upper Delaware	41 (29.7%)	49 (35.5%)	39 (28.3%)	9 (6.5%)	138
Third round					
Upper Delaware	33 (23.4%)	48 (34.0%)	43 (30.5%)	17 (12.1%)	141
Northeast	8 (7.8%)	13 (12.7%)	56 (54.9%)	25 (24.5%)	102
Raritan	27 (20.8%)	38 (29.2%)	64 (40.0%)	31 (23.8%)	160
Atlantic	53 (27.0%)	44 (22.4%)	77 (39.3%)	22 (11.2%)	196
Lower Delaware	13 (8.1%)	35 (21.9%)	80 (50.0%)	32 (20.0%)	160

* As defined in the N.J. Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and the Federal Water Pollution Control Act, aka "Clean Water Act" (33 U.S.C. 1251-1376)

Results and Trends

Overall, the bioassessment ratings for each of the monitoring stations are best estimates of the in-stream biological impairment based upon the data obtained in the current AMNET survey. Detailed taxonomic and statistical data, bioassessment ratings, habitat assessment scores and observations for each AMNET site are given in Table 2 and Appendix D, Volume 2.

Figure 5 depicts the overall results for the Round 4 study in the Upper Delaware/Northwest Water Region. Of the 138 monitoring stations sampled during this study period, 41 (29.7%) were found "excellent", 49 (35.5%) "good", 39 (28.3%) "fair", and 9 (6.5%) "poor" (see Table 2, Volume 2).

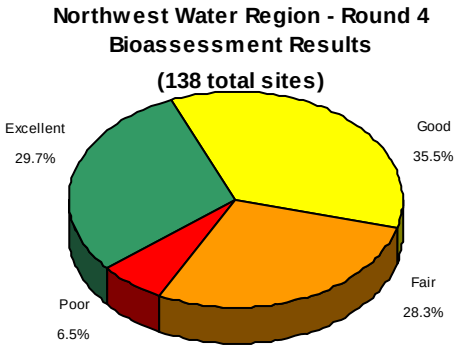


Figure 5

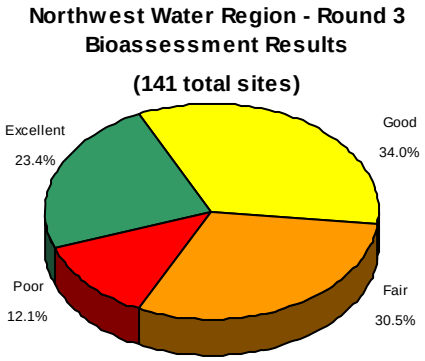


Figure 6

Figure 6 shows the results obtained from 141 AMNET sites within the Upper Delaware/Northwest Water Region that were sampled during the previous (Round 3) Upper Delaware/Northwest study (see "Site Selection" p.6 & Table 2, Volume 2). While the results for Round 4 were similar to those for Round 3, for the current sampling period the numbers of "good" sites were slightly higher, and the number of "excellent", "fair", and "poor" sites were slightly lower. [4].

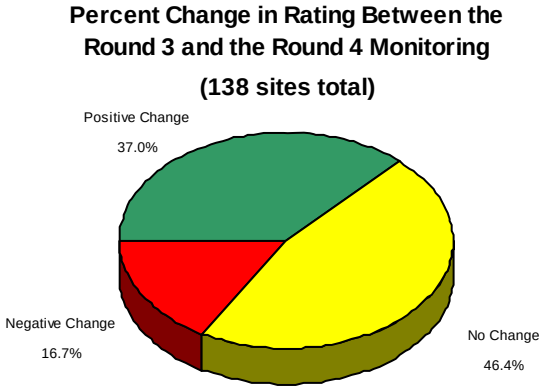


Figure 7

Figure 7 displays the percentage of change in rating among the same 138 AMNET sites in the Upper Delaware/Northwest Water Region that were sampled during the third round study period [4], and again during the current (Round 4) study period (see "Site Selection" & Table 2, Volume 2). The green indicates sites that have undergone a positive change, yellow indicates no change, and red indicates a negative change. Positive change is defined as an improved rating from the previous Round's rating, while a negative change is defined as a downgraded rating from the previous Round (see Table 2, Volume 2).

Regional Results

A USGS study, using data generated from NJDEP's AMNET program [15], statistically related levels of impairment to physiographic land types, corresponding land uses, and other anthropogenic factors on a statewide scale. A non-impaired community was most positively related to the area of forested and undeveloped land in its watershed upstream, and to the total underlying terrain in the steeper gradient ecoregions of northwestern New Jersey (i.e. Reading Prong/Highlands). Conversely, an impaired community was most positively related to the area of urban land, and to the total volume of wastewater (point source) discharge [15]. The table below presents the proportion of "excellent", "good", "fair", and "poor" AMNET sites, based on the current data, in each of the Upper Delaware/Northwest Watershed Management Areas.

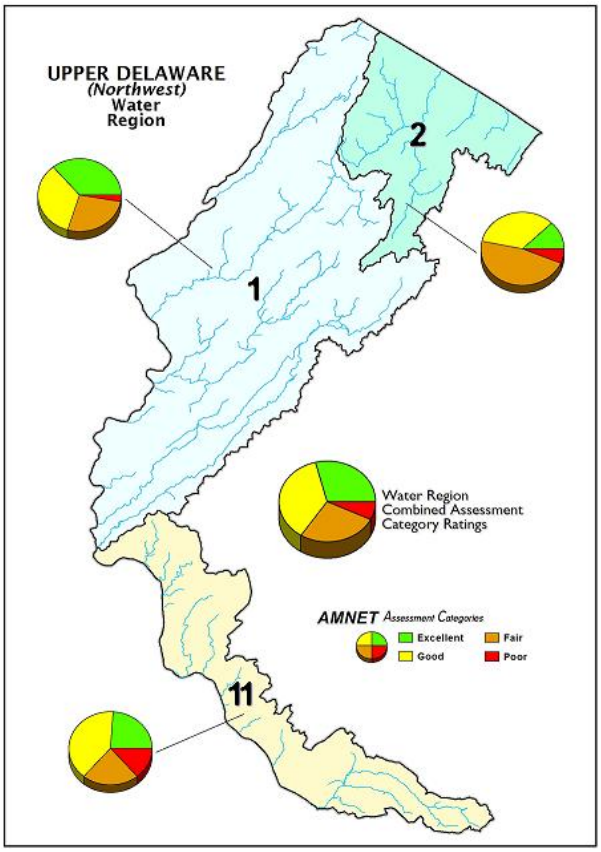


Figure 8

WMA	Sub-basins	Excellent	Good	Fair	Poor	Total sites
1	Upper Delaware River tributaries	28 (37.3%)	25 (33.3%)	20 (26.7%)	2 (2.7%)	75
2	Upper Wallkill River system	2 (11.8%)	6 (35.3%)	8 (47.1%)	1 (5.9%)	17
11	Central Delaware River tributaries	11 (23.9%)	18 (39.1%)	11 (23.9%)	6 (13.0%)	46
	Totals:	41 (29.7%)	49 (35.5%)	39 (28.3%)	9 (6.5%)	138

Figure 8 illustrates the proportions of "excellent", "good", "fair", and "poor" sites in each WMA of the Upper Delaware/Northwest Water Region for the current AMNET round.

Evaluation by WMA

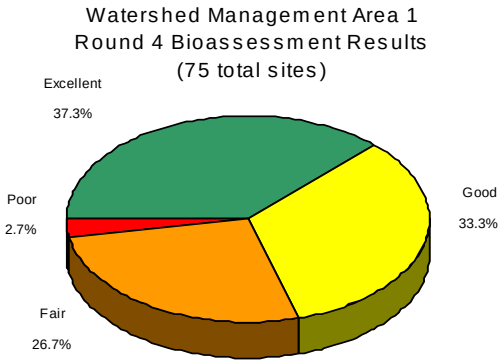


Figure 9

Watershed Management Area #1 includes a total of 75 AMNET sites in the Shimmers Brook, Flat Brook, Vancampens Brook, Papakating Creek, Delawanna Creek, Pohatcong Creek, Lopatcong Creek, Pequest River, Paulins Kill, Clove Brook, and Musconetcong River watersheds, in Hunterdon, Sussex, Morris and Warren Counties (see Maps 2, 3, 4, & 5, Volume 2). Three sites were not sampled. AN0001 due to lack of flow, AN0020 due to a collection error, and AN0031 inaccessable because of bridge construction. Figure 9 shows the current site rating summaries for WMA #1 with 37.3% (28 sites) "excellent", 33.3% (25 sites) "good", 26.7% (20 sites) "fair", and 2.7% (2 sites) "poor". Figure 10 depicts the results obtained from 78 sites sampled during the earlier (Round 3) survey [4]. Comparing the current results to the earlier results, a significant improvement is seen at 31 sites and a significant decline at 12 sites (see Table 2, Volume 2). The number of "excellent" and "fair" sites is slightly higher than the earlier data, and the number of "poor" and "good" sites have declined. The majority (68.0%) of habitat scores are in the suboptimal range, with 30.7% receiving an optimal score and 1.3% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families were found at eight sites (one each on Culvers Ck, UNT to Pequest River, Bear Ck, Pequest River, Pophandusing Bk, Lopatcong Ck, Pohatcong Ck, and Hances Bk) (see Maps 2, 3, 4, & 5, Table 3, Volume 2). One of these sites (AN0053) displayed chronic abnormalities (see Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #1; AMNET site locations and bioassessment ratings within WMA #1 are shown in Figure 11.

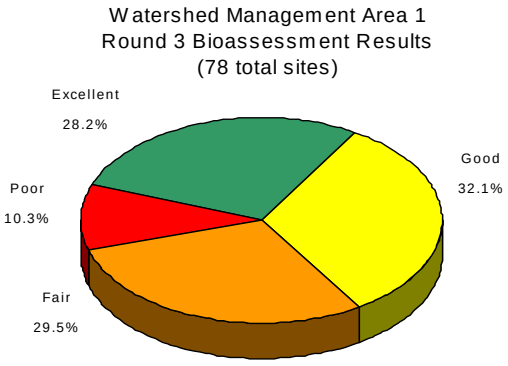


Figure 10

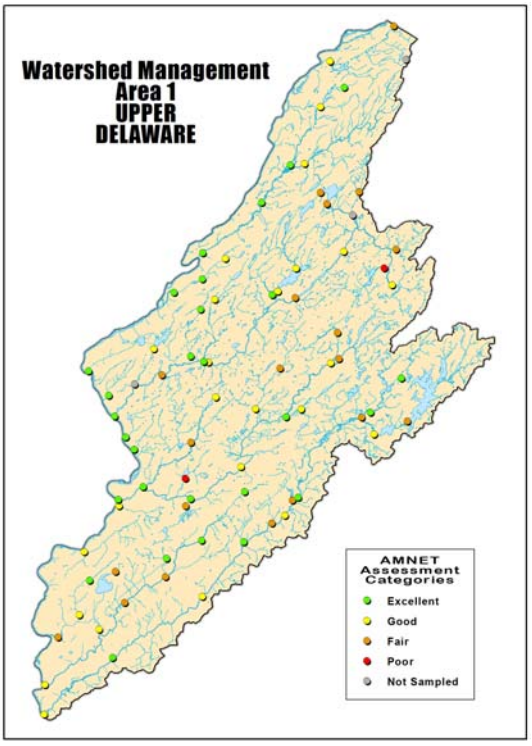


Figure 11

WMA # 1 Combined Results Table

Bio Rating	Round 3		Round 4			Habitat Assessment	Round 4	
Excellent	22	28.2%	28	37.3%		Optimal	23	30.7%
Good	25	32.1%	25	33.3%		Suboptimal	51	68.0%
Fair	23	29.5%	20	26.7%		Marginal	1	1.3%
Poor	8	10.3%	2	2.7%		Poor	---	---
Total sites	78		75				75	

Watershed Management Area #2 includes a total of 17 AMNET sites in the Beaver Run, Black Ck, Clove Bk , Papakating Ck, Wallkill River, and Wawayanda Ck watersheds, in Sussex County (see Map 8, Volume 2). Figure 12 shows the current site rating summaries for WMA # 2: 11.8% (2 sites) "excellent", 35.3% (6 sites) "good", 47.1% (8 sites) "fair", and 5.9% (1 site) "poor". Figure 13 depicts the results obtained from 17 sites sampled during the earlier (Round 3) survey [4]. Comparing the current (Round 4) results to the earlier (Round 3) results, a significant improvement is apparent at four sites while five sites exhibited a decline in impairment rating (see Table 2, Volume 2). The number of "excellent" sites decreased slightly, while the number of "good" sites increased slightly, since the earlier sampling, with the number of "fair" and "poor" sites remaining the same (see Table 2, Volume 2). The majority (58.8%) of habitat scores are in the suboptimal range with 29.4% receiving an optimal and 11.8% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families were found at one site (Papakating Ck) (Maps 6 & 7, Table 3, Volume 2). This site did not display chronic abnormalities (see Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #2; AMNET site locations and bioassessment ratings within WMA #2 are shown in Figure 14.

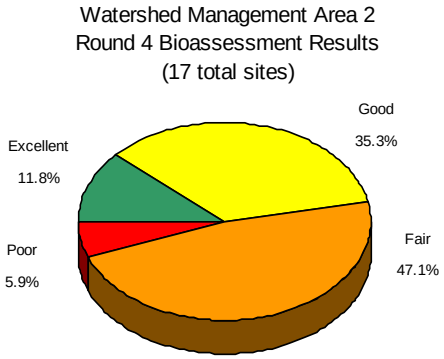


Figure 12

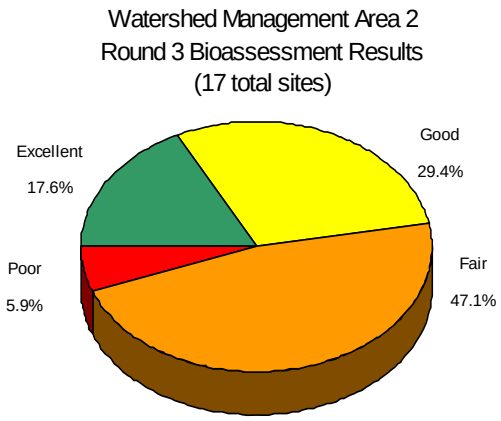


Figure 13

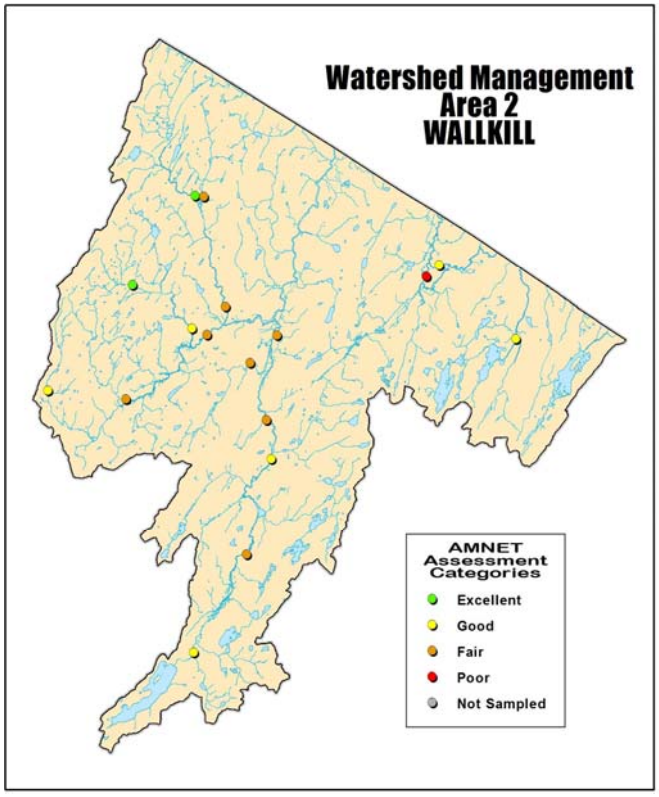


Figure 14

WMA # 2 Combined Results Table

Bio Rating	Round 3		Round 4			Habitat Assessment	Round 4	
Excellent	3	17.6%	2	11.8%		Optimal	5	29.4%
Good	5	29.4%	6	35.3%		Suboptimal	10	58.8%
Fair	8	47.1%	8	47.1%		Marginal	2	11.8%
Poor	1	5.9%	1	5.9%		Poor	---	---
Total sites	17		17				17	

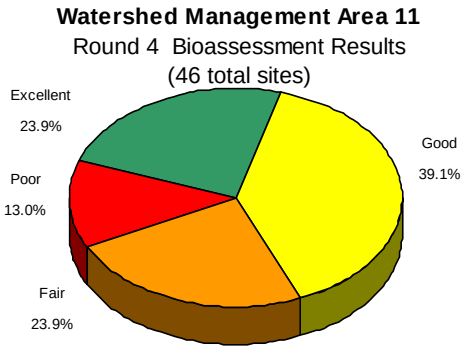


Figure 15

Watershed Management Area #11 includes a total of 46 AMNET sites in the Alexauken Ck, Assunpink Ck, Hakihokake Ck, Jacobs Ck, Lockatong Ck, Miry Run, Moores Ck, Nishisakawick Ck, Plum Brook, Shabakunk Ck, Swan Ck, Warford Ck, Wickecheoke Ck, and Woolseys Bk watersheds, in Hunterdon, Mercer, and Monmouth Counties (see Maps 6 & 7, Volume 2). Figure 15 shows the current site rating summaries for WMA # 11: 23.9% (11 sites) "excellent", 39.1% (18 sites) "good", 23.9% (11 sites) "fair", and 13.0% (6 sites) "poor". Figure 16 depicts the results obtained from 46 sites sampled during the earlier (Round 3) survey [4]. Comparing the current to the earlier results, a significant improvement is seen at 16 sites, and a significant decline, at 7 sites (see Table 2, Volume 2). The number of "excellent" sites increased slightly from that of the earlier sampling, and the number "fair" and "poor" sites is slightly decreased, with the number of "good"sites remaining the same (see Table 2, Volume 2). The majority of sites (76.1%) received an suboptimal habitat score, with 15.2% receiving an optimal score and 8.7% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families were found at six sites (one each on Harihokake Ck, Wickecheoke Ck, Swan Ck , UNT to Shipetaukin Ck, Shabakunk Ck, and Miry Run) (see Map 8, Table 3, Volume 2). None of these sites displayed chronic abnormalities (see Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #11; AMNET site locations and bioassessment ratings within WMA # 11 are shown in Figure 17.

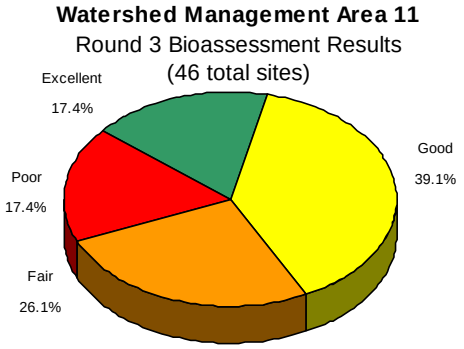


Figure 16

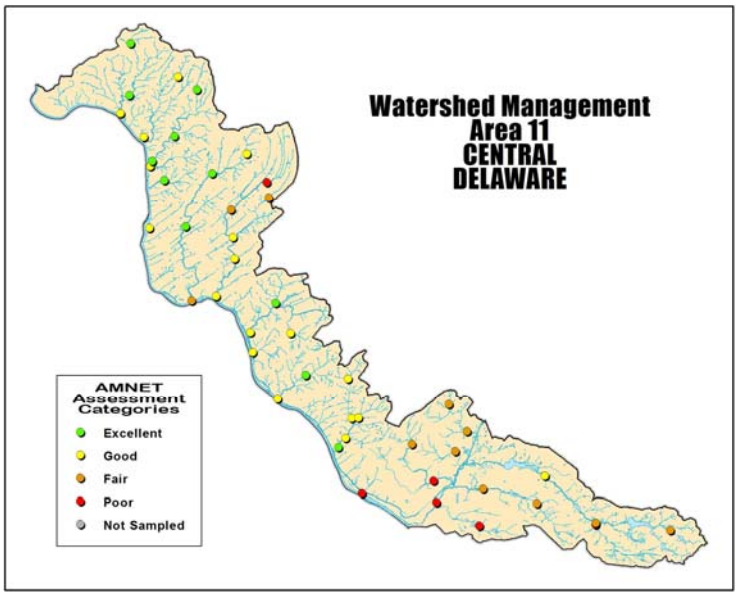


Figure 17

WMA # 11 Combined Results Table

Bio Rating	Round 3		Round 4			Habitat Assessment	Round 4	
Excellent	8	17.4%	11	23.9%		Optimal	7	15.2%
Good	18	39.1%	18	39.1%		Suboptimal	35	76.1%
Fair	12	26.1%	11	23.9%		Marginal	4	8.7%
Poor	8	17.4%	6	13.0%		Poor	---	---
Total sites	46		46				46	

Macroinvertebrate Abnormalities

Occasionally, morphological abnormalities have been found in individual macroinvertebrates recovered in WM&S/BFBM's AMNET collections. These deformities have been most often detected in larval organisms belonging to the insect family Chironomidae (midges), where they occur primarily in the head appendages (antennae) and mouthparts (mentum and mandibles). Abnormalities have also been observed in individuals of other taxonomic groups (such as Amphipoda), but they are most often noted in the mouthparts and antennae of Chironomidae because these features are key characteristics used in identification. Chironomidae larvae often comprise a large component of the benthic community of a stream or river, particularly in those affected by human disturbances, and they are part of the diet of predatory invertebrates and fish. As a result, chironomids are an important transfer vector linking the movement of contaminants from sediments to higher trophic levels [16].

Hamilton and Saether [17] noted deformed specimens (Chironomidae) occurred in areas of industrial or agricultural chemical input, but not in areas receiving only domestic effluents. Subsequent studies have supported this finding. But the presence of deformed organisms in a sample is difficult to interpret. Not all genera appear to react to the presence of contaminants in the same manner [18]. Most of the research has been focused on a few genera. The North Carolina Division of Environmental Management [19] has developed an index to evaluate deformities, using the frequency and severity of deformities observed in Chironomidae larvae of just the genus *Chironomus*. Secondly, morphological deformities undoubtedly occur in Chironomidae larvae living in uncontaminated environments. Even robust, healthy populations of any fauna are likely to include a certain proportion of physiologically weaker individuals which, for various reasons, may be more prone or genetically predisposed to malformation [18]. With a lack of baseline data of deformities in more pristine environments, the level at which these deformities becomes significant is somewhat uncertain. Currently, although not an indicator of specific contaminants, the occurrence of abnormal chironomid larvae can serve as an economical and long-term monitor of the benthic environment, and can suggest where more intensive bioassays and chemical testing would be most effectively employed [20].

Bearing in mind that the primary focus of the AMNET sampling is not to find morphological abnormalities, a listing of all AMNET sites in the Upper Delaware/Northwest Water Region exhibiting these deformities is presented in Table 3, Volume 2. The data are displayed as # of chironomids with abnormalities/# of chironomids examined. For all other taxa, just the number of individuals with abnormalities is presented. The significance of these abnormalities has not been statistically evaluated. Deformities are called "chronic" if they were observed in more than one round of sampling at a given site. Also, the presence of abnormalities is not factored into the index scoring, but used to identify sites where additional investigations are needed.

A slight decrease in the number of abnormalities are seen in the current sampling as compared to the previous (Round 3) sampling [4]. From the current sampling of 138 sites, 15 (10.9%) contained organisms with abnormalities (Maps 2 - 8 , Volume 2). Only one of the sites (AN0053) exhibited a "chronic" presence of abnormalities (Table 3, Volume 2). Further study is needed to establish the significance of the presence of abnormalities.

Causes of Biological 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. Although bioassessments are useful for identifying biological impairments, they do not identify the cause or causes of impairments. Linking biological effects with their causes is particularly complex when multiple stressors impact a waterbody[22]. A more intensive Stressor Identification (SI) study is necessary in order to pinpoint the probable cause or causes of the observed biological impairment.

Some common candidate causes which frequently appear on the USEPA's 303(d) list of impaired waterbodies include[23]:

Metals
Sediments
Nutrients
Dissolved Oxygen
Temperature
Ionic Strength
Flow Alteration
Unspecified Toxic Chemicals

Habitat Assessment vs. Biological Assessment

Generally, there is a correlation between habitat and biological impairment. However, definitive correlations can only be determined on a site specific basis. When assessing habitat degradation on an individual site, often the data suggests that other factors, which may include land use and/or water quality, are likely contributing to the observed biological assessments. Due to the prevalence of multiple stressors in areas of complex land use, sites with a "fair" or "poor" biological assessment, but with a relatively high habitat assessment score, could be impacted by point and/or nonpoint sources outside the range of the visual based habitat assessment. Also, an intermittent or short term impact may have occurred which left no obvious visual evidence at the site. In these cases, further investigation is needed to determine the source of impairment that is affecting the biota. Some sites assessed with an "excellent" or "good" biological assessment may have a relatively degraded habitat assessment. This could be due to a temporary degradation, such as drought or flooding (near to the time of the assessment), which was not severe enough to effect the biota. It is also possible that a temporary or recent degradation may not have immediate observable effects on the biota. In either case these sites should be studied further to avoid future impairment to the biota.

As reflected in the present study results, human land uses and practices, superimposed on the undisturbed physical terrain, play a major role in controlling the degree of pollution or degradation in a stream system [15]. The relationship between benthic macroinvertebrate community impairment has been statistically related to different physiographic land types, land uses and other anthropogenic factors, on a statewide basis [15]. These findings strongly indicate that human land uses and practices play a major role in the degree of pollution or degradation in a stream system. Data analysis from Ayers et al., 2000 [21] for instance, concludes the following:

1. Fish and invertebrate communities are commonly impaired in urban streams;
2. Invertebrate community impairment was related to total urban land and total wastewater flow upstream of a site;

3. Changes in aquatic community structure were statistically related to environmental variables along the urban gradient – that is to say that such things as impervious surfaces were related to a negative response in the aquatic invertebrate community.

Conversely, the same Ayers data analysis also demonstrated that the area of forest and wetland in a stream's drainage basin was a strong mitigating factor in protecting invertebrate community health.

Additional Information

Additional Information on the AMNET program can be obtained from the WM&S' Bureau of Freshwater & Biological Monitoring by calling 609-292-0427 or visiting its website at: http://www.state.nj.us/dep/wms/bfbm

Raw data is posted on this website by the end of the calendar year that the data is received and validated. GIS shapefiles will also be available on the NJDEP web site once all data is reviewed and finalized.

Additionally, raw data is submitted to WQX as soon as the data is received and validated. WQX is USEPA's repository and framework for water quality, biological, and physical data. It is used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and many others to store data. The retrieval of the data is handled through the STORET interface and can be accessed at: http://www.epa.gov/storet

Comments are welcome and may be emailed to: bfbm@dep.state.nj.us.

For more information, please contact:

Department of Environmental Protection
Victor Poretti
Water Monitoring & Standards
Bureau of Freshwater and Biological Monitoring
P. O. Box 427
Trenton, NJ 08625-0427

http://www.state.nj.us/dep/wms/bfbm

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Table 1

Coastal Plain Macroinvertebrate Index (CPMI)[1]

Study area: southern New Jersey, below the geologic fall-line; Middle Atlantic Coastal Plain ecoregion, excluding the Pinelands National Reserve. See figure A1.

Index Metrics
1. Total number of genera
2. Total number of EPT genera
3. Percent Ephemeroptera genera
4. Hilsenhoff Biotic Index
5. Percent Clinger genera

	Score			
Index Metric	6	4	2	0
Number of genera	>25	17-25	9-16	<9
Number of EPT genera	>9	7-9	4-6	<4
% of Ephemeroptera	>29	20-29	10-19	<10
Hilsenhoff Biotic Index	<4.9	4.9-6.0	6.1-7.3	>7.3
% Clingers	>51	34-51	17-33	<17

Assessment Rating	Score
Excellent	22-30
Good	12-20
Fair	10-6
Poor	< 6

Reference

J.R. Maxted, et al. Assessment framework for mid-Atlantic coastal plain streams using benthic macroinvertebrates. J.N. Am. Benthol. Soc. 2000, 19(1):128-144.

Attributes

Excellent: Minimal changes in structure of biological community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

Good: Some evident changes in structure of the biotic community and minimal changes in ecosystem function. Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained.

Fair: **Moderate to major changes in structure of biological community and moderate changes in ecosystem function.** Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism condition shows signs of physiological stress; system function shows reduced complexity.

Poor: Extreme changes in structure of biological community and major loss of ecosystem function. Extreme changes in structure; wholesale changes in taxonomic composition; extreme alterations from normal densities and distributions; organism condition is often poor; ecosystem functions are severely altered.

[1] Based on 100 organism subsample, genus level taxonomy

Table 1 (cont)

Pinelands Macroinvertebrate Index (PMI)[1]

Study area: southern New Jersey, below the geologic fall-line within the Pinelands National Reserve and extending 5 kilometers outside the Reserve boundary. See figure A1.

Index Metrics

1. Number of Insect genera
2. Number of Non-insect genera
3. Percent Plecoptera (P) and Trichoptera (T)
4. Percent Diptera genera excluding Tanytarsini
5. Percent Mollusca and Amphipoda
6. Beck's Biotic Index
7. Percent Filterers

Assessment Rating	Score
Excellent	≥ 63
Good	< 63-56
Fair	< 56-34
Poor	< 34

Reference

Benjamin Jessup, et al. Report. Development of the New Jersey Pinelands macroinvertebrate index (PMI). TetraTech, Inc. Owings Mills, MD. March, 2005.

Attributes

Excellent: Minimal changes in structure of biological community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

Good: Some evident changes in structure of the biotic community and minimal changes in ecosystem function. Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained.

Fair: **Moderate to major changes in structure of biological community and moderate changes in ecosystem function.** Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism condition shows signs of physiological stress; system function shows reduced complexity.

Poor: Extreme changes in structure of biological community and major loss of ecosystem function. Extreme changes in structure; wholesale changes in taxonomic composition; extreme alterations from normal densities and distributions; organism condition is often poor; ecosystem functions are severely altered.

[1] Based on 100 organism subsample, genus level taxonomy

Table 1 (cont)

High Gradient Macroinvertebrate Index (HGMI)[1]

Study area: northern New Jersey, above the geologic fall-line including the following ecoregions:
North Central Appalachians, Central Appalachian Ridges and Valleys, Northeastern Highlands, Northeastern Coastal Zone, and Northern Piedmont. See figure A1.

Index Metrics

1. Total number of genera $_{adj}$ = 26.53 + Metric – [22.776 + 4.173*log10(areasqkm)]
2. Percent of genera that are not insects
3. Percent sensitive EPT (excluding Hydropyschidae, including Diplectrona) $_{adj}$
   = 37.49 + Metric – [49.922 – 13.800*log10(areasqkm)]
4. Number of scraper genera $_{adj}$ = 5.44 + Metric – [3.889 + 1.724*log10(areasqkm)]
5. Hilsenhoff Biotic Index $_{adj}$ = 4.23 + Metric – [3.407 + 0.918*log10(areasqkm)]
6. Number of New Jersey TALU attribute 2 genera
7. Number of New Jersey TALU attribute 3 genera

ADJ (Adjusted metric value) = Mean $_{reference}$ + Metric $_{observed}$ – Metric $_{predicted}$, where predictions are based on linear regression analysis of reference metric values on catchment size.

Assessment Rating	Score
Excellent	≥ 63
Good	< 63 - 42
Fair	< 42 - 21
Poor	< 21

Reference

Benjamin Jessup, et al. Report. Development of the New Jersey high gradient macroinvertebrate index (HGMI). TetraTech, Inc. Owings Mills, MD. February, 2007.

Attributes

Excellent: Minimal changes in structure of biological community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

Good: Some evident changes in structure of the biotic community and minimal changes in ecosystem function. Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained.

Fair: **Moderate to major changes in structure of biological community and moderate changes in ecosystem function.** Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism condition shows signs of physiological stress; system function shows reduced complexity.

Poor: Extreme changes in structure of biological community and major loss of ecosystem function. Extreme changes in structure; wholesale changes in taxonomic composition; extreme alterations from normal densities and distributions; organism condition is often poor; ecosystem functions are severely altered.

[1] Based on 100 organism subsample, genus level taxonomy

Map of New Jersey Macroinvertebrate Indices

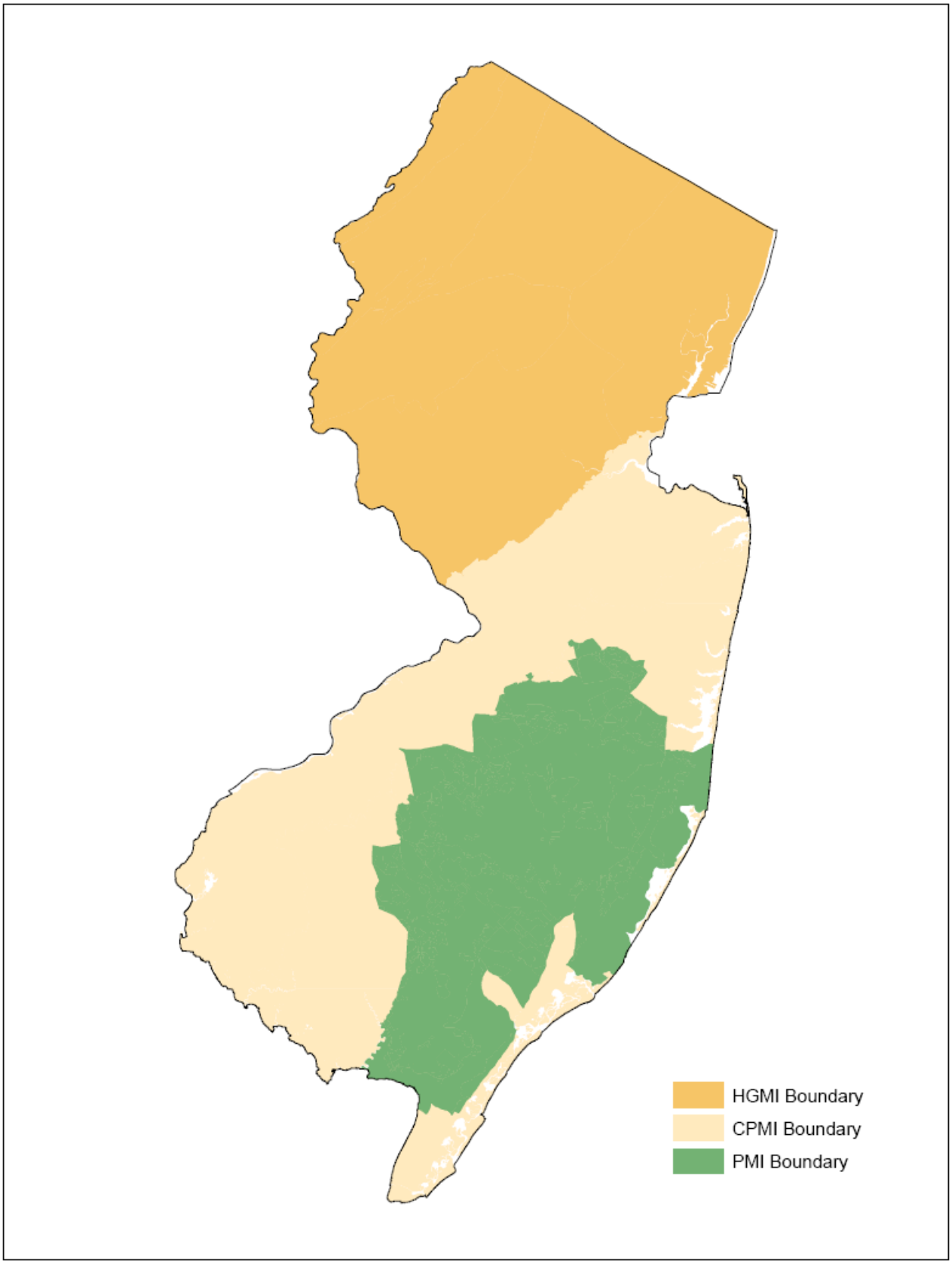

Figure A1. Boundaries for generic level index use.

NJ Department of Environmental Protection
Water Monitoring and Standards

AMBIENT BIOMONITORING NETWORK

Northwest Water Region
Upper Delaware and Wallkill River Drainages

Watershed Management Areas 1, 2, and 11
Round 4 Benthic Macroinvertebrate Data
Volume 2 of 2

December 2012

State of New Jersey
Chris Cristie, Governor
Kim Guadagno, Lt. Governor

NJ Department of Environmental Protection
Bob Martin, Commissioner

NJ Department of Environmental Protection
Land Use Management
John Plonski, Assistant Commissioner

Water Monitoring and Standards
Jill Lipoti, Director

Bureau of Freshwater & Biological Monitoring
Leslie McGeorge, Administrator

December 2012

AMBIENT BIOMONITORING NETWORK

Northwest Water Region
Upper Delaware and Wallkill River Drainages
Watershed Management Areas 1, 2, and 11

Round 4 Benthic Macroinvertebrate Data

Volume 2 of 2

Water Monitoring Report Prepared By:
Water Monitoring & Standards
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[cover photo: Site AN0091, Wickecheoke Ck at Sergeantsville Rd, Hunterdon County, NJ.]

AMBIENT BIOMONITORING NETWORK

Watershed Management Areas 1, 2, and 11

Northwest Water Region
Upper Delaware and Wallkill River Drainages

Round 4 Benthic Macroinvertebrate Data

Volume 2 of 2

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Watershed Management Area # 11	Maps 6-7
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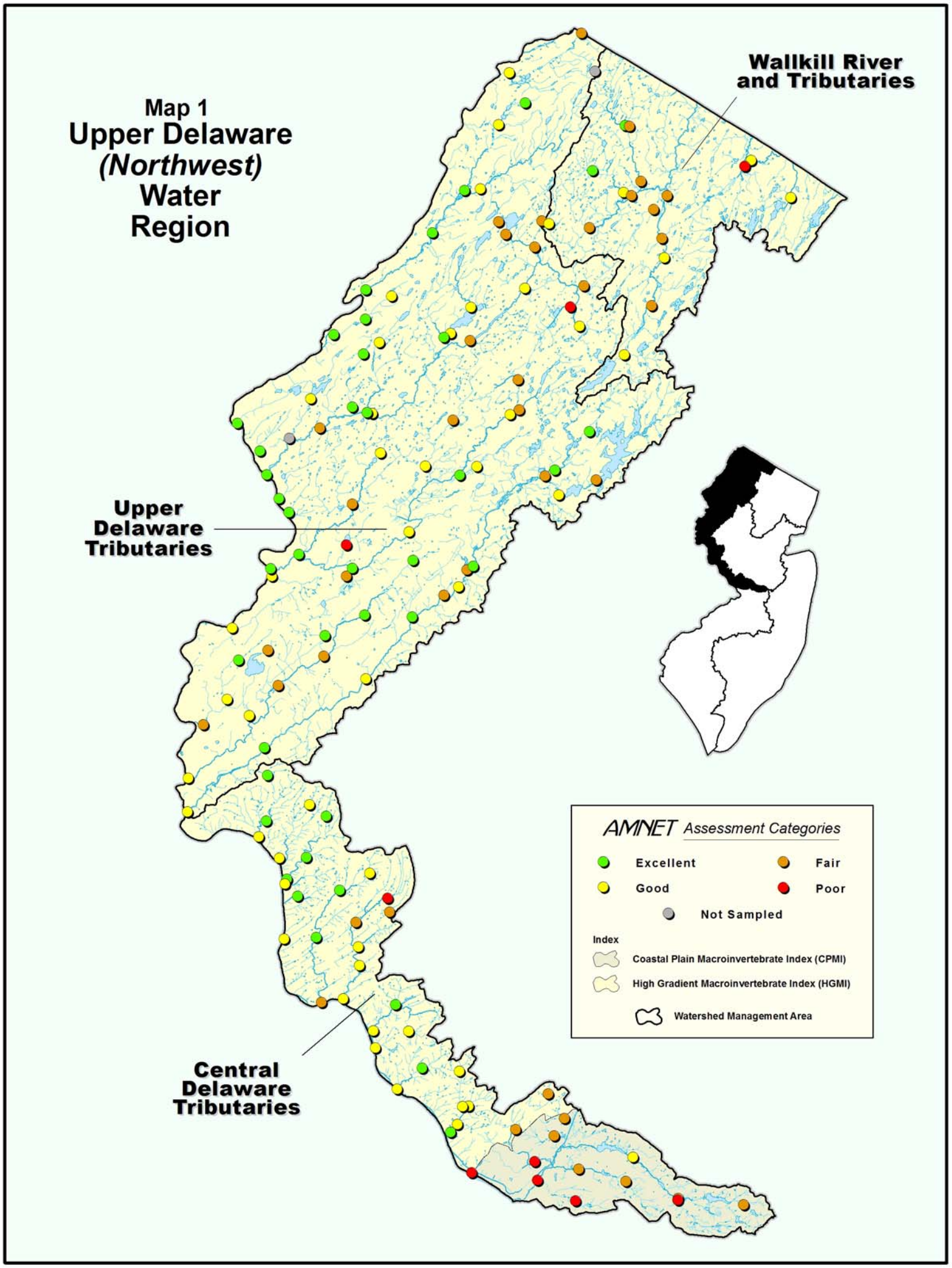
MAPS

Round 4 Northwest Water Region AMNET Study
WMA's 1, 2, & 11

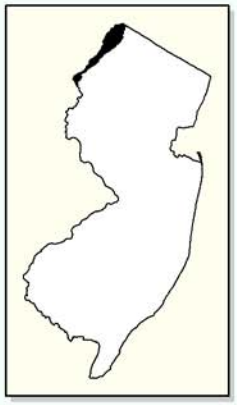
AMNET site locations and their respective biological ratings, for each major sub-basin, are shown in maps 1- 8. Also identified are sites that exhibited significant and chronic macroinvertebrate abnormalities.


Map 1
Upper Delaware
(Northwest)
Water
Region
Wallkill River
and Tributaries
Upper
Delaware
Tributaries
Central
Delaware
Tributaries
AMNET Assessment Categories
Excellent
Fair
Good
Poor
Not Sampled
Index
Coastal Plain Macroinvertebrate Index (CPMI)
High Gradient Macroinvertebrate Index (HGMI)
Watershed Management Area

Map 2

Flat, Shimers and Van Campens Brooks

Watershed Management Area 1 (Part)



AN0002 - *Clove Brook*

Duttonville

521

23

AN0001 - *UNT to Mill Brook*

AN0003 - *Shimers Brook*

Montague

AN0004 - *Little Flat Brook*

AN0005 - *Little Flat Brook*

Shaytown

560

206

AN0005A - *Little Flat Brook*

AN0006 - *Big Flat Brook*

AN0007 - *Flat Brook*

AN0008 - *Flat Brook*

AN0009 - *Van Campens Brook*

AN0010 - *Van Campens Brook*

AN0011 - *Van Campens Brook*

Calno

AN0012 - *Dunnfield Creek*

Dunnfield

80

AN0013 - *Stony Brook*

Columbia

AMNET *Assessment Categories*

- Excellent
- Fair
- Good
- Poor
- Not Sampled
- Macroinvertebrate Abnormalities Present
- Chronic Macroinvertebrate Abnormalities

Index

- Coastal Plain Macroinvertebrate Index (CPMI)
- High Gradient Macroinvertebrate Index (HGMI)

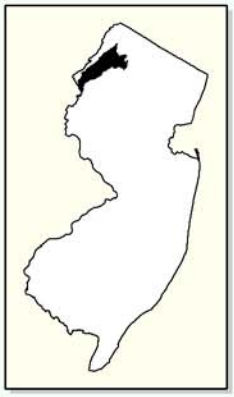
0 1.5 3 6 Miles

1 inch = 3.29 miles

Map 3

Paulins Kill and Delawanna Creek

Watershed Management Area 1 (Part)



AN0017 - *Culvers Creek*

AN0019 - *Dry Brook*

AN0018 - *Culvers Creek*

Branchville

AN0020 - *Dry Brook*

AN0021 - *Paulins Kill*

AN0016 - *UNT to Paulins Kill*

519

94

AN0015 - *Paulins Kill*

AN0023A - *Troy Brook*

15

206

AN0014 - *UNT to Paulins Kill*

AN0023 - *Troy Brook*

AN0024 - *Trout Brook*

Newton

AN0026 - *Blair Creek*

Middleville

AN0022 - *Paulins Kill*

181

AN0028 - *Jacksonburg Creek*

521

94

517

AN0030 - *Yards Creek*

Jacksonburg

AN0029 - *Jacksonburg Creek*

AN0025 - *Paulins Kill*

AN0027 - *Blair Creek*

AN0031 - *Yards Creek*

94

AN0032A - *Paulins Kill*

80

AN0032 - *Paulins Kill*

46

AN0033 - *Delawanna Creek*

AN0034 - *Ramseysburg Creek*

Ramseyburg

AMNET *Assessment Categories*

- Excellent
- Fair
- Good
- Poor
- Not Sampled
- Macroinvertebrate Abnormalities Present
- Chronic Macroinvertebrate Abnormalities

Index

- Coastal Plain Macroinvertebrate Index (CPMI)
- High Gradient Macroinvertebrate Index (HGMI)

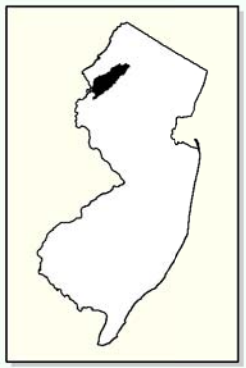
0 2 4 8 Miles

1 inch = 3.32 miles

Map 4

Pequest River

Watershed Management Area 1 (Part)



AN0035 - *Pequest River*

AN0036 - *UNT to Pequest River*

AN0037 - *Pequest River*

AN0040A - *Bear Creek*

AN0045 - *Beaver Brook*

AN0040 - *Bear Creek*

AN0038 - *Trout Brook*

AN0039 - *Pequest River*

AN0046 - *Honey Run*

AN0041 - *Pequest River*

AN0044 - *Mountain Lake Brook*

AN0047 - *Beaver Brook*

AN0048 - *Pequest River*

AN0043 - *Pequest River*

AN0042 - *Furnace Brook*

Johnsonburg

Andover

Hope

Alphano

Belvidere

Oxford

94 206 517 519 521 80 46 31

AMNET *Assessment Categories*

- Excellent
- Fair
- Good
- Poor
- Not Sampled
- Macroinvertebrate Abnormalities Present
- Chronic Macroinvertebrate Abnormalities

Index

- Coastal Plain Macroinvertebrate Index (CPMI)
- High Gradient Macroinvertebrate Index (HGMI)

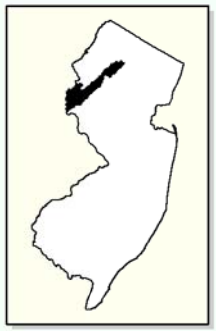
0 1.5 3 6 Miles

1 inch = 2.49 miles

Map 5

Musconetcong River, Lopatcong and Pohatcong Creeks

Watershed Management Area 1 (Part)



AN0065 - *Lubbers Run*

AN0066 - *Lubbers Run*

AN0064 - *Musconetcong River*

AN0062 - *Musconetcong River*

AN0063 - *Musconetcong River*

Hopatcong

Hackettstown

AN0054 - *Pohatcong Creek*

AN0067 - *Mine Brook*

AN0068 - *Trout Brook*

Beattystown

AN0069 - *Musconetcong River*

AN0070 - *Hances Brook*

AN0049 - *Pophandusing Brook*

AN0055 - *Pohatcong Creek*

AN0071 - *UNT to Musconetcong River*

Roxburg

AN0050 - *Buck Horn Creek*

AN0056 - *Brass Castle Creek*

AN0059 - *Merrill Creek*

AN0051 - *Lopatcong Creek*

AN0057 - *Pohatcong Creek*

AN0072 - *Musconetcong River*

AN0058 - *Pohatcong Creek*

AN0052 - *Lopatcong Creek*

Phillipsburg

AN0053 - *Lopatcong Creek*

AN0060 - *Merrill Creek*

AN0073 - *Musconetcong River*

AN0061 - *Pohatcong Creek*

Riegelsville

AN0074 - *Musconetcong River*

181 15 206 80 517 46 57 31 519 22 122 174 78

0 2.5 5 10 Miles

1 inch equals 3.94 miles

AMNET *Assessment Categories*

- Excellent
- Good
- Fair
- Poor
- Not Sampled
- Macroinvertebrate Abnormalities Present
- Chronic Macroinvertebrate Abnormalities

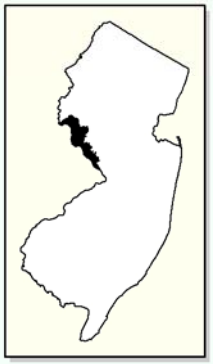
Index

- Coastal Plain Macroinvertebrate Index (CPMI)
- High Gradient Macroinvertebrate Index (HGMI)

Map 6

Lockatong, Alexauken, Moore and Jacobs Creeks

Watershed Management Area 11 (Part)



AN0075 - *Hakihokake Creek*
AN0078 - *Harihokake Creek*
AN0080 - *Nishisakawick Creek*
AN0076 - *Hakihokake Creek*
Holland
AN0077 - *Hakihokake Creek*
AN0079 - *Harihokake Creek*
AN0081 - *Nishisakawick Creek*
AN0086 - *Lockatong Creek*
AN0082 - *Nishisakawick Creek*
Frenchtown
AN0083 - *Little Nishisakawick Creek*
AN0087 - *Lockatong Creek*
AN0084 - *Copper Creek*
AN0090 - *Wickecheoke Creek*
AN0092 - *Plum Brook*
AN0091 - *Wickecheoke Creek*
AN0088 - *Lockatong Creek*
AN0085 - *Warford Creek*
AN0093 - *Plum Brook*
Sergeantsville
AN0094 - *Wickecheoke Creek*
AN0095 - *Wickecheoke Creek*
AN0089 - *Lockatong Creek*
AN0097 - *UNT to Alexauken Creek*
AN0098 - *Alexauken Ck*
AN0096 - *Alexauken Creek*
AN0099 - *Swan Creek*
Lambertville
AN0100 - *Moores Creek*
AN0102 - *Jacobs Creek*
AN0101 - *Moores Creek*
Titusville
AN0104 - *Woolseys Brook*
AN0105 - *Jacobs Creek*
AN0103 - *Airport Branch of Jacobs Creek*
AN0106 - *Jacobs Creek*
West Trenton
AN0107 - *Gold Run*

519 513 519 29 523 202 179 518 579 579 31 95

AMNET Assessment Categories

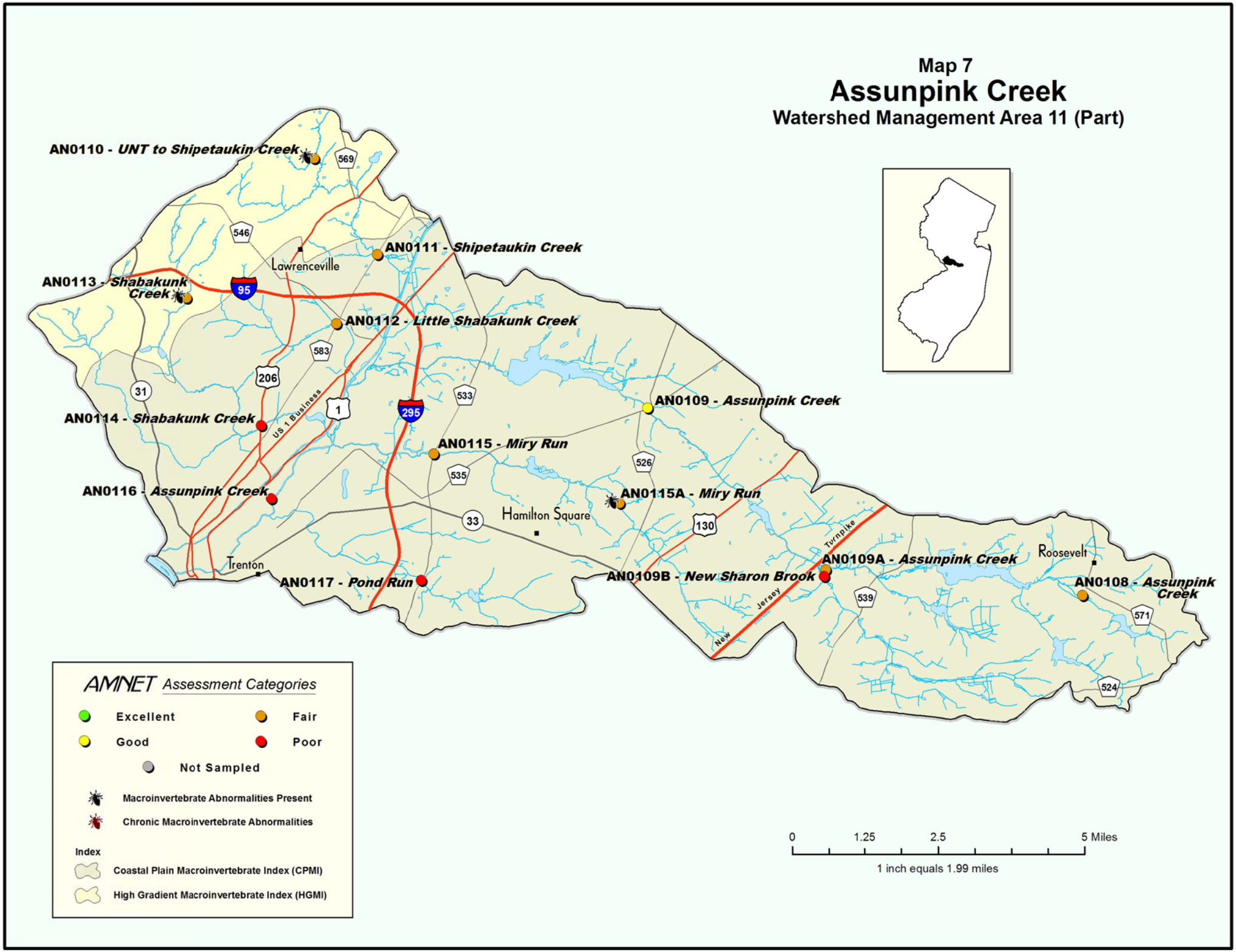
- Excellent
- Good
- Fair
- Poor
- Not Sampled
- Macroinvertebrate Abnormalities Present
- Chronic Macroinvertebrate Abnormalities

Index

- Coastal Plain Macroinvertebrate Index (CPMI)
- High Gradient Macroinvertebrate Index (HGMI)

0 1.5 3 6 Miles

1 inch equals 3.08 miles

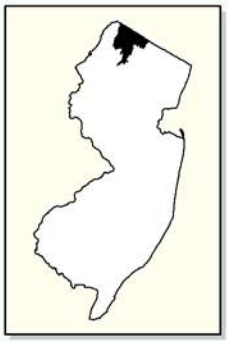


Map 7
Assunpink Creek
Watershed Management Area 11 (Part)
AN0110 - UNT to Shipetaukin Creek
AN0111 - Shipetaukin Creek
AN0113 - Shabakunk Creek
AN0112 - Little Shabakunk Creek
AN0114 - Shabakunk Creek
AN0109 - Assunpink Creek
AN0115 - Miry Run
AN0116 - Assunpink Creek
AN0115A - Miry Run
AN0109A - Assunpink Creek
AN0109B - New Sharon Brook
AN0108 - Assunpink Creek
AN0117 - Pond Run
Lawrenceville
Hamilton Square
Trenton
Roosevelt
US 1 Business
New Jersey Turnpike
569
546
95
583
206
31
1
295
533
535
526
33
130
539
571
524
AMNET Assessment Categories
Excellent
Fair
Good
Poor
Not Sampled
Macroinvertebrate Abnormalities Present
Chronic Macroinvertebrate Abnormalities
Index
Coastal Plain Macroinvertebrate Index (CPMI)
High Gradient Macroinvertebrate Index (HGMI)
0
1.25
2.5
5 Miles
1 inch equals 1.99 miles

Map 8

Wallkill River, Papakating and Pochuck Creeks

Watershed Management Area 2



Mount Salem

AN0309A - *Clove Brook*

AN0308 - *UNT to Clove Brook*

519

284

AN0295 - *Wawayanda Brook*

AN0305 - *Papakating Creek West Branch*

565

AN0296 - *Black Creek*

517

AN0309 - *Clove Brook*

AN0306 - *Papakating Creek West Branch*

23

AN0302 - *Wallkill River*

Vernon

AN0294 - *Lake Lookout Brook*

AN0307 - *Papakating Creek*

AN0301 - *Beaver Run*

515

AN0303 - *Papakating Creek*

94

AN0304 - *Papakating Creek*

AN0300 - *Wallkill River*

AN0299 - *Wallkill River*

Franklin

AN0298 - *Wallkill River*

517

15

AN0297 - *Wallkill River*

Sparta

181

AMNET *Assessment Categories*

- Excellent
- Fair
- Good
- Poor
- Not Sampled
- Macroinvertebrate Abnormalities Present
- Chronic Macroinvertebrate Abnormalities

Index

- Coastal Plain Macroinvertebrate Index (CPMI)
- High Gradient Macroinvertebrate Index (HGMI)

0 1.5 3 6 Miles

1 inch equals 2.77 miles

Table 2

Comparative Scores / Ratings (see notes)

Watershed Management Areas 1, 2, and 11

Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA	Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA
001	HGMI	28.50	nd	Fair	no sample	nd	nd	01	038	HGMI	25.42	52.92	Fair	Good	+	100	01
002	HGMI	64.88	30.54	Excellent	Fair	—	151	01	039	HGMI	53.36	64.89	Good	Excellent	+	145	01
003	HGMI	67.84	52.46	Excellent	Good	—	182	01	040	HGMI	32.98	48.99	Fair	Good	+	145	01
004	HGMI	91.37	66.99	Excellent	Excellent	/	154	01	040A	HGMI	11.77	31.88	Poor	Fair	+	123	01
005	HGMI	52.74	52.58	Good	Good	/	151	01	041	HGMI	19.95	61.44	Poor	Good	+	131	01
005A	HGMI	54.19	71.39	Good	Excellent	+	189	01	042	HGMI	20.13	37.61	Poor	Fair	+	128	01
006	HGMI	70.53	58.91	Excellent	Good	—	182	01	043	HGMI	52.92	80.03	Good	Excellent	+	155	01
007	HGMI	37.50	70.68	Fair	Excellent	+	161	01	044	HGMI	25.78	20.90	Fair	Poor	—	121	01
008	HGMI	73.84	73.70	Excellent	Excellent	/	175	01	045	HGMI	40.30	49.50	Fair	Good	+	156	01
009	HGMI	54.42	52.41	Good	Good	/	172	01	046	HGMI	31.13	23.70	Fair	Fair	/	115	01
010	HGMI	91.43	90.37	Excellent	Excellent	/	166	01	047	HGMI	65.53	76.79	Excellent	Excellent	/	167	01
011	HGMI	78.30	86.84	Excellent	Excellent	/	176	01	048	HGMI	56.63	66.92	Good	Excellent	+	170	01
012	HGMI	80.30	75.02	Excellent	Excellent	/	157	01	049	HGMI	46.94	47.57	Good	Good	/	127	01
013	HGMI	68.83	92.83	Excellent	Excellent	/	148	01	050	HGMI	48.26	47.74	Good	Good	/	149	01
014	HGMI	30.50	57.03	Fair	Good	+	155	01	051	HGMI	72.86	78.64	Excellent	Excellent	/	151	01
015	HGMI	28.26	18.70	Fair	Poor	—	134	01	052	HGMI	31.68	48.25	Fair	Good	+	153	01
016	HGMI	20.98	31.55	Poor	Fair	+	151	01	053	HGMI	24.51	34.64	Fair	Fair	/	137	01
017	HGMI	12.48	23.82	Poor	Fair	+	136	01	054	HGMI	84.70	78.23	Excellent	Excellent	/	153	01
018	HGMI	11.69	38.98	Poor	Fair	+	133	01	055	HGMI	65.39	63.81	Excellent	Excellent	/	138	01
019	HGMI	28.67	40.93	Fair	Fair	/	124	01	056	HGMI	65.39	76.07	Excellent	Excellent	/	136	01
020	HGMI	56.38	nd	Good	no sample	nd	nd	01	057	HGMI	57.09	36.22	Good	Fair	—	150	01
021	HGMI	58.38	54.63	Good	Good	/	168	01	058	HGMI	31.53	34.90	Fair	Fair	/	136	01
022	HGMI	24.62	26.51	Fair	Fair	/	140	01	059	HGMI	65.78	24.22	Excellent	Fair	—	140	01
023	HGMI	28.18	47.97	Fair	Good	+	164	01	060	HGMI	51.49	42.24	Good	Good	/	117	01
023A	HGMI	70.63	56.90	Excellent	Good	—	162	01	061	HGMI	71.07	62.62	Excellent	Good	—	140	01
024	HGMI	83.31	90.27	Excellent	Excellent	/	164	01	062	HGMI	28.66	29.62	Fair	Fair	/	163	01
025	HGMI	29.50	48.15	Fair	Good	+	123	01	063	HGMI	49.26	57.37	Good	Good	/	159	01
026	HGMI	47.42	52.64	Good	Good	/	149	01	064	HGMI	45.51	34.60	Good	Fair	—	171	01
027	HGMI	52.29	63.64	Good	Excellent	+	113	01	065	HGMI	43.34	67.74	Good	Excellent	+	166	01
028	HGMI	61.55	63.79	Good	Excellent	+	146	01	066	HGMI	43.39	68.33	Good	Excellent	+	176	01
029	HGMI	74.94	72.52	Excellent	Excellent	/	152	01	067	HGMI	31.51	79.49	Fair	Excellent	+	114	01
030	HGMI	23.83	52.78	Fair	Good	+	149	01	068	HGMI	33.37	27.78	Fair	Fair	/	136	01
031	HGMI	79.49	nd	Excellent	no sample	nd	nd	01	069	HGMI	44.10	43.87	Good	Good	/	163	01
032	HGMI	54.93	68.33	Good	Excellent	+	170	01	070	HGMI	26.12	35.99	Fair	Fair	/	156	01
032A	HGMI	63.65	32.73	Excellent	Fair	—	163	01	071	HGMI	40.76	66.88	Fair	Excellent	+	121	01
033	HGMI	48.70	70.08	Good	Excellent	+	141	01	072	HGMI	36.10	60.04	Fair	Good	+	165	01
034	HGMI	72.81	64.27	Excellent	Excellent	/	144	01	073	HGMI	58.85	63.05	Good	Excellent	+	165	01
035	HGMI	17.23	39.61	Poor	Fair	+	139	01	074	HGMI	51.52	49.39	Good	Good	/	115	01
036	HGMI	18.26	38.40	Poor	Fair	+	138	01	075	HGMI	74.82	81.50	Excellent	Excellent	/	117	11
037	HGMI	61.07	54.80	Good	Good	/	142	01	076	HGMI	79.71	70.83	Excellent	Excellent	/	153	11

NOTES:

Comparison of NJ impairment score results between earliest and latest sampling dates:

nd no data
\+ indicates positive change in rating
— indicates negative change in rating
/ indicates no change in rating

CPMI	Value
Excellent	22.0-30.0
Good	11.0-21.0
Fair	6.0-10.0
Poor	0-5.99

PMI	Value
Excellent	63.0-100.0
Good	56.0-62.99
Fair	34.0-55.99
Poor	0-33.99

HGMI	Value
Excellent	63.0-100.0
Good	42.0-62.99
Fair	21.0-41.99
Poor	0-20.99

Habitat Score	Value
Optimal	160 - 200
Sub-optimal	110 - 159
Marginal	60 - 109
Poor	<60

Table 2

Comparative Scores / Ratings (see notes)

Watershed Management Areas 1, 2, and 11

Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA	Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA
077	HGMI	74.38	52.36	Excellent	Good	—	92	11	115	CPMI	4	6	Poor	Fair	+	111	11
078	HGMI	60.63	59.60	Good	Good	/	146	11	115A	CPMI	6	8	Fair	Fair	/	153	11
079	HGMI	54.33	59.27	Good	Good	/	142	11	116	HGMI	22.06	18.21	Fair	Poor	—	154	11
080	HGMI	66.01	67.15	Excellent	Excellent	/	150	11	117	CPMI	2	4	Poor	Poor	/	136	11
081	HGMI	66.05	77.10	Excellent	Excellent	/	131	11	294	HGMI	49.94	43.71	Good	Good	/	158	02
082	HGMI	73.59	68.62	Excellent	Excellent	/	142	11	295	HGMI	43.17	43.29	Good	Good	/	156	02
083	HGMI	56.48	52.49	Good	Good	/	120	11	296	HGMI	36.85	15.93	Fair	Poor	—	121	02
084	HGMI	68.01	78.18	Excellent	Excellent	/	133	11	297	HGMI	30.96	43.05	Fair	Good	+	166	02
085	HGMI	63.29	47.55	Excellent	Good	—	157	11	298	HGMI	54.08	33.19	Good	Fair	—	135	02
086	HGMI	55.51	55.15	Good	Good	/	149	11	299	HGMI	40.09	42.70	Fair	Good	+	166	02
087	HGMI	61.53	64.27	Good	Excellent	+	127	11	300	HGMI	47.21	35.98	Good	Fair	—	150	02
088	HGMI	51.25	66.88	Good	Excellent	+	166	11	301	HGMI	30.43	33.36	Fair	Fair	/	157	02
089	HGMI	56.51	26.24	Good	Fair	—	160	11	302	HGMI	23.29	36.02	Fair	Fair	/	98	02
090	HGMI	46.57	15.12	Good	Poor	—	167	11	303	HGMI	67.92	45.99	Excellent	Good	—	161	02
091	HGMI	45.49	36.78	Good	Fair	—	169	11	304	HGMI	33.67	35.43	Fair	Fair	/	128	02
092	HGMI	40.83	37.59	Fair	Fair	/	158	11	305	HGMI	53.76	64.16	Good	Excellent	+	160	02
093	HGMI	59.78	51.90	Good	Good	/	160	11	306	HGMI	65.52	42.83	Excellent	Good	—	155	02
094	HGMI	57.13	43.33	Good	Good	/	156	11	307	HGMI	32.92	38.78	Fair	Fair	/	100	02
095	HGMI	46.68	52.17	Good	Good	/	167	11	308	HGMI	9.63	23.92	Poor	Fair	+	133	02
096	HGMI	54.79	51.12	Good	Good	/	138	11	309	HGMI	31.53	26.33	Fair	Fair	/	116	02
097	HGMI	55.97	70.87	Good	Excellent	+	151	11	309A	HGMI	85.26	64.20	Excellent	Excellent	/	167	02
098	HGMI	41.60	48.48	Fair	Good	+	156	11									
099	HGMI	32.56	62.51	Fair	Good	+	102	11									
100	HGMI	59.73	70.86	Good	Excellent	+	144	11									
101	HGMI	27.47	42.64	Fair	Good	+	130	11									
102	HGMI	62.42	61.02	Good	Good	/	149	11									
103	HGMI	38.12	61.88	Fair	Good	+	145	11									
104	HGMI	21.47	46.44	Fair	Good	+	130	11									
105	HGMI	56.03	59.95	Good	Good	/	140	11									
106	HGMI	44.81	70.42	Good	Excellent	+	171	11									
107	HGMI	19.19	13.72	Poor	Poor	/	121	11									
108	CPMI	4	6	Poor	Fair	+	127	11									
109	CPMI	8	12	Fair	Good	+	153	11									
109A	CPMI	2	8	Poor	Fair	+	151	11									
109B	CPMI	6	4	Fair	Poor	—	153	11									
110	HGMI	18.84	39.91	Poor	Fair	+	150	11									
111	HGMI	27.61	33.89	Fair	Fair	/	106	11									
112	HGMI	15.68	22.60	Poor	Fair	+	111	11									
113	HGMI	27.04	26.78	Fair	Fair	/	98	11									
114	HGMI	11.08	20.13	Poor	Poor	/	151	11									

NOTES:

Comparison of NJ impairment score results between earliest and latest sampling dates:

nd no data
\+ indicates positive change in rating
— indicates negative change in rating
/ indicates no change in rating

CPMI	Value
Excellent	22.0-30.0
Good	11.0-21.0
Fair	6.0-10.0
Poor	0-5.99

PMI	Value
Excellent	63.0-100.0
Good	56.0-62.99
Fair	34.0-55.99
Poor	0-33.99

HGMI	Value
Excellent	63.0-100.0
Good	42.0-62.99
Fair	21.0-41.99
Poor	0-20.99

Habitat Score	Value
Optimal	160 - 200
Sub-optimal	110 - 159
Marginal	60 - 109
Poor	<60

Table 3

Macroinvertebrate Abnormalities (see notes)

Watershed Management Areas 1, 2, and 11

Station	Round 3	Round 4	WMA			Station	Round 3	Round 4	WMA				
017		+1	01										
036		1/9	01										
040A		+1	01										
043		+1	01										
044	1/78		01										
049		1/7	01										
053	**+2**	**1/16**	01										
058		1/53	01										
070		1/50	01										
079		+1	11										
088	1/49		11										
089	+1		11										
091	1/47		11										
094		1/67	11										
097	1/120		11										
098	1/62		11										
099		1/35	11										
100	1/31		11										
106	2/41		11										
110		1/42	11										
111	1/47		11										
112	1/50		11										
113		1/78	11										
114	1/18		11										
115	+1		11										
115A		+1	11										
116	+1, 1/15		11										
295	+2		02										
296	+1		02										
297	+1		02										
303		2/86	02										

NOTES:

chironomids with deformities / # chironomids examined

+ — indicates the number of non-chironomids having abnormalities

abnormalities are considered chronic if they appear in both the Round 3 and the Round 4 columns

Table 4 — **HABITAT ASSESSMENT FOR *HIGH* GRADIENT STREAMS**

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regimes	All 4 velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (slow is <0.3 m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity / depth regime (usually slow-deep).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) 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
9. Bank Vegetative Protection (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
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
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 X 200
SUB-OPTIMAL	110 X 159
MARGINAL	60 X 109
POOR	< 60

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

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/Available Cover	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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and 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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	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.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank 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
9. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, 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
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
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 X 200
SUB-OPTIMAL	110 X 159
MARGINAL	60 X 109
POOR	< 60

Appendix A — Station Numbers and Locations for the Round 4 Northwest 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 56'38.309"N 75 05'48.808"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
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 74 58'43.178"W	1
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

Appendix A — Station Numbers and Locations for the Round 4 Northwest Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
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
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

Site	Stream	Latitude Longitude	Watershed Management Area
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 74 55'49.813"W	11
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

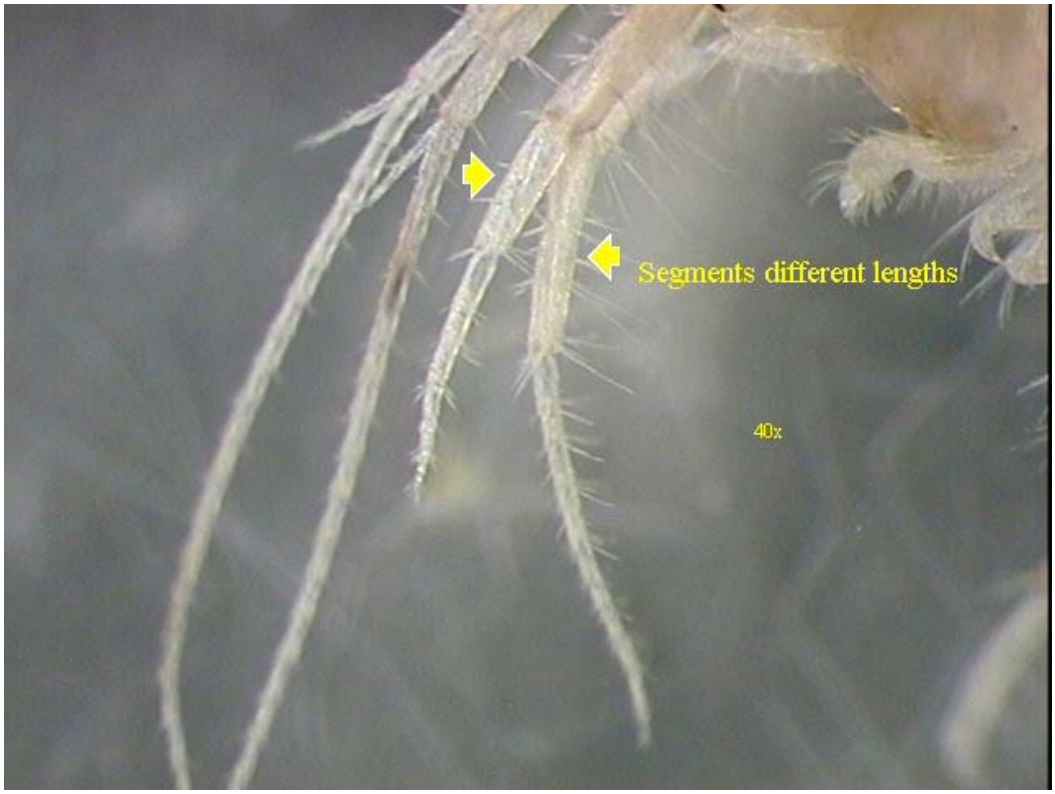
Appendix A — Station Numbers and Locations for the Round 4 Northwest Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
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
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

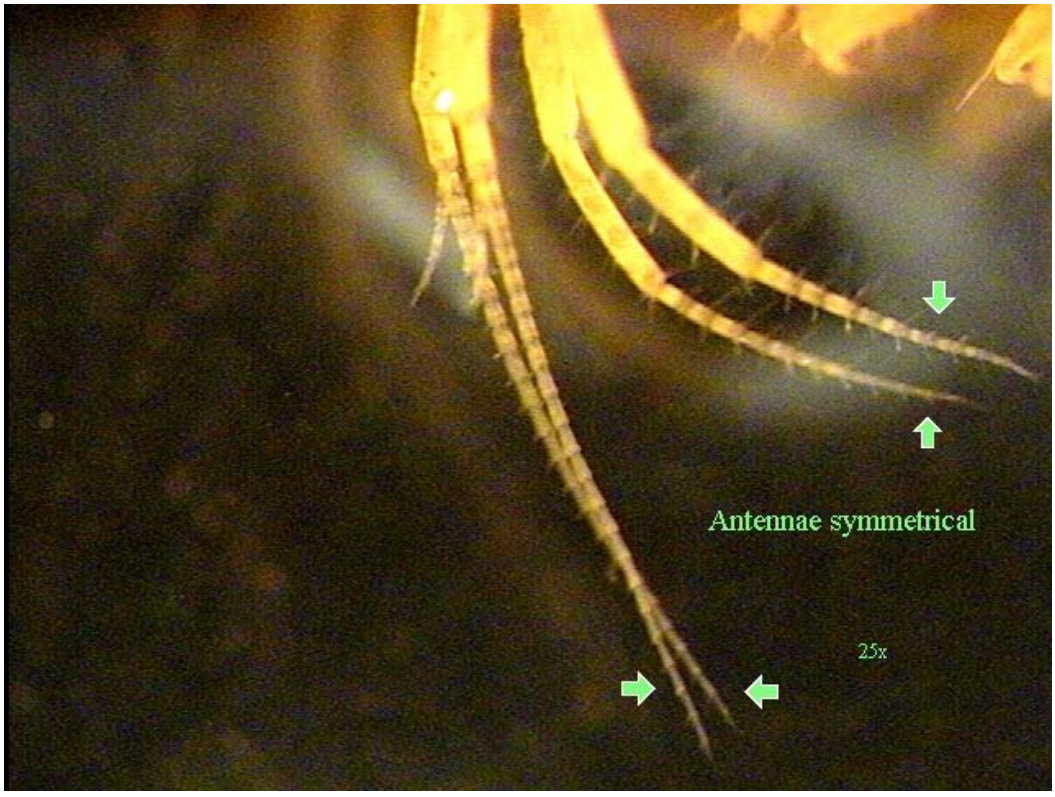
APPENDIX B

Pictures of Morphological Abnormalities in Larval Chironomidae and Amphipoda Recovered in Recent AMNET Surveys

Gammarus fasciatus with second antennae showing different lengths

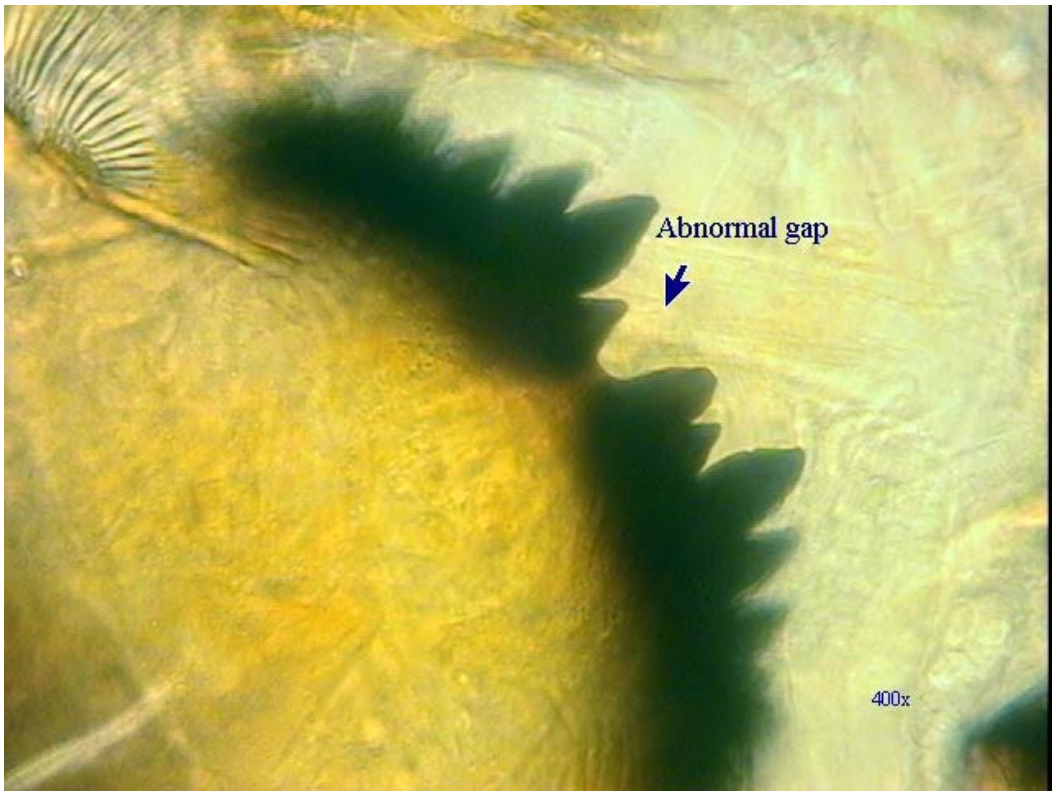


Gammarus fasciatus with normal antennae (showing antennal pairs of same length)

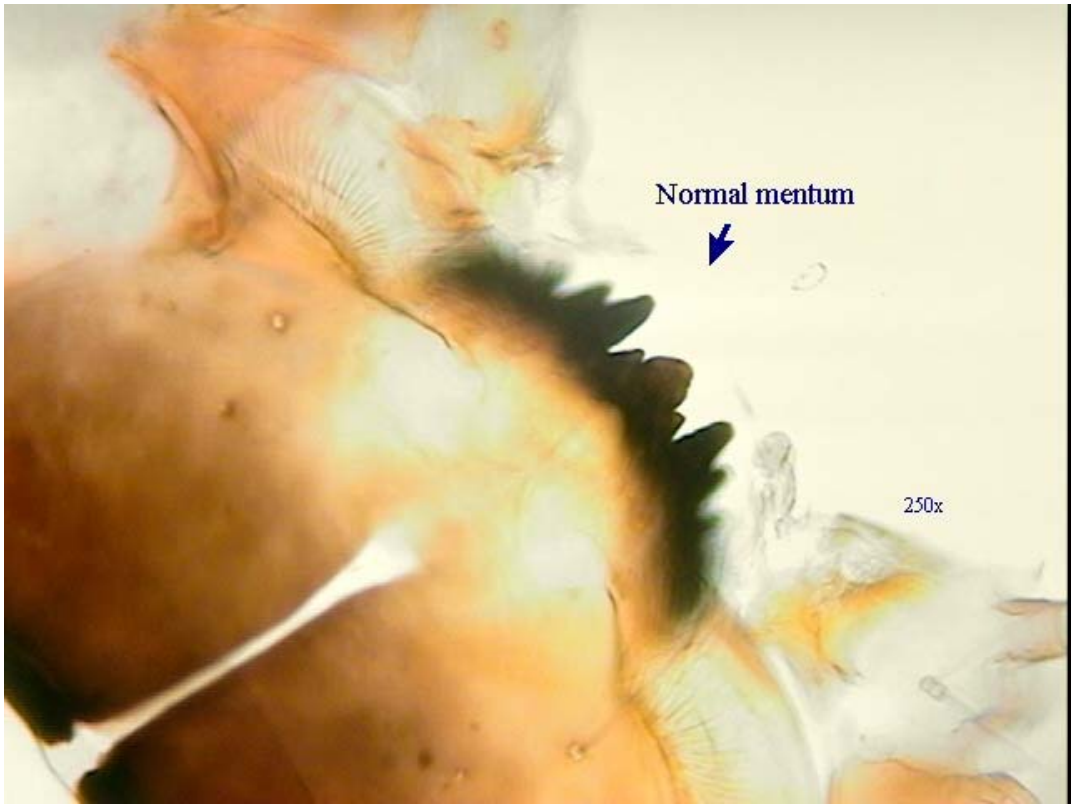


All photographs taken by D.Bryson, NJDEP

Chironomus species with mentum abnormality



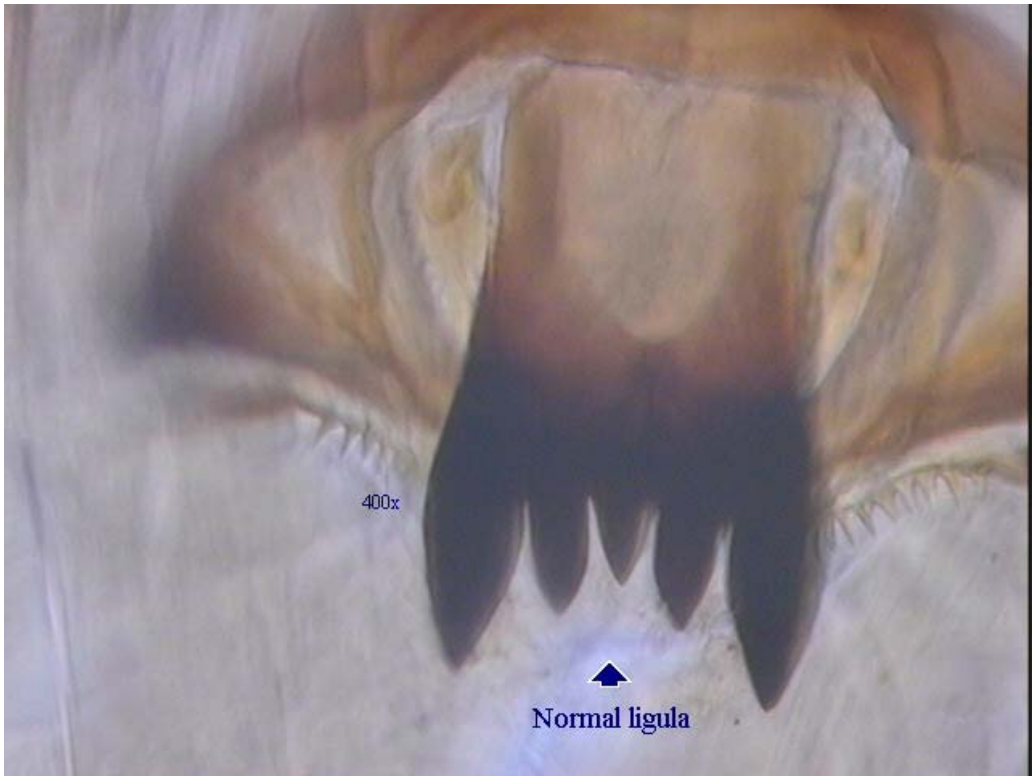
Chironomus species with normal mentum



All photographs taken by D.Bryson, NJDEP

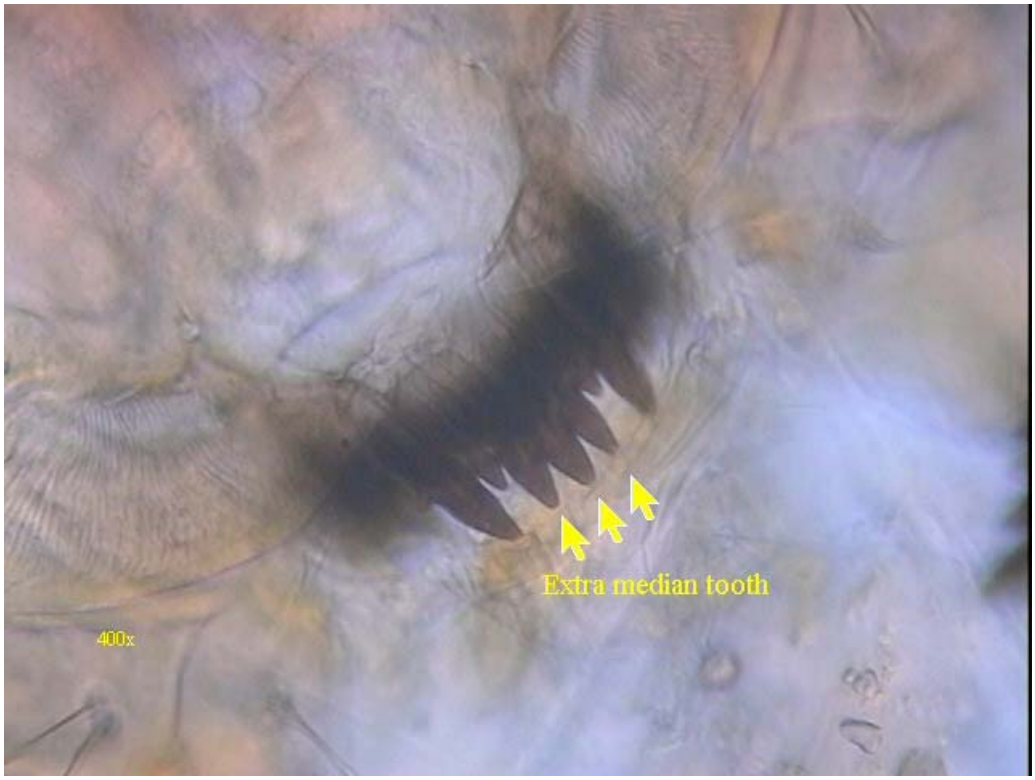
Procladius species with abnormal ligula

Procladius species with normal ligula

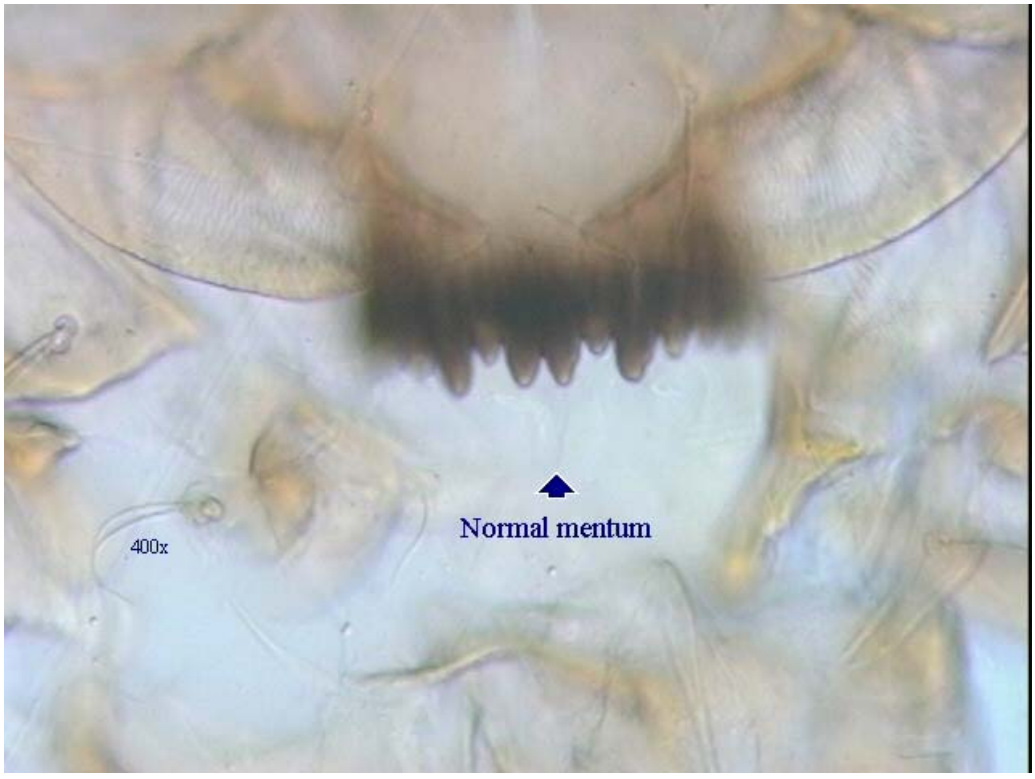


All photographs taken by D.Bryson, NJDEP

Polypedilum species with abnormal mentum



Polypedilum species with normal mentum



All photographs taken by D.Bryson, NJDEP

APPENDIX C

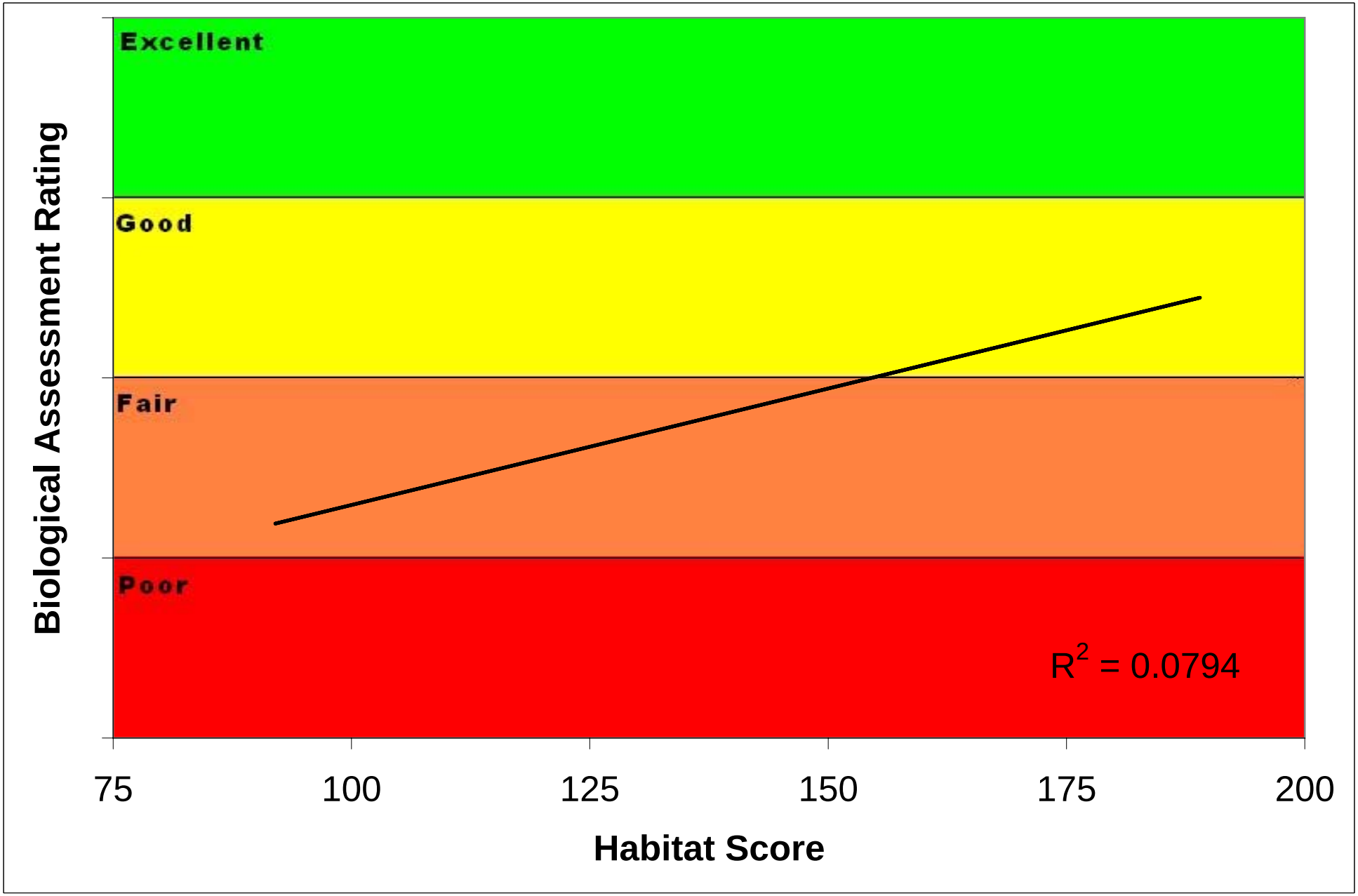
Graphical Comparison of Habitat Assessment Scores versus Biological Assessment Ratings from the Round 4 Northwest Water Region AMNET Study

Comparative Scores of

Biological Assessment Rating vs. Habitat Score

Combined

Round 4

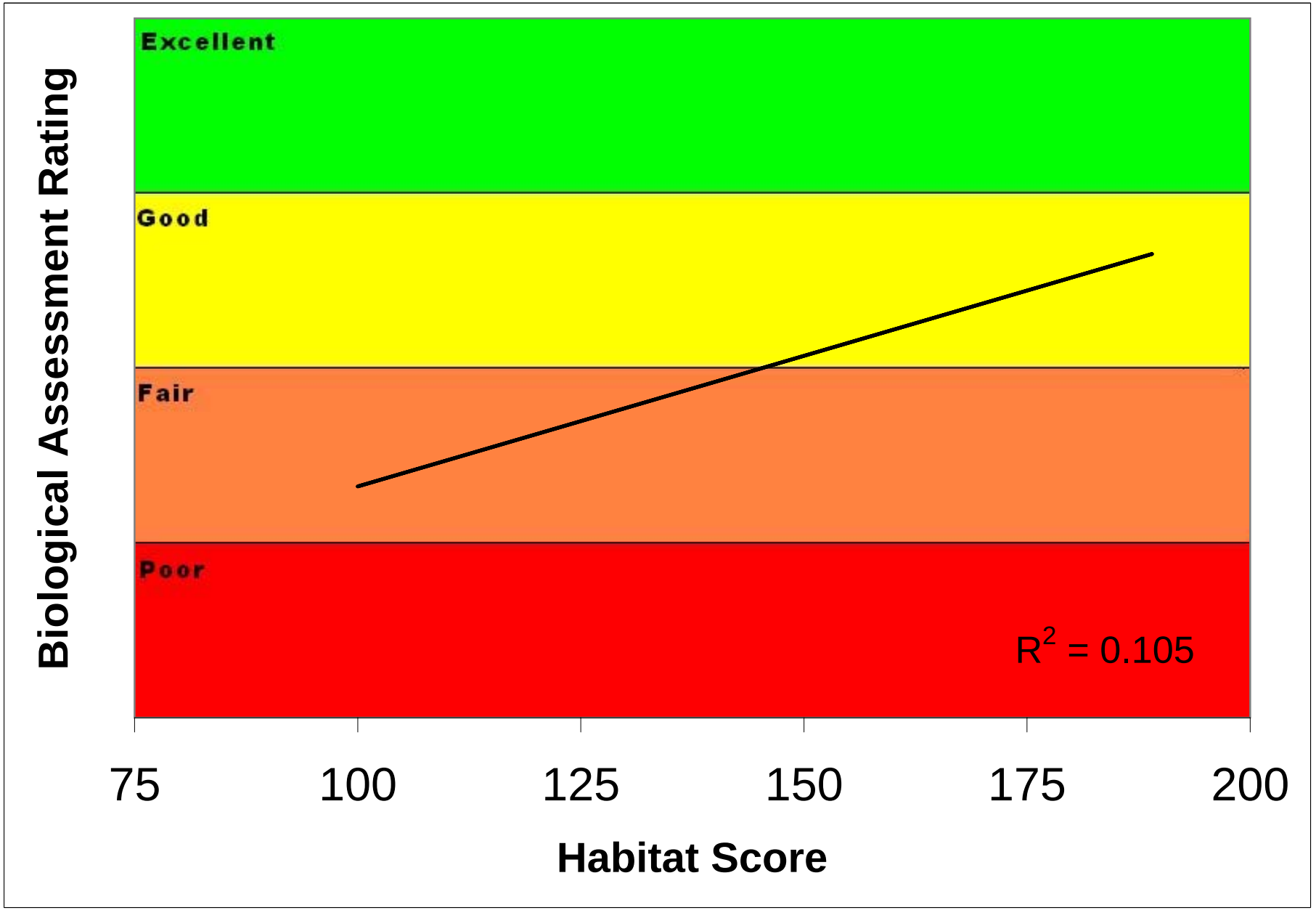


Comparative Scores of

Biological Assessment Rating vs. Habitat Score

WMA 1

Round 4

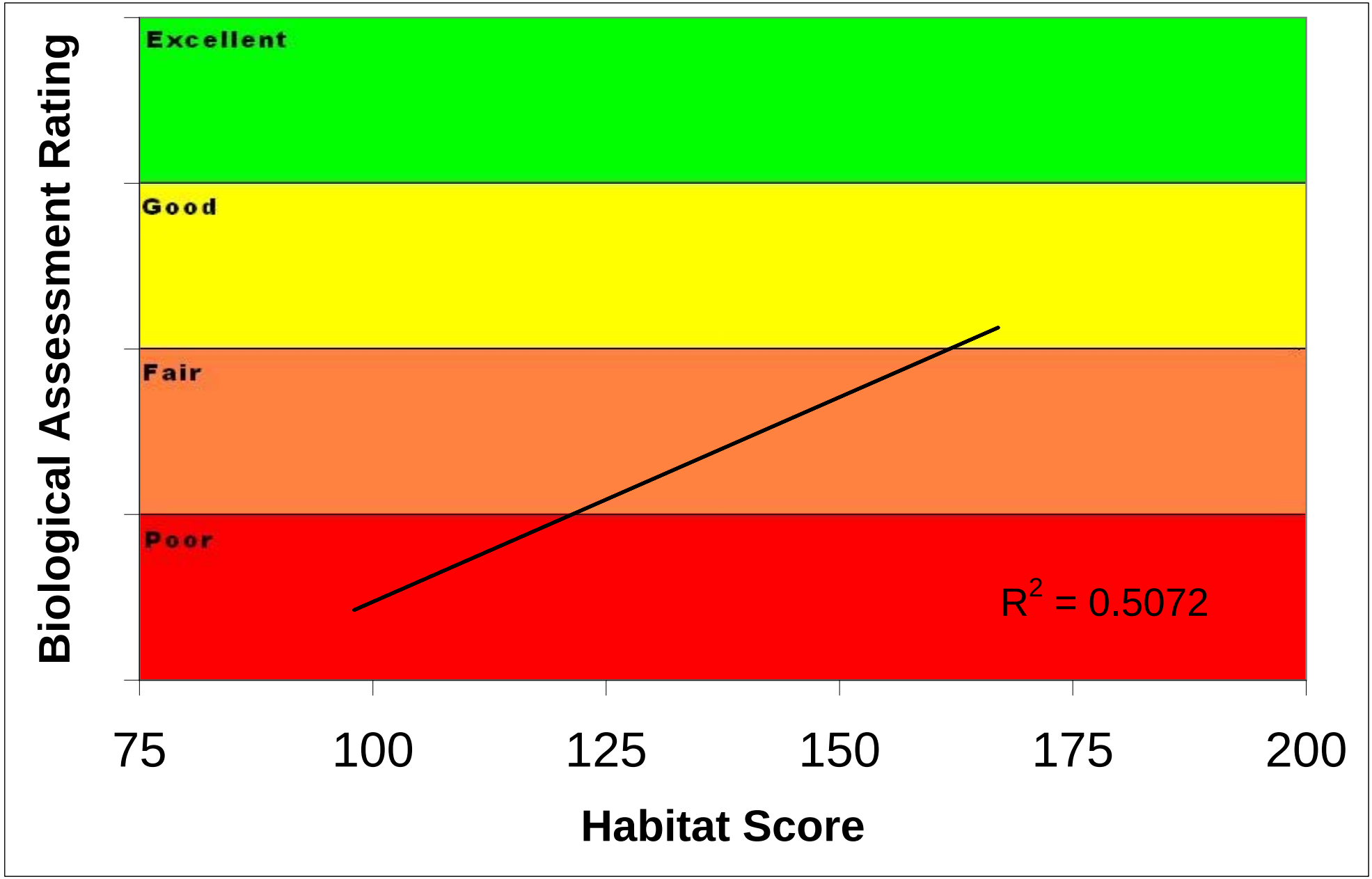


Comparative Scores of

Biological Assessment Rating vs. Habitat Score

WMA 2

Round 4

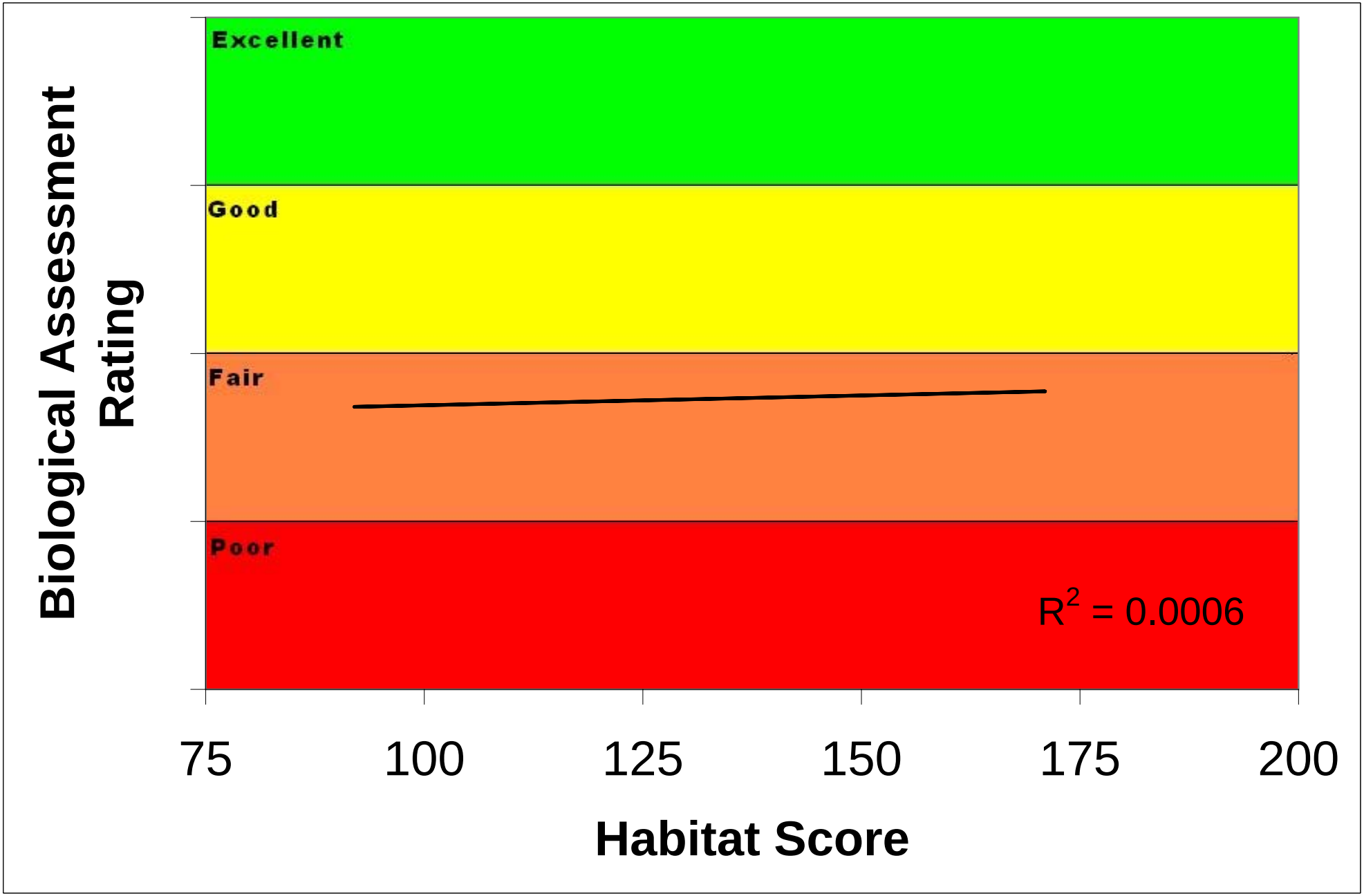


Comparative Scores of

Biological Assessment Rating vs. Habitat Score

WMA 11

Round 4



APPENDIX D

Taxonomic and Statistical Data, Biological Assessments, Habitat Assessment Scores and Observations from the Round 4 Northwest Water Region AMNET Study

(Site numbers, locations, sample dates, and USGS topographic quadrangle, top of page.)

Notes/Definitions:

Statistical data includes those biometric results that are applied to the following ratings.

CPMI	PMI	HGMI
1. Total # of Taxa 2. # of EPT taxa 3. % Ephemeroptera 4. Hilsenhoff Biotic Index (HBI) 5. % clingers	1. Insect taxa 2. Non-insect taxa 3. % Plecoptera + Trichoptera 4. % Diptera excluding Tanytarsini 5. % Mollusca + Amphipoda 6. Beck's Biotic Index (BBI) 7. % filterers	1. # of genera 2. % non-insect genera 3. % sensitive EPT 4. # of scraper genera 5. Hilsenhoff Biotic Index (HBI) 6. # of Attribute 2 genera 7. # of Attribute 3 genera

See METHODS, Table 1, Volume 1.

Other notes:

1. Ck – Creek, Bk – Brook, Br – Branch, R – River, UNT – un-named tributary
2. Habitat observations supplement the habitat assessment scores in Table 2 and Appendix C; Open Canopy = overhead vegetation; water quality measurements taken in field include temperature (°C), pH, dissolved oxygen, conductivity.

AMNET Site # **AN0002** *Stream Name:* **Clove Bk**

Location: **Rt 23; Montague Twp; Sussex County**

Collection Date: *7/12/2007* *USGS Topo Map:* **Port Jervis South**

	Genus	Tolerance Value	Amount
	Helisoma	7	26
	Phaenopsectra	7	26
	Microtendipes	7	14
	Cricotopus	7	12
	Tribelos	5	4
	Paratendipes	8	3
	Physella	9.1	3
	Menetus	6	2
*	Micrasema	2	2
	Stenelmis	5	2
	Dicrotendipes	8	1
	Dubiraphia	6	1
*	Hydropsyche	4	1
*	Mystacides	4	1
	Pisidium	6.8	1
	Rheotanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.78 *# Scrapers:* 6

% Sensitive EPT: 3.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 25.0% *Attribute 3 genera:* 2

HGMI Rating: **30.54** **Fair**

Habitat Analysis: 151 Suboptimal USEPA Protocol

Observations: Water temp: 23.38 C; Cond: 305 umhos; DO: 9.57 mg/L; pH: 8.19 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 41' / <1'; Substrate: gravel, cobble

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Other: fish, macrophytes, periphytes, foam downstream

AMNET Site # **AN0003** *Stream Name:* **Shimers Bk**

Location: **Millville Rd; Montague Twp; Sussex County**

Collection Date: *7/12/2007* *USGS Topo Map:* **Milford**

	Genus	Tolerance Value	Amount
	Microtendipes	7	29
*	Hydropsyche	4	21
	Polypedilum	6	7
	Stenelmis	5	5
*	Chimarra	4	4
	Phaenopsectra	7	4
*	Leuctra	0	3
	Psephenus	4	3
	Stylogomphus	1	3
	Tribelos	5	3
*	Acroneuria	0	2
	Antocha	3	2
*	Maccaffertium	3	2
*	Paragnetina	1	2
	Rheotanytarsus	6	2
	Tanytarsus	6	2
	Atrichopogon	2	1
*	Baetis	6	1
	Boyeria	2	1
	Cricotopus	7	1
	Orthocladius	6	1
	Rhagovelia	9	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.98	*# Scrapers:*	4
% Sensitive EPT:	14.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	0.0%	*Attribute 3 genera:*	5
HGMI Rating:	**52.46**	**Good**	
Habitat Analysis:	182	Optimal	USEPA Protocol

Observations: Water temp: 21.53 C; Cond: 370 umhos; DO: 8.75 mg/L; pH: 8.23 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 14'/<1'; Substrate: gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, periphytes

AMNET Site # **AN0004** ***Stream Name:*** **Little Flat Bk**

Location: **Deckertown Tpk; Montague Twp; Sussex County**

Collection Date: ***7/17/2007*** ***USGS Topo Map:*** **Milford**

	Genus	Tolerance Value	Amount
*	Hydroptila	6	7
	Chironomus	10	6
*	Micrasema	2	6
	Paralauterborniella	8	6
*	Psilotreta	0	6
	Lanthus	5	5
	Tribelos	5	5
	Dicrotendipes	8	4
*	Baetidae	4	3
*	Cheumatopsyche	5	3
	Corydalus	4	3
*	Eurylophella	4	3
	Paratendipes	8	3
	Polypedilum	6	3
	Rheopelopia	4	3
	Tanytarsus	6	3
	Tipula	4	3
*	Caenis	7	2
	Cordulegaster	3	2
	Mesovelia	9	2
	Orthocladius	6	2
	Stylodrilus	10	2
	Chironomidae	6	1
	Chrysops	6	1
	Cricotopus	7	1
	Cryptochironomus	8	1
	Dicranota	3	1
	Eclipidrilus	8	1
	Heterotrissocladius	0	1
*	Lepidostoma	1	1
*	Leptoceridae	4	1
*	Leuctra	0	1
	Limnodrilus	10	1
	Musculium	5	1
*	Neophylax	3	1
*	Paraleptophlebia	1	1
*	Pteronarcys	0	1
	Sialis	4	1
	Stenelmis	5	1
	Tubificidae	10	1

**** (EPT organism)*** ***Taxa Richness:*** 40 ***Population:*** 100

Hilsenhoff Biotic Index (HBI):	5.30	*# Scrapers:*	5
% Sensitive EPT:	33.0%	*Attribute 2 genera:*	5
% Non-Insect Taxa:	12.5%	*Attribute 3 genera:*	8

HGMI Rating: **66.99** **Excellent**

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 18.63 C; Cond: 62 umhos; DO: 7.48 mg/L; pH: 7.17 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 5'/<1'; Substrate: gravel, sand, cobble, silt

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, frogs, crayfish, macrophytes, periphytes

AMNET Site # **AN0005** *Stream Name:* **Little Flat Bk**

Location: **Rt 656 (Shaytown Rd); Sandyston Twp; Sussex County**

Collection Date: ***7/17/2007*** *USGS Topo Map:* **Milford**

	Genus	Tolerance Value	Amount
	Hyalella	8	22
	Caecidotea	8	12
	Amnicola	4.8	7
	Physella	9.1	7
*	Maccaffertium	3	6
*	Helicopsyche	3	4
*	Oecetis	8	4
*	Callibaetis	9	3
	Dugesia	4	3
	Ischnura	9	3
*	Hydropsyche	4	2
	Microtendipes	7	2
*	Mystacides	4	2
	Nigronia	2	2
	Polypedilum	6	2
*	Serratella	2	2
	Unionidae	8	2
	Aulodrilus	8	1
	Basiaeschna	2	1
	Boyeria	2	1
*	Chimarra	4	1
	Helisoma	7	1
	Helobdella	8	1
	Menetus	6	1
	Paraponyx	5	1
*	Perlidae	1	1
	Phaenopsectra	7	1
*	Plauditus	4	1
	Psephenus	4	1
	Stenelmis	5	1
	Stylaria	8	1
	Stylogomphus	1	1

** (EPT organism)* *Taxa Richness:* 32 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.35 *# Scrapers:* 10

% Sensitive EPT: 24.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 34.4% *Attribute 3 genera:* 6

HGMI Rating: **52.58** **Good**

Habitat Analysis: 151 Suboptimal USEPA Protocol

Observations: Water temp: 22.67 C; Cond: 208 umhos; DO: 8.03 mg/L; pH: 7.84 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 14'/<1'; Substrate: cobble, gravel, root mats

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, weeds, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock, rural

Other: fish, frogs, macrophytes

AMNET Site # **AN0005A** ***Stream Name:*** **Little Flat Bk**

Location: **Rt 615; Sandyston Twp; Sussex County**

Collection Date: ***7/25/2007*** ***USGS Topo Map:*** **Culvers Gap**

	Genus	Tolerance Value	Amount
*	Ceratopsyche	4	25
*	Isonychia	2	12
*	Hydropsyche	4	6
	Optioservus	4	6
	Polypedilum	6	5
	Antocha	3	4
*	Cheumatopsyche	5	4
	Atherix	2	3
*	Tricorythodes	4	3
*	Centroptilum	2	2
	Cricotopus	7	2
	Dubiraphia	6	2
	Eukiefferiella	8	2
*	Maccaffertium	3	2
	Prostoma	7	2
	Psephenus	4	2
	Bezzia	6	1
	Calopteryx	6	1
	Corydalus	4	1
	Crangonyx	8	1
	Dicrotendipes	8	1
*	Ephemerella	1	1
*	Glossosoma	0	1
*	Helicopsyche	3	1
	Hemerodromia	6	1
	Lumbricidae	10	1
	Lumbriculus	8	1
	Microtendipes	7	1
*	Mystacides	4	1
	Physella	9.1	1
	Promoresia	2	1
*	Pseudocloeon	4	1
	Rheotanytarsus	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 34 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.23 *# Scrapers:* 7

% Sensitive EPT: 24.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 14.7% *Attribute 3 genera:* 8

HGMI Rating: **71.39** **Excellent**

Habitat Analysis: 189 Optimal USEPA Protocol

Observations: Water temp: 21.12 C; Cond: 257 umhos; DO: 9.02 mg/L; pH: 8.27 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15'/1'; Substrate: gravel, sand, cobble

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds, grasses

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, macrophytes, periphytes, filamentous algae, salamander, purple loosestrife

AMNET Site # **AN0006** *Stream Name:* **Big Flat Bk**

Location: **Rt 560; Sandyston Twp; Sussex County**

Collection Date: *7/25/2007* *USGS Topo Map:* **Culvers Gap**

	Genus	Tolerance Value	Amount
	Polypedilum	6	26
*	Ceratopsyche	4	13
	Cricotopus	7	13
	Atherix	2	6
*	Hydroptila	6	6
	Microtendipes	7	5
	Rheotanytarsus	6	4
	Tanytarsus	6	4
*	Baetis	6	3
*	Epeorus	0	3
	Tvetenia	5	3
*	Acentrella	4	2
*	Agnetina	2	1
	Antocha	3	1
*	Centroptilum	2	1
*	Cheumatopsyche	5	1
	Dicranota	3	1
*	Isonychia	2	1
*	Maccaffertium	3	1
	Naididae	7	1
	Phaenopsectra	7	1
*	Pteronarcys	0	1
	Thienemannimyia	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):		5.15	*# Scrapers:*	3
% Sensitive EPT:		19.0%	*Attribute 2 genera:*	5
% Non-Insect Taxa:		4.2%	*Attribute 3 genera:*	5
HGMI Rating:	**58.91**	**Good**		
Habitat Analysis:	182	Optimal	USEPA Protocol	

Observations: Water temp: 18.81 C; Cond: 90 umhos; DO: 10.0 mg/L; pH: 7.58 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 35'/1'; Substrate: gravel, sand, cobble

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: pipes under bridge

Other: fish, macrophytes, periphytes, filamentous algae

AMNET Site # **AN0007** *Stream Name:* **Flat Bk**

Location: **off of Rt 615; Walpack Twp; Sussex County**

Collection Date: *7/31/2007* *USGS Topo Map:* **Lake Maskenozha**

	Genus	Tolerance Value	Amount
*	Isonychia	2	15
*	Cheumatopsyche	5	11
*	Ceratopsyche	4	9
	Cricotopus	7	9
*	Maccaffertium	3	7
	Rheotanytarsus	6	7
	Gyraulus	6	6
	Optioservus	4	5
*	Plauditus	4	4
	Polypedilum	6	4
	Lumbriculus	8	3
*	Serratella	2	3
	Atherix	2	2
*	Baetis	6	1
*	Epeorus	0	1
*	Helicopsyche	3	1
*	Leuctra	0	1
*	Micrasema	2	1
	Microtendipes	7	1
*	Neophylax	3	1
*	Neureclipsis	7	1
	Nigronia	2	1
*	Oecetis	8	1
	Ophiogomphus	1	1
	Psephenus	4	1
	Rheocricotopus	6	1
	Tanytarsus	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.37	*# Scrapers:*	6
% Sensitive EPT:	37.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	7.1%	*Attribute 3 genera:*	9
HGMI Rating:	**70.68**	**Excellent**	
Habitat Analysis:	161	Optimal	USEPA Protocol

Observations: Water temp: 20.10 C; Cond: 188 umhos; DO: 10.49 mg/L; pH: 8.30 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 52'/<1'; Substrate: gravel, sand, cobble

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: periphytes, filamentous algae

AMNET Site # **AN0008** *Stream Name:* **Flat Bk**

Location: **adjacent to Rt 615; Walpack Twp; Sussex County**

Collection Date: *7/31/2007* *USGS Topo Map:* **Flatbrookville**

	Genus	Tolerance Value	Amount
*	Ceratopsyche	4	19
	Polypedilum	6	18
*	Hydropsyche	4	10
*	Epeorus	0	8
*	Heterocloeon	2	5
*	Isonychia	2	5
*	Chimarra	4	4
*	Lype	2	4
*	Maccaffertium	3	3
	Corydalus	4	2
*	Micrasema	2	2
	Optioservus	4	2
	Orthocladius	6	2
	Rheotanytarsus	6	2
	Simulium	6	2
	Tvetenia	5	2
*	Acroneuria	0	1
*	Brachycentrus	1	1
	Dubiraphia	6	1
*	Glossosoma	0	1
	Gyrinus	4	1
	Menetus	6	1
*	Paragnetina	1	1
*	Perlidae	1	1
*	Rhyacophila	1	1
	Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI):	3.73	*# Scrapers:*	5
% Sensitive EPT:	37.0%	*Attribute 2 genera:*	6
% Non-Insect Taxa:	7.7%	*Attribute 3 genera:*	6

HGMI Rating: **73.70** **Excellent**

Habitat Analysis: 175 Optimal USEPA Protocol

Observations: Water temp: 21.77 C; Cond: 166 umhos; DO: 9.74 mg/L; pH: 8.44 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 45' / 2'; Substrate: cobble, gravel

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, grasses

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: periphytes

AMNET Site # **AN0009** *Stream Name:* **Van Campens Bk**

Location: **Flatbrookville -Middleville Rd; Walpack Twp; Sussex County**

Collection Date: *8/8/2007* *USGS Topo Map:* **Flatbrookville**

	Genus	Tolerance Value	Amount
	Polypedilum	6	31
	Nais	8	10
	Lumbricidae	10	6
	Micropsectra	7	6
	Phaenopsectra	7	5
	Cricotopus	7	4
*	Diplectrona	0	4
*	Eurylophella	4	4
	Tanytarsus	6	4
	Thienemannimyia	6	3
	Limnophyes	8	2
	Microtendipes	7	2
	Nigronia	2	2
	Tipula	4	2
	Cardiocladius	5	1
	Ceratopogonidae	6	1
	Clinocera	6	1
	Cordulegaster	3	1
	Cryptochironomus	8	1
	Enchytraeidae	10	1
	Hexatoma	2	1
*	Leuctra	0	1
*	Maccaffertium	3	1
*	Paraleptophlebia	1	1
	Parametriocnemus	5	1
	Paratendipes	8	1
	Pentaneura	6	1
*	Polycentropus	6	1
	Pristina	8	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.08 *# Scrapers:* 3

% Sensitive EPT: 12.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 13.8% *Attribute 3 genera:* 7

HGMI Rating: **52.41** **Good**

Habitat Analysis: 172 Optimal USEPA Protocol

Observations: Water temp: 25.97 C; Cond: 28 umhos; DO: 7.26 mg/L; pH: 6.51 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 11' / 1'; Substrate: cobble, gravel, boulder, bedrock

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: macrophytes, periphytes

AMNET Site # **AN0010** *Stream Name:* **Van Campens Bk**

Location: **Mill Rd; Hardwick Twp; Warren County**

Collection Date: ***8/8/2007*** *USGS Topo Map:* **Flatbrookville**

	Genus	Tolerance Value	Amount
*	Maccaffertium	3	16
	Polypedilum	6	7
*	Psilotreta	0	7
	Tipula	4	7
*	Eurylophella	4	5
*	Glossosoma	0	5
*	Stenacron	4	5
*	Acroneuria	0	3
	Hexatoma	2	3
*	Hydropsyche	4	3
*	Agnetina	2	2
	Eukiefferiella	8	2
*	Leuctra	0	2
	Orthocladius	6	2
*	Acerpenna	4	1
	Brillia	5	1
*	Cheumatopsyche	5	1
*	Chimarra	4	1
	Corydalus	4	1
	Cricotopus	7	1
	Ectopria	5	1
*	Goera	0	1
	Lanthus	5	1
	Menetus	6	1
	Oulimnius	4	1
	Psephenus	4	1
*	Pteronarcys	0	1
	Rheopelopia	4	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 84

Hilsenhoff Biotic Index (HBI): 3.23 *# Scrapers:* 10

% Sensitive EPT: 58.3% *Attribute 2 genera:* 7

% Non-Insect Taxa: 3.4% *Attribute 3 genera:* 7

HGMI Rating: **90.37** **Excellent**

Habitat Analysis: 166 Optimal USEPA Protocol

Observations: Water temp: 19.97 C; Cond: 39 umhos; DO: 9.56 mg/L; pH: 6.94 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 18' / 1'; Substrate: cobble, gravel, boulder

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested (Delaware Water Gap Recreation Area)

Other: frogs, macrophytes, periphytes

AMNET Site # **AN0011** *Stream Name:* **Van Campens Bk**

Location: **Depew Rec Site Rd (Old Mine Rd); Hardwick Twp; Warren & Sussex County**

Collection Date: ***8/8/2007*** *USGS Topo Map:* **Bushkill**

	Genus	Tolerance Value	Amount
*	Psilotreta	0	17
	Psephenus	4	13
*	Maccaffertium	3	12
*	Leucrocuta	1	8
*	Baetis	6	7
	Polypedilum	6	6
*	Ceratopsyche	4	5
	Hexatoma	2	5
*	Leuctra	0	4
*	Agnetina	2	3
*	Isonychia	2	3
*	Chloroperlidae	1	2
*	Dolophilodes	0	2
*	Glossosoma	0	2
*	Pycnopsyche	4	2
*	Acentrella	4	1
*	Acroneuria	0	1
	Antocha	3	1
	Clinocera	6	1
*	Epeorus	0	1
	Microtendipes	7	1
	Promoresia	2	1
	Rheotanytarsus	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI): 2.60 *# Scrapers:* 6

% Sensitive EPT: 65.0% *Attribute 2 genera:* 8

% Non-Insect Taxa: 0.0% *Attribute 3 genera:* 7

HGMI Rating: **86.84** **Excellent**

Habitat Analysis: 176 Optimal USEPA Protocol

Observations: Water temp: 20.72 C; Cond: 59 umhos; DO: 6.59 mg/L; pH: 7.19 SU
Clarity: clear; Flow Rate: moderate; Width/Depth: 23' / 1'; Substrate: cobble, gravel, sand
Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds
Stream Gradient: High Gradient Stream; Land Uses: forested

AMNET Site # **AN0012** *Stream Name:* **Dunnfield Ck**

Location: **off of I-80 Westbound (foot bridge at rest area); Hardwick Twp; Warren County**

Collection Date: *8/8/2007* *USGS Topo Map:* **Stroudsburg**

	Genus	Tolerance Value	Amount
*	Glossosoma	0	20
	Polypedilum	6	9
*	Ceratopsyche	4	8
*	Lepidostoma	1	8
*	Baetis	6	7
*	Leuctra	0	6
	Planariidae	4	6
	Microtendipes	7	5
*	Hydropsychidae	4	4
	Nais	8	3
*	Pteronarcys	0	3
*	Dolophilodes	0	2
	Phaenopsectra	7	2
*	Sweltsa	0	2
*	Tallaperla	0	2
*	Acroneuria	0	1
	Chelifera	6	1
	Dicranota	3	1
*	Epeorus	0	1
	Hemerodromia	6	1
	Hexatoma	2	1
	Lumbriculus	8	1
*	Maccaffertium	3	1
	Micropsectra	7	1
	Parametriocnemus	5	1
	Tanytarsus	6	1
	Thienemannimyia	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.06 *# Scrapers:* 3

% Sensitive EPT: 53.0% *Attribute 2 genera:* 7

% Non-Insect Taxa: 10.7% *Attribute 3 genera:* 5

HGMI Rating: **75.02** **Excellent**

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 19.52 C; Cond: 35 umhos; DO: 9.38 mg/L; pH: 6.72 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 14' / 1'; Substrate: cobble, gravel, silt

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: macrophytes, salamander

AMNET Site # **AN0013** *Stream Name:* **Stony Bk**

Location: **Stark Rd; Knowlton Twp; Warren County**

Collection Date: ***6/12/2008*** *USGS Topo Map:* **Portland**

	Genus	Tolerance Value	Amount
*	Acerpenna	4	12
*	Centroptilum	2	11
*	Glossosoma	0	11
*	Epeorus	0	10
*	Baetis	6	8
	Rheopelopia	4	8
*	Dannella	2	4
*	Leuctra	0	4
*	Leucrocuta	1	3
*	Pycnopsyche	4	3
	Cambaridae	5	2
	Cricotopus	7	2
*	Lepidostoma	1	2
	Paratendipes	8	2
	Psephenus	4	2
	Trepobates	8	2
*	Acentrella	4	1
*	Acroneuria	0	1
*	Apatania	3	1
*	Baetidae	4	1
*	Cheumatopsyche	5	1
*	Cinygmula	4	1
	Eclipidrilus	8	1
*	Eurylophella	4	1
*	Isoperla	2	1
*	Leptophlebiidae	2	1
*	Maccaffertium	3	1
	Pentaneura	6	1
*	Serratella	2	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI): 2.90 *# Scrapers:* 7

% Sensitive EPT: 79.0% *Attribute 2 genera:* 9

% Non-Insect Taxa: 6.7% *Attribute 3 genera:* 9

HGMI Rating: **92.83** **Excellent**

Habitat Analysis: 148 Suboptimal USEPA Protocol

Observations: Water temp: 13.24 C; Cond: 78 umhos; DO: 6.88 mg/L; pH: 5.96 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 6'/<1'; Substrate: cobble, gravel, sand, boulder

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: frogs, crayfish, salamanders

AMNET Site # **AN0014** *Stream Name:* **UNT to Paulins Kill**

Location: **Rt 623; Lafayette Twp; Sussex County**

Collection Date: *8/9/2007* *USGS Topo Map:* **Newton East**

	Genus	Tolerance Value	Amount
	Gammarus	6	19
	Gillia	8	10
*	Helicopsyche	3	10
	Microtendipes	7	7
	Trichocorixa	9	6
	Fossaria	6	5
	Amnicola	4.8	4
	Polypedilum	6	4
	Stenelmis	5	4
	Limnophila	3	3
*	Oecetis	8	3
*	Cheumatopsyche	5	2
	Cladotanytarsus	7	2
*	Lepidostoma	1	2
*	Mystacides	4	2
	Psephenus	4	2
*	Acerpenna	4	1
	Antocha	3	1
*	Brachycentrus	1	1
	Corydalus	4	1
	Dubiraphia	6	1
*	Hydroptila	6	1
	Lanthus	5	1
	Limnodrilus	10	1
	Optioservus	4	1
	Oulimnius	4	1
	Physella	9.1	1
*	Polycentropus	6	1
	Prostoma	7	1
	Sphaerium	8	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 31 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.78 *# Scrapers:* 9

% Sensitive EPT: 21.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 25.8% *Attribute 3 genera:* 4

HGMI Rating: **57.03** **Good**

Habitat Analysis: 155 Suboptimal USEPA Protocol

Observations: Water temp: 23.44 C; Cond: 456 umhos; DO: 6.17 mg/L; pH: 7.70 SU

Clarity: clear, cedar; Flow Rate: fast; Width/Depth: 21' / < 1'; Substrate: gravel, sand, silt, snags

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, crayfish, macrophytes

AMNET Site # **AN0015** *Stream Name:* **Paulins Kill**

Location: **Rt 663; Lafayette Twp; Sussex County**

Collection Date: ***8/9/2007*** *USGS Topo Map:* **Newton East**

	Genus	Tolerance Value	Amount
	Rheotanytarsus	6	14
	Gammarus	6	12
	Microtendipes	7	11
	Enallagma	9	10
	Limnodrilus	10	9
	Polypedilum	6	6
	Hyalella	8	5
	Caecidotea	8	4
*	Hydroptila	6	4
	Physella	9.1	4
*	Cheumatopsyche	5	3
	Dubiraphia	6	3
	Musculium	5	2
	Sphaerium	8	2
	Spirosperma	10	2
	Stylodrilus	10	2
	Calopteryx	6	1
	Helobdella	8	1
	Menetus	6	1
	Nais	8	1
	Rheopelopia	4	1
	Tubifex	10	1
	Valvata	2	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.24 *# Scrapers:* 5

% Sensitive EPT: 4.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 60.9% *Attribute 3 genera:* 0

HGMI Rating: **18.70** **Poor**

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 22.53 C; Cond: 375 umhos; DO: 3.21 mg/L; pH: 7.14 SU

Clarity: slightly turbid, cedar-brown; Flow Rate: moderate; Width/Depth: 30' / 1- 2'; Substrate: gravel, sand, silt, snags

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested, agriculture-cropland (corn)

Pipes / Ditches: storm sewers

Other: fish, macrophytes; deteriorating concrete on bridge; some downed trees in stream; adj to Rail to Trail park

AMNET Site # **AN0016** *Stream Name:* **UNT to Paulins Kill**

Location: **Meadows Rd; Lafayette Twp; Sussex County**

Collection Date: ***8/9/2007*** *USGS Topo Map:* **Newton East**

	Genus	Tolerance Value	Amount
	Stenelmis	5	16
*	Hydropsyche	4	14
	Polypedilum	6	13
	Caecidotea	8	12
*	Chimarra	4	12
*	Cheumatopsyche	5	9
	Microtendipes	7	8
	Psephenus	4	3
	Thienemannimyia	6	2
	Antocha	3	1
	Chelifera	6	1
	Dubiraphia	6	1
	Gammarus	6	1
	Hemerodromia	6	1
	Limnodrilus	10	1
	Optioservus	4	1
	Orthocladiinae	5	1
	Pisidium	6.8	1
	Rheotanytarsus	6	1
	Tabanus	5	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.47 *# Scrapers:* 3

% Sensitive EPT: 12.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 20.0% *Attribute 3 genera:* 0

HGMI Rating: **31.55** **Fair**

Habitat Analysis: 151 Suboptimal USEPA Protocol

Observations: Water temp: 22.00 C; Cond: 384 umhos; DO: 5.00 mg/L; pH: 7.35 SU

Clarity: clear, cedar; Flow Rate: moderate; Width/Depth: 11' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, weeds, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, crayfish, periphytes

AMNET Site # **AN0017** *Stream Name:* **Culvers Ck**

Location: **Rt 206; Frankford Twp; Sussex County**

Collection Date: *7/25/2007* *USGS Topo Map:* **Culvers Gap**

	Genus	Tolerance Value	Amount
*	Hydropsyche	4	29
	Gammarus	6	25
	Simulium	6	17
*	Chimarra	4	10
*	Cheumatopsyche	5	7
	Amnicola	4.8	2
	Hemerodromia	6	2
	Nais	8	2
	Caecidotea	8	1
	Ischnura	9	1
	Limonia	6	1
	Lymnaeidae	6	1
	Paratanytarsus	6	1
	Rheotanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.22	*# Scrapers:*	2
% Sensitive EPT:	10.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	35.7%	*Attribute 3 genera:*	0

HGMI Rating: **23.82** **Fair**

Habitat Analysis: 136 Suboptimal USEPA Protocol

Observations: Water temp: 20.31 C; Cond: 113 umhos; DO: 5.85 mg/L; pH: 6.67 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 13' / 1'; Substrate: gravel, sand, cobble

Canopy: partly open; Bank Stability: good; Bank Vegetation: shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Downstream of Impoundment: Lake Owassa

Other: fish, macrophytes, periphytes, filamentous algae, purple loosestrife

AMNET Site # **AN0018** *Stream Name:* **Culvers Ck**

Location: **Long Bridge Rd; Frankford Twp; Sussex County**

Collection Date: *7/25/2007* *USGS Topo Map:* **Culvers Gap**

	Genus	Tolerance Value	Amount
	Caecidotea	8	14
	Tanytarsus	6	14
	Limnodrilus	10	7
	Epicordulia	5.6	5
	Musculium	5	5
	Rheotanytarsus	6	5
	Paratendipes	8	4
	Physella	9.1	4
	Stenelmis	5	4
	Amnicola	4.8	3
	Helisoma	7	3
	Nais	8	3
	Dromogomphus	4	2
	Eclipidrilus	8	2
	Enallagma	9	2
	Ferrissia	7	2
	Gammarus	6	2
	Phaenopsectra	7	2
	Sphaerium	8	2
	Stylodrilus	10	2
	Tubificidae	10	2
	Chironomus	10	1
	Corydalus	4	1
	Cryptochironomus	8	1
	Enchytraeidae	10	1
*	Lype	2	1
	Menetus	6	1
	Microvelia	6	1
*	Oecetis	8	1
	Oulimnius	4	1
	Parametriocnemus	5	1
	Polypedilum	6	1

** (EPT organism)* *Taxa Richness:* 32 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.04 *# Scrapers:* 8

% Sensitive EPT: 2.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 46.9% *Attribute 3 genera:* 5

HGMI Rating: **38.98** **Fair**

Habitat Analysis: 133 Suboptimal USEPA Protocol

Observations: Water temp: 24.30 C; Cond: 185 umhos; DO: 7.44 mg/L; pH: 7.48 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / 1'; Substrate: cobble, gravel, sand, silt, root mats

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: fish, periphytes; small dam created by logs and trash

AMNET Site # **AN0019** *Stream Name:* **Dry Bk**

Location: **Rt 519; Frankford Twp; Sussex County**

Collection Date: *7/17/2007* *USGS Topo Map:* **Branchville**

	Genus	Tolerance Value	Amount
	Argia	6	19
	Tanytarsus	6	15
	Dicrotendipes	8	10
	Rheotanytarsus	6	8
	Phaenopsectra	7	5
	Polypedilum	6	5
*	Baetidae	4	3
	Dubiraphia	6	3
	Hyalella	8	3
	Trichocorixa	9	3
	Bezzia	6	2
	Boyeria	2	2
	Enallagma	9	2
	Gomphus	5	2
	Microtendipes	7	2
	Procladius	9	2
	Rheopelopia	4	2
	Ablabesmyia	8	1
	Amnicola	4.8	1
	Eclipidrilus	8	1
	Mesovelia	9	1
*	Mystacides	4	1
	Paratendipes	8	1
	Physella	9.1	1
	Sialis	4	1
	Stempellinella	6	1
	Tribelos	5	1
	Tubificidae	10	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 99

Hilsenhoff Biotic Index (HBI):	6.44	*# Scrapers:*	4
% Sensitive EPT:	4.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	17.9%	*Attribute 3 genera:*	5

HGMI Rating: **40.93** **Fair**

Habitat Analysis: 124 Suboptimal USEPA Protocol

Observations: Water temp: 21.72 C; Cond: 261 umhos; DO: 6.64 mg/L; pH: 7.32 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 16'/<1-1'; Substrate: gravel, sand, cobble, undercut banks

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland

Other: fish, frogs, macrophytes, periphytes, filamentous algae

AMNET Site # **AN0021** *Stream Name:* **Paulins Kill**

Location: **Rt 626; Hampton Twp; Sussex County**

Collection Date: ***8/14/2007*** *USGS Topo Map:* **Newton West**

	Genus	Tolerance Value	Amount
	Cura	4	21
*	Hydropsyche	4	13
*	Cheumatopsyche	5	7
*	Ceratopsyche	4	6
	Polypedilum	6	6
*	Serratella	2	6
	Stenelmis	5	6
*	Macrostemum	3	5
*	Brachycentrus	1	4
	Promoresia	2	4
	Cardiocladius	5	3
	Psephenus	4	3
	Rheotanytarsus	6	3
	Simulium	6	3
*	Chimarra	4	2
*	Heterocloeon	2	2
*	Acerpenna	4	1
	Amnicola	4.8	1
*	Caenis	7	1
*	Micrasema	2	1
	Nilotanypus	6	1
	Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.09	*# Scrapers:*	5
% Sensitive EPT:	17.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:	13.6%	*Attribute 3 genera:*	3
HGMI Rating:	**54.63**	**Good**	
Habitat Analysis:	168	Optimal	USEPA Protocol

Observations: Water temp: 20.36 C; Cond: 481 umhos; DO: 8.31 mg/L; pH: 7.95 SU

Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 27' / 1 - 2'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: filamentous algae, macrophytes, periphytes

AMNET Site # **AN0022** *Stream Name:* **Paulins Kill**

Location: **Rt 614; Stillwater Twp; Sussex County**

Collection Date: ***8/15/2007*** *USGS Topo Map:* **Newton West**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	38
	Cura	4	26
	Polypedilum	6	15
	Hemerodromia	6	5
*	Chimarra	4	3
	Musculium	5	3
	Petrophila	5	3
	Stenelmis	5	2
	Helobdella	8	1
*	Hydropsyche	4	1
	Limnodrilus	10	1
	Nais	8	1
	Simuliidae	6	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.94	*# Scrapers:*	2
% Sensitive EPT:	3.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	30.8%	*Attribute 3 genera:*	0
HGMI Rating:	**26.51**	**Fair**	
Habitat Analysis:	140	Suboptimal	USEPA Protocol

Observations: Water temp: 23.07 C; Cond: 377 umhos; DO: 7.61 mg/L; pH: 7.81 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 100' / 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested, ball field and bathing beach on lake

Downstream of Impoundment: Paulinskill Lake

Other: periphytes; weir

AMNET Site # **AN0023** *Stream Name:* **Troy Bk**

Location: **outlet of Swartswood Lk; Stillwater Twp; Sussex County**

Collection Date: *8/15/2007* *USGS Topo Map:* **Newton West**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	19
*	Serratella	2	19
	Polypedilum	6	15
*	Chimarra	4	14
*	Hydropsyche	4	13
*	Maccaffertium	3	7
*	Ceratopsyche	4	4
	Corydalus	4	3
	Simulium	6	2
	Amnicola	4.8	1
*	Oecetis	8	1
	Pseudochironomus	5	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.15 *# Scrapers:* 3

% Sensitive EPT: 41.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 7.7% *Attribute 3 genera:* 3

HGMI Rating: **47.97** **Good**

Habitat Analysis: 164 Optimal USEPA Protocol

Observations: Water temp: 24.75 C; Cond: 209 umhos; DO: 7.33 mg/L; pH: 8.43 SU

Clarity: clear, greyish; Flow Rate: fast; Width/Depth: 21' / 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Downstream of Impoundment: Swartswood Lake

Other: filamentous algae; weir

AMNET Site # **AN0023A** *Stream Name:* **UNT to Troy Bk**

Location: **Swartswood Rd (upstream of Swartswood Lk); Stillwater Twp; Sussex County**

Collection Date: ***8/15/2007*** *USGS Topo Map:* **Newton West**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	29
*	Ceratopsyche	4	13
*	Isonychia	2	8
*	Acroneuria	0	6
*	Chimarra	4	5
*	Hydropsyche	4	5
	Rheotanytarsus	6	5
*	Maccaffertium	3	4
*	Glossosoma	0	3
	Polypedilum	6	3
	Prostoma	7	3
*	Baetis	6	2
	Corydalus	4	2
	Stenelmis	5	2
	Antocha	3	1
	Brillia	5	1
	Chelifera	6	1
	Eclipidrilus	8	1
	Ferrissia	7	1
	Macronychus	2	1
	Mesovelia	9	1
*	Oecetis	8	1
	Physella	9.1	1
*	Polycentropus	6	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.27	*# Scrapers:*	6
% Sensitive EPT:	30.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	16.7%	*Attribute 3 genera:*	5
HGMI Rating:	**56.90**	**Good**	
Habitat Analysis:	162	Optimal	USEPA Protocol

Observations: Water temp: 19.40 C; Cond: 141 umhos; DO: 8.72 mg/L; pH: 7.67 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 23' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: crayfish, periphytes

AMNET Site # **AN0024** *Stream Name:* **Trout Bk**

Location: **Rt 612 & 521; Stillwater Twp; Sussex County**

Collection Date: ***8/15/2007*** *USGS Topo Map:* **Newton West**

	Genus	Tolerance Value	Amount
*	Helicopsyche	3	21
	Psephenus	4	14
*	Perlidae	1	8
	Polypedilum	6	8
*	Psilotreta	0	5
	Rheotanytarsus	6	5
	Stenelmis	5	4
	Diamesa	5	3
*	Glossosoma	0	3
*	Leuctra	0	3
*	Paragnetina	1	3
*	Cheumatopsyche	5	2
*	Maccaffertium	3	2
	Microtendipes	7	2
	Nigronia	2	2
*	Acroneuria	0	1
*	Apatania	3	1
	Cricotopus	7	1
*	Epeorus	0	1
	Hexatoma	2	1
	Lanthus	5	1
	Optioservus	4	1
	Orthocladius	6	1
	Phaenopsectra	7	1
	Prostoma	7	1
*	Pteronarcys	0	1
*	Rhyacophila	1	1
*	Tallaperla	0	1
	Tanytarsus	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.29 *# Scrapers:* 8

% Sensitive EPT: 51.0% *Attribute 2 genera:* 9

% Non-Insect Taxa: 3.3% *Attribute 3 genera:* 8

HGMI Rating: **90.27** **Excellent**

Habitat Analysis: 164 Optimal USEPA Protocol

Observations: Water temp: 17.56 C; Cond: 118 umhos; DO: 8.76 mg/L; pH: 7.57 SU
Clarity: clear; Flow Rate: moderate; Width/Depth: 16' / 1'; Substrate: cobble, gravel, sand
Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds
Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock, rural

AMNET Site # **AN0025** *Stream Name:* **Paulins Kill**

Location: **off Sunset Hill Rd (USGS gauge); Blairstown Twp; Warren County**

Collection Date: ***8/16/2007*** *USGS Topo Map:* **Blairstown**

	Genus	Tolerance Value	Amount
	Amnicola	4.8	39
	Gammarus	6	17
*	Caenis	7	5
*	Cheumatopsyche	5	4
	Elimia	2	4
	Lumbriculus	8	4
*	Ceratopsyche	4	3
	Musculium	5	3
	Stenelmis	5	3
*	Lepidostoma	1	2
*	Plauditus	4	2
	Polypedilum	6	2
	Rheotanytarsus	6	2
	Calopteryx	6	1
	Dicrotendipes	8	1
*	Helicopsyche	3	1
*	Maccaffertium	3	1
*	Mystacides	4	1
	Physella	9.1	1
	Prostoma	7	1
*	Serratella	2	1
	Thienemannimyia	6	1
*	Tricorythodes	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.12 *# Scrapers:* 7

% Sensitive EPT: 14.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 30.4% *Attribute 3 genera:* 4

HGMI Rating: **48.15** **Good**

Habitat Analysis: 123 Suboptimal USEPA Protocol

Observations: Water temp: 22.57 C; Cond: 320 umhos; DO: 7.71 mg/L; pH: 7.93 SU
Clarity: clear; Flow Rate: moderate; Width/Depth: 75' / 3'; Substrate: gravel, sand
Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, grasses, weeds
Stream Gradient: High Gradient Stream; Land Uses: rural

Other: macrophytes; USGS gage

AMNET Site # **AN0026** *Stream Name:* **Blair Ck**

Location: **Shannon Rd; Hardwick Twp; Warren County**

Collection Date: ***8/16/2007*** *USGS Topo Map:* **Flatbrookville**

	Genus	Tolerance Value	Amount
*	Hydropsyche	4	19
*	Chimarra	4	16
	Stenelmis	5	14
*	Ceratopsyche	4	6
	Cricotopus	7	6
*	Cheumatopsyche	5	5
	Psephenus	4	5
	Rheotanytarsus	6	5
*	Acroneuria	0	4
	Prostoma	7	4
	Antocha	3	3
*	Epeorus	0	3
*	Maccaffertium	3	3
*	Baetis	6	2
*	Diplectrona	0	1
*	Hydroptila	6	1
*	Oecetis	8	1
	Optioservus	4	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.33	*# Scrapers:*	4
% Sensitive EPT:	31.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	5.3%	*Attribute 3 genera:*	3
HGMI Rating:	**52.64**	**Good**	
Habitat Analysis:	149	Suboptimal	USEPA Protocol

Observations: Water temp: 21.25 C; Cond: 65 umhos; DO: 8.03 mg/L; pH: 7.27 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 22' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, salamanders, filamentous algae, periphytes

AMNET Site # **AN0027** ***Stream Name:*** **Blair Ck**

Location: **Rt 94; Blairstown Twp; Warren County**

Collection Date: ***8/16/2007*** ***USGS Topo Map:*** **Blairstown**

	Genus	*Tolerance Value*	*Amount*
	Psephenus	4	13
	Stenelmis	5	10
	Cricotopus	7	7
	Ferrissia	7	7
	Gammarus	6	7
	Prostoma	7	5
	Amnicola	4.8	3
*	Chimarra	4	3
*	Maccaffertium	3	3
	Musculium	5	3
*	Serratella	2	3
*	Acroneuria	0	2
*	Apatania	3	2
*	Ceratopsyche	4	2
*	Cheumatopsyche	5	2
	Cura	4	2
*	Hydropsyche	4	2
*	Lepidostoma	1	2
	Orthocladius	6	2
	Oulimnius	4	2
	Pisidium	6.8	2
	Stylodrilus	10	2
	Tanytarsus	6	2
	Argia	6	1
*	Glossosoma	0	1
	Helisoma	7	1
	Menetus	6	1
	Mesovelia	9	1
*	Mystacides	4	1
	Nanocladius	3	1
*	Neureclipsis	7	1
	Paratanytarsus	6	1
	Promoresia	2	1
	Stylogomphus	1	1

** (EPT organism)* *Taxa Richness:* 34 *Population:* 99

Hilsenhoff Biotic Index (HBI): 4.97 *# Scrapers:* 11

% Sensitive EPT: 18.2% *Attribute 2 genera:* 2

% Non-Insect Taxa: 29.4% *Attribute 3 genera:* 6

HGMI Rating: **63.64** **Excellent**

Habitat Analysis: 113 Suboptimal USEPA Protocol

Observations: Water temp: 20.76 C; Cond: 249 umhos; DO: 7.80 mg/L; pH: 8.15 SU
Clarity: clear; Flow Rate: moderate; Width/Depth: 44' / 1'; Substrate: cobble, gravel, sand
Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds
Stream Gradient: High Gradient Stream; Land Uses: rural, forested

AMNET Site # **AN0028** *Stream Name:* **Jacksonburg Ck**

Location: **Rt 602; Hardwick Twp; Warren County**

Collection Date: ***8/16/2007*** *USGS Topo Map:* **Flatbrookville**

	Genus	*Tolerance Value*	*Amount*
	Tanytarsus	6	21
	Tribelos	5	8
*	Maccaffertium	3	7
	Microtendipes	7	7
	Pisidium	6.8	6
	Polypedilum	6	5
	Calopteryx	6	4
	Ischnura	9	4
*	Micrasema	2	4
	Nigronia	2	4
	Stenelmis	5	4
*	Chimarra	4	3
	Hemerodromia	6	3
*	Oecetis	8	3
	Psephenus	4	2
	Ablabesmyia	8	1
	Aulodrilus	8	1
*	Ceraclea	3	1
*	Cheumatopsyche	5	1
	Cricotopus	7	1
*	Diplectrona	0	1
*	Hydropsyche	4	1
*	Lepidostoma	1	1
*	Leuctra	0	1
	Macronychus	2	1
	Micropsectra	7	1
	Parametriocnemus	5	1
	Paratendipes	8	1
	Promoresia	2	1
*	Psilotreta	0	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.25 *# Scrapers:* 6

% Sensitive EPT: 22.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 6.7% *Attribute 3 genera:* 6

HGMI Rating: **63.79** **Excellent**

Habitat Analysis: 146 Suboptimal USEPA Protocol

Observations: Water temp: 20.46 C; Cond: 47 umhos; DO: 7.21 mg/L; pH: 6.66 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 11' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: salamanders, macrophytes, periphytes

AMNET Site # **AN0029** *Stream Name:* **Jacksonburg Ck**

Location: **Rt 94; Blairstown Twp; Warren County**

Collection Date: ***8/23/2007*** *USGS Topo Map:* **Blairstown**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	13
	Psephenus	4	11
*	Maccaffertium	3	9
	Calopteryx	6	7
*	Glossosoma	0	6
*	Hydropsyche	4	6
*	Baetis	6	5
	Ferrissia	7	5
*	Oecetis	8	5
*	Ceratopsyche	4	4
*	Leucrocuta	1	4
	Rheotanytarsus	6	4
	Boyeria	2	2
	Dugesia	4	2
*	Isonychia	2	2
*	Acentrella	4	1
	Brillia	5	1
*	Chimarra	4	1
*	Lepidostoma	1	1
	Lumbricidae	10	1
	Macronychus	2	1
	Menetus	6	1
*	Perlidae	1	1
	Pisidium	6.8	1
	Promoresia	2	1
*	Pteronarcys	0	1
*	Serratella	2	1
	Stenelmis	5	1
*	Triaenodes	6	1
*	Tricorythodes	4	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.26 *# Scrapers:* 9

% Sensitive EPT: 39.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 16.7% *Attribute 3 genera:* 6

HGMI Rating: **72.52** **Excellent**

Habitat Analysis: 152 Suboptimal USEPA Protocol

Observations: Water temp: 17.32 C; Cond: 138 umhos; DO: 9.62 mg/L; pH: 7.62 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 18' / < 1 - 1'; Substrate: cobble, gravel, sand, root mats, undercut banks

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, agriculture-cropland (corn)

Other: fish, periphytes

AMNET Site # **AN0030** *Stream Name:* **Yards Ck**

Location: **Mt Vernon Rd; Blairstown Twp; Warren County**

Collection Date: *8/23/2007* *USGS Topo Map:* **Portland**

	Genus	Tolerance Value	Amount
*	Hydropsyche	4	16
*	Cheumatopsyche	5	15
*	Chimarra	4	10
*	Isonychia	2	10
*	Maccaffertium	3	10
	Dugesia	4	6
	Polypedilum	6	4
*	Hydroptila	6	3
	Optioservus	4	3
*	Pseudocloeon	4	3
	Tanytarsus	6	3
	Musculium	5	2
	Rheotanytarsus	6	2
	Stenelmis	5	2
	Argia	6	1
	Atrichopogon	2	1
	Aulodrilus	8	1
*	Baetis	6	1
	Calopteryx	6	1
	Cricotopus	7	1
	Hemerodromia	6	1
	Nais	8	1
*	Oxyethira	3	1
	Pseudochironomus	5	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.32	*# Scrapers:*	3
% Sensitive EPT:	38.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	16.0%	*Attribute 3 genera:*	4
HGMI Rating:	**52.78**	**Good**	
Habitat Analysis:	149	Suboptimal	USEPA Protocol

Observations: Water temp: 21.06 C; Cond: 95 umhos; DO: 8.05 mg/L; pH: 6.97 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 13' / < 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: good; Bank Vegetation: shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers (12" plastic corrugated pipe) downstream

Other: fish, frogs, turtle, crayfish, tadpoles, water snake, macrophytes, periphytes, purple loosestrife; adj to power station

AMNET Site # **AN0032** *Stream Name:* **Paulins Kill**

Location: **Rt 46; Knowlton Twp; Warren County**

Collection Date: ***8/23/2007*** *USGS Topo Map:* **Portland**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	19
*	Heterocloeon	2	12
	Stenelmis	5	7
	Simulium	6	6
	Gillia	8	5
	Psephenus	4	5
	Caecidotea	8	4
*	Cheumatopsyche	5	4
	Dineutus	4	3
*	Helicopsyche	3	3
*	Hydropsyche	4	3
	Polypedilum	6	3
*	Acroneuria	0	2
*	Baetis	6	2
*	Ceratopsyche	4	2
	Ferrissia	7	2
	Helisoma	7	2
*	Lepidostoma	1	2
*	Neophylax	3	2
*	Serratella	2	2
*	Stenacron	4	2
	Cardiocladius	5	1
	Dubiraphia	6	1
	Dugesia	4	1
	Helobdella	8	1
*	Lype	2	1
	Macronychus	2	1
*	Mystacides	4	1
	Physella	9.1	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.80 *# Scrapers:* 11

% Sensitive EPT: 29.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 27.6% *Attribute 3 genera:* 7

HGMI Rating: **68.33** **Excellent**

Habitat Analysis: 170 Optimal USEPA Protocol

Observations: Water temp: 17.64 C; Cond: 374 umhos; DO: 8.04 mg/L; pH: 7.70 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 134' / 1 - 3'; Substrate: cobble, gravel, sand, snags

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: macrophytes; adj to I 80

AMNET Site # **AN0032A** *Stream Name:* **Paulins Kill**

Location: **Vail Rd; Blairstown Twp; Warren County**

Collection Date: ***8/23/2007*** *USGS Topo Map:* **Portland**

	Genus	*Tolerance Value*	*Amount*
	Limnodrilus	10	34
	Gammarus	6	18
	Gillia	8	8
	Pisidium	6.8	6
	Stylodrilus	10	4
	Ancyronyx	2	3
*	Helicopsyche	3	3
	Basiaeschna	2	2
	Dubiraphia	6	2
*	Lepidostoma	1	2
*	Micrasema	2	2
	Stenelmis	5	2
*	Tricorythodes	4	2
	Tubificidae	10	2
	Dugesia	4	1
*	Hydropsyche	4	1
	Lanthus	5	1
	Lumbriculus	8	1
*	Neureclipsis	7	1
*	Oecetis	8	1
	Physella	9.1	1
	Polypedilum	6	1
	Prostoma	7	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.32	*# Scrapers:*	4
% Sensitive EPT:	11.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	41.7%	*Attribute 3 genera:*	3
HGMI Rating:	**32.73**	**Fair**	
Habitat Analysis:	163	Optimal	USEPA Protocol

Observations: Water temp: 18.20 C; Cond: 389 umhos; DO: 9.45 mg/L; pH: 7.98 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 118' / 1 - 2'; Substrate: cobble, gravel, sand, silt, snags, root mats

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: fish, crayfish, clams, macrophytes, purple loosestrife

AMNET Site # **AN0033** *Stream Name:* **Delawanna Ck**

Location: **Rt 46; Knowlton Twp; Warren County**

Collection Date: ***8/23/2007*** *USGS Topo Map:* **Portland**

	Genus	Tolerance Value	Amount
	Psephenus	4	14
*	Chimarra	4	11
	Cura	4	11
*	Epeorus	0	9
	Polypedilum	6	8
	Stenelmis	5	7
	Optioservus	4	6
*	Cheumatopsyche	5	4
	Corydalus	4	3
*	Glossosoma	0	3
*	Psilotreta	0	3
	Tanytarsus	6	3
*	Acroneuria	0	2
*	Agnetina	2	2
*	Baetis	6	2
*	Maccaffertium	3	2
*	Paragnetina	1	2
	Rheopelopia	4	2
*	Lype	2	1
	Micropsectra	7	1
	Physidae	7	1
	Prosimulium	2	1
	Prostoma	7	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	3.62	*# Scrapers:*	6
% Sensitive EPT:	38.0%	*Attribute 2 genera:*	5
% Non-Insect Taxa:	12.5%	*Attribute 3 genera:*	6

HGMI Rating: **70.08** **Excellent**

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 18.27 C; Cond: 360 umhos; DO: 9.41 mg/L; pH: 8.06 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 15' / 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: fish, periphytes

AMNET Site # **AN0034** *Stream Name:* **Ramseysburg Ck**

Location: **Valley St off Rt 46; Knowlton Twp; Warren County**

Collection Date: *8/23/2007* *USGS Topo Map:* **Portland**

	Genus	Tolerance Value	Amount
	Polypedilum	6	21
*	Ceratopsyche	4	16
*	Baetis	6	14
*	Dolophilodes	0	10
	Psephenus	4	8
*	Acroneuria	0	5
*	Glossosoma	0	4
*	Hydropsyche	4	2
	Lumbricidae	10	2
*	Maccaffertium	3	2
*	Psilotreta	0	2
	Stenelmis	5	2
	Brillia	5	1
*	Chimarra	4	1
	Cricotopus	7	1
*	Diplectrona	0	1
	Enchytraeidae	10	1
*	Leucrocuta	1	1
*	Leuctra	0	1
	Limnodrilus	10	1
	Microtendipes	7	1
	Prostoma	7	1
*	Rhyacophila	1	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.07	*# Scrapers:*	6
% Sensitive EPT:	42.0%	*Attribute 2 genera:*	6
% Non-Insect Taxa:	16.7%	*Attribute 3 genera:*	3

HGMI Rating: **64.27** **Excellent**

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 16.92 C; Cond: 270 umhos; DO: 9.71 mg/L; pH: 8.10 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 9' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, periphytes

AMNET Site # **AN0035** *Stream Name:* **Pequest River**

Location: **Rt 206; Andover Twp; Sussex County**

Collection Date: ***8/14/2007*** *USGS Topo Map:* **Newton West**

	Genus	Tolerance Value	Amount
	Polypedilum	6	18
	Stenelmis	5	11
	Rheotanytarsus	6	9
	Tanytarsus	6	9
	Pisidium	6.8	8
*	Hydroptila	6	7
	Basiaeschna	2	6
	Aulodrilus	8	3
	Gomphus	5	3
	Ischnura	9	3
	Amnicola	4.8	2
	Cricotopus	7	2
	Dubiraphia	6	2
	Gammarus	6	2
	Calopteryx	6	1
*	Cheumatopsyche	5	1
	Glossiphoniidae	8	1
	Limnodrilus	10	1
	Microtendipes	7	1
	Nanocladius	3	1
	Peltodytes	5	1
	Physella	9.1	1
	Planorbidae	6	1
	Procladius	9	1
	Rhagovelia	9	1
	Sialis	4	1
	Simulium	6	1
	Stenochironomus	5	1
*	Triaenodes	6	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.91 *# Scrapers:* 6

% Sensitive EPT: 8.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 27.6% *Attribute 3 genera:* 2

HGMI Rating: **39.61** **Fair**

Habitat Analysis: 139 Suboptimal USEPA Protocol

Observations: Water temp: 19.36 C; Cond: 439 umhos; DO: 5.94 mg/L; pH: 7.41 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 13' / 1'; Substrate: gravel, sand, silt

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, agriculture-cropland (strawberries, pumpkins, etc.)

Other: fish, macrophytes, periphytes, purple loosestrife; adjacent to U-Pick farm

AMNET Site # **AN0036** *Stream Name:* **UNT to Pequest River**

Location: **Rt 603 (Brighton Rd); Green Twp; Sussex County**

Collection Date: ***8/14/2007*** *USGS Topo Map:* **Tranquility**

	Genus	Tolerance Value	Amount
	Amnicola	4.8	61
	Gammarus	6	17
	Cladotanytarsus	7	4
	Polypedilum	6	2
*	Tricorythodes	4	2
	Caecidotea	8	1
*	Caenis	7	1
	Dubiraphia	6	1
	Dugesia	4	1
*	Goera	0	1
*	Helicopsyche	3	1
	Limnodrilus	10	1
*	Mystacides	4	1
*	Neophylax	3	1
	Orconectes	6	1
	Physella	9.1	1
	Pisidium	6.8	1
	Stenelmis	5	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.21	*# Scrapers:*	7
% Sensitive EPT:	7.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	42.1%	*Attribute 3 genera:*	3

HGMI Rating: **38.40** **Fair**

Habitat Analysis: 138 Suboptimal USEPA Protocol

Observations: Water temp: 22.15 C; Cond: 458 umhos; DO: 7.85 mg/L; pH: 7.89 SU
Clarity: clear; Flow Rate: moderate; Width/Depth: 30' / 1'; Substrate: gravel, sand
Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds
Stream Gradient: High Gradient Stream; Land Uses: forested, agriculture-cropland (corn)

Other: fish, crayfish, mussels, macrophytes

AMNET Site # **AN0037** *Stream Name:* **Pequest River**

Location: **Pequest Rd; Green Twp; Sussex County**

Collection Date: ***8/14/2007*** *USGS Topo Map:* **Tranquility**

	Genus	Tolerance Value	Amount
	Cladotanytarsus	7	9
	Gammarus	6	9
	Simulium	6	9
*	Hydropsyche	4	8
*	Caenis	7	7
	Ischnura	9	6
	Cricotopus	7	5
	Stenelmis	5	5
	Amnicola	4.8	4
*	Plauditus	4	4
*	Hydroptila	6	3
*	Maccaffertium	3	3
	Microtendipes	7	3
	Tanytarsus	6	3
	Prostoma	7	2
	Rheotanytarsus	6	2
*	Acentrella	4	1
	Antocha	3	1
	Argia	6	1
*	Brachycentrus	1	1
	Calopteryx	6	1
*	Cheumatopsyche	5	1
	Dicrotendipes	8	1
	Dubiraphia	6	1
	Eukiefferiella	8	1
*	Helicopsyche	3	1
	Hemerodromia	6	1
	Hydrobiidae	8	1
	Pisidium	6.8	1
	Polypedilum	6	1
	Tanytarsini	6	1
	Thienemanniella	6	1
*	Triaenodes	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 34 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.93 *# Scrapers:* 8

% Sensitive EPT: 21.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 14.7% *Attribute 3 genera:* 2

HGMI Rating: **54.80** **Good**

Habitat Analysis: 142 Suboptimal USEPA Protocol

Observations: Water temp: 21.09 C; Cond: 465 umhos; DO: 7.99 mg/L; pH: 7.94 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 46' / 1-2'; Substrate: gravel, sand, silt, root mats

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: fish, crayfish, mussels, macrophytes; weir; USGS gage: 2.75

AMNET Site # **AN0038** *Stream Name:* **Trout Bk**

Location: **Rt 612; Allamuchy Twp; Warren County**

Collection Date: ***6/12/2008*** *USGS Topo Map:* **Tranquility**

	Genus	Tolerance Value	Amount
*	Ephemerella	1	22
	Gammarus	6	19
*	Lepidostoma	1	17
	Micropsectra	7	14
*	Brachycentrus	1	5
*	Lype	2	5
	Cladotanytarsus	7	4
	Microtendipes	7	4
	Tvetenia	5	3
	Brillia	5	1
	Caecidotea	8	1
	Chrysops	6	1
	Dicranota	3	1
*	Glossosoma	0	1
	Parametriocnemus	5	1
	Physella	9.1	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI):	3.73		*# Scrapers:*	2
% Sensitive EPT:	50.0%		*Attribute 2 genera:*	3
% Non-Insect Taxa:	18.8%		*Attribute 3 genera:*	3
HGMI Rating:	**52.92**	**Good**		
Habitat Analysis:	100	Marginal	USEPA Protocol	

Observations: Water temp: 18.81 C; Cond: 460 umhos; DO: 9.90 mg/L; pH: 7.71 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 12' / 1'; Substrate: gravel, sand, silt, undercut banks

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested, agriculture-cropland

Other: fish, periphytes

AMNET Site # **AN0039** *Stream Name:* **Pequest River**

Location: **Rt 615; Allamuchy Twp; Warren County**

Collection Date: ***8/28/2007*** *USGS Topo Map:* **Tranquility**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	33
*	Chimarra	4	11
	Gammarus	6	9
*	Hydropsyche	4	7
*	Maccaffertium	3	7
	Optioservus	4	3
*	Pseudocloeon	4	3
*	Baetis	6	2
*	Brachycentrus	1	2
	Dubiraphia	6	2
	Dugesia	4	2
	Paraponyx	5	2
	Promoresia	2	2
	Stenelmis	5	2
	Amnicola	4.8	1
	Ancyronyx	2	1
*	Caenis	7	1
	Campeloma	7	1
	Cricotopus	7	1
*	Lype	2	1
	Macromia	2	1
	Macronychus	2	1
	Nigronia	2	1
	Paratanytarsus	6	1
*	Plauditus	4	1
	Simulium	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.50	*# Scrapers:*	8
% Sensitive EPT:	28.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	14.8%	*Attribute 3 genera:*	6

HGMI Rating: **64.89** **Excellent**

Habitat Analysis: 145 Suboptimal USEPA Protocol

Observations: Water temp: 19.74 C; Cond: 483 umhos; DO: 8.36 mg/L; pH: 7.94 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 27'/1-3'; Substrate: cobble, gravel, sand, silt, snags, root mats

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, forested

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes, purple loose stife, stocked with trout, USGS gage 1.0

AMNET Site # **AN0040** *Stream Name:* **Bear Ck**

Location: **Shades of Death Rd; Allamuchy Twp; Warren County**

Collection Date: ***8/28/2007*** *USGS Topo Map:* **Blairstown**

	Genus	Tolerance Value	Amount
	Gillia	8	34
	Amnicola	4.8	9
	Gammarus	6	8
	Calopteryx	6	6
*	Baetis	6	5
*	Hydropsyche	4	5
	Trichocorixa	9	5
*	Cheumatopsyche	5	4
	Promoresia	2	4
	Physella	9.1	3
	Stenelmis	5	3
*	Brachycentrus	1	2
	Corydalus	4	2
*	Maccaffertium	3	2
	Microtendipes	7	2
	Antocha	3	1
	Boyeria	2	1
*	Goera	0	1
*	Pycnopsyche	4	1
	Rheotanytarsus	6	1
	Sialis	4	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.14	*# Scrapers:*	6
% Sensitive EPT:	11.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	19.0%	*Attribute 3 genera:*	6
HGMI Rating:	**48.99**	**Good**	
Habitat Analysis:	145	Suboptimal	USEPA Protocol

Observations: Water temp: 17.76 C; Cond: 460 umhos; DO: 8.51 mg/L; pH: 7.90 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 18'/1'; Substrate: sand, gravel, cobble, silt, root mats

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, crayfish, periphytes, macrophytes, possible beaver dam, natural preserve trust land (Bear Ck Preserve)

AMNET Site # **AN0040A** *Stream Name:* **Bear Ck**

Location: **Rt 519 (Dark Moon Rd); Frelinghuysen Twp; Warren County**

Collection Date: *8/28/2007* *USGS Topo Map:* **Tranquility**

	Genus	Tolerance Value	Amount
	Gammarus	6	41
	Simulium	6	13
	Polypedilum	6	8
*	Baetis	6	5
	Tanytarsus	6	5
*	Limnephilus	3	4
	Dicrotendipes	8	3
	Dugesia	4	3
	Micropsectra	7	3
*	Ceratopsyche	4	2
	Cricotopus	7	2
*	Hydropsyche	4	2
	Optioservus	4	2
	Physella	9.1	2
	Boyeria	2	1
	Gyraulus	6	1
	Lumbricidae	10	1
	Rheotanytarsus	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.87	*# Scrapers:*	2
% Sensitive EPT:	9.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	26.3%	*Attribute 3 genera:*	3
HGMI Rating:	**31.88**	**Fair**	
Habitat Analysis:	123	Suboptimal	USEPA Protocol

Observations: Water temp: 15.67 C; Cond: 436 umhos; DO: 11.31 mg/L; pH: 7.95 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 5' / <1'; Substrate: gravel, sand, root mats, clay, undercut banks

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock (horses), rural

Downstream of Impoundment: 2 small ponds

Other: fish, frogs, macrophytes, periphytes, salamander; USGS gage 1.20

AMNET Site # **AN0041** *Stream Name:* **Pequest River**

Location: **Cemetery Rd; Independence Twp; Warren County**

Collection Date: ***8/30/2007*** *USGS Topo Map:* **Washington**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	16
	Stenelmis	5	11
*	Maccaffertium	3	7
	Macronychus	2	7
	Prostoma	7	6
	Rheotanytarsus	6	6
*	Brachycentrus	1	5
	Corydalus	4	5
	Gammarus	6	5
	Tanytarsus	6	4
	Hemerodromia	6	3
*	Hydropsyche	4	3
	Ancyronyx	2	2
	Ferrissia	7	2
	Lanthus	5	2
	Nais	8	2
	Nematoda	6	2
	Optioservus	4	2
	Arigomphus	1	1
	Atherix	2	1
*	Baetis	6	1
	Dubiraphia	6	1
	Oulimnius	4	1
	Polypedilum	6	1
	Promoresia	2	1
	Psephenus	4	1
	Rheocricotopus	6	1
	Thienemanniella	6	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.64 *# Scrapers:* 8

% Sensitive EPT: 13.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 17.9% *Attribute 3 genera:* 7

HGMI Rating: **61.44** **Good**

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 19.37 C; Cond: 491 umhos; DO: 7.52 mg/L; pH: 7.76 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 44'/2'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds, grasses

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, frogs, periphytes, trout stocked water

AMNET Site # **AN0042** *Stream Name:* **Furnace Bk**

Location: **Pequest Rd; White Twp; Warren County**

Collection Date: ***8/30/2007*** *USGS Topo Map:* **Washington**

	Genus	*Tolerance Value*	*Amount*
	Rheotanytarsus	6	26
	Stenelmis	5	8
	Paratanytarsus	6	7
	Polypedilum	6	7
	Gammarus	6	6
	Ancyronyx	2	5
	Dubiraphia	6	5
	Enallagma	9	5
	Chrysops	6	3
	Prostoma	7	3
	Basiaeschna	2	2
*	Hydropsyche	4	2
	Sialis	4	2
	Stylaria	8	2
	Tanytarsus	6	2
	Ablabesmyia	8	1
	Caecidotea	8	1
*	Caenis	7	1
*	Cheumatopsyche	5	1
	Corydalus	4	1
	Cricotopus	7	1
	Endochironomus	10	1
	Limnodrilus	10	1
*	Mystacides	4	1
	Pentaneura	6	1
	Phaenopsectra	7	1
	Pisidium	6.8	1
	Placobdella	8	1
*	Polycentropus	6	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.89 *# Scrapers:* 4

% Sensitive EPT: 4.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 23.3% *Attribute 3 genera:* 2

HGMI Rating: **37.61** **Fair**

Habitat Analysis: 128 Suboptimal USEPA Protocol

Observations: Water temp: 20.78 C; Cond: 219 umhos; DO: 6.51 mg/L; pH: 7.16 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 17'/2'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, rural

Other: macrophytes, periphytes, purple loosestrife; STP upstream

AMNET Site # **AN0043** *Stream Name:* **Pequest River**

Location: **Rt 625; White Twp; Warren County**

Collection Date: ***8/28/2007*** *USGS Topo Map:* **Washington**

	Genus	Tolerance Value	Amount
	Antocha	3	10
*	Lepidostoma	1	9
*	Ceratopsyche	4	8
*	Hydropsyche	4	7
*	Ephemerella	1	6
	Stenelmis	5	6
	Atherix	2	4
*	Chimarra	4	4
	Polypedilum	6	4
*	Baetis	6	3
	Cricotopus	7	3
	Dugesia	4	3
	Psephenus	4	3
*	Acroneuria	0	2
	Gammarus	6	2
*	Maccaffertium	3	2
	Optioservus	4	2
	Pisidium	6.8	2
	Rheotanytarsus	6	2
	Simulium	6	2
	Boyeria	2	1
*	Cheumatopsyche	5	1
	Elimia	2	1
*	Glossosoma	0	1
*	Goera	0	1
*	Helicopsyche	3	1
	Lirceus	8	1
	Lumbriculus	8	1
	Macronychus	2	1
	Microtendipes	7	1
	Peltodytes	5	1
	Promoresia	2	1
	Prostoma	7	1
*	Protoptila	1	1
	Rhagovelia	9	1
	Thienemanniella	6	1

** (EPT organism)* *Taxa Richness:* 36 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.77 *# Scrapers:* 10

% Sensitive EPT: 30.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 19.4% *Attribute 3 genera:* 9

HGMI Rating: **80.03** **Excellent**

Habitat Analysis: 155 Suboptimal USEPA Protocol

Observations: Water temp: 19.71 C; Cond: 490 umhos; DO: 9.21 mg/L; pH: 8.28 SU
Clarity: clear; Flow Rate: fast; Width/Depth: 62'/1-3'; Substrate: cobble, gravel, sand
Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds
Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, periphytes, macrophytes, clams, weir, USGS, turtle eggs

AMNET Site # **AN0044** *Stream Name:* **Mountain Lake Bk**

Location: **Tamarack Rd outlet of Mountain Lk; Liberty Twp; Warren County**

Collection Date: ***8/30/2007*** *USGS Topo Map:* **Washington**

	Genus	Tolerance Value	Amount
	Tanytarsus	6	55
	Rheotanytarsus	6	21
	Gammarus	6	5
	Endochironomus	10	3
	Stenelmis	5	3
	Valvata	2	3
	Amnicola	4.8	2
	Cricotopus	7	2
	Paratanytarsus	6	2
	Gyraulus	6	1
	Ischnura	9	1
	Nais	8	1
*	Oecetis	8	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.04	*# Scrapers:*	4
% Sensitive EPT:	1.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	38.5%	*Attribute 3 genera:*	0

HGMI Rating: **20.90** **Poor**

Habitat Analysis: 121 Suboptimal USEPA Protocol

Observations: Water temp: 24.89 C; Cond: 292 umhos; DO: 6.60 mg/L; pH: 8.14 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 16'/2'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural

Downstream of Impoundment: Mountain Lake

Other: macrophytes, periphytes; stream restoration project in process; Mt. Lake Bog Preserve

AMNET Site # **AN0045** *Stream Name:* **Beaver Bk**

Location: **Ridgeway Ave; Hope Twp; Warren County**

Collection Date: ***8/28/2007*** *USGS Topo Map:* **Blairstown**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	28
*	Hydropsyche	4	24
*	Chimarra	4	16
	Prostoma	7	7
*	Baetis	6	4
	Polypedilum	6	4
*	Maccaffertium	3	3
	Simulium	6	3
*	Acentrella	4	2
	Cricotopus	7	1
	Lanthus	5	1
	Macronychus	2	1
	Menetus	6	1
	Optioservus	4	1
	Parametriocnemus	5	1
	Physella	9.1	1
	Stenelmis	5	1
*	Tallaperla	0	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.75	*# Scrapers:*	5
% Sensitive EPT:	26.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	16.7%	*Attribute 3 genera:*	4
HGMI Rating:	**49.50**	**Good**	
Habitat Analysis:	156	Suboptimal	USEPA Protocol

Observations: Water temp: 19.51 C; Cond: 273 umhos; DO: 8.43 mg/L; pH: 7.90 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15'/<1'; Substrate: cobble, gravel, sand, root mats, snags

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, frogs, macrophytes, periphytes, filamentous algae

AMNET Site # **AN0046** *Stream Name:* **Honey Run**

Location: **Rt 519; Hope Twp; Warren County**

Collection Date: ***8/28/2007*** *USGS Topo Map:* **Blairstown**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	31
	Rheotanytarsus	6	18
	Dubiraphia	6	12
	Polypedilum	6	8
	Stenelmis	5	5
	Tanytarsus	6	4
	Enallagma	9	3
	Optioservus	4	3
	Gillia	8	2
	Microtendipes	7	2
	Spirosperma	10	2
	Amnicola	4.8	1
	Aulodrilus	8	1
	Caecidotea	8	1
*	Cheumatopsyche	5	1
*	Chimarra	4	1
	Chironomus	10	1
	Chrysops	6	1
	Musculium	5	1
*	Oecetis	8	1
	Prostoma	7	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.18	*# Scrapers:*	3
% Sensitive EPT:	2.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	38.1%	*Attribute 3 genera:*	0
HGMI Rating:	**23.70**	**Fair**	
Habitat Analysis:	115	Suboptimal	USEPA Protocol

Observations: Water temp: 19.92 C; Cond: 324 umhos; DO: 6.26 mg/L; pH: 7.45 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24'/1-2'; Substrate: cobble, sand, silt, root mats

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, rural, forested

Other: fish, macrophytes, periphytes, trout stocked water

AMNET Site # **AN0047** *Stream Name:* **Beaver Bk**

Location: **off Rt 618 at Woodsedge Ct (USGS gauge); White Twp; Warren County**

Collection Date: ***8/30/2007*** *USGS Topo Map:* **Belvidere**

	Genus	Tolerance Value	Amount
*	Helicopsyche	3	29
	Gammarus	6	13
	Psephenus	4	6
	Dubiraphia	6	5
*	Maccaffertium	3	5
*	Psilotreta	0	5
	Stenelmis	5	5
	Limnodrilus	10	4
*	Ceratopsyche	4	3
	Polypedilum	6	3
	Macronychus	2	2
	Optioservus	4	2
*	Paragnetina	1	2
	Antocha	3	1
*	Baetis	6	1
*	Caenis	7	1
*	Cheumatopsyche	5	1
*	Chimarra	4	1
*	Heterocloeon	2	1
	Ischnura	9	1
*	Isonychia	2	1
*	Lepidostoma	1	1
	Microtendipes	7	1
*	Oecetis	8	1
	Pisidium	6.8	1
	Promoresia	2	1
	Rhagovelia	9	1
	Tanytarsus	6	1
*	Tricorythodes	4	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.25 *# Scrapers:* 9

% Sensitive EPT: 49.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 10.3% *Attribute 3 genera:* 6

HGMI Rating: **76.79** **Excellent**

Habitat Analysis: 167 Optimal USEPA Protocol

Observations: Water temp: 20.40 C; Cond: 400 umhos; DO: 10.02 mg/L; pH: 8.35 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 80'/1.9'; Substrate: cobble, gravel, sand, root mats, bedrock

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: periphytes

AMNET Site # **AN0048** *Stream Name:* **Pequest River**

Location: **off Water St nr. confluence with Delaware River; Belvidere; Warren County**

Collection Date: ***9/6/2007*** *USGS Topo Map:* **Belvidere**

	Genus	Tolerance Value	Amount
*	Chimarra	4	17
*	Cheumatopsyche	5	14
	Lumbriculus	8	8
*	Ephemerellidae	1	7
*	Helicopsyche	3	6
	Optioservus	4	6
	Stenelmis	5	6
	Psephenus	4	5
*	Acroneuria	0	3
*	Baetis	6	3
*	Ceratopsyche	4	3
	Dugesia	4	3
*	Hydropsychidae	4	3
*	Acentrella	4	2
	Cricotopus	7	2
*	Heterocloeon	2	2
*	Lepidostoma	1	2
	Polypedilum	6	2
	Atherix	2	1
	Hemerodromia	6	1
*	Hydropsyche	4	1
*	Paragnetina	1	1
	Promoresia	2	1
	Prostoma	7	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.17 *# Scrapers:* 5

% Sensitive EPT: 43.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 12.5% *Attribute 3 genera:* 5

HGMI Rating: **66.92** **Excellent**

Habitat Analysis: 170 Optimal USEPA Protocol

Observations: Water temp: 14.30 C; Cond: 521 umhos; DO: 10.49 mg/L; pH: 8.47 SU
Clarity: clear; Flow Rate: fast; Width/Depth: 80'/2'; Substrate: cobble, gravel, sand
Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, weeds, vines
Stream Gradient: High Gradient Stream; Land Uses: suburban
Downstream of Impoundment: dam / weir

AMNET Site # **AN0049** *Stream Name:* **Pophandusing Bk**

Location: **Spring St; Belvidere; Warren County**

Collection Date: *9/6/2007* *USGS Topo Map:* **Belvidere**

	Genus	Tolerance Value	Amount
*	Chimarra	4	21
*	Cheumatopsyche	5	17
*	Hydropsyche	4	10
	Psephenus	4	10
*	Baetis	6	8
	Lumbricillus	10	7
	Stenelmis	5	7
*	Hydroptilidae	4	3
	Polypedilum	6	3
	Simulium	6	3
*	Ceratopsyche	4	2
	Ferrissia	7	2
	Prostoma	7	2
*	Acroneuria	0	1
*	Hydroptila	6	1
	Nigronia	2	1
	Phaenopsectra	7	1
*	Rhyacophila	1	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.02 *# Scrapers:* 5

% Sensitive EPT: 35.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 16.7% *Attribute 3 genera:* 3

HGMI Rating: **47.57** **Good**

Habitat Analysis: 127 Suboptimal USEPA Protocol

Observations: Water temp: 15.48 C; Cond: 362 umhos; DO: 9.19 mg/L; pH: 8.20 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15'/<1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, grasses, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: filamentous algae; manure-like odor

AMNET Site # **AN0050** *Stream Name:* **Buck Horn Ck**

Location: **Hutchinson Rd; Harmony Twp; Warren County**

Collection Date: ***9/6/2007*** *USGS Topo Map:* **Bangor**

	Genus	Tolerance Value	Amount
	Polypedilum	6	34
	Gammarus	6	15
*	Chimarra	4	9
	Rheotanytarsus	6	6
*	Baetis	6	5
*	Hydropsychidae	4	4
	Psephenus	4	3
	Stenelmis	5	3
	Antocha	3	2
	Sublettea	6	2
*	Acroneuria	0	1
	Brillia	5	1
*	Cheumatopsyche	5	1
	Cricotopus	7	1
	Eukiefferiella	8	1
	Ferrissia	7	1
*	Hydropsyche	4	1
*	Hydroptila	6	1
	Lumbriculus	8	1
	Macronychus	2	1
	Nais	8	1
	Nilotanypus	6	1
	Optioservus	4	1
*	Psychomyia	2	1
*	Rhyacophila	1	1
	Simulium	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.42 *# Scrapers:* 5

% Sensitive EPT: 18.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 14.8% *Attribute 3 genera:* 3

HGMI Rating: **47.74** **Good**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 14.84 C; Cond: 276 umhos; DO: 9.72 mg/L; pH: 7.87 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 26'/<1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, grasses, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: forested, rural

Pipes / Ditches: storm sewers (plastic pipe)

Other: fish, periphytes, filamentous algae, purple loosestrife, snake

AMNET Site # **AN0051** *Stream Name:* **Lopatcong Ck**

Location: **Rt 647 near Montana Mountain Rd; Harmony Twp; Warren County**

Collection Date: *9/6/2007* *USGS Topo Map:* **Bloomsbury**

	Genus	Tolerance Value	Amount
	Polypedilum	6	18
*	Ceratopsyche	4	15
*	Baetis	6	10
*	Acroneuria	0	9
	Simulium	6	9
*	Dolophilodes	0	4
	Hexatoma	2	4
*	Acentrella	4	3
*	Isonychia	2	3
*	Maccaffertium	3	3
*	Paragnetina	1	3
*	Diplectrona	0	2
*	Glossosoma	0	2
*	Goera	0	2
	Promoresia	2	2
	Cricotopus	7	1
	Ectopria	5	1
*	Epeorus	0	1
*	Helicopsychidae	3	1
*	Hydropsyche	4	1
	Lumbriculus	8	1
	Micropsectra	7	1
	Optioservus	4	1
*	Paraleptophlebia	1	1
	Thienemanniella	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI):	3.74	*# Scrapers:*	6
% Sensitive EPT:	44.0%	*Attribute 2 genera:*	8
% Non-Insect Taxa:	3.8%	*Attribute 3 genera:*	6

HGMI Rating: **78.64** **Excellent**

Habitat Analysis: 151 Suboptimal USEPA Protocol

Observations: Water temp: 10.20 C; Cond: 223 umhos; DO: 12.31 mg/L; pH: 7.56 SU
Clarity: clear; Flow Rate: fast; Width/Depth: 11'/<1'; Substrate: cobble, gravel, sand
Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds, lawn
Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish

AMNET Site # **AN0052** *Stream Name:* **Lopatcong Ck**

Location: **Rt 57; Lopatcong Twp; Warren County**

Collection Date: ***9/17/2007*** *USGS Topo Map:* **Easton**

	Genus	Tolerance Value	Amount
	Simulium	6	23
	Polypedilum	6	14
*	Cheumatopsyche	5	10
*	Chimarra	4	8
*	Hydropsyche	4	7
*	Maccaffertium	3	7
*	Baetis	6	5
	Cricotopus	7	5
*	Ceratopsyche	4	4
	Optioservus	4	3
	Stenelmis	5	3
*	Hydropsychidae	4	2
	Rheotanytarsus	6	2
	Tvetenia	5	2
*	Acentrella	4	1
*	Isonychia	2	1
*	Paragnetina	1	1
	Planariidae	4	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.06	*# Scrapers:*	2
% Sensitive EPT:	23.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	5.3%	*Attribute 3 genera:*	4
HGMI Rating:	**48.25**	**Good**	
Habitat Analysis:	153	Suboptimal	USEPA Protocol

Observations: Water temp: 14.88 C; Cond: 228 umhos; DO: 10.64 mg/L; pH: 7.97 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 20' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland (corn)

Other: fish, periphytes, filamentous algae, purple loosestrife

AMNET Site # **AN0053** *Stream Name:* **Lopatcong Ck**

Location: **Alt Rt 22; Pohatcong Twp; Warren County**

Collection Date: ***9/17/2007*** *USGS Topo Map:* **Easton**

	Genus	Tolerance Value	Amount
	Gammarus	6	41
*	Baetis	6	23
	Micropsectra	7	4
	Nais	8	4
	Polypedilum	6	4
*	Cheumatopsyche	5	3
	Dugesia	4	3
	Simulium	6	3
	Diamesa	5	2
	Eukiefferiella	8	2
*	Hydroptila	6	2
	Parametriocnemus	5	2
*	Ceratopsyche	4	1
*	Chimarra	4	1
	Corynoneura	4	1
*	Hydropsychidae	4	1
	Lumbriculus	8	1
	Optioservus	4	1
	Prostoma	7	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.96	*# Scrapers:*	1
% Sensitive EPT:	26.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	26.3%	*Attribute 3 genera:*	2

HGMI Rating: **34.64** **Fair**

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 13.55 C; Cond: 482 umhos; DO: 9.80 mg/L; pH: 7.83 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 33' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: suburban, commercial (adj to Pips Paving Co)

Pipes / Ditches: storm sewers

Other: fish, periphytes; "Trout stocked waters" sign; channelized upstream under large RR tracks

AMNET Site # **AN0054** *Stream Name:* **Pohatcong Ck**

Location: **Jane(s) Chapel Rd; Mansfield Twp; Warren County**

Collection Date: ***8/30/2007*** *USGS Topo Map:* **Washington**

	Genus	Tolerance Value	Amount
	Promoresia	2	29
	Psephenus	4	8
*	Hydropsychidae	4	6
*	Baetis	6	4
	Lanthus	5	4
*	Dolophilodes	0	3
*	Epeorus	0	3
*	Isonychia	2	3
*	Lype	2	3
*	Maccaffertium	3	3
	Micropsectra	7	3
*	Apatania	3	2
*	Ceratopsyche	4	2
*	Cheumatopsyche	5	2
	Nigronia	2	2
	Optioservus	4	2
	Oulimnius	4	2
	Parametriocnemus	5	2
*	Pteronarcys	0	2
	Tanytarsus	6	2
*	Ephemerella	1	1
	Helichus	5	1
*	Leuctra	0	1
*	Micrasema	2	1
	Microtendipes	7	1
	Nais	8	1
*	Neophylax	3	1
	Rhagovelia	9	1
	Rheotanytarsus	6	1
*	Rhyacophila	1	1
	Simulium	6	1
	Stylogomphus	1	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 33 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.20 *# Scrapers:* 7

% Sensitive EPT: 28.0% *Attribute 2 genera:* 5

% Non-Insect Taxa: 3.0% *Attribute 3 genera:* 13

HGMI Rating: **78.23** **Excellent**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 17.35 C; Cond: 144 umhos; DO: 8.42 mg/L; pH: 7.28 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 16'/<1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: crayfish, periphytes, macrophytes

AMNET Site # **AN0055** *Stream Name:* **Pohatcong Ck**

Location: **Rt 650; Washington Twp; Warren County**

Collection Date: ***9/25/2007*** *USGS Topo Map:* **Washington**

	Genus	Tolerance Value	Amount
*	Maccaffertium	3	14
	Physella	9.1	10
	Cricotopus	7	8
	Prostoma	7	8
	Stenelmis	5	8
	Dubiraphia	6	5
	Amnicola	4.8	4
	Microtendipes	7	4
	Ischnura	9	3
	Macronychus	2	3
*	Oecetis	8	3
	Rheotanytarsus	6	3
*	Triaenodes	6	3
	Argia	6	2
	Calopteryx	6	2
	Helichus	5	2
*	Hydropsyche	4	2
*	Apatania	3	1
*	Baetis	6	1
	Boyeria	2	1
*	Centroptilum	2	1
*	Cheumatopsyche	5	1
	Dicrotendipes	8	1
*	Ephemerellidae	1	1
*	Isonychia	2	1
	Lumbricidae	10	1
	Nanocladius	3	1
	Optioservus	4	1
	Pisidium	6.8	1
	Planorbidae	6	1
	Polypedilum	6	1
	Promoresia	2	1
	Rhagovelia	9	1

** (EPT organism)* *Taxa Richness:* 33 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.73 *# Scrapers:* 10

% Sensitive EPT: 25.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 18.2% *Attribute 3 genera:* 7

HGMI Rating: **63.81** **Excellent**

Habitat Analysis: 138 Suboptimal USEPA Protocol

Observations: Water temp: 16.46 C; Cond: 143 umhos; DO: 7.92 mg/L; pH: 7.48 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 19'/1-2'; Substrate: cobble, gravel, sand, root mats, boulder

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, agriculture-cropland

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes

AMNET Site # **AN0056** *Stream Name:* **Brass Castle Ck**

Location: **Brass Castle Rd; Washington Twp; Warren County**

Collection Date: ***9/17/2007*** *USGS Topo Map:* **Belvidere**

	Genus	Tolerance Value	Amount
*	Baetis	6	17
*	Cheumatopsyche	5	17
*	Chimarra	4	14
*	Hydropsyche	4	6
*	Acroneuria	0	5
	Eclipidrilus	8	5
*	Heterocloeon	2	4
*	Maccaffertium	3	4
	Cricotopus	7	3
*	Pteronarcys	0	3
*	Symphitopsyche	4	3
*	Ephemerella	1	2
*	Glossosoma	0	2
	Parametriocnemus	5	2
	Antocha	3	1
	Atrichopogon	2	1
	Corydalus	4	1
	Dicranota	3	1
	Lanthus	5	1
	Oulimnius	4	1
	Paratanytarsus	6	1
*	Peltoperla	1	1
*	Polycentropus	6	1
	Polypedilum	6	1
	Promoresia	2	1
	Psephenus	4	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.24 *# Scrapers:* 6

% Sensitive EPT: 53.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 3.7% *Attribute 3 genera:* 8

HGMI Rating: **76.07** **Excellent**

Habitat Analysis: 136 Suboptimal USEPA Protocol

Observations: Water temp: 15.71 C; Cond: 196 umhos; DO: 8.03 mg/L; pH: 7.71 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 21'/<1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, salamander, invasive japanese bamboo

AMNET Site # **AN0057** *Stream Name:* **Pohatcong Ck**

Location: **Buttermilk Bridge Rd; Washington Twp; Warren County**

Collection Date: ***9/17/2007*** *USGS Topo Map:* **Bloomsbury**

	Genus	Tolerance Value	Amount
	Gammarus	6	35
	Cricotopus	7	12
	Caecidotea	8	5
*	Ceratopsyche	4	5
*	Hydropsychidae	4	5
	Tanytarsus	6	5
*	Cheumatopsyche	5	4
	Dubiraphia	6	4
*	Hydropsyche	4	3
	Macronychus	2	3
	Antocha	3	2
*	Baetis	6	2
	Limnodrilus	10	2
	Polypedilum	6	2
	Stenelmis	5	2
	Thienemanniella	6	2
	Ablabesmyia	8	1
	Dicrotendipes	8	1
	Microtendipes	7	1
	Optioservus	4	1
	Planorbidae	6	1
*	Polycentropus	6	1
	Psephenus	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.81 *# Scrapers:* 5

% Sensitive EPT: 3.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 17.4% *Attribute 3 genera:* 1

HGMI Rating: **36.22** **Fair**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 15.57 C; Cond: 322 umhos; DO: 9.64 mg/L; pH: 7.97 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 31'/3'; Substrate: cobble, gravel, sand, root mats, silt

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, agriculture-cropland, forested

Other: fish, filamentous algae, periphytes, trout stocked waters

AMNET Site # **AN0058** *Stream Name:* **Pohatcong Ck**

Location: **Edison Rd; Franklin Twp; Warren County**

Collection Date: ***9/17/2007*** *USGS Topo Map:* **Bloomsbury**

	Genus	Tolerance Value	Amount
*	Ceratopsyche	4	22
	Cricotopus	7	16
*	Cheumatopsyche	5	13
	Microtendipes	7	11
	Tanytarsus	6	8
	Tvetenia	5	6
	Nais	8	3
	Cladotanytarsus	7	2
	Gammarus	6	2
	Hemerodromia	6	2
	Optioservus	4	2
*	Plauditus	4	2
	Polypedilum	6	2
*	Protoptila	1	2
	Dicrotendipes	8	1
	Dubiraphia	6	1
*	Hydropsyche	4	1
	Lumbriculus	8	1
	Macronychus	2	1
	Prostoma	7	1
	Rheotanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.53	*# Scrapers:*	4
% Sensitive EPT:	4.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	19.0%	*Attribute 3 genera:*	0

HGMI Rating: **34.90** **Fair**

Habitat Analysis: 136 Suboptimal USEPA Protocol

Observations: Water temp: 15.56 C; Cond: 318 umhos; DO: 11.89 mg/L; pH: 8.45 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 40'/<1'; Substrate: sand, gravel, cobble

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, agriculture-livestock, rural

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes, purple loosestrife, gage station 0.5

AMNET Site # **AN0059** *Stream Name:* **Merrill Ck**

Location: **Richline Rd; Harmony Twp; Warren County**

Collection Date: ***9/6/2007*** *USGS Topo Map:* **Bloomsbury**

Genus	*Tolerance Value*	*Amount*
Paratanytarsus	6	36
Tanytarsus	6	13
Microtendipes	7	10
Polypedilum	6	7
Limnodrilus	10	5
Paratendipes	8	5
Phaenopsectra	7	5
Chironomus	10	4
Rheotanytarsus	6	4
Physella	9.1	3
Ablabesmyia	8	2
Vejdovskyella	4	2
Calopteryx	6	1
Cryptochironomus	8	1
Oulimnius	4	1
Rheopelopia	4	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.68 *# Scrapers:* 3

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 18.8% *Attribute 3 genera:* 0

HGMI Rating: **24.22** **Fair**

Habitat Analysis: 140 Suboptimal USEPA Protocol

Observations: Water temp: 12.32 C; Cond: 207 umhos; DO: 8.88 mg/L; pH: 7.13 SU

Clarity: slightly turbid; Flow Rate: very slow; Width/Depth: 15'/3'; Substrate: cobble, mud

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers, concrete pipe downstream

Other: frogs; area flooded; property owner reports beaver dam downstream

AMNET Site # **AN0060** *Stream Name:* **Merrill Ck**

Location: **Stewartville Rd.; Greenwich Twp; Warren County**

Collection Date: ***9/17/2007*** *USGS Topo Map:* **Bloomsbury**

	Genus	Tolerance Value	Amount
	Gammarus	6	43
*	Baetis	6	13
*	Dolophilodes	0	11
	Simulium	6	6
	Optioservus	4	5
	Nais	8	3
	Tvetenia	5	3
	Caecidotea	8	2
*	Leuctra	0	2
	Lumbricidae	10	2
	Lumbriculus	8	2
	Parametriocnemus	5	2
*	Acentrella	4	1
*	Cheumatopsyche	5	1
*	Glossosoma	0	1
	Planariidae	4	1
*	Rhyacophila	1	1
*	Sweltsa	0	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.07 *# Scrapers:* 1

% Sensitive EPT: 30.0% *Attribute 2 genera:* 5

% Non-Insect Taxa: 33.3% *Attribute 3 genera:* 2

HGMI Rating: **42.24** **Good**

Habitat Analysis: 117 Suboptimal USEPA Protocol

Observations: Water temp: 9.55 C; Cond: 123 umhos; DO: 11.48 mg/L; pH: 7.62 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 11'/<1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: good; Bank Vegetation: shrubs, grasses, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, suburban

Other: filamentous algae, macrophytes, periphytes, invasive japanese bamboo, new bridge construction half a mile upstream of site

AMNET Site # **AN0061** *Stream Name:* **Pohatcong Ck**

Location: **Carpentersville Rd (River Rd); Pohatcong Twp; Warren County**

Collection Date: ***6/12/2008*** *USGS Topo Map:* **Easton**

	Genus	Tolerance Value	Amount
*	Glossosoma	0	28
	Polypedilum	6	14
	Stenelmis	5	7
	Optioservus	4	6
*	Brachycentrus	1	5
*	Acentrella	4	4
*	Baetis	6	4
	Gammarus	6	4
	Lumbriculus	8	4
	Diamesa	5	3
	Cladotanytarsus	7	2
*	Hydropsyche	4	2
	Microtendipes	7	2
	Phaenopsectra	7	2
	Rheotanytarsus	6	2
	Simulium	6	2
	Tvetenia	5	2
*	Acroneuria	0	1
*	Agnetina	2	1
	Antocha	3	1
	Bezzia	6	1
	Caecidotea	8	1
*	Cheumatopsyche	5	1
	Psephenus	4	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	3.71	*# Scrapers:*	4
% Sensitive EPT:	43.0%	*Attribute 2 genera:*	5
% Non-Insect Taxa:	12.5%	*Attribute 3 genera:*	2
HGMI Rating:	**62.62**	**Good**	
Habitat Analysis:	140	Suboptimal	USEPA Protocol

Observations: Water temp: 20.17 C; Cond: 322 umhos; DO: 11.76 mg/L; pH: 7.85 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 30' / <1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, rural

Pipes / Ditches: storm sewers on left bank

Other: periphytes, railroad tracks

AMNET Site # **AN0062** *Stream Name:* **Musconetcong R**

Location: **outlet of Lk Hopatcong Rt 607; Roxbury Twp; Morris County**

Collection Date: ***10/4/2007*** *USGS Topo Map:* **Stanhope**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	20
*	Chimarra	4	14
	Gammarus	6	14
	Simulium	6	14
	Cura	4	12
	Polypedilum	6	9
*	Hydropsyche	4	5
	Prosimulium	2	3
*	Oecetis	8	2
	Paratanytarsus	6	2
	Prostoma	7	2
*	Baetis	6	1
	Limnodrilus	10	1
	Pisidium	6.8	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.17	*# Scrapers:*	0
% Sensitive EPT:	17.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	35.7%	*Attribute 3 genera:*	2
HGMI Rating:	**29.62**	**Fair**	
Habitat Analysis:	163	Optimal	USEPA Protocol

Observations: Water temp: 21.07 C; Cond: 285 umhos; DO: 7.65 mg/L; pH: 8.54 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 25'/<1-1'; Substrate: cobble, gravel, sand, root mats

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: forested, suburban

Downstream of Impoundment: Lake Hopatcong

Other: fish, crayfish, clams, periphytes, macrophytes, filamentous algae; large dead fish (trout, bass); trash, floatables, foam

AMNET Site # **AN0063** *Stream Name:* **Musconetcong R**

Location: **Waterloo Rd; Mt Olive Twp; Morris & Sussex County**

Collection Date: ***11/28/2007*** *USGS Topo Map:* **Stanhope**

	Genus	Tolerance Value	Amount
	Stenelmis	5	21
	Orthocladius	6	9
*	Chimarra	4	7
	Cricotopus	7	7
	Psephenus	4	7
	Corbicula	4	5
	Optioservus	4	5
	Physella	9.1	4
*	Cheumatopsyche	5	3
	Ferrissia	7	3
	Promoresia	2	3
*	Protoptila	1	3
	Rheotanytarsus	6	3
	Argia	6	2
*	Ceratopsyche	4	2
	Gammarus	6	2
	Hemerodromia	6	2
*	Lepidostoma	1	2
	Simulium	6	2
	Corydalus	4	1
	Dugesia	4	1
	Elimia	2	1
*	Ephemerella	1	1
*	Glossosoma	0	1
	Lumbricidae	10	1
	Macronychus	2	1
*	Micrasema	2	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.86 *# Scrapers:* 9

% Sensitive EPT: 15.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 25.9% *Attribute 3 genera:* 4

HGMI Rating: **57.37** **Good**

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 4.29 C; Cond: 335 umhos; DO: 13.28 mg/L; pH: 7.87 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 37' / 1 - 3'; Substrate: cobble, gravel, sand, boulder, snags

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, vines

Stream Gradient: High Gradient Stream; Land Uses: forested, industrial

Pipes / Ditches: storm sewers

Downstream of Impoundment: Lake Musconetcong

Other: macrophytes, filamentous algae; sampled site after a heating oil spill; oil sheen on water; oil smell; "Trout stocked water" sign

AMNET Site # **AN0064** *Stream Name:* **Musconetcong R**

Location: **off Rt 604 (abv. confluence of Lubbers Run); Byram Twp; Sussex & Morris County**

Collection Date: ***4/30/2008*** *USGS Topo Map:* **Stanhope**

	Genus	Tolerance Value	Amount
	Nais	8	62
	Cricotopus	7	14
	Polypedilum	6	6
*	Ephemerella	1	3
	Oulimnius	4	3
	Psephenus	4	3
	Diamesa	5	2
	Parametriocnemus	5	2
	Micropsectra	7	1
	Microtendipes	7	1
	Paratendipes	8	1
*	Protoptila	1	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.05	*# Scrapers:*	4
% Sensitive EPT:	4.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	7.7%	*Attribute 3 genera:*	2
HGMI Rating:	**34.60**	**Fair**	
Habitat Analysis:	171	Optimal	USEPA Protocol

Observations: Water temp: 11.93 C; Cond: 512 umhos; DO: 11.62 mg/L; pH: 8.61 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 30'/1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs. Skunk cabbage

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: YOY fish, macrophytes, periphytes, filamentous algae

AMNET Site # **AN0065** *Stream Name:* **Lubbers Run**

Location: **Rt 607; Byram Twp; Sussex County**

Collection Date: *10/4/2007* *USGS Topo Map:* **Stanhope**

	Genus	Tolerance Value	Amount
*	Isonychia	2	25
*	Hydropsyche	4	23
*	Ceratopsyche	4	13
*	Cheumatopsyche	5	13
*	Baetis	6	5
*	Acroneuria	0	2
*	Chimarra	4	2
*	Maccaffertium	3	2
	Promoresia	2	2
	Tvetenia	5	2
*	Apatania	3	1
*	Brachycentrus	1	1
	Ectopria	5	1
	Hemerodromia	6	1
	Macronychus	2	1
	Nigronia	2	1
*	Oecetis	8	1
	Optioservus	4	1
	Oulimnius	4	1
	Rhagovelia	9	1
*	Taeniopteryx	2	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	3.63	*# Scrapers:*	6
% Sensitive EPT:	40.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	0.0%	*Attribute 3 genera:*	9

HGMI Rating: **67.74** **Excellent**

Habitat Analysis: 166 Optimal USEPA Protocol

Observations: Water temp: 19.87 C; Cond: 386 umhos; DO: 7.35 mg/L; pH: 8.10 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 21'/<1-2'; Substrate: cobble, gravel, sand, root mats

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: macrophytes, periphytes

AMNET Site # **AN0066** *Stream Name:* **Lubbers Run**

Location: **Rt 206; Byram Twp; Sussex County**

Collection Date: *8/9/2007* *USGS Topo Map:* **Stanhope**

	Genus	Tolerance Value	Amount
	Gammarus	6	35
*	Micrasema	2	15
*	Hydropsyche	4	7
*	Oecetis	8	6
*	Acentrella	4	4
*	Baetis	6	4
*	Heterocloeon	2	4
*	Isonychia	2	3
	Stenelmis	5	3
	Boyeria	2	2
	Macronychus	2	2
*	Plauditus	4	2
	Promoresia	2	2
	Ancylidae	6	1
	Calopteryx	6	1
*	Ceratopsyche	4	1
	Cricotopus	7	1
	Dugesia	4	1
*	Ephemerella	1	1
	Gomphus	5	1
*	Hydroptila	6	1
*	Mystacides	4	1
	Optioservus	4	1
*	Triaenodes	6	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.58	*# Scrapers:*	7
% Sensitive EPT:	42.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	12.5%	*Attribute 3 genera:*	8

HGMI Rating: **68.33** **Excellent**

Habitat Analysis: 176 Optimal USEPA Protocol

Observations: Water temp: 19.13 C; Cond: 240 umhos; DO: 8.90 mg/L; pH: 7.54 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 26' / 1 - 2'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes; a lot of downed trees; sewage odor; site adj to plant nursery

AMNET Site # **AN0067** *Stream Name:* **Mine Brook**

Location: **Rt 517; Mansfield Twp; Warren County**

Collection Date: ***4/30/2008*** *USGS Topo Map:* **Hackettstown**

	Genus	Tolerance Value	Amount
*	Agapetus	0	26
*	Ephemerella	1	13
	Lumbriculus	8	7
	Stenelmis	5	7
	Polypedilum	6	6
*	Epeorus	0	4
	Microtendipes	7	4
	Tanytarsus	6	4
	Cricotopus	7	3
*	Acentrella	4	2
*	Acroneuria	0	2
*	Chimarra	4	2
	Cladotanytarsus	7	2
	Micropsectra	7	2
	Nais	8	2
*	Amphinemura	3	1
	Antocha	3	1
*	Cheumatopsyche	5	1
	Diamesa	5	1
	Dicrotendipes	8	1
*	Diplectrona	0	1
*	Maccaffertium	3	1
*	Neophylax	3	1
	Oulimnius	4	1
*	Plauditus	4	1
	Psephenus	4	1
	Simulium	6	1
	Tipula	4	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.30 *# Scrapers:* 7

% Sensitive EPT: 54.0% *Attribute 2 genera:* 5

% Non-Insect Taxa: 6.9% *Attribute 3 genera:* 6

HGMI Rating: **79.49** **Excellent**

Habitat Analysis: 114 Suboptimal USEPA Protocol

Observations: Water temp: 9.65 C; Cond: 238 umhos; DO: 10.84 mg/L; pH: 8.93 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / <1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, turf grass

Stream Gradient: High Gradient Stream; Land Uses: commercial

Other: fish, waterfowl, trash; runs through golf course

AMNET Site # **AN0068** *Stream Name:* **Trout Brook**

Location: **Rt 57; Hackettstown; Warren County**

Collection Date: ***9/25/2007*** *USGS Topo Map:* **Hackettstown**

	Genus	*Tolerance Value*	*Amount*
	Limnodrilus	10	24
	Gammarus	6	20
*	Hydropsyche	4	8
	Dugesia	4	6
	Stenelmis	5	5
*	Chimarra	4	4
	Crangonyx	8	4
	Simulium	6	4
	Caecidotea	8	3
	Cricotopus	7	3
	Micropsectra	7	3
*	Cheumatopsyche	5	2
	Lirceus	8	2
	Nais	8	2
	Placobdella	8	2
	Calopteryx	6	1
	Helisoma	7	1
	Ischnura	9	1
*	Lype	2	1
*	Mystacides	4	1
	Optioservus	4	1
*	Psychomyia	2	1
	Rheotanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.77 *# Scrapers:* 2

% Sensitive EPT: 7.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 39.1% *Attribute 3 genera:* 2

HGMI Rating: **27.78** **Fair**

Habitat Analysis: 136 Suboptimal USEPA Protocol

Observations: Water temp: 19.02 C; Cond: 545 umhos; DO: 8.77 mg/L; pH: 8.11 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 16'/<1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Pipes / Ditches: storm sewers

Other: fish, frogs, filamentous algae, macrophytes, periphytes, adjacent to Hackettstown trout hatchery

AMNET Site # **AN0069** *Stream Name:* **Musconetcong R**

Location: **Kings Hwy; Mansfield Twp; Warren & Morris County**

Collection Date: *9/25/2007* *USGS Topo Map:* **Hackettstown**

	Genus	Tolerance Value	Amount
*	Hydropsyche	4	20
	Cricotopus	7	15
*	Heterocloeon	2	15
*	Baetis	6	6
*	Cheumatopsyche	5	6
	Eukiefferiella	8	6
*	Chimarra	4	5
	Cardiocladius	5	4
*	Ceratopsyche	4	4
	Cura	4	4
	Gammarus	6	3
	Simulium	6	2
	Stylodrilus	10	2
	Tvetenia	5	2
	Amnicola	4.8	1
*	Isoperla	2	1
	Oulimnius	4	1
	Polypedilum	6	1
	Prostoma	7	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.90	*# Scrapers:*	4
% Sensitive EPT:	27.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	25.0%	*Attribute 3 genera:*	1
HGMI Rating:	**43.87**	**Good**	
Habitat Analysis:	163	Optimal	USEPA Protocol

Observations: Water temp: 16.60 C; Cond: 464 umhos; DO: 9.46 mg/L; pH: 8.06 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 67'/<1'; Substrate: cobble

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: periphytes, macrophytes, filamentous algae

AMNET Site # **AN0070** *Stream Name:* **Hances Brook**

Location: **Rt 57; Mansfield Twp; Warren County**

Collection Date: ***9/25/2007*** *USGS Topo Map:* **Hackettstown**

	Genus	*Tolerance Value*	*Amount*
	Polypedilum	6	24
	Simulium	6	12
*	Chimarra	4	11
*	Baetis	6	7
	Cricotopus	7	6
	Micropsectra	7	6
	Calopteryx	6	4
	Lumbriculus	8	4
	Cardiocladius	5	3
	Planariidae	4	3
	Tipula	4	3
	Dicrotendipes	8	2
*	Plauditus	4	2
	Prostoma	7	2
	Tanytarsus	6	2
	Antocha	3	1
	Brillia	5	1
	Erpobdellidae	8	1
	Eukiefferiella	8	1
*	Hydropsyche	4	1
	Nais	8	1
	Rheocricotopus	6	1
	Rheotanytarsus	6	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.84	*# Scrapers:*	2
% Sensitive EPT:	20.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	20.8%	*Attribute 3 genera:*	2

HGMI Rating: **35.99** **Fair**

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 14.22 C; Cond: 220 umhos; DO: 10.13 mg/L; pH: 7.87 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 11'/<1'; Substrate: cobble, gravel, sand, root mats, boulder

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: fish, periphytes, purple loosestrife, deteriorating concrete bridge

AMNET Site # **AN0071** ***Stream Name:*** **UNT to Musconetcong River**

Location: **Rt 57; Mansfield Twp; Warren County**

Collection Date: ***9/25/2007*** ***USGS Topo Map:*** **Washington**

	Genus	Tolerance Value	Amount
	Gammarus	6	7
	Stylodrilus	10	7
	Caecidotea	8	5
*	Chimarra	4	5
*	Baetis	6	4
	Cricotopus	7	4
	Dicranota	3	4
*	Isonychia	2	4
*	Mystacides	4	4
*	Peltoperla	1	4
	Physella	9.1	4
	Polypedilum	6	4
	Tanytarsus	6	4
*	Hydropsyche	4	3
*	Acroneuria	0	2
	Boyeria	2	2
	Cordulegaster	3	2
	Dugesia	4	2
	Enochrus	8.5	2
*	Glossosoma	0	2
	Helichus	5	2
	Microvelia	6	2
	Pisidium	6.8	2
	Rheotanytarsus	6	2
	Thienemanniella	6	2
	Tipula	4	2
*	Brachycentrus	1	1
*	Cheumatopsyche	5	1
	Chironomus	10	1
*	Diplectrona	0	1
*	Maccaffertium	3	1
	Microtendipes	7	1
*	Molanna	6	1
	Orthocladiinae	5	1
	Oulimnius	4	1
*	Phylocentropus	5	1
	Procotyla	4	1
	Rheocricotopus	6	1
*	Symphitopsyche	4	1

** (EPT organism)* *Taxa Richness:* 39 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.23 *# Scrapers:* 6

% Sensitive EPT: 30.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 17.9% *Attribute 3 genera:* 10

HGMI Rating: **66.88** **Excellent**

Habitat Analysis: 121 Suboptimal USEPA Protocol

Observations: Water temp: 14.51 C; Cond: 219 umhos; DO: 10.51 mg/L; pH: 7.67 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 7'/<1'; Substrate: gravel, sand, root mats

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock, rural

Other: fish, purple loosestrife, salamander

AMNET Site # **AN0072** *Stream Name:* **Musconetcong R**

Location: **Springtown Rd New Hampton Rd; Lebanon Twp; Hunterdon & Warren County**

Collection Date: ***10/16/2007*** *USGS Topo Map:* **High Bridge**

	Genus	Tolerance Value	Amount
*	Symphitopsyche	4	21
*	Cheumatopsyche	5	14
	Amnicola	4.8	11
*	Lepidostoma	1	9
*	Chimarra	4	5
*	Protoptila	1	5
	Tvetenia	5	4
	Ferrissia	7	3
	Stenelmis	5	3
	Antocha	3	2
	Cura	4	2
*	Helicopsyche	3	2
*	Isonychia	2	2
	Nematoda	6	2
*	Serratella	2	2
	Stylodrilus	10	2
*	Acroneuria	0	1
*	Baetis	6	1
*	Brachycentrus	1	1
	Cricotopus	7	1
	Gammarus	6	1
*	Hydropsyche	4	1
*	Macrostemum	3	1
	Microtendipes	7	1
	Optioservus	4	1
	Prostoma	7	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.08	*# Scrapers:*	5
% Sensitive EPT:	28.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:	25.9%	*Attribute 3 genera:*	5
HGMI Rating:	**60.04**	**Good**	
Habitat Analysis:	165	Optimal	USEPA Protocol

Observations: Water temp: 12.50 C; Cond: 407 umhos; DO: 8.57 mg/L; pH: 8.09 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 84' / 2'; Substrate: cobble, gravel, sand, silt, snags

Canopy: mostly open; Bank Stability: good; Bank Vegetation: vines, trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested, suburban

Other: periphytes, lawn mowed up to left bank; rip rap by bridge; bridge appears new

AMNET Site # **AN0073** *Stream Name:* **Musconetcong R**

Location: **Rt 579; Bloomsbury Boro; Hunterdon & Warren County**

Collection Date: *10/16/2007* *USGS Topo Map:* **Bloomsbury**

	Genus	Tolerance Value	Amount
	Dugesia	4	18
*	Chimarra	4	11
	Stenelmis	5	11
*	Cheumatopsyche	5	10
*	Maccaffertium	3	8
*	Ceratopsyche	4	6
*	Brachycentrus	1	5
	Antocha	3	3
*	Lepidostoma	1	3
	Psephenus	4	3
*	Acroneuria	0	2
	Ferrissia	7	2
	Gammarus	6	2
	Macronychus	2	2
*	Micrasema	2	2
	Optioservus	4	2
*	Serratella	2	2
	Amnicola	4.8	1
	Corbicula	4	1
*	Ephemerella	1	1
	Eukiefferiella	8	1
*	Hydropsyche	4	1
*	Leucotrichia	3	1
*	Psychomyia	2	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI):	3.76	*# Scrapers:*	7
% Sensitive EPT:	36.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	20.0%	*Attribute 3 genera:*	5

HGMI Rating: **63.05** **Excellent**

Habitat Analysis: 165 Optimal USEPA Protocol

Observations: Water temp: 12.39 C; Cond: 412 umhos; DO: 8.94 mg/L; pH: 7.97 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 86.4'/2'; Substrate: cobble, gravel, sand, silt, snags, undercut banks

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers, many outfalls near bridge

Downstream of Impoundment: dam upstream

Other: periphytes

AMNET Site # **AN0074** *Stream Name:* **Musconetcong R**

Location: **River Rd (Rt 627); Pohatcong Twp; Warren County**

Collection Date: *10/16/2007* *USGS Topo Map:* **Reigelsville**

	Genus	Tolerance Value	Amount
*	Symphitopsyche	4	26
*	Glossosoma	0	18
	Gammarus	6	16
*	Cheumatopsyche	5	8
*	Lepidostoma	1	8
	Stenelmis	5	5
	Cura	4	3
*	Hydropsyche	4	3
	Microtendipes	7	3
	Antocha	3	2
*	Chimarra	4	1
	Corydalus	4	1
	Orthocladius	6	1
	Pleurocera	7	1
	Promoresia	2	1
	Psephenus	4	1
	Stylodrilus	10	1
	Thienemanniella	6	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.67 *# Scrapers:* 5

% Sensitive EPT: 27.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 22.2% *Attribute 3 genera:* 2

HGMI Rating: **49.39** **Good**

Habitat Analysis: 115 Suboptimal USEPA Protocol

Observations: Water temp: 12.75 C; Cond: 396 umhos; DO: 9.40 mg/L; pH: 8.12 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 73.8'/2'; Substrate: snags, silt, cobble, gravel, sand, mud

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested, suburban

Pipes / Ditches: storm sewers

Other: periphytes; left bank had severe erosion scars

AMNET Site # **AN0075** *Stream Name:* **Hakihokake Ck**

Location: **Myler Rd; Alexandria Twp; Hunterdon County**

Collection Date: *10/16/2007* *USGS Topo Map:* **Bloomsbury**

	Genus	Tolerance Value	Amount
*	Acroneuria	0	11
	Optioservus	4	11
*	Baetis	6	9
*	Dolophilodes	0	9
	Oulimnius	4	9
*	Ephemerella	1	6
*	Maccaffertium	3	6
*	Hydropsyche	4	4
*	Pteronarcys	0	4
*	Ceratopsyche	4	3
*	Cheumatopsyche	5	3
	Hexatoma	2	3
	Lanthus	5	2
*	Leptophlebia	4	2
*	Lype	2	2
	Stenelmis	5	2
*	Taeniopteryx	2	2
	Cambarus	6	1
*	Chimarra	4	1
*	Diplectrona	0	1
	Dugesia	4	1
	Eclipidrilus	8	1
*	Goera	0	1
*	Hydropsychidae	4	1
*	Leucrocuta	1	1
*	Leuctra	0	1
	Orthocladius	6	1
*	Rhyacophila	1	1
*	Sweltsa	0	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 2.77 *# Scrapers:* 5

% Sensitive EPT: 58.0% *Attribute 2 genera:* 6

% Non-Insect Taxa: 10.3% *Attribute 3 genera:* 9

HGMI Rating: **81.50** **Excellent**

Habitat Analysis: 117 Suboptimal USEPA Protocol

Observations: Water temp: 11.71 C; Cond: 160 umhos; DO: 9.13 mg/L; pH: 7.72 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 13.3'/<1'; Substrate: silt, cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: mowed lawn on left bank; new bridge upstream of site

AMNET Site # **AN0076** *Stream Name:* **Hakihokake Ck**

Location: **Miller Park Rd; Holland Twp; Hunterdon County**

Collection Date: ***11/8/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	28
*	Maccaffertium	3	19
*	Ceratopsyche	4	10
*	Chimarra	4	9
*	Acroneuria	0	6
*	Isonychia	2	6
*	Apatania	3	4
*	Capniidae	1	2
*	Glossosoma	0	2
*	Hydropsyche	4	2
*	Hydropsychidae	4	2
	Optioservus	4	2
	Antocha	3	1
*	Dolophilodes	0	1
*	Ephemerellidae	1	1
*	Eurylophella	4	1
	Hexatoma	2	1
	Lumbriculus	8	1
	Psephenus	4	1
*	Taeniopteryx	2	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.47 *# Scrapers:* 5

% Sensitive EPT: 52.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 5.0% *Attribute 3 genera:* 7

HGMI Rating: **70.83** **Excellent**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 4.50 C; Cond: 199 umhos; DO: 12.68 mg/L; pH: 8.74 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 27.9'/<1'; Substrate: cobble, gravel, sand, undercut banks

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: periphytes, trout stocked waters

AMNET Site # **AN0077** *Stream Name:* **Hakihokake Ck**

Location: **Bridge St; Milford Boro; Hunterdon County**

Collection Date: ***10/16/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	Tolerance Value	Amount
	Gammarus	6	21
*	Cheumatopsyche	5	18
	Microtendipes	7	7
*	Isonychia	2	6
	Lumbriculus	8	6
	Optioservus	4	6
	Prostoma	7	5
*	Ceratopsyche	4	4
	Physella	9.1	4
	Tanytarsus	6	3
*	Glossosoma	0	2
*	Maccaffertium	3	2
	Antocha	3	1
	Chironomus	10	1
	Corydalus	4	1
	Dicrotendipes	8	1
	Dugesia	4	1
*	Ephemerella	1	1
	Ferrissia	7	1
*	Hydropsyche	4	1
*	Hydropsychidae	4	1
	Menetus	6	1
*	Mystacides	4	1
	Oulimnius	4	1
	Psephenus	4	1
	Rheotanytarsus	6	1
	Stenelmis	5	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.39	*# Scrapers:*	8
% Sensitive EPT:	12.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	25.0%	*Attribute 3 genera:*	5
HGMI Rating:	**52.36**	**Good**	
Habitat Analysis:	92	Marginal	USEPA Protocol

Observations: Water temp: 13.44 C; Cond: 287 umhos; DO: 9.47 mg/L; pH: 8.38 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 38'/<1'; Substrate: snags, mud, silt, cobble, gravel, sand

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: commercial, urban

Pipes / Ditches: storm sewers

Other: periphytes, waterfowl; small park on left bank; rip rap on bank at park

AMNET Site # **AN0078** *Stream Name:* **Harihokake Ck**

Location: **Hartpence Rd; Alexandria Twp; Hunterdon County**

Collection Date: ***11/8/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	25
*	Ceratopsyche	4	23
*	Chimarra	4	17
*	Hydropsyche	4	15
*	Maccaffertium	3	2
	Polypedilum	6	2
*	Taeniopteryx	2	2
*	Acroneuria	0	1
	Antocha	3	1
*	Apatania	3	1
*	Baetis	6	1
	Cricotopus	7	1
*	Ephemerella	1	1
*	Eurylophella	4	1
*	Isonychia	2	1
	Lumbriculus	8	1
	Orthocladiinae	5	1
	Oulimnius	4	1
*	Tallaperla	0	1
	Thienemanniella	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.20 *# Scrapers:* 4

% Sensitive EPT: 28.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 4.8% *Attribute 3 genera:* 9

HGMI Rating: **59.60** **Good**

Habitat Analysis: 146 Suboptimal USEPA Protocol

Observations: Water temp: 5.00 C; Cond: 100 umhos; DO: 11.75 mg/L; pH: 8.36 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 172'/<1'; Substrate: cobble, gravel, sand, snags, root mats

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: vines, trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock, agriculture-cropland, forested, rural

Pipes / Ditches: storm sewers

Other: periphytes, macrophytes, salamander; deer carcass in stream near bridge

AMNET Site # **AN0079** *Stream Name:* **Harihokake Ck**

Location: **Rt 619 (River Rd); Alexandria Twp; Hunterdon County**

Collection Date: ***11/8/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	38
*	Isonychia	2	12
*	Cheumatopsyche	5	9
*	Maccaffertium	3	7
*	Ephemerella	1	6
*	Apatania	3	3
	Dineutus	4	3
*	Hydropsyche	4	3
*	Caenis	7	2
*	Mystacides	4	2
	Pisidium	6.8	2
	Psephenus	4	2
*	Taeniopteryx	2	2
*	Acroneuria	0	1
	Boyeria	2	1
*	Ceratopsyche	4	1
	Corydalus	4	1
	Curculionidae	7	1
*	Lepidostoma	1	1
	Lumbriculus	8	1
	Optioservus	4	1
*	Polycentropus	6	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.41 *# Scrapers:* 3

% Sensitive EPT: 37.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 13.6% *Attribute 3 genera:* 9

HGMI Rating: **59.27** **Good**

Habitat Analysis: 142 Suboptimal USEPA Protocol

Observations: Water temp: 5.67 C; Cond: 186 umhos; DO: 12.15 mg/L; pH: 9.28 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 29'/<1'; Substrate: sand, gravel, cobble, bedrock, root mats, snags, undercut banks

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, vines, weeds

Stream Gradient: High Gradient Stream; Land Uses: commercial, industrial

Pipes / Ditches: storm sewers

Other: fish, periphytes, A lot of Red Shale

AMNET Site # **AN0080** *Stream Name:* **Nishisakawick Ck**

Location: **Airport Rd; Alexandria Twp; Hunterdon County**

Collection Date: ***11/14/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	*Tolerance Value*	*Amount*
	Parachaetocladius	2	40
*	Maccaffertium	3	12
*	Acroneuria	0	7
	Psephenus	4	7
*	Allocapnia	3	5
	Stenelmis	5	4
	Brillia	5	2
*	Ceratopsyche	4	2
	Dicranota	3	2
*	Ephemerellidae	1	2
*	Hydropsyche	4	2
	Optioservus	4	2
	Polypedilum	6	2
	Antocha	3	1
	Calopteryx	6	1
*	Cheumatopsyche	5	1
*	Diplectrona	0	1
	Hexatoma	2	1
	Nanocladius	3	1
*	Neophylax	3	1
*	Psilotreta	0	1
	Rheotanytarsus	6	1
	Thienemanniella	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	2.71	*# Scrapers:*	5
% Sensitive EPT:	29.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:	0.0%	*Attribute 3 genera:*	6

HGMI Rating: **67.15** **Excellent**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 7.30 C; Cond: 99 umhos; DO: 10.29 mg/L; pH: 7.78 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 3' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, agriculture-cropland

Other: salamander

AMNET Site # **AN0081** *Stream Name:* **Nishisakawick Ck**

Location: **Private road off Creek Rd; Alexandria Twp; Hunterdon County**

Collection Date: ***11/8/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	18
*	Serratella	2	16
*	Isonychia	2	14
*	Maccaffertium	3	12
*	Hydropsyche	4	8
*	Chimarra	4	5
*	Acroneuria	0	4
*	Leuctra	0	3
*	Symphitopsyche	4	3
*	Taeniopteryx	2	3
*	Dannella	2	2
*	Helicopsyche	3	2
*	Apatania	3	1
	Boyeria	2	1
	Caecidotea	8	1
*	Glossosoma	0	1
*	Lype	2	1
	Polypedilum	6	1
*	Psilotreta	0	1
*	Pycnopsyche	4	1
	Stictochironomus	9	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.05 *# Scrapers:* 5

% Sensitive EPT: 66.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 4.5% *Attribute 3 genera:* 11

HGMI Rating: **77.10** **Excellent**

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 5.13 C; Cond: 204 umhos; DO: 12.14 mg/L; pH: 7.80 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 31.8'/<1'; Substrate: cobble, bedrock

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested, agriculture-cropland

Other: periphytes; new bank stabilization on left bank

AMNET Site # **AN0082** *Stream Name:* **Nishisakawick Ck**

Location: **Creek Rd; Frenchtown Boro; Hunterdon County**

Collection Date: ***11/8/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	24
*	Isonychia	2	18
*	Ceratopsyche	4	17
*	Ephemerella	1	10
*	Maccaffertium	3	9
*	Chimarra	4	4
*	Eurylophella	4	4
*	Platycentropus	4	2
*	Acroneuria	0	1
	Antocha	3	1
*	Apatania	3	1
*	Brachycentrus	1	1
	Corynoneura	4	1
	Crangonyx	8	1
*	Epeorus	0	1
*	Helicopsyche	3	1
	Lumbriculus	8	1
	Rheotanytarsus	6	1
	Stylogomphus	1	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.42 *# Scrapers:* 4

% Sensitive EPT: 52.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 10.0% *Attribute 3 genera:* 9

HGMI Rating: **68.62** **Excellent**

Habitat Analysis: 142 Suboptimal USEPA Protocol

Observations: Water temp: 4.74 C; Cond: 200 umhos; DO: 12.70 mg/L; pH: 7.58 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 32'/<1'; Substrate: cobble, gravel, sand, snags, bedrock, concrete

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, vines, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: commercial, suburban, park

Pipes / Ditches: storm sewers

Other: periphytes; Trout stocked; a lot of exposed bedrock

AMNET Site # **AN0083** *Stream Name:* **Little Nishisakawick Ck**

Location: **Rt 29; Frenchtown Boro; Hunterdon County**

Collection Date: ***11/8/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	Tolerance Value	Amount
	Gammarus	6	21
	Physella	9.1	17
	Helisoma	7	11
	Gyraulus	6	9
*	Cheumatopsyche	5	6
*	Isonychia	2	5
*	Ephemerella	1	4
	Stylogomphus	1	4
	Calopteryx	6	3
*	Hydropsyche	4	2
	Hydrovatus	5	2
*	Leuctra	0	2
*	Maccaffertium	3	2
	Boyeria	2	1
*	Caenis	7	1
*	Chimarra	4	1
	Corynoneura	4	1
	Cricotopus	7	1
	Cura	4	1
	Dromogomphus	4	1
	Fossaria	6	1
*	Lype	2	1
*	Mystacides	4	1
*	Taeniopteryx	2	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.52	*# Scrapers:*	5
% Sensitive EPT:	18.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	24.0%	*Attribute 3 genera:*	9

HGMI Rating: **52.49** **Good**

Habitat Analysis: 120 Suboptimal USEPA Protocol

Observations: Water temp: 5.93 C; Cond: 208 umhos; DO: 11.23 mg/L; pH: 8.13 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 22'/<1'; Substrate: cobble, gravel, sand, bedrock, root mats, undercut banks

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: commercial, suburban

Pipes / Ditches: storm sewers

Other: periphytes, salamander, steep banks, LDB mostly rock, multiple storm sewers

AMNET Site # **AN0084** *Stream Name:* **Copper Ck**

Location: **Horseshoe Bend Rd; Kingwood Twp; Hunterdon County**

Collection Date: ***11/8/2007*** *USGS Topo Map:* **Frenchtown**

	Genus	Tolerance Value	Amount
*	Ephemerella	1	57
	Physella	9.1	4
*	Chimarra	4	3
*	Lype	2	3
	Boyeria	2	2
	Eclipidrilus	8	2
	Hexatoma	2	2
*	Hydropsyche	4	2
*	Lepidostoma	1	2
	Psephenus	4	2
*	Taeniopteryx	2	2
	Tipula	4	2
*	Acroneuria	0	1
	Caecidotea	8	1
*	Cheumatopsyche	5	1
	Cricotopus	7	1
*	Leuctra	0	1
	Limnodrilus	10	1
*	Maccaffertium	3	1
*	Ochrotrichia	4	1
	Orthocladius	6	1
	Oulimnius	4	1
	Phaenopsectra	7	1
*	Serratella	2	1
	Stenelmis	5	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI): 2.35 *# Scrapers:* 6

% Sensitive EPT: 72.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 15.4% *Attribute 3 genera:* 9

HGMI Rating: **78.18** **Excellent**

Habitat Analysis: 133 Suboptimal USEPA Protocol

Observations: Water temp: 6.88 C; Cond: 201 umhos; DO: 11.64 mg/L; pH: 7.70 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 38'/<1'; Substrate: cobble, gravel, sand, snags, undercut banks

Canopy: mostly open; Bank Stability: good; Bank Vegetation: grasses, shrubs, trees

Stream Gradient: High Gradient Stream; Land Uses: forested, suburban, agriculture-cropland

Pipes / Ditches: storm sewers

Other: fish

AMNET Site # **AN0085** *Stream Name:* **Warford Ck**

Location: **Rt 29; Kingwood Twp; Hunterdon County**

Collection Date: ***6/17/2008*** *USGS Topo Map:* **Lumberville**

	Genus	*Tolerance Value*	*Amount*
	Phaenopsectra	7	23
	Tanytarsus	6	22
*	Acentrella	4	11
	Nais	8	7
	Physella	9.1	4
	Cricotopus	7	3
	Eukiefferiella	8	3
	Polypedilum	6	3
*	Acroneuria	0	2
*	Baetis	6	2
	Chironomus	10	2
	Corynoneura	4	2
*	Leuctra	0	2
	Microtendipes	7	2
	Simulium	6	2
	Thienemanniella	6	2
	Tribelos	5	2
	Curculionidae	7	1
*	Glossosoma	0	1
*	Oecetis	8	1
*	Paraleptophlebia	1	1
	Parametriocnemus	5	1
	Rheopelopia	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.05 *# Scrapers:* 3

% Sensitive EPT: 20.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 8.7% *Attribute 3 genera:* 3

HGMI Rating: **47.55** **Good**

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 18.21 C; Cond: 149 umhos; DO: 9.24 mg/L; pH: 7.31 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 10' / <1'; Substrate: cobble, gravel, sand, bedrock

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, frogs, periphytes, salamander, logging in progress (LB)

AMNET Site # **AN0086** *Stream Name:* **Lockatong Ck**

Location: **Oak Grove Rd; Frankiln Twp; Hunterdon County**

Collection Date: ***11/14/2007*** *USGS Topo Map:* **Pittstown**

	Genus	Tolerance Value	Amount
*	Maccaffertium	3	30
*	Cheumatopsyche	5	18
*	Eurylophella	4	11
*	Chimarra	4	10
	Musculium	5	9
*	Hydropsyche	4	4
	Polypedilum	6	3
	Prostoma	7	3
	Microtendipes	7	2
	Stenelmis	5	2
	Antocha	3	1
*	Apatania	3	1
*	Baetis	6	1
	Caecidotea	8	1
*	Leuctra	0	1
	Optioservus	4	1
	Psephenus	4	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.22	*# Scrapers:*	5
% Sensitive EPT:	54.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	16.7%	*Attribute 3 genera:*	4
HGMI Rating:	**55.15**	**Good**	
Habitat Analysis:	149	Suboptimal	USEPA Protocol

Observations: Water temp: 6.91 C; Cond: 206 umhos; DO: 11.63 mg/L; pH: 7.56 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 23' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, forested

Other: salamander; fence restricting upstream sampling

AMNET Site # **AN0087** *Stream Name:* **Lockatong Ck**

Location: **Rt 12; Kingwood Twp; Hunterdon County**

Collection Date: *11/8/2007* *USGS Topo Map:* **Pittstown**

	Genus	Tolerance Value	Amount
*	Maccaffertium	3	24
*	Chimarra	4	13
	Cura	4	8
	Psephenus	4	8
	Oulimnius	4	7
*	Hydropsyche	4	4
	Physella	9.1	4
*	Cheumatopsyche	5	3
	Parametriocnemus	5	3
	Atherix	2	2
	Dicrotendipes	8	2
	Gammarus	6	2
	Helisoma	7	2
	Microtendipes	7	2
	Optioservus	4	2
	Polypedilum	6	2
*	Caenis	7	1
*	Cloeon	4	1
	Dubiraphia	6	1
*	Helicopsyche	3	1
*	Isonychia	2	1
	Lumbriculus	8	1
	Macronychus	2	1
	Menetus	6	1
*	Serratella	2	1
	Simulium	6	1
	Tribelos	5	1
	Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.39	*# Scrapers:*	9
% Sensitive EPT:	42.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	25.0%	*Attribute 3 genera:*	7

HGMI Rating: **64.27** **Excellent**

Habitat Analysis: 127 Suboptimal USEPA Protocol

Observations: Water temp: 4.88 C; Cond: 201 umhos; DO: 11.93 mg/L; pH: 7.76 SU

Clarity: slightly turbid, milky-green; Flow Rate: moderate; Width/Depth: 25'/<1-1.5'; Substrate: mud, silt, cobble, gravel, sand, undercut banks

Canopy: mostly open; Bank Stability: poor; Bank Vegetation: vines, trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock, commercial, suburban

Pipes / Ditches: storm sewers

Other: crayfish, periphytes

AMNET Site # **AN0088** *Stream Name:* **Lockatong Ck**

Location: **Rt 519; Kingwood Twp; Hunterdon County**

Collection Date: *11/14/2007* *USGS Topo Map:* **Lumberville**

	Genus	Tolerance Value	Amount
*	Maccaffertium	3	25
*	Isonychia	2	19
	Psephenus	4	14
*	Cheumatopsyche	5	7
*	Chimarra	4	5
*	Ephemerella	1	5
	Stenelmis	5	5
*	Hydropsyche	4	3
	Ferrissia	7	2
	Lumbriculus	8	2
	Optioservus	4	2
*	Serratella	2	2
*	Acroneuria	0	1
*	Apatania	3	1
	Ectopria	5	1
	Enallagma	9	1
	Helisoma	7	1
	Musculium	5	1
*	Paraleptophlebia	1	1
	Prostoma	7	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	3.49	*# Scrapers:*	8
% Sensitive EPT:	60.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	23.8%	*Attribute 3 genera:*	6
HGMI Rating:	**66.88**	**Excellent**	
Habitat Analysis:	166	Optimal	USEPA Protocol

Observations: Water temp: 5.94 C; Cond: 210 umhos; DO: 11.20 mg/L; pH: 8.68 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 40' / <1'; Substrate: sand, gravel, cobble

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: forested, rural

Other: Trout stocked water

AMNET Site # **AN0089** *Stream Name:* **Lockatong Ck**

Location: **Rt 29; Delaware Twp; Hunterdon County**

Collection Date: *6/17/2008* *USGS Topo Map:* **Lumberville**

	Genus	Tolerance Value	Amount
	Gammarus	6	53
	Phaenopsectra	7	7
	Physella	9.1	7
*	Cheumatopsyche	5	6
*	Ceratopsyche	4	5
	Caecidotea	8	4
*	Chimarra	4	3
	Aulodrilus	8	2
*	Perlesta	4	2
*	Perlidae	1	2
	Polypedilum	6	2
	Rheotanytarsus	6	2
	Chironomus	10	1
	Naididae	7	1
	Pisidium	6.8	1
	Psephenus	4	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.08	*# Scrapers:*	3
% Sensitive EPT:	7.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	35.3%	*Attribute 3 genera:*	1
HGMI Rating:	**26.24**	**Fair**	
Habitat Analysis:	160	Optimal	USEPA Protocol

Observations: Water temp: 23.43 C; Cond: 239 umhos; DO: 7.35 mg/L; pH: 7.72 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 68' / <1'; Substrate: cobble, gravel, sand, snags

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Other: fish, snake, toad tadpoles

AMNET Site # **AN0090** *Stream Name:* **Wickecheoke Ck**

Location: **Rt 579; Raritan Twp; Hunterdon County**

Collection Date: ***11/14/2007*** *USGS Topo Map:* **Pittstown**

	Genus	Tolerance Value	Amount
	Caecidotea	8	60
	Stenelmis	5	13
	Crangonyx	8	6
	Sphaeriidae	8	5
	Dubiraphia	6	4
	Tubificidae	10	3
	Diplocladius	8	2
	Psephenus	4	2
*	Cheumatopsyche	5	1
	Glossiphoniidae	8	1
	Hydroporus	5	1
	Lumbriculidae	8	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.41 *# Scrapers:* 3

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 46.2% *Attribute 3 genera:* 1

HGMI Rating: **15.12** **Poor**

Habitat Analysis: 167 Optimal USEPA Protocol

Observations: Water temp: 5.46 C; Cond: 265 umhos; DO: 9.72 mg/L; pH: 7.55 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' /< 1'; Substrate: cobble, gravel, sand, bedrock

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, agriculture-cropland, forested

Pipes / Ditches: 2 storm sewers

Other: macrophytes, salamanders

AMNET Site # **AN0091** *Stream Name:* **Wickecheoke Ck**

Location: **Locktown/Sergeantsville Rd; Delaware Twp; Hunterdon County**

Collection Date: ***11/14/2007*** *USGS Topo Map:* **Stockton**

	Genus	*Tolerance Value*	*Amount*
	Stenelmis	5	40
	Musculium	5	12
	Corydalus	4	5
	Eukiefferiella	8	4
	Hymanella	4	4
	Orthocladius	6	4
	Prosimulium	2	4
	Helisoma	7	3
	Lumbriculus	8	3
	Prostoma	7	3
	Simulium	6	3
*	Cheumatopsyche	5	2
	Cura	4	2
	Psephenus	4	2
*	Apatania	3	1
*	Caenis	7	1
	Cricotopus	7	1
	Enallagma	9	1
	Gammarus	6	1
	Lanthus	5	1
	Nematoda	6	1
	Physella	9.1	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.28 *# Scrapers:* 5

% Sensitive EPT: 2.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 39.1% *Attribute 3 genera:* 4

HGMI Rating: **36.78** **Fair**

Habitat Analysis: 169 Optimal USEPA Protocol

Observations: Water temp: 7.03 C; Cond: 206 umhos; DO: 10.78 mg/L; pH: 8.84 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 36'/<1'; Substrate: sand, gravel, cobble

Canopy: mostly open; Bank Stability: good; Bank Vegetation: vines, trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

AMNET Site # **AN0092** *Stream Name:* **Plum Brook**

Location: **Rt 579 (Mile 21.15); Delaware Twp; Hunterdon County**

Collection Date: ***11/28/2007*** *USGS Topo Map:* **Stockton**

	Genus	Tolerance Value	Amount
	Prosimulium	2	46
*	Allocapnia	3	20
	Musculium	5	5
	Diamesa	5	3
	Enchytraeidae	10	3
	Heterotrissocladius	0	3
	Nais	8	2
	Physella	9.1	2
	Rheocricotopus	6	2
	Stenelmis	5	2
	Tetragoneuria	8.5	2
	Tipula	4	2
	Agabus	5	1
	Caecidotea	8	1
	Cura	4	1
	Helisoma	7	1
	Menetus	6	1
	Placobdella	8	1
	Stylaria	8	1
	Tubificidae	10	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.59 *# Scrapers:* 4

% Sensitive EPT: 20.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 55.0% *Attribute 3 genera:* 2

HGMI Rating: **37.59** **Fair**

Habitat Analysis: 158 Suboptimal USEPA Protocol

Observations: Water temp: 4.95 C; Cond: 151 umhos; DO: 11.72 mg/L; pH: 7.76 SU

Clarity: slightly turbid, brown; Flow Rate: moderate; Width/Depth: 11' / < 1'; Substrate: cobble, boulder, snags, root mats

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: rural, agriculture-cropland, agriculture-livestock

Pipes / Ditches: ditches draining surrounding lawns and fields

Other: macrophytes, periphytes; water brown, cedar-like color

AMNET Site # **AN0093** *Stream Name:* **Plum Brook**

Location: **Pine Hill Rd; Delaware Twp; Hunterdon County**

Collection Date: ***6/17/2008*** *USGS Topo Map:* **Stockton**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	13
*	Baetis	6	12
	Tvetenia	5	11
*	Perlesta	4	8
	Lumbriculidae	8	6
*	Ceratopsyche	4	5
	Psephenus	4	5
	Perithemis	4	4
	Stenelmis	5	4
	Tanytarsus	6	4
*	Centroptilum	2	3
	Thienemannimyia	6	3
*	Paraleptophlebia	1	2
*	Perlidae	1	2
	Physella	9.1	2
	Slavina	7	2
	Dicrotendipes	8	1
	Dubiraphia	6	1
	Ferrissia	7	1
	Gerris	8	1
	Hexatoma	2	1
*	Hydropsyche	4	1
	Microtendipes	7	1
	Ophidonais	7	1
	Paratanytarsus	6	1
	Pisidium	6.8	1
	Polypedilum	6	1
	Rheocricotopus	6	1
	Rheotanytarsus	6	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.18 *# Scrapers:* 5

% Sensitive EPT: 27.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 20.0% *Attribute 3 genera:* 3

HGMI Rating: **51.90** **Good**

Habitat Analysis: 160 Optimal USEPA Protocol

Observations: Water temp: 18.55 C; Cond: 178 umhos; DO: 8.34 mg/L; pH: 7.02 SU

Clarity: slightly turbid, greenish color; Flow Rate: moderate; Width/Depth: 33' / <1'; Substrate: cobble, gravel, sand, bedrock

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: fish, frogs, periphytes, salamander, tires; "Wickecheoke Preserved Land"

AMNET Site # **AN0094** *Stream Name:* **Wickecheoke Ck**

Location: **Rt 604 Green Sargents Covered Bridge; Delaware Twp; Hunterdon County**

Collection Date: ***6/17/2008*** *USGS Topo Map:* **Stockton**

	Genus	Tolerance Value	Amount
	Polypedilum	6	16
	Rheotanytarsus	6	13
*	Ceratopsyche	4	12
	Tvetenia	5	8
	Tanytarsus	6	6
*	Chimarra	4	5
	Micropsectra	7	5
	Naididae	7	5
*	Cheumatopsyche	5	4
	Cricotopus	7	3
*	Hydropsychidae	4	3
	Psephenus	4	3
	Thienemannimyia	6	3
*	Perlesta	4	2
	Physella	9.1	2
*	Polycentropus	6	2
*	Acentrella	4	1
	Hexatoma	2	1
	Menetus	6	1
	Parametriocnemus	5	1
	Rheocricotopus	6	1
	Simulium	6	1
	Slavina	7	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.50	*# Scrapers:*	4
% Sensitive EPT:	10.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	16.7%	*Attribute 3 genera:*	3

HGMI Rating: **43.33** **Good**

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 20.43 C; Cond: 177 umhos; DO: 8.97 mg/L; pH: 7.16 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15'/<1'; Substrate: cobble, gravel, sand, root mats, boulder, bedrock

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, periphytes, salamander

AMNET Site # **AN0095** *Stream Name:* **Wickecheoke Ck**

Location: **Rt 29; Delaware Twp; Hunterdon County**

Collection Date: ***11/14/2007*** *USGS Topo Map:* **Stockton**

	Genus	Tolerance Value	Amount
	Gammarus	6	39
*	Isonychia	2	17
*	Maccaffertium	3	8
*	Caenis	7	7
*	Cheumatopsyche	5	7
*	Chimarra	4	5
*	Stenacron	4	5
*	Polycentropus	6	3
*	Acroneuria	0	2
	Argia	6	1
*	Baetis	6	1
	Dicrotendipes	8	1
*	Hydropsyche	4	1
*	Mystacides	4	1
	Optioservus	4	1
	Polypedilum	6	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.72	*# Scrapers:*	2
% Sensitive EPT:	49.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	6.3%	*Attribute 3 genera:*	5
HGMI Rating:	**52.17**	**Good**	
Habitat Analysis:	167	Optimal	USEPA Protocol

Observations: Water temp: 6.49 C; Cond: 223 umhos; DO: 12.12 mg/L; pH: 9.53 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 20' / < 1 -1'; Substrate: cobble, gravel, sand, bedrock

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: corrugated metal pipe

Other: periphytes

AMNET Site # **AN0096** *Stream Name:* **Alexauken Ck**

Location: **Rocktown-Lambertville Rd; West Amwell Twp; Hunterdon County**

Collection Date: ***4/10/2008*** *USGS Topo Map:* **Stockton**

	Genus	Tolerance Value	Amount
	Stenelmis	5	37
	Nais	8	15
	Cricotopus	7	5
	Rheocricotopus	6	5
*	Serratella	2	5
	Thienemannimyia	6	5
*	Amphinemura	3	4
	Psephenus	4	4
	Tanytarsus	6	3
	Polypedilum	6	2
*	Chimarra	4	1
	Clinocera	6	1
	Diamesa	5	1
	Enchytraeidae	10	1
*	Haploperla	1	1
*	Isoperla	2	1
*	Maccaffertium	3	1
	Musculium	5	1
*	Paraleptophlebia	1	1
*	Polycentropus	6	1
	Prosimulium	2	1
	Simulium	6	1
	Slavina	7	1
	Stylodrilus	10	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.41	*# Scrapers:*	4
% Sensitive EPT:	15.0%	*Attribute 2 genera:*	4
% Non-Insect Taxa:	20.0%	*Attribute 3 genera:*	4

HGMI Rating: **51.12** **Good**

Habitat Analysis: 138 Suboptimal USEPA Protocol

Observations: Water temp: 12.93 C; Cond: 220 umhos; DO: 11.53 mg/L; pH: 8.04 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 14' / <1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: poor; Bank Vegetation: trees, shrubs, vines

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, rural

Pipes / Ditches: storm sewers flowing downstream

Other: fish, filamentous algae, garter snake

AMNET Site # **AN0097** *Stream Name:* **UNT to Alexauken Ck**

Location: **Queen Rd & Alexauken Ck Rd; West Amwell Twp; Hunterdon County**

Collection Date: *4/10/2008* *USGS Topo Map:* **Stockton**

	Genus	Tolerance Value	Amount
*	Amphinemura	3	29
*	Ephemerella	1	22
	Stenelmis	5	10
	Cricotopus	7	6
*	Isoperla	2	6
*	Caenis	7	5
*	Stenacron	4	4
*	Acerpenna	4	3
	Psephenus	4	3
*	Maccaffertium	3	2
*	Acroneuria	0	1
	Argia	6	1
*	Cheumatopsyche	5	1
*	Chimarra	4	1
	Gomphidae	1	1
	Lanthus	5	1
	Lumbriculus	8	1
	Planorbidae	6	1
*	Polycentropus	6	1
	Prosimulium	2	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.37 *# Scrapers:* 5

% Sensitive EPT: 74.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 10.0% *Attribute 3 genera:* 7

HGMI Rating: **70.87** **Excellent**

Habitat Analysis: 151 Suboptimal USEPA Protocol

Observations: Water temp: 10.73 C; Cond: 204 umhos; DO: 13.01 mg/L; pH: 8.64 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 20' / <1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, vines

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: fish, snake

AMNET Site # **AN0098** *Stream Name:* **Alexauken Ck**

Location: **Rt 29; Lambertville; Hunterdon County**

Collection Date: ***11/28/2007*** *USGS Topo Map:* **Stockton**

	Genus	Tolerance Value	Amount
*	Isonychia	2	17
	Gammarus	6	16
*	Maccaffertium	3	8
*	Chimarra	4	7
	Caecidotea	8	6
	Gyraulus	6	6
	Physella	9.1	5
	Nais	8	4
	Berosus	5	3
*	Cheumatopsyche	5	3
	Cricotopus	7	3
	Dugesia	4	3
	Psephenus	4	3
*	Caenis	7	2
	Helisoma	7	2
	Argia	6	1
	Corydalus	4	1
	Crangonyx	8	1
	Dero	10	1
	Dicrotendipes	8	1
	Menetus	6	1
	Orthocladius	6	1
	Phaenopsectra	7	1
	Pisidium	6.8	1
	Prostoma	7	1
*	Stenacron	4	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.23	*# Scrapers:*	8
% Sensitive EPT:	35.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	44.4%	*Attribute 3 genera:*	4

HGMI Rating: **48.48** **Good**

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 6.73 C; Cond: 267 umhos; DO: 13.50 mg/L; pH: 8.25 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 20' / < 1'; Substrate: cobble, gravel, sand, boulder, snags, root mats

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: rural, forested; adj to Rt 202

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes

AMNET Site # **AN0099** *Stream Name:* **Swan Ck**

Location: **South Union St nr Canal Overflow; Lambertville; Hunterdon County**

Collection Date: *4/10/2008* *USGS Topo Map:* **Lambertville**

	Genus	Tolerance Value	Amount
	Hydrobaenus	8	30
*	Amphinemura	3	24
	Stenelmis	5	10
	Psephenus	4	8
*	Ameletus	0	4
*	Isoperla	2	4
	Eclipidrilus	8	2
*	Neophylax	3	2
*	Ostrocerca	2	2
	Cricotopus	7	1
	Diamesa	5	1
*	Diplectrona	0	1
	Enchytraeidae	10	1
*	Epeorus	0	1
*	Eurylophella	4	1
	Gammarus	6	1
	Lumbriculus	8	1
	Menetus	6	1
	Mooreobdella	7.8	1
	Nais	8	1
*	Paraleptophlebia	1	1
	Prosimulium	2	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI):		4.97	*# Scrapers:*	7
% Sensitive EPT:		41.0%	*Attribute 2 genera:*	7
% Non-Insect Taxa:		30.4%	*Attribute 3 genera:*	4
HGMI Rating:	**62.51**	**Good**		
Habitat Analysis:	102	Marginal	USEPA Protocol	

Observations: Water temp: 12.19 C; Cond: 351 umhos; DO: 13.52 mg/L; pH: 9.36 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 14' / <1.0'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers (PVC pipes)

Other: periphytes, waterfowl (ducks); Rip Rap wall on right bank; left bank eroded

AMNET Site # **AN0100** *Stream Name:* **Moores Ck**

Location: **Barry Rd; West Amwell Twp; Hunterdon County**

Collection Date: *4/10/2008* *USGS Topo Map:* **Lambertville**

	Genus	Tolerance Value	Amount
	Prosimulium	2	27
*	Amphinemura	3	22
*	Neophylax	3	20
*	Agapetus	0	5
*	Ameletus	0	5
*	Ostrocerca	2	5
*	Isoperla	2	4
	Psephenus	4	2
	Boyeria	2	1
	Clinocera	6	1
	Eclipidrilus	8	1
*	Ephemerellidae	1	1
	Hydrobaenus	8	1
	Nilotanypus	6	1
	Parametriocnemus	5	1
*	Polycentropus	6	1
	Sphaeriidae	8	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI): 2.60 *# Scrapers:* 5

% Sensitive EPT: 64.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 11.1% *Attribute 3 genera:* 5

HGMI Rating: **70.86** **Excellent**

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 11.76 C; Cond: 210 umhos; DO: 9.98 mg/L; pH: 8.64 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / <1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers - concrete

Other: fish, frogs, filamentous algae, waterfowl, snake

AMNET Site # **AN0101** *Stream Name:* **Moores Ck**

Location: **Rt 29; Hopewell Twp; Mercer County**

Collection Date: ***6/17/2008*** *USGS Topo Map:* **Lambertville**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	21
	Cricotopus	7	18
	Polypedilum	6	9
*	Baetis	6	7
	Orthocladius	6	6
	Tvetenia	5	5
*	Acerpenna	4	3
	Rheotanytarsus	6	3
*	Symphitopsyche	4	3
	Tanytarsus	6	3
*	Acentrella	4	2
	Caecidotea	8	2
	Alboglossiphonia	8	1
	Brillia	5	1
	Cardiocladius	5	1
*	Cheumatopsyche	5	1
*	Chimarra	4	1
*	Cloeon	4	1
	Dicrotendipes	8	1
	Enchytraeidae	10	1
	Erpobdellidae	8	1
	Hemerodromia	6	1
	Microtendipes	7	1
	Nais	8	1
	Physella	9.1	1
*	Siphlonurus	7	1
	Stenochironomus	5	1
	Thienemanniella	6	1
	Tipula	4	1
	Trichocorixa	9	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.11 *# Scrapers:* 1

% Sensitive EPT: 15.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 23.3% *Attribute 3 genera:* 3

HGMI Rating: **42.64** **Good**

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 18.93 C; Cond: 223 umhos; DO: 9.68 mg/L; pH: 7.40 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / <1'; Substrate: gravel, sand, root mats, undercut banks

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes, storm sewer on right bank by bridge and on left bank upstream flowing, milky gray in deep areas, storm drain upstream flowing heavily, grayish sedimentation in area of discharge, newly installed erosion control on right bank

AMNET Site # **AN0102** *Stream Name:* **Jacobs Ck**

Location: **Woosamonsa Rd; Hopewell Twp; Mercer County**

Collection Date: *4/17/2008* *USGS Topo Map:* **Pennington**

	Genus	Tolerance Value	Amount
	Diamesa	5	31
*	Amphinemura	3	20
	Stenelmis	5	8
	Hydrobaenus	8	7
*	Serratella	2	7
	Cricotopus	7	6
	Psephenus	4	4
*	Baetis	6	3
*	Eurylophella	4	3
	Tanytarsus	6	3
*	Acerpenna	4	1
	Bezzia	6	1
*	Brachycentrus	1	1
	Chironomus	10	1
	Dubiraphia	6	1
	Eukiefferiella	8	1
*	Neophylax	3	1
	Prosimulium	2	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.71 *# Scrapers:* 6

% Sensitive EPT: 36.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 0.0% *Attribute 3 genera:* 6

HGMI Rating: **61.02** **Good**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 9.43 C; Cond: 216 umhos; DO: 12.46 mg/L; pH: 7.90 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 14' / <1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, frogs, periphytes, macrophytes

AMNET Site # **AN0103** *Stream Name:* **Airport Br of Jacobs Ck**

Location: **Rt 579; Hopewell Twp; Mercer County**

Collection Date: ***4/10/2008*** *USGS Topo Map:* **Pennington**

	Genus	Tolerance Value	Amount
*	Amphinemura	3	26
	Stenelmis	5	11
*	Ostrocerca	2	7
	Prosimulium	2	7
	Cricotopus	7	6
	Hydrobaenus	8	6
	Simulium	6	6
	Orthocladius	6	5
	Clinocera	6	3
	Diamesa	5	3
	Orthocladiinae	5	3
	Tanytarsus	6	3
*	Caenis	7	2
	Cnephia	4	1
	Enchytraeidae	10	1
*	Eurylophella	4	1
	Helisoma	7	1
*	Isoperla	2	1
	Nais	8	1
	Parametriocnemus	5	1
	Phaenopsectra	7	1
	Physella	9.1	1
*	Polycentropus	6	1
	Psephenus	4	1
	Rheocricotopus	6	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.69	*# Scrapers:*	7
% Sensitive EPT:	38.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:	16.0%	*Attribute 3 genera:*	5

HGMI Rating: **61.88** **Good**

Habitat Analysis: 145 Suboptimal USEPA Protocol

Observations: Water temp: 18.01 C; Cond: 536 umhos; DO: 13.15 mg/L; pH: 9.77 SU

Clarity: clear, brownish color; Flow Rate: moderate; Width/Depth: 25 ' / < 1.0'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: corrugated metal pipe, dripping

Other: periphytes, filamentous algae

AMNET Site # **AN0104** *Stream Name:* **Woolseys Bk**

Location: **Rt 546; Hopewell Twp; Mercer County**

Collection Date: *4/10/2008* *USGS Topo Map:* **Pennington**

	Genus	Tolerance Value	Amount
*	Amphinemura	3	37
	Stenelmis	5	35
	Psephenus	4	6
	Hydrobaenus	8	5
	Sphaeriidae	8	5
	Cricotopus	7	4
*	Ameletus	0	1
*	Chimarra	4	1
	Dugesia	4	1
	Eukiefferiella	8	1
	Menetus	6	1
*	Neophylax	3	1
	Probezzia	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.53	*# Scrapers:*	5
% Sensitive EPT:	40.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	21.4%	*Attribute 3 genera:*	3
HGMI Rating:	**46.44**	**Good**	
Habitat Analysis:	130	Suboptimal	USEPA Protocol

Observations: Water temp: 15.77 C; Cond: 318 umhos; DO: 9.98 mg/L; pH: 8.18 SU

Clarity: clear, brownish color; Flow Rate: moderate; Width/Depth: 10' / < 1.0'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers (flowing)

Other: fish, periphytes, filamentous algae; sampled downstream of a small feeder stream

AMNET Site # **AN0105** *Stream Name:* **Jacobs Ck**

Location: **Rt 546; Hopewell Twp; Mercer County**

Collection Date: ***4/10/2008*** *USGS Topo Map:* **Pennington**

	Genus	Tolerance Value	Amount
*	Amphinemura	3	38
	Cricotopus	7	21
	Clinocera	6	8
*	Isoperla	2	5
*	Ameletus	0	4
	Prostoma	7	4
	Diamesa	5	3
	Cura	4	2
	Prosimulium	2	2
	Psephenus	4	2
	Simulium	6	2
	Argia	6	1
*	Baetis	6	1
*	Caenis	7	1
*	Hydropsyche	4	1
	Lumbriculus	8	1
*	Maccaffertium	3	1
*	Neophylax	3	1
	Stenelmis	5	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.41	*# Scrapers:*	4
% Sensitive EPT:	51.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:	15.0%	*Attribute 3 genera:*	5
HGMI Rating:	**59.95**	**Good**	
Habitat Analysis:	140	Suboptimal	USEPA Protocol

Observations: Water temp: 15.74 C; Cond: 231 umhos; DO: 14.78 mg/L; pH: 9.25 SU

Clarity: clear, brownish; Flow Rate: moderate; Width/Depth: 29' / <1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers - concrete 24", flowing

Other: fish, frogs, periphytes, snake

AMNET Site # **AN0106** *Stream Name:* **Jacobs Ck**

Location: **Jacobs Ck Rd, 0.4 miles from Rt 29; Hopewell Twp; Mercer County**

Collection Date: *4/10/2008* *USGS Topo Map:* **Pennington**

	Genus	Tolerance Value	Amount
*	Amphinemura	3	20
	Prosimulium	2	19
	Cricotopus	7	12
	Stenelmis	5	9
*	Ameletus	0	7
*	Eurylophella	4	4
	Diamesa	5	3
*	Helicopsyche	3	3
*	Lepidostoma	1	3
	Orthocladius	6	3
	Tanytarsus	6	3
	Clinocera	6	2
	Caecidotea	8	1
*	Caenis	7	1
	Gammarus	6	1
	Hydrobaenus	8	1
*	Isoperla	2	1
*	Micrasema	2	1
*	Mystacides	4	1
	Planorbidae	6	1
	Polypedilum	6	1
	Psephenus	4	1
	Psychodidae	10	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.85 *# Scrapers:* 7

% Sensitive EPT: 42.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 12.5% *Attribute 3 genera:* 6

HGMI Rating: **70.42** **Excellent**

Habitat Analysis: 171 Optimal USEPA Protocol

Observations: Water temp: 18.80 C; Cond: 348 umhos; DO: 13.59 mg/L; pH: 10.21 SU

Clarity: clear, brownish color; Flow Rate: moderate; Width/Depth: 46' / < 1.0'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, vines

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: periphytes, waterfowl (ducks)

AMNET Site # **AN0107** *Stream Name:* **Gold Run**

Location: **Rt 29 & Lower Ferry Rd; Ewing Twp; Mercer County**

Collection Date: ***4/17/2008*** *USGS Topo Map:* **Trenton West**

	Genus	Tolerance Value	Amount
	Nais	8	25
	Cricotopus	7	22
	Diamesa	5	17
	Gammarus	6	9
	Stenelmis	5	7
*	Caenis	7	5
	Caecidotea	8	3
	Crangonyx	8	3
	Pisidium	6.8	2
	Psephenus	4	2
	Aulodrilus	8	1
*	Cheumatopsyche	5	1
	Limnodrilus	10	1
	Planariidae	4	1
	Slavina	7	1

** (EPT organism)* *Taxa Richness:* 15 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.67	*# Scrapers:*	2
% Sensitive EPT:	5.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	60.0%	*Attribute 3 genera:*	0

HGMI Rating: **13.72** **Poor**

Habitat Analysis: 121 Suboptimal USEPA Protocol

Observations: Water temp: 14.81 C; Cond: 332 umhos; DO: 11.01 mg/L; pH: 8.40 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 8' / <1.0'; Substrate: cobble, gravel, sand, root mats

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, golf course downstream

Other: turtle, waterfowl

AMNET Site # **AN0108** *Stream Name:* **Assunpink Ck**

Location: **off Rt 571 Roosevelt Rd (S. Rochdale Rd); Roosevelt Boro; Monmouth County**

Collection Date: ***5/20/2008*** *USGS Topo Map:* **Roosevelt**

Genus	*Tolerance Value*	*Amount*
Musculium	5	20
Thienemannimyia	6	14
Spirosperma	10	13
Caecidotea	8	11
Nais	8	5
Simulium	6	5
Chironomus	10	4
Pentaneura	6	4
Prodiamesa	3	4
Parametriocnemus	5	3
Tanytarsus	6	3
Dicranota	3	2
Polypedilum	6	2
Sialis	4	2
Ablabesmyia	8	1
Bezzia	6	1
Limnodrilus	10	1
Microvelia	6	1
Nematoda	6	1
Phaenopsectra	7	1
Rheotanytarsus	6	1
Rheumatobates	8	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

%Dominance / Dominant Taxon(s): 20.0% Musculium

Hilsenhoff Biotic Index (HBI): 6.64 *%Clingers:* 7.00%

** E+P+T:* 0 ( ) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **6 Fair**

Habitat Analysis: 127 Suboptimal USEPA Protocol

Observations: Water temp: 13.49 C; Cond: 69 umhos; DO: 8.10 mg/L; pH: 5.93 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 8' / <1'; Substrate: sand, snags, undercut banks

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, shrubs

Stream Gradient: Low Gradient Stream; Land Uses: forested

Other: frogs, excessive orange floc, sand stained reddish-brown, Assunpink WMA

AMNET Site # **AN0109** *Stream Name:* **Assunpink Ck**

Location: **Rt 535 (Old Trenton Rd); West Windsor Twp; Mercer County**

Collection Date: *5/20/2008* *USGS Topo Map:* **Hightstown**

	Genus	Tolerance Value	Amount
	Tanytarsus	6	31
	Polypedilum	6	18
	Caecidotea	8	8
	Rheocricotopus	6	5
*	Maccaffertium	3	4
	Phaenopsectra	7	4
	Stenelmis	5	4
	Rheotanytarsus	6	3
	Slavina	7	3
	Gammarus	6	2
	Macronychus	2	2
	Orthocladiinae	5	2
	Sphaeriidae	8	2
	Stylaria	8	2
	Tipula	4	2
	Ablabesmyia	8	1
*	Acentrella	4	1
*	Cheumatopsyche	5	1
	Nais	8	1
	Orconectes	6	1
	Planorbidae	6	1
*	Pseudocloeon	4	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

%Dominance / Dominant Taxon(s): 31.0% Tanytarsus

Hilsenhoff Biotic Index (HBI): 6.00 *%Clingers:* 19.00%

** E+P+T:* 4 (3) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 6.00%

CPMI Rating: **12 Good**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 13.51 C; Cond: 126 umhos; DO: 7.84 mg/L; pH: 6.15 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 30' / 1-2'; Substrate: cobble, gravel, sand, silt, snags, root mats, undercut banks

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: Low Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers left bank

Other: fish, macrophytes, waterfowl; trout stocked

AMNET Site # **AN0109A** *Stream Name:* **Assunpink Ck**

Location: **Windsor Rd; Robbinsville; Mercer County**

Collection Date: ***5/22/2008*** *USGS Topo Map:* **Allentown**

	Genus	*Tolerance Value*	*Amount*
	Caecidotea	8	55
	Gammarus	6	14
*	Maccaffertium	3	12
	Clinotanypus	8	2
	Enallagma	9	2
	Palaemonetes	4	2
	Tribelos	5	2
	Amnicola	4.8	1
	Dugesia	4	1
*	Eurylophella	4	1
	Hyalella	8	1
	Limnodrilus	10	1
	Limnophyes	8	1
	Lymnaeidae	6	1
	Naididae	7	1
	Phaenopsectra	7	1
	Plathemis	3	1
	Polypedilum	6	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

%Dominance / Dominant Taxon(s): 55.0% Caecidotea

Hilsenhoff Biotic Index (HBI): 6.80 *%Clingers:* 14.00%

** E+P+T:* 2 (2) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 13.00%

CPMI Rating: **8 Fair**

Habitat Analysis: 151 Suboptimal USEPA Protocol

Observations: Water temp: 13.79 C; Cond: 108 umhos; DO: 6.88 mg/L; pH: 6.37 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 27'/2-3'; Substrate: mud, silt, snags

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: Low Gradient Stream; Land Uses: forested

Other: macrophytes, grass shrimp

AMNET Site # **AN0109B** *Stream Name:* **New Sharon Br**

Location: **Sharon Rd; Robbinsville; Mercer County**

Collection Date: ***5/22/2008*** *USGS Topo Map:* **Allentown**

Genus	*Tolerance Value*	*Amount*
Caecidotea	8	23
Tanytarsus	6	19
Slavina	7	14
Sphaeriidae	8	14
Physella	9.1	5
Corixidae	9	4
Gammarus	6	3
Ablabesmyia	8	2
Dubiraphia	6	2
Limnodrilus	10	2
Phaenopsectra	7	2
Tubificidae	10	2
Clinotanypus	8	1
Hyalella	8	1
Hydrolimax	4	1
Nais	8	1
Peltodytes	5	1
Polypedilum	6	1
Tribelos	5	1
Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

%Dominance / Dominant Taxon(s): 23.0% Caecidotea

Hilsenhoff Biotic Index (HBI): 7.44 *%Clingers:* 4.00%

** E+P+T:* 0 ( ) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **4 Poor**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 12.85 C; Cond: 153 umhos; DO: 7.97 mg/L; pH: 6.49 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 30' / 2-3'; Substrate: gravel, mud, silt, snags

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: Low Gradient Stream; Land Uses: suburban, forested

Other: crayfish, macrophytes, periphytes, waterfowl

AMNET Site # **AN0110** *Stream Name:* **UNT to Shipetaukin Ck**

Location: **Van Kirk Rd; Lawrence Twp; Mercer County**

Collection Date: ***4/17/2008*** *USGS Topo Map:* **Princeton**

Genus	*Tolerance Value*	*Amount*
Stenelmis	5	17
Prosimulium	2	16
Simulium	6	16
Diamesa	5	13
Cricotopus	7	12
Hydrobaenus	8	9
Rheocricotopus	6	4
Cnephia	4	2
Orthocladiinae	5	2
Physella	9.1	2
Corixidae	9	1
Gerris	8	1
Menetus	6	1
Peltodytes	5	1
Prostoma	7	1
Somatochlora	1	1
Tipula	4	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.34 *# Scrapers:* 4

% Sensitive EPT: 0.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 17.6% *Attribute 3 genera:* 3

HGMI Rating: **39.91** **Fair**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 15.13 C; Cond: 217 umhos; DO: 12.94 mg/L; pH: 8.30 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / <1'; Substrate: cobble, gravel, sand, bedrock

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: frogs, periphytes, filamentous algae, salamanders

AMNET Site # **AN0111** *Stream Name:* **Shipetaukin Ck**

Location: **Rt 583 (Princeton Pk); Lawrence Twp; Mercer County**

Collection Date: *4/17/2008* *USGS Topo Map:* **Princeton**

	Genus	Tolerance Value	Amount
	Limnodrilus	10	21
	Hydrobaenus	8	16
	Gammarus	6	13
	Tanytarsus	6	7
	Corbicula	4	6
	Cricotopus	7	4
	Paratendipes	8	4
	Musculium	5	3
	Psectrocladius	8	3
	Amnicola	4.8	2
	Bezzia	6	2
	Microtendipes	7	2
	Orthocladius	6	2
	Stenelmis	5	2
	Tubifex	10	2
*	Baetis	6	1
	Calopteryx	6	1
	Dubiraphia	6	1
	Enallagma	9	1
*	Helicopsyche	3	1
	Menetus	6	1
*	Mystacides	4	1
	Physella	9.1	1
	Placobdella	8	1
	Polypedilum	6	1
	Tribelos	5	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.27	*# Scrapers:*	7
% Sensitive EPT:	3.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	34.6%	*Attribute 3 genera:*	3

HGMI Rating: **33.89** **Fair**

Habitat Analysis: 106 Marginal USEPA Protocol

Observations: Water temp: 13.36 C; Cond: 295 umhos; DO: 12.77 mg/L; pH: 7.78 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 29'/2'; Substrate: silt, mud, gravel, sand, cobble

Canopy: mostly open; Bank Stability: poor; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural

AMNET Site # **AN0112** *Stream Name:* **Little Shabakunk Ck**

Location: **Princeton Pike (Rt 583); Lawrence Twp; Mercer County**

Collection Date: ***4/17/2008*** *USGS Topo Map:* **Princeton**

Genus	*Tolerance Value*	*Amount*
Paratendipes	8	23
Limnodrilus	10	15
Polypedilum	6	8
Phaenopsectra	7	7
Pristinella	10	7
Enallagma	9	6
Gillia	8	5
Chironomus	10	4
Pisidium	6.8	4
Gammarus	6	3
Hydrobaenus	8	3
Psectrocladius	8	3
Dubiraphia	6	2
Ablabesmyia	8	1
Amnicola	4.8	1
Cricotopus	7	1
Enchytraeidae	10	1
Fossaria	6	1
Lumbriculus	8	1
Menetus	6	1
Metrobates	8	1
Peltodytes	5	1
Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 8.09 *# Scrapers:* 6

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 43.5% *Attribute 3 genera:* 0

HGMI Rating: **22.60** **Fair**

Habitat Analysis: 111 Suboptimal USEPA Protocol

Observations: Water temp: 12.01 C; Cond: 361 umhos; DO: 9.32 mg/L; pH: 7.42 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 27' / 2'; Substrate: cobble, gravel, sand, mud, silt, root mats, undercut banks

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: turtle, periphytes, filamentous algae, waterfowl

AMNET Site # **AN0113** *Stream Name:* **Shabakunk Ck**

Location: **Bull Run Rd; Ewing Twp; Mercer County**

Collection Date: ***4/17/2008*** *USGS Topo Map:* **Pennington**

	Genus	Tolerance Value	Amount
	Cricotopus	7	45
	Ophidonais	7	13
	Polypedilum	6	11
	Dicrotendipes	8	9
	Orthocladius	6	3
	Psephenus	4	3
	Stenelmis	5	3
	Tvetenia	5	3
	Diamesa	5	2
*	Cheumatopsyche	5	1
	Cryptochironomus	8	1
	Gammarus	6	1
	Microvelia	6	1
	Nais	8	1
	Orthocladiinae	5	1
	Paratendipes	8	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.66	*# Scrapers:*	2
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	17.6%	*Attribute 3 genera:*	1
HGMI Rating:	**26.78**	**Fair**	
Habitat Analysis:	98	Marginal	USEPA Protocol

Observations: Water temp: 11.55 C; Cond: 509 umhos; DO: 11.49 mg/L; pH: 7.86 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 13' / <1'; Substrate: gravel, sand, silt, root mats, undercut banks

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes, waterfowl

AMNET Site # **AN0114** *Stream Name:* **Shabakunk Ck**

Location: **Rt 206; Lawrence Twp; Mercer County**

Collection Date: ***5/22/2008*** *USGS Topo Map:* **Princeton**

Genus	*Tolerance Value*	*Amount*
Tanytarsus	6	22
Gammarus	6	19
Limnodrilus	10	9
Physella	9.1	8
Nais	8	6
Micropsectra	7	5
Phaenopsectra	7	4
Slavina	7	4
Dicrotendipes	8	3
Spirosperma	10	3
Stenelmis	5	3
Cricotopus	7	2
Rheopelopia	4	2
Stictochironomus	9	2
Stylodrilus	10	2
Chironomus	10	1
Eukiefferiella	8	1
Menetus	6	1
Procladius	9	1
Prostoma	7	1
Rheocricotopus	6	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.23	*# Scrapers:*	4
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	42.9%	*Attribute 3 genera:*	0

HGMI Rating: **20.13** **Poor**

Habitat Analysis: 151 Suboptimal USEPA Protocol

Observations: Water temp: 13.87 C; Cond: 253 umhos; DO: 7.88 mg/L; pH: 6.86 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 39'/1-2'; Substrate: cobble, gravel, sand, root mats, undercut banks

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Pipes / Ditches: storm sewers

Other: fish, periphytes, waterfowl

AMNET Site # **AN0115** *Stream Name:* **Miry Run**

Location: **Rt 533 (Quakerbridge Rd); Hamilton Twp; Mercer County**

Collection Date: *5/22/2008* *USGS Topo Map:* **Trenton East**

Genus	*Tolerance Value*	*Amount*
Gammarus	6	27
Slavina	7	14
Caecidotea	8	9
Physella	9.1	9
Tribelos	5	8
Dero	10	4
Pisidium	6.8	4
Dicrotendipes	8	3
Limnodrilus	10	3
Tanytarsus	6	3
Chironomus	10	2
Nais	8	2
Phaenopsectra	7	2
Stylaria	8	2
Amnicola	4.8	1
Corixidae	9	1
Menetus	6	1
Micropsectra	7	1
Peltodytes	5	1
Procladius	9	1
Psychodidae	10	1
Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

%Dominance / Dominant Taxon(s): 27.0% Gammarus

Hilsenhoff Biotic Index (HBI): 7.20 *%Clingers:* 2.00%

** E+P+T:* 0 ( ) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **6 Fair**

Habitat Analysis: 111 Suboptimal USEPA Protocol

Observations: Water temp: 14.82 C; Cond: 129 umhos; DO: 7.12 mg/L; pH: 6.66 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 42' / 1-2'; Substrate: gravel, sand, silt, snags

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: Low Gradient Stream; Land Uses: commercial, other- recreational ball field

Other: waterfowl, trash

AMNET Site # **AN0115A** *Stream Name:* **Miry Run**

Location: **Pond Rd; Robbinsville; Mercer County**

Collection Date: *5/22/2008* *USGS Topo Map:* **Trenton East**

	Genus	Tolerance Value	Amount
	Gammarus	6	37
	Dubiraphia	6	11
	Stenelmis	5	11
	Tanytarsus	6	9
	Limnodrilus	10	6
	Physella	9.1	5
	Caecidotea	8	3
	Cricotopus	7	3
	Aulodrilus	8	2
	Corbicula	4	2
*	Eurylophella	4	2
	Calopteryx	6	1
	Dicrotendipes	8	1
	Ischnura	9	1
	Macronychus	2	1
	Phaenopsectra	7	1
	Polypedilum	6	1
	Slavina	7	1
*	Stenacron	4	1
*	Triaenodes	6	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

%Dominance / Dominant Taxon(s): 37.0% Gammarus

Hilsenhoff Biotic Index (HBI): 6.35 *%Clingers:* 30.00%

** E+P+T:* 3 (2) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 3.00%

CPMI Rating: **8 Fair**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 13.06 C; Cond: 148 umhos; DO: 7.48 mg/L; pH: 6.75 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 54'/1'; Substrate: cobble, gravel, sand, mud, snags, undercut banks

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: shrubs, grasses, weeds

Stream Gradient: Low Gradient Stream; Land Uses: commercial, forested

Pipes / Ditches: storm sewers, discharges

Other: frogs, turtle; bank restoration netting; adj to Pond Road Middle School

AMNET Site # **AN0116** *Stream Name:* **Assunpink Ck**

Location: **Mulberry St; Trenton; Mercer County**

Collection Date: ***5/22/2008*** *USGS Topo Map:* **Trenton East**

	Genus	Tolerance Value	Amount
	Gammarus	6	44
	Stenelmis	5	20
	Cardiocladius	5	9
	Nais	8	7
	Caecidotea	8	3
*	Hydropsyche	4	3
	Physella	9.1	3
	Cricotopus	7	2
	Musculium	5	2
	Slavina	7	2
	Ancylidae	6	1
*	Cheumatopsyche	5	1
	Dicrotendipes	8	1
	Polypedilum	6	1
	Stylaria	8	1

** (EPT organism)* *Taxa Richness:* 15 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.99	*# Scrapers:*	3
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	53.3%	*Attribute 3 genera:*	0

HGMI Rating: **18.21** **Poor**

Habitat Analysis: 154 Suboptimal USEPA Protocol

Observations: Water temp: 14.74 C; Cond: 191 umhos; DO: 7.97 mg/L; pH: 6.88 SU
Clarity: clear; Flow Rate: fast; Width/Depth: 126'/1-2'; Substrate: cobble, gravel, sand
Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds
Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Other: fish, macrophytes, waterfowl, purple loosestrife

AMNET Site # **AN0117** *Stream Name:* **Pond Run**

Location: **Rt 533 (Whitehorse-Mercerville Rd); Hamilton Twp; Mercer County**

Collection Date: *5/22/2008* *USGS Topo Map:* **Trenton East**

Genus	*Tolerance Value*	*Amount*
Gammarus	6	53
Dero	10	9
Slavina	7	9
Physella	9.1	6
Menetus	6	5
Pisidium	6.8	5
Nais	8	4
Aulodrilus	8	2
Limnodrilus	10	2
Stylaria	8	2
Caecidotea	8	1
Plathemis	3	1
Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

%Dominance / Dominant Taxon(s): 53.0% Gammarus

Hilsenhoff Biotic Index (HBI): 6.95 *%Clingers:* 0.00%

** E+P+T:* 0 ( ) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **4 Poor**

Habitat Analysis: 136 Suboptimal USEPA Protocol

Observations: Water temp: 14.60 C; Cond: 123 umhos; DO: 6.75 mg/L; pH: 6.53 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 35'/2-3'; Substrate: sand, mud, silt, snags

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: Low Gradient Stream; Land Uses: commercial, forested

Other: macrophytes

AMNET Site # **AN0294** *Stream Name:* **Lake Lookout Bk(trib to Wawayanda C**

Location: **Wawayanda Rd Wawayanda St. Pk; Vernon Twp; Sussex County**

Collection Date: ***6/3/2008*** *USGS Topo Map:* **Wawayanda**

	Genus	Tolerance Value	Amount
*	Baetis	6	16
	Cricotopus	7	13
	Polypedilum	6	10
	Parametriocnemus	5	9
	Gammarus	6	6
	Tvetenia	5	6
*	Cheumatopsyche	5	5
	Nais	8	5
*	Isoperla	2	4
	Sphaeriidae	8	4
	Stenelmis	5	4
	Eukiefferiella	8	3
*	Paragnetina	1	3
	Prostoma	7	2
	Psephenus	4	2
	Simulium	6	2
	Diamesa	5	1
*	Leuctra	0	1
	Limnodrilus	10	1
*	Micrasema	2	1
	Orconectes	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.73 *# Scrapers:* 2

% Sensitive EPT: 25.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 27.3% *Attribute 3 genera:* 3

HGMI Rating: **43.71** **Good**

Habitat Analysis: 158 Suboptimal USEPA Protocol

Observations: Water temp: 19.13 C; Cond: 155 umhos; DO: 8.19 mg/L; pH: 7.11 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 40' / <1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: crayfish, periphytes

AMNET Site # **AN0295** *Stream Name:* **Wawayanda Ck (Pochuck Ck)**

Location: **Canal Rd; Vernon Twp; Sussex County**

Collection Date: ***5/29/2008*** *USGS Topo Map:* **Wawayanda**

	Genus	Tolerance Value	Amount
	Gammarus	6	45
	Tanytarsus	6	11
	Nais	8	7
	Lumbriculus	8	5
	Caecidotea	8	3
	Rheotanytarsus	6	3
*	Ephemerella	1	2
	Limnodrilus	10	2
	Ophidonais	7	2
	Optioservus	4	2
	Prostoma	7	2
*	Baetis	6	1
*	Centroptilum	2	1
	Corixidae	9	1
*	Dannella	2	1
	Dicrotendipes	8	1
	Dugesia	4	1
*	Eurylophella	4	1
	Micropsectra	7	1
*	Paraleptophlebia	1	1
	Paratanytarsus	6	1
*	Perlesta	4	1
*	Plauditus	4	1
	Polypedilum	6	1
	Simulium	6	1
	Stenelmis	5	1
	Stictochironomus	9	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.15 *# Scrapers:* 3

% Sensitive EPT: 9.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 29.6% *Attribute 3 genera:* 5

HGMI Rating: **43.29** **Good**

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 14.54 C; Cond: 234 umhos; DO: 9.20 mg/L; pH: 7.50 SU

Clarity: turbid; Flow Rate: fast; Width/Depth: 32'/3-4'; Substrate: gravel, sand, mud, snags, undercut banks

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: frogs

AMNET Site # **AN0296** *Stream Name:* **Black Ck**

Location: **Marker Rd (Maple Grange Rd); Vernon Twp; Sussex County**

Collection Date: ***5/29/2008*** *USGS Topo Map:* **Wawayanda**

Genus	*Tolerance Value*	*Amount*
Corixidae	9	47
Gammarus	6	38
Acricotopus	10	2
Peltodytes	5	2
Physella	9.1	2
Cricotopus	7	1
Dubiraphia	6	1
Gyraulus	6	1
Lestes	9	1
Limnodrilus	10	1
Lymnaeidae	6	1
Pisidium	6.8	1
Sciomyzidae	10	1
Tipulidae	3	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.63 *# Scrapers:* 4

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 42.9% *Attribute 3 genera:* 0

HGMI Rating: **15.93** **Poor**

Habitat Analysis: 121 Suboptimal USEPA Protocol

Observations: Water temp: 16.23 C; Cond: 478 umhos; DO: 0.12 mg/L; pH: 7.43 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 55' / 2-3'; Substrate: mud, silt, snags

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: fish, frogs, macrophytes, filamentous algae

AMNET Site # **AN0297** *Stream Name:* **Wallkill River**

Location: **dirt road off Main St near Rt 15; Sparta Twp; Sussex County**

Collection Date: ***4/30/2008*** *USGS Topo Map:* **Newton East**

	Genus	*Tolerance Value*	*Amount*
	Diamesa	5	37
	Cricotopus	7	14
	Nais	8	9
	Simulium	6	8
	Heterotrissocladius	0	6
	Eukiefferiella	8	4
	Orthocladius	6	3
	Pristinella	10	3
	Prosimulium	2	3
	Cnephia	4	2
*	Heterocloeon	2	2
*	Serratella	2	2
	Stenelmis	5	2
*	Acerpenna	4	1
	Bezzia	6	1
*	Hydropsyche	4	1
*	Leucotrichia	3	1
	Polypedilum	6	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI):		5.38	*# Scrapers:*	3
% Sensitive EPT:		6.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:		11.1%	*Attribute 3 genera:*	3
HGMI Rating:	**43.05**	**Good**		
Habitat Analysis:	166	Optimal	USEPA Protocol	

Observations: Water temp: 14.91 C; Cond: 638 umhos; DO: 9.9 mg/L; pH: 8.6 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 12' / <1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Other: macrophytes, periphytes, sampled downstream of confluence of small stream

AMNET Site # **AN0298** *Stream Name:* **Wallkill River**

Location: **Kennedy Ave; Ogdensburg Boro; Sussex County**

Collection Date: *4/30/2008* *USGS Topo Map:* **Franklin**

	Genus	Tolerance Value	Amount
	Tanytarsus	6	39
	Cladotanytarsus	7	25
	Limnodrilus	10	5
	Dicrotendipes	8	3
	Dubiraphia	6	3
	Gammarus	6	3
	Microtendipes	7	3
	Cryptochironomus	8	2
*	Maccaffertium	3	2
	Paratendipes	8	2
	Pisidium	6.8	2
	Actinobdella	8	1
	Clinocera	6	1
	Cricotopus	7	1
	Cryptotendipes	6	1
	Gomphus	5	1
	Haliplus	5	1
	Macronychus	2	1
	Musculium	5	1
	Peltodytes	5	1
	Polypedilum	6	1
*	Rhyacophila	1	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.48	*# Scrapers:*	3
% Sensitive EPT:	3.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	22.7%	*Attribute 3 genera:*	2

HGMI Rating: **33.19** **Fair**

Habitat Analysis: 135 Suboptimal USEPA Protocol

Observations: Water temp: 10.11 C; Cond: 488 umhos; DO: 11.16 mg/L; pH: 8.06 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 21' / 2-3'; Substrate: gravel, sand, mud, silt

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers (concrete) flowing

Other: large fish

AMNET Site # **AN0299** *Stream Name:* **Wallkill River**

Location: **Scott Rd; Franklin Boro; Sussex County**

Collection Date: ***5/15/2008*** *USGS Topo Map:* **Hamburg**

	Genus	Tolerance Value	Amount
	Stenelmis	5	19
	Cricotopus	7	15
	Rheotanytarsus	6	9
*	Acerpenna	4	8
	Eukiefferiella	8	8
	Heterotrissocladius	0	6
	Macronychus	2	6
*	Isonychia	2	4
	Polypedilum	6	4
	Tanytarsus	6	4
	Nais	8	3
	Cardiocladius	5	2
*	Chimarra	4	2
	Simulium	6	2
	Argia	6	1
	Gammarus	6	1
*	Hydropsyche	4	1
	Nematoda	6	1
	Psectrocladius	8	1
	Psephenus	4	1
*	Serratella	2	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.13	*# Scrapers:*	3
% Sensitive EPT:	15.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	13.6%	*Attribute 3 genera:*	2
HGMI Rating:	**42.70**	**Good**	
Habitat Analysis:	166	Optimal	USEPA Protocol

Observations: Water temp: 15.54 C; Cond: 418 umhos; DO: 8.82 mg/L; pH: 8.08 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 39' / 2'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: crayfish, periphytes, filamentous algae; Railroad tracks on right bank

AMNET Site # **AN0300** *Stream Name:* **Wallkill River**

Location: **Rt 94; Hamburg Boro; Sussex County**

Collection Date: ***5/15/2008*** *USGS Topo Map:* **Hamburg**

	Genus	Tolerance Value	Amount
	Cricotopus	7	28
	Stenelmis	5	19
*	Baetis	6	9
	Optioservus	4	8
	Eukiefferiella	8	6
	Gammarus	6	5
	Nais	8	5
	Polypedilum	6	3
	Rheotanytarsus	6	3
*	Acentrella	4	2
	Oulimnius	4	2
	Parametriocnemus	5	2
	Psephenus	4	2
	Dugesia	4	1
	Hydroporus	5	1
	Micropsectra	7	1
	Orconectes	6	1
	Tanytarsus	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.99 *# Scrapers:* 3

% Sensitive EPT: 11.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 21.1% *Attribute 3 genera:* 2

HGMI Rating: **35.98** **Fair**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 15.53 C; Cond: 437 umhos; DO: 9.34 mg/L; pH: 7.99 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 39' / 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: commercial, rural

Pipes / Ditches: storm sewers, discharge from Sussex County MUA

Other: fish, crayfish, periphytes, filamentous algae

AMNET Site # **AN0301** *Stream Name:* **Beaver Run**

Location: **Cemetery Rd off Pond School Rd; Wantage Twp; Sussex County**

Collection Date: *5/29/2008* *USGS Topo Map:* **Hamburg**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	21
	Gammarus	6	21
	Stenelmis	5	10
	Cricotopus	7	9
	Rheotanytarsus	6	7
	Nais	8	6
	Optioservus	4	4
	Polypedilum	6	4
*	Acentrella	4	2
*	Agnetina	2	2
	Tvetenia	5	2
	Caecidotea	8	1
	Dubiraphia	6	1
	Eukiefferiella	8	1
	Hexatoma	2	1
	Hydra	5	1
	Hydrobaenus	8	1
*	Hydropsyche	4	1
	Musculium	5	1
	Pristinella	10	1
	Simuliidae	6	1
	Stylodrilus	10	1
	Thienemanniella	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.74 *# Scrapers:* 3

% Sensitive EPT: 4.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 30.4% *Attribute 3 genera:* 1

HGMI Rating: **33.36** **Fair**

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 20.59 C; Cond: 435 umhos; DO: 8.19 mg/L; pH: 8.22 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 16'/<1'; Substrate: cobble, gravel, sand, snags

Canopy: mostly open; Bank Stability: good; Bank Vegetation: shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: fish, crayfish, macrophytes, periphytes, filamentous algae

AMNET Site # **AN0302** *Stream Name:* **Wallkill River**

Location: **Rt 565 (Glenwood Rd); Wantage Twp; Sussex County**

Collection Date: ***6/3/2008*** *USGS Topo Map:* **Hamburg**

	Genus	Tolerance Value	Amount
	Gammarus	6	48
*	Brachycentrus	1	21
	Amnicola	4.8	7
*	Heterocloeon	2	5
	Caecidotea	8	3
	Crangonyx	8	2
	Cricotopus	7	2
	Dubiraphia	6	2
	Limnodrilus	10	2
	Simulium	6	2
	Fossaria	6	1
	Hydra	5	1
	Macronychus	2	1
	Physella	9.1	1
	Rheotanytarsus	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.85	*# Scrapers:*	6
% Sensitive EPT:	26.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	50.0%	*Attribute 3 genera:*	0
HGMI Rating:	**36.02**	**Fair**	
Habitat Analysis:	98	Marginal	USEPA Protocol

Observations: Water temp: 18.66 C; Cond: 500 umhos; DO: 8.62 mg/L; pH: 7.79 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 48' / 3'; Substrate: cobble, gravel, sand, mud

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: frogs, macrophytes, periphytes

AMNET Site # **AN0303** *Stream Name:* **Papakating Ck**

Location: **Rt 629 (Wykertown Rd) & Gunn Rd; Frankford Twp; Sussex County**

Collection Date: ***6/10/2008*** *USGS Topo Map:* **Branchville**

	Genus	*Tolerance Value*	*Amount*
	Polypedilum	6	40
	Naididae	7	9
	Aulodrilus	8	8
	Phaenopsectra	7	5
	Tanytarsus	6	4
	Thienemannimyia	6	4
*	Hydropsychidae	4	3
	Cricotopus	7	2
	Dubiraphia	6	2
*	Glossosoma	0	2
	Paratanytarsus	6	2
	Rheotanytarsus	6	2
	Slavina	7	2
	Stenelmis	5	2
	Tvetenia	5	2
*	Baetis	6	1
	Brillia	5	1
*	Cheumatopsyche	5	1
*	Dolophilodes	0	1
*	Hydropsyche	4	1
*	Hydroptila	6	1
*	Isonychia	2	1
	Lanthus	5	1
*	Ochrotrichia	4	1
	Ophidonais	7	1
	Parametriocnemus	5	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.95 *# Scrapers:* 5

% Sensitive EPT: 7.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 15.4% *Attribute 3 genera:* 4

HGMI Rating: **45.99** **Good**

Habitat Analysis: 161 Optimal USEPA Protocol

Observations: Water temp: 24.43 C; Cond: 291 umhos; DO: 7.66 mg/L; pH: 7.53 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / <1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: fish, frogs, crayfish, salamander, snake

AMNET Site # **AN0304** *Stream Name:* **Papakating Ck**

Location: **Rt 565 & Pelltown Rd; Frankford Twp; Sussex County**

Collection Date: ***6/10/2008*** *USGS Topo Map:* **Branchville**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	80
	Cricotopus	7	3
	Optioservus	4	2
	Rheotanytarsus	6	2
	Stenelmis	5	2
	Tanytarsus	6	2
	Boyeria	2	1
	Brillia	5	1
	Dubiraphia	6	1
	Eukiefferiella	8	1
*	Maccaffertium	3	1
	Microtendipes	7	1
*	Perlesta	4	1
	Stictochironomus	9	1
	Trichocorixa	9	1

** (EPT organism)* *Taxa Richness:* 15 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.96	*# Scrapers:*	3
% Sensitive EPT:	2.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	6.7%	*Attribute 3 genera:*	3

HGMI Rating: **35.43** **Fair**

Habitat Analysis: 128 Suboptimal USEPA Protocol

Observations: Water temp: 24.07 C; Cond: 357 umhos; DO: 7.09 mg/L; pH: 7.45 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / <1-2'; Substrate: gravel, sand, root mats, undercut banks

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested; USGS gage: 2.05

Pipes / Ditches: storm sewers

Other: fish, crayfish, macrophytes

AMNET Site # **AN0305** *Stream Name:* **W Br Papakating Ck**

Location: **Rt 519 & Rt 628; Wantage Twp; Sussex County**

Collection Date: ***6/10/2008*** *USGS Topo Map:* **Branchville**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	17
	Rheocricotopus	6	11
	Cardiocladius	5	8
*	Leucrocuta	1	7
	Polypedilum	6	7
	Tanytarsus	6	5
	Nais	8	4
	Brillia	5	3
*	Chimarra	4	3
	Phaenopsectra	7	3
	Slavina	7	3
	Stenelmis	5	3
*	Baetidae	4	2
	Caecidotea	8	2
*	Heterocloeon	2	2
*	Maccaffertium	3	2
	Musculium	5	2
	Rheumatobates	8	2
	Tvetenia	5	2
*	Acerpenna	4	1
	Antocha	3	1
	Cricotopus	7	1
	Diamesa	5	1
*	Glossosoma	0	1
	Optioservus	4	1
	Parametriocnemus	5	1
*	Perlesta	4	1
	Promoresia	2	1
	Rheotanytarsus	6	1
	Sialis	4	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 31 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.04 *# Scrapers:* 8

% Sensitive EPT: 20.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 12.9% *Attribute 3 genera:* 5

HGMI Rating: **64.16** **Excellent**

Habitat Analysis: 160 Optimal USEPA Protocol

Observations: Water temp: 25.33 C; Cond: 259 umhos; DO: 7.03 mg/L; pH: 7.53 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 17' / <1'; Substrate: cobble, gravel, sand, bedrock

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, frogs, crayfish, periphytes, salamander

AMNET Site # **AN0306** *Stream Name:* **W Br Papakating Ck**

Location: **Rt 565; Wantage Twp; Sussex County**

Collection Date: *6/5/2008* *USGS Topo Map:* **Branchville**

	Genus	Tolerance Value	Amount
	Nais	8	19
	Polypedilum	6	14
	Parametriocnemus	5	11
*	Cheumatopsyche	5	10
	Stenelmis	5	8
*	Baetis	6	6
	Gammarus	6	6
*	Acerpenna	4	4
	Eukiefferiella	8	4
	Psephenus	4	4
	Physella	9.1	3
	Cricotopus	7	2
*	Paragnetina	1	2
*	Ceratopsyche	4	1
*	Hydropsyche	4	1
*	Maccaffertium	3	1
*	Neoperla	1	1
	Rheotanytarsus	6	1
	Simulium	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.90	*# Scrapers:*	4
% Sensitive EPT:	14.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	15.0%	*Attribute 3 genera:*	3

HGMI Rating: **42.83** **Good**

Habitat Analysis: 155 Suboptimal USEPA Protocol

Observations: Water temp: 17.51 C; Cond: 291 umhos; DO: 8.08 mg/L; pH: 7.65 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 45' / 1-2'; Substrate: cobble, silt

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Pipes / Ditches: storm sewers

Other: frogs, crayfish, macrophytes, periphytes, purple loosestrife, ponded area on right bank, snake

AMNET Site # **AN0307** *Stream Name:* **Papakating Ck**

Location: **Rt 565; Wantage Twp; Sussex County**

Collection Date: ***6/5/2008*** *USGS Topo Map:* **Hamburg**

	Genus	Tolerance Value	Amount
	Gammarus	6	52
*	Pseudocloeon	4	9
	Rheotanytarsus	6	6
	Microtendipes	7	4
	Brillia	5	3
	Corixidae	9	3
	Polypedilum	6	3
*	Acentrella	4	2
*	Centroptilum	2	2
	Ophidonais	7	2
	Paratanytarsus	6	2
	Caecidotea	8	1
	Cricotopus	7	1
	Cryptochironomus	8	1
	Enallagma	9	1
	Hydrophilidae	5	1
*	Maccaffertium	3	1
	Orconectes	6	1
	Pelocoris	8	1
	Physella	9.1	1
	Stictochironomus	9	1
	Tanytarsini	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.94 *# Scrapers:* 2

% Sensitive EPT: 14.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 21.7% *Attribute 3 genera:* 1

HGMI Rating: **38.78** **Fair**

Habitat Analysis: 100 Marginal USEPA Protocol

Observations: Water temp: 17.07 C; Cond: 313 umhos; DO: 7.18 mg/L; pH: 7.50 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 48' / 2-3'; Substrate: cobble, mud, snags

Canopy: open; Bank Stability: poor; Bank Vegetation: grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock

Pipes / Ditches: storm sewers

Other: fish, waterfowl, purple loosestrife, cows grazing at stream bank

AMNET Site # **AN0308** *Stream Name:* **UNT to Clove Bk**

Location: **Rose Marrow Ave nr Rt 651; Wantage Twp; Sussex County**

Collection Date: ***6/5/2008*** *USGS Topo Map:* **Unionville**

	Genus	*Tolerance Value*	*Amount*
	Hyalella	8	27
	Cricotopus	7	18
	Nais	8	11
	Rheotanytarsus	6	6
	Caecidotea	8	5
	Physella	9.1	4
	Stictochironomus	9	4
*	Baetis	6	3
	Rheopelopia	4	3
	Tanytarsus	6	3
	Brillia	5	2
	Clinotanypus	8	2
	Polypedilum	6	2
	Pristina	8	2
	Pseudochironomus	5	2
	Dicrotendipes	8	1
	Dubiraphia	6	1
	Erpobdellidae	8	1
	Glyptotendipes	10	1
	Ischnura	9	1
	Phaenopsectra	7	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.38	*# Scrapers:*	3
% Sensitive EPT:	3.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	28.6%	*Attribute 3 genera:*	1
HGMI Rating:	**23.92**	**Fair**	
Habitat Analysis:	133	Suboptimal	USEPA Protocol

Observations: Water temp: 16.07 C; Cond: 239 umhos; DO: 9.17 mg/L; pH: 7.25 SU
Clarity: clear; Flow Rate: slow; Width/Depth: 16' / 1'; Substrate: cobble, gravel, snags
Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds
Stream Gradient: High Gradient Stream; Land Uses: rural

Other: fish, frogs, crayfish, filamentous algae

AMNET Site # **AN0309** *Stream Name:* **Clove Bk**

Location: **Loomis Ave; Sussex Boro; Sussex County**

Collection Date: ***6/10/2008*** *USGS Topo Map:* **Hamburg**

	Genus	*Tolerance Value*	*Amount*
	Physella	9.1	19
	Gammarus	6	15
	Rheotanytarsus	6	15
	Paratanytarsus	6	11
	Nanocladius	3	6
	Hyalella	8	5
	Neoplea	9	5
	Endochironomus	10	3
	Polypedilum	6	3
	Simulium	6	3
	Cricotopus	7	2
	Peltodytes	5	2
	Ablabesmyia	8	1
	Caecidotea	8	1
*	Caenis	7	1
	Chironomus	10	1
	Hydroporus	5	1
*	Hydroptila	6	1
	Ischnura	9	1
	Nais	8	1
	Ophidonais	7	1
	Thienemannimyia	6	1
	Zavreliella	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.92 *# Scrapers:* 2

% Sensitive EPT: 2.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 26.1% *Attribute 3 genera:* 0

HGMI Rating: **26.33** **Fair**

Habitat Analysis: 116 Suboptimal USEPA Protocol

Observations: Water temp: 24.91 C; Cond: 273 umhos; DO: 7.01 mg/L; pH: 7.27 SU

Clarity: clear, brownish; Flow Rate: moderate; Width/Depth: 63' / 1-2'; Substrate: cobble, gravel, sand, snags, root mats

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Pipes / Ditches: storm sewers

Other: fish, crayfish, macrophytes; trash

AMNET Site # **AN0309A** *Stream Name:* **Clove Bk**

Location: **Unionville Rd; Wantage Twp; Sussex County**

Collection Date: ***6/5/2008*** *USGS Topo Map:* **Port Jervis South**

	Genus	Tolerance Value	Amount
	Polypedilum	6	21
	Tanytarsus	6	10
*	Paraleptophlebia	1	8
	Parametriocnemus	5	7
	Microtendipes	7	6
	Slavina	7	6
*	Baetis	6	5
*	Dolophilodes	0	4
*	Leucrocuta	1	4
	Paratanytarsus	6	3
	Phaenopsectra	7	3
	Rheocricotopus	6	3
	Calopteryx	6	2
*	Centroptilum	2	2
*	Ephemerella	1	2
*	Eurylophella	4	2
	Stempellinella	6	2
	Ablabesmyia	8	1
	Chironomus	10	1
	Cricotopus	7	1
*	Epeorus	0	1
	Lumbriculidae	8	1
*	Maccaffertium	3	1
	Rheotanytarsus	6	1
	Simulium	6	1
*	Stenacron	4	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.99 *# Scrapers:* 5

% Sensitive EPT: 30.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 7.4% *Attribute 3 genera:* 6

HGMI Rating: **64.20** **Excellent**

Habitat Analysis: 167 Optimal USEPA Protocol

Observations: Water temp: 16.86 C; Cond: 208 umhos; DO: 8.04 mg/L; pH: 7.44 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 19' / <1'; Substrate: cobble, gravel, sand, bedrock

Canopy: closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes, salamanders