



**NJ Department of Environmental Protection
Water Monitoring and Standards**



AMBIENT BIOMONITORING NETWORK



Raritan Water Region

Watershed Management Areas 7, 8, 9, and 10 Round 4 Benthic Macroinvertebrate Data



Volume 1 of 2



December, 2012

**State of New Jersey
Chris Christie, Governor
Kim Guadagno, Lt. Governor**

**NJ Department of Environmental Protection
Bob Martin, Commissioner**



NJ Department of Environmental Protection

Water Monitoring and Standards
Jill Lipoti, Director

Bureau of Freshwater & Biological Monitoring
Leslie McGeorge, Administrator

December 2012

AMBIENT BIOMONITORING NETWORK

Raritan Water Region Watershed Management Areas 7, 8, 9, and 10

Round 4 Benthic Macroinvertebrate Data

Volume 1 of 2

Water Monitoring Report Prepared By:

Water Monitoring & Standards
Bureau of Freshwater and Biological Monitoring

Sampling and Data Analysis:

Victor Poretti, Project Manager-Sampling Coordination
Dean Bryson, Project Manager-Laboratory Operations
Thomas Miller
Anna Signor

Report Preparation:

Thomas Miller

Map Preparation:

John Sell

Edited By:

Alfred Korndoerfer
Leslie McGeorge
Alena Baldwin-Brown

[cover photo: Site AN0361, Lamington River tributary at Black River Rd, Somerset County, NJ.]



ACKNOWLEDGEMENTS

This report would not have been possible without the significant contributions from environmental scientists at the New Jersey Department of Environmental Protection and the United States Environmental Protection Agency. Leslie McGeorge, Alena Baldwin-Brown, Alfred Korndorfer, Victor Poretti, and Dean Bryson of NJDEP Water Monitoring and Standards provided useful editorial comments and interpretation of results. Jim Kurtenbach at U.S. EPA Region 2 provided guidance on the Network's design and implementation.

AMBIENT BIOMONITORING NETWORK

Watershed Management Areas 7, 8, 9, and 10

Raritan Water Region

Round 4 Benthic Macroinvertebrate Data

Volume 1 of 2

TABLE OF CONTENTS

	page
Executive Summary	1
Introduction	5
Rationale for Biological Monitoring	5
Advantages of Using Benthic Macroinvertebrates	5
Limitations of Biological Monitoring	5
Benthic Macroinvertebrates Usually Indicative of Good Water Quality	6
Benthic Macroinvertebrates Usually Indicative of Poor Water Quality	7
Study Design	8
Data Quality Objectives	8
Site Selection	8
Field and Laboratory Methods	9
Sample Collection	9
Sample Processing and Sorting	10
Macroinvertebrate Identification and Quality Control	10
Data Analysis	10
Multimetric Index Development	10
High Gradient and Low Gradient Streams	11
Pinelands Streams	11
Trend Analysis	13
Supplemental Analyses/Evaluation Methods	13
Morphological Abnormalities	13
Habitat Assessment	13
Chemical Monitoring	14
Results and Discussion	16

Summary of Statewide AMNET Data	16
Results & Trends	17
Regional Results	18
Evaluation by WMA	19
Watershed Management Area # 7	19
Watershed Management Area # 8	20
Watershed Management Area # 9	21
Watershed Management Area # 10	22
Macroinvertebrate Abnormalities	23
Causes of Biological Impairment	24
Habitat Assessment vs. Biological Assessment	24
Additional Information	25
REFERENCES	26
Table 1	

Ambient Biomonitoring Network Watershed Management Areas 7, 8, 9, and 10

Raritan Water Region

Round 4 Benthic Macroinvertebrate Data

Volume 1 of 2

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 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.

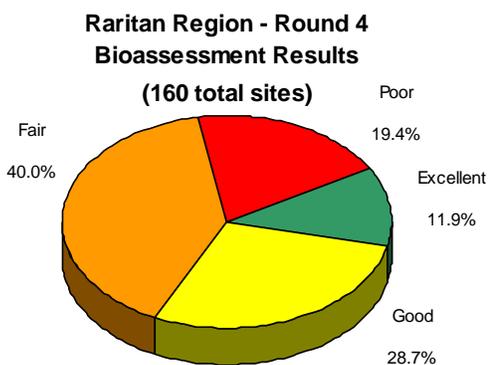


Figure 1

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 Raritan Water Region and includes WMA #'s 7 (Elizabeth, Rahway, Woodbridge), 8 (North and South Branch Raritan), 9 (Lower Raritan, South River, Lawrence Brook), and 10 (Millstone River). This report presents the results for the biological monitoring conducted from April 2009 – November 2009 (see Map 1, page 4). The sampling of the Raritan 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 160 AMNET sites sampled in the Raritan Water Region, 19 (11.9%) were found to exhibit “excellent” benthic macroinvertebrate communities, with 46 (28.7%) exhibiting “good”, 64 (40.0%) “fair”, and 31 (19.4%) exhibiting “poor” benthic communities (See Figure 1).

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 160 AMNET sites sampled in the Raritan Water Region, the Round 4 samplings yielded sites with more “good” (28.6%) and “fair” (40.4%) ratings than did the third round sampling (23.8%, 40.0% respectively). Conversely, the number of “excellent” (11.8%) rated sites observed in the

Round 4 sampling has declined since the Round 3 sampling (16.9%) with the number of “poor” sites remaining the same (31 sites or 19.3%). Figure 2 displays the percentage of change in rating among the same 157 AMNET sites in the Raritan 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.

Percent Change in Rating Between the Round 3 and the Round 4 Monitoring

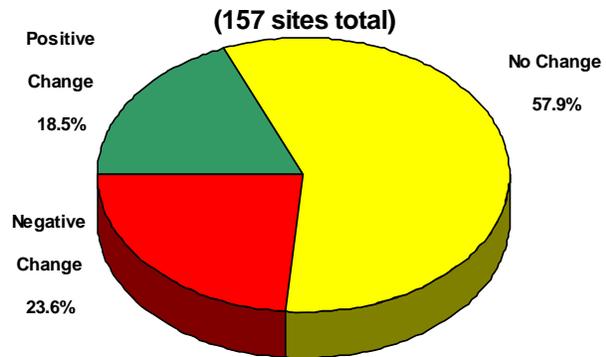


Figure 2

Figure 3 compares the results of each round of sampling in the Raritan Region. The percentage of excellent and severe results decreased from round 1 to round 4, while the percentage of fair results increased and good results remained stable.

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.

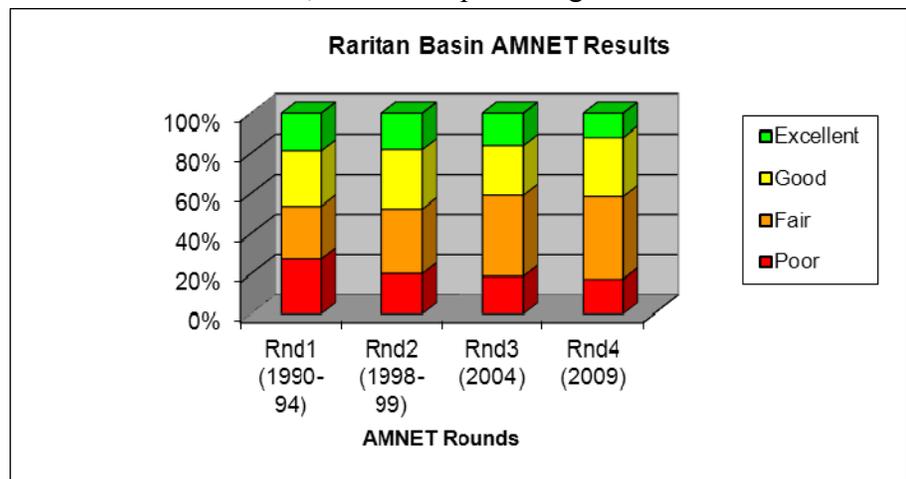


Figure 3

Assessment Rating	Round 1	Round 2	Round 3	Round 4
Excellent	19.4%	18.6%	16.9%	11.9%
Good	28.5%	27.3%	23.8%	28.8%
Fair	28.5%	32.3%	40.0%	40.0%
Poor	23.6%	21.7%	19.4%	19.4%

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. Five sites have been selected in this Water Region for initial Stressor Identification work. These sites are: AN0311 (Drakes Brook), AN0324 (Beaver Brook), AN0343 (Holland Brook) and AN0333 & AN0337 (Neshanic River).

Additional Information

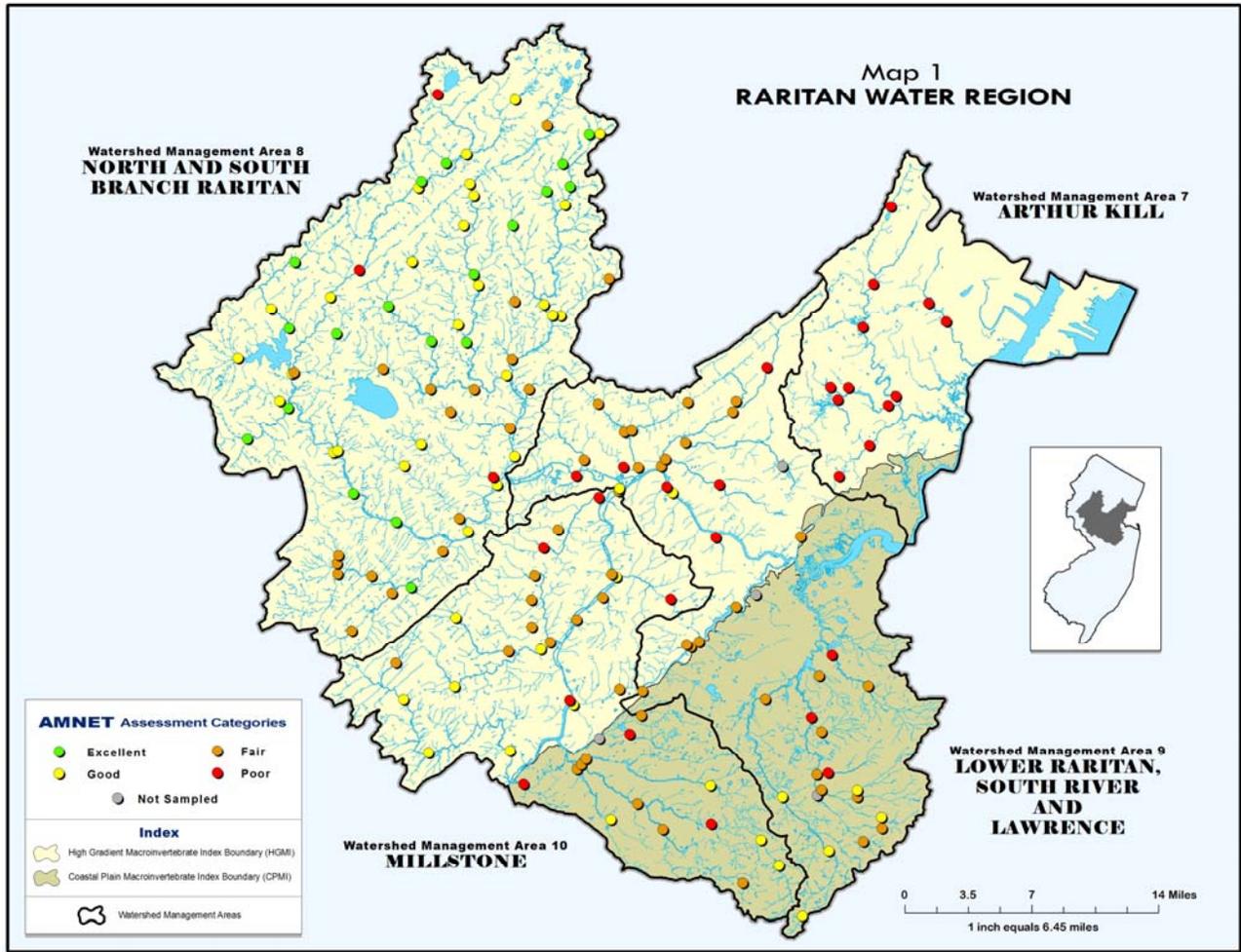
Additional Information on the AMNET program can be obtained from the WM&S' Bureau of Freshwater & Biological Monitoring by calling 609-292-0427 or visiting its website at: <http://www.state.nj.us/dep/wms/bfbm>

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



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

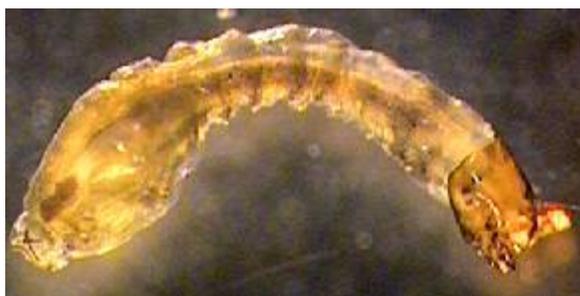


Midges (chironomids) are among the most common of aquatic invertebrates. They occupy a variety of aquatic habitats, including lakes, ponds, bogs, rivers, creeks, and marshes. They even exploit manmade habitats such as sewage treatment plants, water treatment plants, fish pools, irrigation ditches, and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

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 Raritan Water Region, and includes WMA #'s 7 (Elizabeth, Rahway, Woodbridge), 8 (North and South Branch Raritan), 9 (Lower Raritan, South River, Lawrence Brook), and 10 (Millstone River) (see Maps 1 – 7, 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. Administratively this sampling time interval starts at the beginning of the State's Fiscal Year in July. Sampling continues from that point, but only during the sampling index 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.

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 Management 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 – 7, Appendix A, Volume 2).

A total of 164 stations had been established in the Raritan Region in the previous round (Round 3) [4].

This area sub-basins that drain to Raritan Bay via the Arthur Kill, i.e., the Elizabeth, Rahway, and Woodbridge rivers (now WMA 7), which were formerly part of the greater Passaic (Northeast) Region [4], have been included in the present study. This area (shown in Figure 4) primarily includes WMA #'s 7 (Elizabeth, Rahway, Woodbridge), 8 (North and South Branch Raritan), 9 (Lower Raritan, South River, Lawrence Brook), and 10 (Millstone River). The present Raritan study area (Figure 4) includes a total of 164 sampling sites, AN0192 – 204 and AN0310 - 454 (see Table 2, Volume 2). Four sites were not sampled this round due to mitigating factors such as bridge construction (AN0435, AN0443) or road closure permitting no access to sites (AN0424B, AN0389). This resulted in 160 sites sampled and assessed for Round 4.

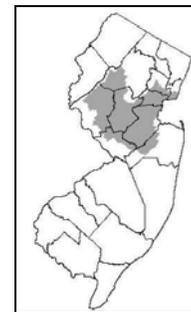


Figure 4

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 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 Raritan Water Region assessments, HGMI was 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 within 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. Five sites have been selected in this Water Region for initial Stressor Identification work. These sites are: AN0311 (Drakes Brook), AN0324 (Beaver Brook), AN0343 (Holland Brook) and AN0333 & AN0337 (Neshanic River).

* 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 DISCUSSION

Summary of Statewide AMNET Data

The current study marks the fourth round of sampling for the Raritan Region AMNET study. For the purpose of comparing Rounds, Round 3 results were re-assessed using the new indices. The Raritan Region has shown considerable changes since the previous rounds by virtue of using the more geographically specific assessment. The number of “good” sites has shown a slight increase, while the number of “excellent” sites has shown a slight decline. The number of “fair” and “poor” sites has remained the same. 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 Raritan Water Region.

Region	Number of sites (% of total)				Total sites
	Excellent	Good	Fair	Poor	
Fourth round					
Raritan	19 (11.9%)	46 (28.7%)	64 (40.0%)	31 (19.4%)	160
Northeast	7 (6.9%)	19 (18.6%)	52 (51.0%)	24 (23.5%)	102
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 (16.9%)	38 (23.8%)	64 (40.0%)	31 (19.4%)	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

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 Raritan Water Region. Of the 160 monitoring stations sampled during this study period, 19 (11.9%) were found “excellent”, 46 (28.7%) “good”, 64 (40.0%) “fair”, and 31 (19.4%) “poor” (see Table 2, Volume 2).

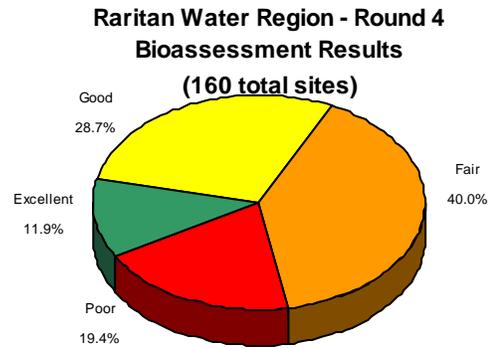


Figure 5

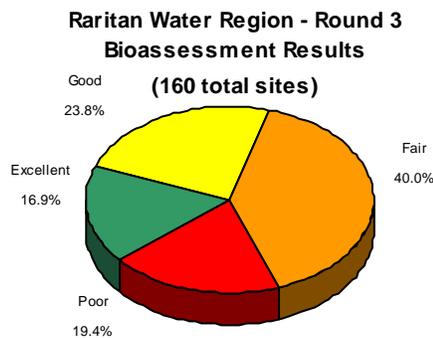


Figure 6

Figure 6 shows the results obtained from 160 AMNET sites within the Raritan Water Region that were sampled during the previous (Round 3) Raritan 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 number of “good” and “fair” sites were slightly higher, and the number of “excellent” sites were slightly lower with the number of “poor” sites remaining constant. [4].

Figure 7 displays the percentage of change in rating among the same 157 AMNET sites in the Raritan 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).

Percent Change in Rating Between the Round 3 and the Round 4 Monitoring (157 sites total)

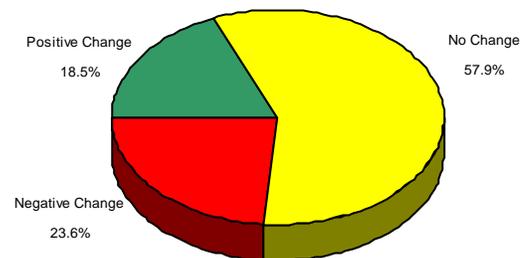


Figure 7

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 Raritan Watershed Management Areas.

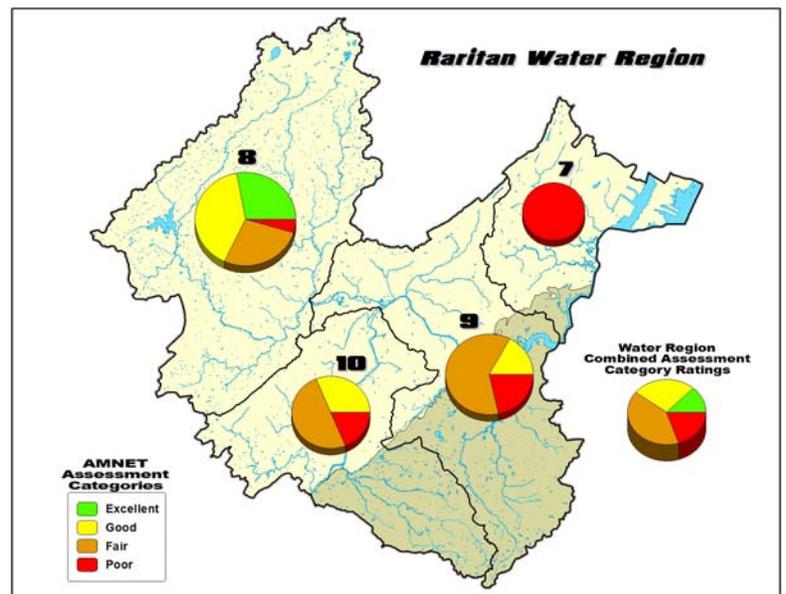


Figure 8

WMA	Sub-basins	Excellent	Good	Fair	Poor	Total sites
7	Elizabeth / Rahway / Woodbridge Rivers system	--	--	--	12 (100%)	12
8	North and South Branch Raritan Rivers system	19 (27.9%)	27 (39.7%)	19 (27.9%)	3 (4.4%)	68
9	Lower Raritan / South Rivers system	--	7 (16.67%)	26 (61.9%)	9 (21.4%)	42
10	Millstone River system	--	12 (31.6%)	19 (50.0%)	7 (18.4%)	38
Totals:		19 (11.9%)	46 (28.7%)	64 (40.0%)	31 (19.4%)	160

Figure 8 illustrates the proportions of “excellent”, “good”, “fair”, and “poor” sites in each WMA of the Raritan Water Region for the current AMNET round.

Evaluation by WMA

Watershed Management Area #7 includes a total of 12 AMNET sites in the Elizabeth and Rahway Rivers and several smaller streams in portions of Essex, Middlesex and Union Counties; these include Robinsons Branch and unnamed tributaries to Robinsons Branch (see Map 2, Volume 2). Figure 9 shows the current site rating summaries for WMA #7 with all 12 sites being “poor”. Figure 10 depicts the results obtained from 11

Watershed Management Area 7
Round 4 Bioassessment Results
(12 total sites)

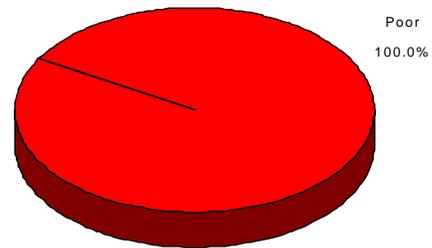


Figure 9

sites sampled during the earlier (Round 3) survey [4]. Comparing the current results to the earlier results

Watershed Management Area 7
Round 3 Bioassessment Results
(11 total sites)

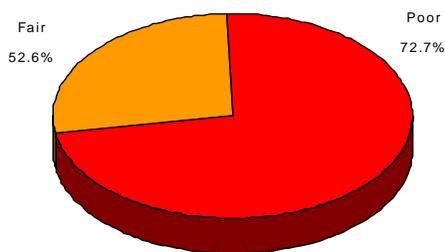


Figure 10

shows a significant decline at 3 sites (see Table 2, Volume 2). The number of “poor” sites is slightly

higher than the earlier data with 8 sites showing no change. Site AN0202 was sampled this round but was not sampled in the previous round. The majority (83.3%) of habitat scores are in the suboptimal range, with 16.7% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families were found at four sites (two on the Rahway River, one on South Br Rahway River and one on Robinsons Br) (see Map 2, Table 3, Volume 2). Three of these sites displayed chronic abnormalities. The table below presents a synopsis of AMNET data for WMA #7; AMNET site locations and bioassessment ratings within WMA #7 are shown in Figure 11.

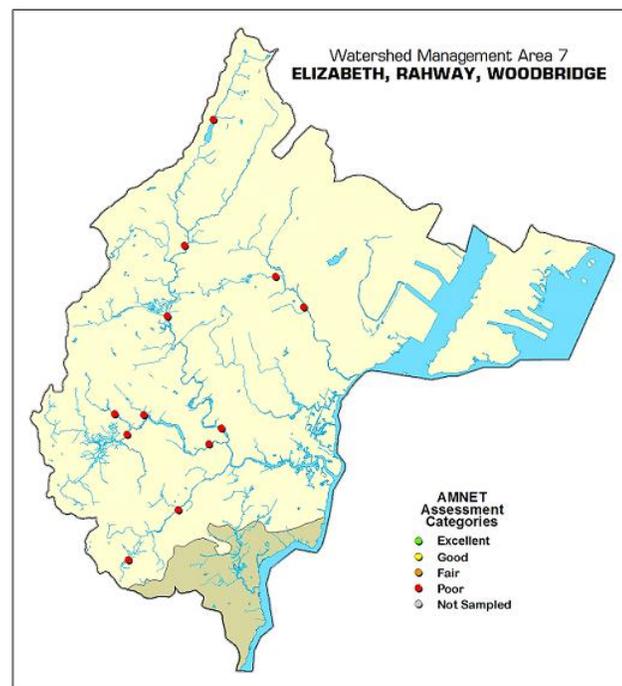


Figure 11

WMA # 7 Combined Results Table

Bio Rating	Round 3		Round 4		Habitat Assessment	Round 4	
Excellent	---	---	---	---	Optimal	---	---
Good	---	---	---	---	Suboptimal	10	83.3%
Fair	3	27.3%	---	---	Marginal	2	16.7%
Poor	8	72.7%	12	100%	Poor	---	---
Total sites	11		12			12	

Watershed Management Area #8 includes a total of 68 AMNET sites in the North and South Branch of the Raritan River, and its tributaries, in Hunterdon, Morris, and Somerset Counties (see Maps 3 & 4, Volume 2). Figure 12 shows the current site rating summaries for WMA # 8: 27.9% (19 sites) “excellent”, 39.7% (27 site) “good”, 27.9% (19 sites) “fair”, and 4.4% (3 sites) “poor”. Figure 13 depicts the results obtained from 68 sites sampled during the earlier (Round 3) survey [4]. Comparing the current (Round 4) impairment rating results to the earlier (Round 3) results, a significant improvement is apparent at 8 sites and a significant

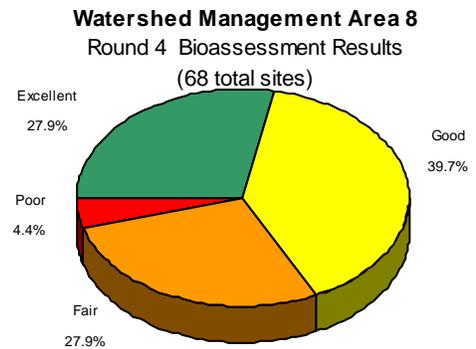


Figure 12

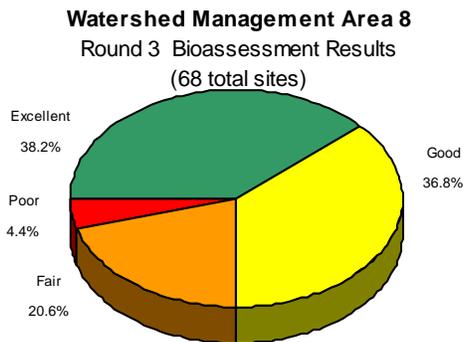


Figure 13

decline at 20 sites (see Table 2, Volume 2). The number of “excellent” sites decreased slightly, while the number of “good” and “fair” sites increased slightly, with the number of “poor” sites remaining the same since the earlier sampling (see Table 2, Volume 2). The majority (75.0%) of habitat scores are in

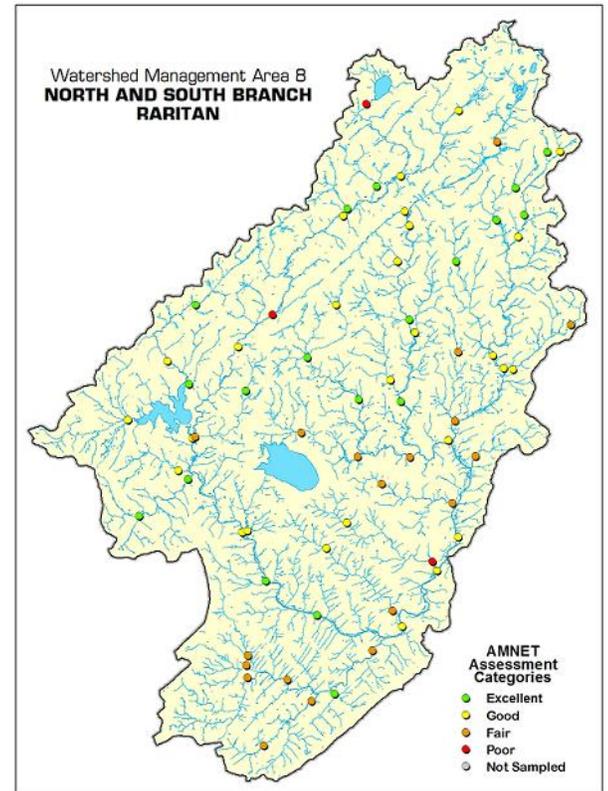


Figure 14

the suboptimal range with 22.1% receiving an optimal score and only 2.9% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families was found at seven sites (one each on Spruce Run, Willoughby Bk, Lamington River, Cold Bk, and 3 on the Neshanic Rivers) (see Maps 3 & 4, Table 3, Volume 2). One site (AN0356, Lamington River) displayed chronic abnormalities (see Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #8; AMNET site locations and bioassessment ratings within WMA #8 are shown in Figure 14.

WMA # 8 Combined Results Table

Bio Rating	Round 3		Round 4		Habitat Assessment	Round 4	
Excellent	26	38.2%	19	27.9%	Optimal	15	22.1%
Good	25	36.8%	27	39.7%	Suboptimal	51	75.0%
Fair	14	20.6%	19	27.9%	Marginal	2	2.9%
Poor	3	4.4%	3	4.4%	Poor	---	---
Total sites	68		68			68	

Watershed Management Area #9 includes a total of 42 AMNET sites in the Lower Raritan River, South River and Lawrence Brook and its tributaries in Middlesex, Monmouth, Somerset and Union Counties (see Map 5, Volume 2). Three sites (AN0424B, AN0435, and AN0443) were not sampled due to inaccessible site access (bridge construction or other obstacle). Figure 15 shows the current site rating summaries for WMA # 9: 16.7% (7 site) “good”, 61.9% (26 sites) “fair”, and 21.4% (9 sites) “poor”. Figure 16 depicts the results obtained from 44 sites sampled during the earlier (Round 3) survey [4]. Comparing the current to the earlier results, a significant improvement is seen at 12 sites, and a significant decline, at 6 sites (see Table 2, Volume 2). The number of “good” sites increased slightly from that of the earlier sampling, and the number of “poor” sites is slightly decreased, with the number of “fair” sites remaining the same (see Table 2, Volume 2). The majority of sites (88.1%) received a suboptimal habitat score, with 2.4% receiving an optimal score and 9.5% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families were found at three sites (Dukes Bk, Peters Bk, and Middle Bk) (Maps 5 & 6, Table 3, Volume 2). All three of these sites (AN0375, AN0376, and AN0420) displayed chronic abnormalities (see Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #9; AMNET site locations and bioassessment ratings within WMA # 9 are shown in Figure 17.

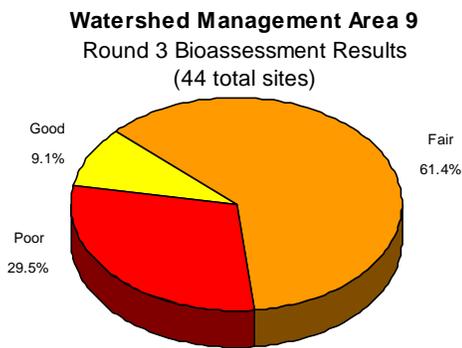


Figure 16

The majority of sites (88.1%) received a suboptimal habitat score, with 2.4% receiving an optimal score and 9.5% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families were found at three sites (Dukes Bk, Peters Bk, and Middle Bk) (Maps 5 & 6, Table 3, Volume 2). All three of these sites (AN0375, AN0376, and AN0420) displayed chronic abnormalities (see Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #9; AMNET site locations and bioassessment ratings within WMA # 9 are shown in Figure 17.

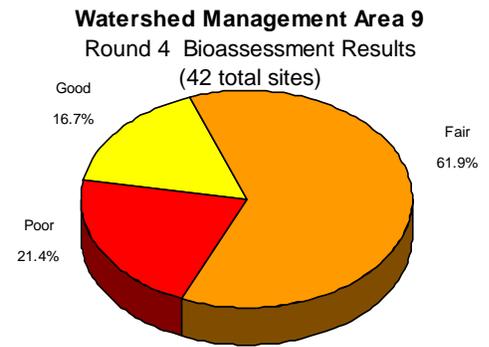


Figure 15

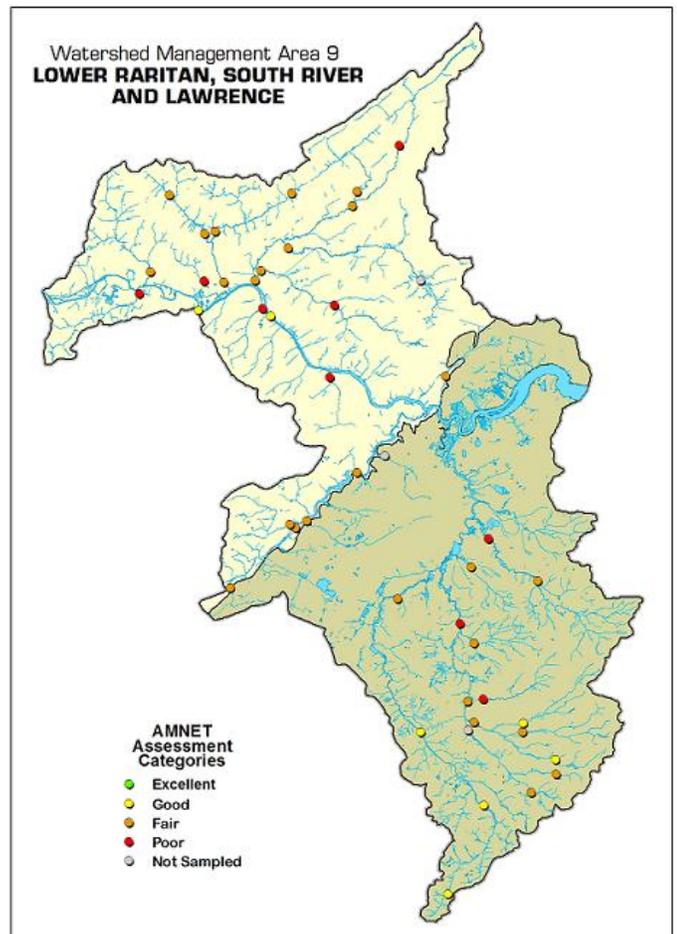


Figure 17

WMA # 9 Combined Results Table

Bio Rating	Round 3		Round 4		Habitat Assessment	Round 4	
	Count	Percentage	Count	Percentage		Count	Percentage
Excellent	---	---	---	---	Optimal	1	2.4%
Good	4	9.1%	7	16.7%	Suboptimal	37	88.1%
Fair	27	61.4%	26	61.9%	Marginal	4	9.5%
Poor	13	29.5%	9	21.4%	Poor	---	---
Total sites	44		42			42	

Watershed Management Area #10 includes a total of 38 AMNET sites in the Millstone River and its tributaries in Mercer, Middlesex, Monmouth and Somerset Counties (see Maps 6, 7, & 8, Volume 2). Site AN0389 (Devils Bk) was not sampled due to site no longer being accessible. This is the second time this site was inaccessible so it will be dropped from the program. Figure 18 shows the current site rating summaries for WMA # 10: 31.6% (12 sites) “good”, 50.0% (19 sites) “fair”, and 18.4% (7 sites) “poor”. Figure 19 depicts the results obtained from 37 sites sampled during the earlier (Round 3) survey [4]. Comparing the current to the earlier results, a significant improvement is seen at 9 sites, and a significant decline, at 8 sites (see Table 2, Volume 2). The number of “good” sites increased slightly from that of the earlier sampling, and the number “excellent” and “fair” sites is slightly decreased, with the number of “poor”

Watershed Management Area 10
Round 4 Bioassessment Results
(38 total sites)

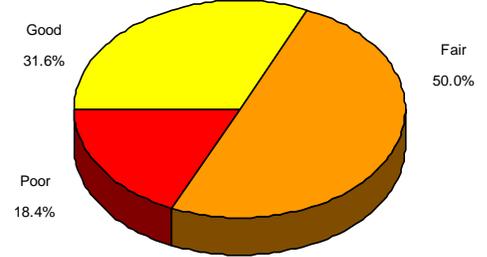


Figure 18

Watershed Management Area 10
Round 3 Bioassessment Results
(37 total sites)

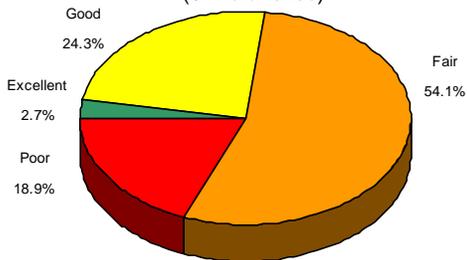


Figure 19

sites remaining the same (see Table 2, Volume 2). The majority of sites (86.8%) received a suboptimal habitat score, with 13.2% receiving an optimal score. Abnormalities in chironomid larvae and other invertebrate families were found at two sites (Back Bk and Royce Bk) (Map 7, Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #10; AMNET site locations and bioassessment ratings within WMA # 10 are shown in Figure 20.

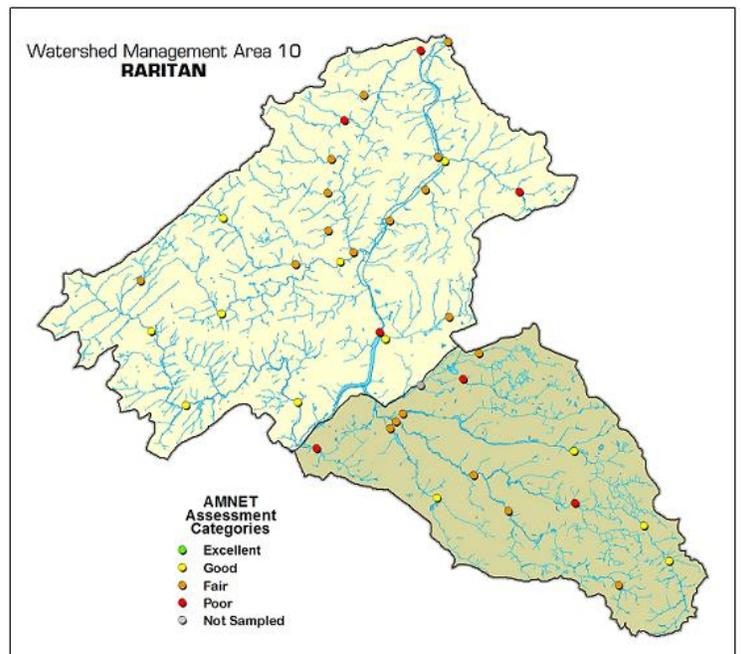


Figure 20

WMA # 10 Combined Results Table

Bio Rating	Round 3		Round 4		Habitat Assessment	Round 4	
	Count	Percentage	Count	Percentage		Count	Percentage
Excellent	1	2.7%	---	---	Optimal	5	13.2%
Good	9	24.3%	12	31.6%	Suboptimal	33	86.8%
Fair	20	54.1%	19	50.0%	Marginal	---	---
Poor	7	18.9%	7	18.4%	Poor	---	---
Total sites	37		38			38	

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 Raritan 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 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 160 sites, 16 (10.0%) contained organisms with abnormalities (Maps 2 - 7 , Volume 2). Seven of the sites (AN0195, AN0199, AN0200, AN0356, AN0375, AN0376, and AN0420) 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 [21]. 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 [22]:

- 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 [23] 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
Mail Code 35-01
P. O. Box 420
Trenton, NJ 08625-0427

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

REFERENCES

1. Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross and R.M. Hughes, 1989. Rapid bioassessment protocols for use in streams and rivers—benthic macroinvertebrates and fish. EPA/44/4-89-002. US Environmental Protection Agency. Washington, D.C.
2. New Jersey Department of Environmental Protection. 2008. New Jersey integrated water quality monitoring and assessment report. Water Monitoring and Standards. Trenton, NJ.
3. New Jersey Department of Environmental Protection. Data report, 1998. New Jersey's modernized ambient chemical monitoring network. Division of Watershed Management. Trenton, NJ.
4. New Jersey Department of Environmental Protection. Data report, 2008. Ambient biomonitoring network, Raritan Region. Bureau of Water Monitoring. Trenton, NJ.
5. New Jersey Department of Environmental Protection. 2005. Field sampling procedures manual. NJDEP. Trenton, NJ.
6. Barbour, M.T., J. Gerritson, B.D. Snyder and J.B. Stribling. 1999. Rapid bioassessment protocols for use in Wadeable streams and rivers: Periphyton, Benthic Macroinvertebrates, and Fish, 2nd ed. USEPA 841-B-99-002. Chps. 1–11 and appendices.
7. New Jersey Department of Environmental Protection. Laboratory report, 2007. Standard operating procedures, Ambient biological monitoring using benthic macroinvertebrates, Field, lab, and assessment methods. Bureau of Freshwater & Biological Monitoring. Trenton, NJ.
8. New Jersey Department of Environmental Protection. Report, 2009. Work/quality assurance project plan: Ambient Biomonitoring Network (AMNET), Raritan Region, FY10. Bureau of Freshwater and Biological Monitoring. Trenton, NJ.
9. U.S. Environmental Protection Agency. 1997. Field and laboratory methods for macroinvertebrate and habitat assessment of low gradient nontidal streams. Mid-Atlantic Coastal Streams Workgroup, Environmental Services Division, Region 3. Wheeling, WV.
10. Klemm, D.J., P.A. Lewis, F. Fulk and J.M. Lazorchak. 1990. Macroinvertebrate field and laboratory methods for evaluating the biological integrity of surface waters. EPA/600/4-90/030. U.S. Environmental Protection Agency. Cincinnati, OH.
11. Jessup, B., 2007. Development of the New Jersey High Gradient Benthic Index (HGMI). Tetra Tech, Inc. Owings Mills, MD.
12. Maxted, J.R., M.T. Barbour, J. Gerritsen, 2000. Assessment framework for mid-Atlantic coastal plain streams using benthic macroinvertebrates, J.N. American Benthological Society, 19(1):128-144.
13. Jessup, B., S. Moegenburg, D. Bryson, V. Poretti, 2005. Development of the New Jersey Pinelands Macroinvertebrate Index (PMI). Tetra Tech, Inc. Owings Mills, MD & NJDEP. Trenton, NJ.
14. New Jersey Department of Environmental Protection. 2006. Surface and Ground Water Quality Standards. Water Monitoring and Standards. Trenton, NJ.
15. 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.
16. Dickman, M., I. Brindle, and M. Benson, 1992. Evidence of teratogens in sediments of the Niagara River Watershed as reflected by chironomid (Diptera: Chironomidae) deformities. Journal of Great Lakes Res. 18(3):467-480.
17. Hamilton, A.L. and O.A. Saether, 1971. The occurrence of characteristic deformities in the chironomid larvae of several Canadian lakes. Canadian Entomologist 103:363-368.
18. Warwick, W.F., 1985. Morphological abnormalities in Chironomidae (Diptera) larvae as measures of toxic stress in freshwater ecosystems: indexing antennal deformities in *Chironomus* Meigen. Canadian Journal of Fisheries and Aquatic Sciences 42:1881-1914.
19. Lenat, David R., 1993. Using mentum deformities of *Chironomus* larvae to evaluate the effects of toxicity and organic loading in streams. Journal of N. Am. Benthol. Soc. 12(3):265-269.
20. Diggins, T.P. and K.M. Stewart, 1993. Deformities of aquatic larval midges (Chironomidae: Diptera) in the sediments of the Buffalo River, New York. Journal of Great Lakes Res. 19(4):648-659
21. USEPA, 2000. Stressor identification guidance document. EPA 822-B-00-025. Office of Research and Development, Washington, D.C.
22. USEPA. Casual Analysis/Diagnosis Decision Information System (CADDIS) website, www.epa.gov/caddis
23. Ayers, M., Kennen, J., Stackleberg, P., Kauffman, L. 2000. Building a stronger scientific basis for landuse planning and watershed management effects on water quality and aquatic communities in NJ streams. USGS. West Trenton, NJ.

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

Index Metric	Score			
	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

<u>Assessment Rating</u>	<u>Score</u>
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} = $26.53 + \text{Metric} - [22.776 + 4.173 * \log_{10}(\text{areasqkm})]$
2. Percent of genera that are not insects
3. Percent sensitive EPT (excluding Hydropyschidae, including Diplectrona)_{adj}
= $37.49 + \text{Metric} - [49.922 - 13.800 * \log_{10}(\text{areasqkm})]$
4. Number of scraper genera_{adj} = $5.44 + \text{Metric} - [3.889 + 1.724 * \log_{10}(\text{areasqkm})]$
5. Hilsenhoff Biotic Index_{adj} = $4.23 + \text{Metric} - [3.407 + 0.918 * \log_{10}(\text{areasqkm})]$
6. Number of New Jersey TALU attribute 2 genera
7. Number of New Jersey TALU attribute 3 genera

ADJ (Adjusted metric value) = $\text{Mean}_{\text{reference}} + \text{Metric}_{\text{observed}} - \text{Metric}_{\text{predicted}}$, 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

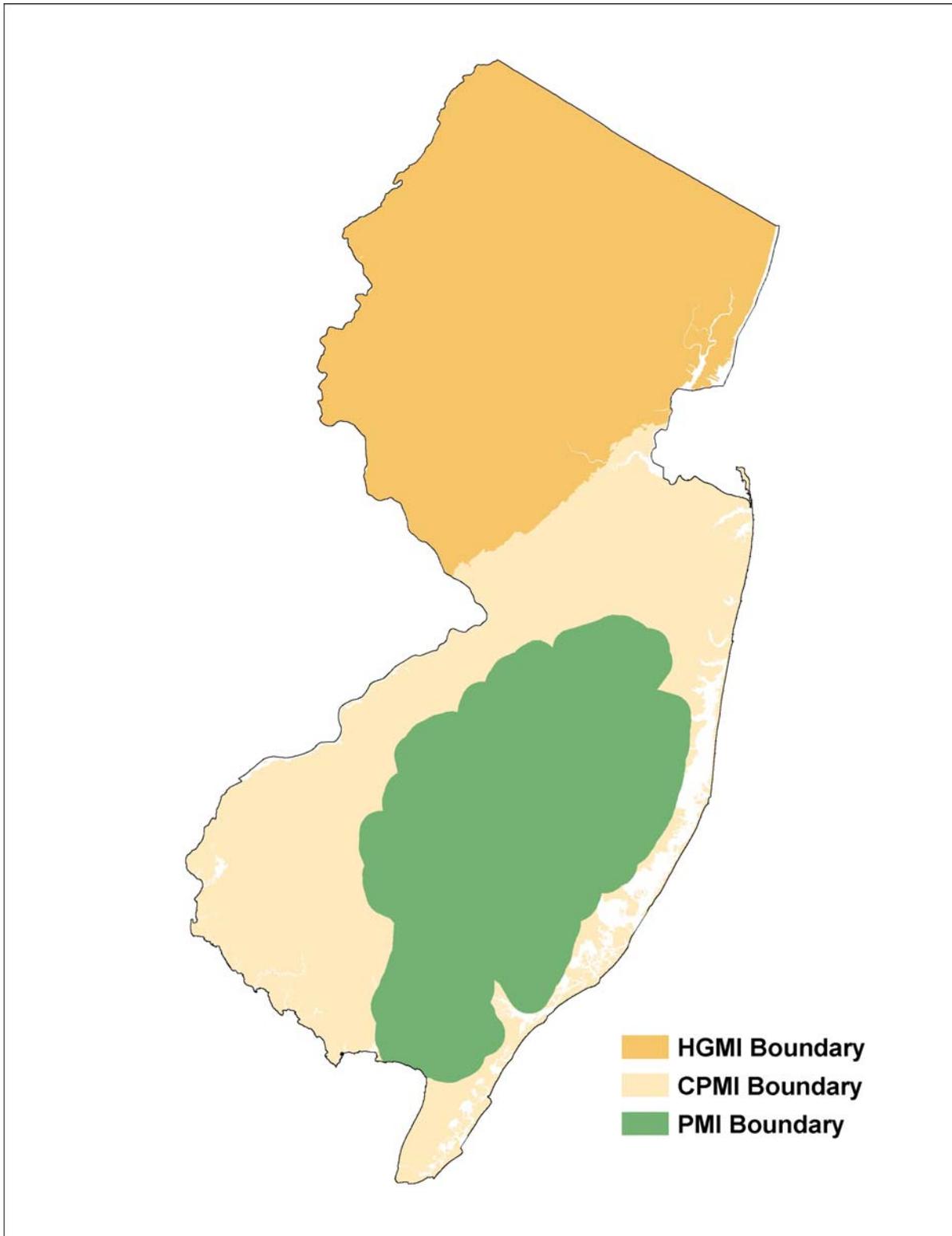


Figure A1. Boundaries for generic level index use.



**NJ Department of Environmental Protection
Water Monitoring and Standards**



AMBIENT BIOMONITORING NETWORK



Raritan Water Region

**Watershed Management Areas 7, 8, 9, and 10
Round 4 Benthic Macroinvertebrate Data
Volume 2 of 2**



December 2012

**State of New Jersey
Chris Christie, 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

Raritan Water Region

Watershed Management Areas 7, 8, 9, and 10

Round 4 Benthic Macroinvertebrate Data

Volume 2 of 2

Water Monitoring Report Prepared By:

Water Monitoring & Standards

Bureau of Freshwater and Biological Monitoring

Sampling and Data Analysis:

Victor Poretti, Project Manager-Sampling Coordination

Dean Bryson, Project Manager-Laboratory Operations

Thomas Miller

Anna Signor

Report Preparation:

Thomas Miller

Map Preparation:

John Sell

Edited By:

Alfred Korndoerfer

Leslie McGeorge

Alena Baldwin-Brown

[cover photo: Site AN0361, Lamington River tributary at Black River Rd, Somerset County, NJ.]



AMBIENT BIOMONITORING NETWORK

Watershed Management Areas 7, 8, 9, and 10

Raritan Water Region

Round 4 Benthic Macroinvertebrate Data

Volume 2 of 2

TABLE OF CONTENTS

	page
MAPS (AMNET Site Locations)	
Raritan Water Region	Map 1
Watershed Management Area # 7	Map 2
Watershed Management Area # 8	Maps 3-4
Watershed Management Area # 9	Maps 5-6
Watershed Management Area # 10	Map 7
TABLE 2. Comparative Scores / Ratings	
TABLE 3. Macroinvertebrates Abnormalities	
TABLE 4. Habitat Assessment	
APPENDIX A. Station Numbers and Locations	A
APPENDIX B. Pictures of Morphological Abnormalities	B
APPENDIX C. Graphical Comparison of Habitat Score vs. Biological Assessment Rating	C
APPENDIX D. Taxonomic and Statistical Data, Biological Assessments, Habitat Assessment Scores and Observations	D

MAPS

Round 4 Raritan Water Region AMNET Study WMA's 7, 8, 9, & 10

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

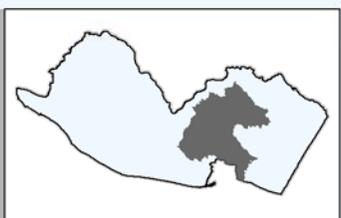
Map 1 RARITAN WATER REGION

Watershed Management Area 8
**NORTH AND SOUTH
BRANCH RARITAN**

Watershed Management Area 7
ARTHUR KILL

Watershed Management Area 10
MILLSTONE

Watershed Management Area 9
**LOWER RARITAN,
SOUTH RIVER
AND
LAWRENCE**

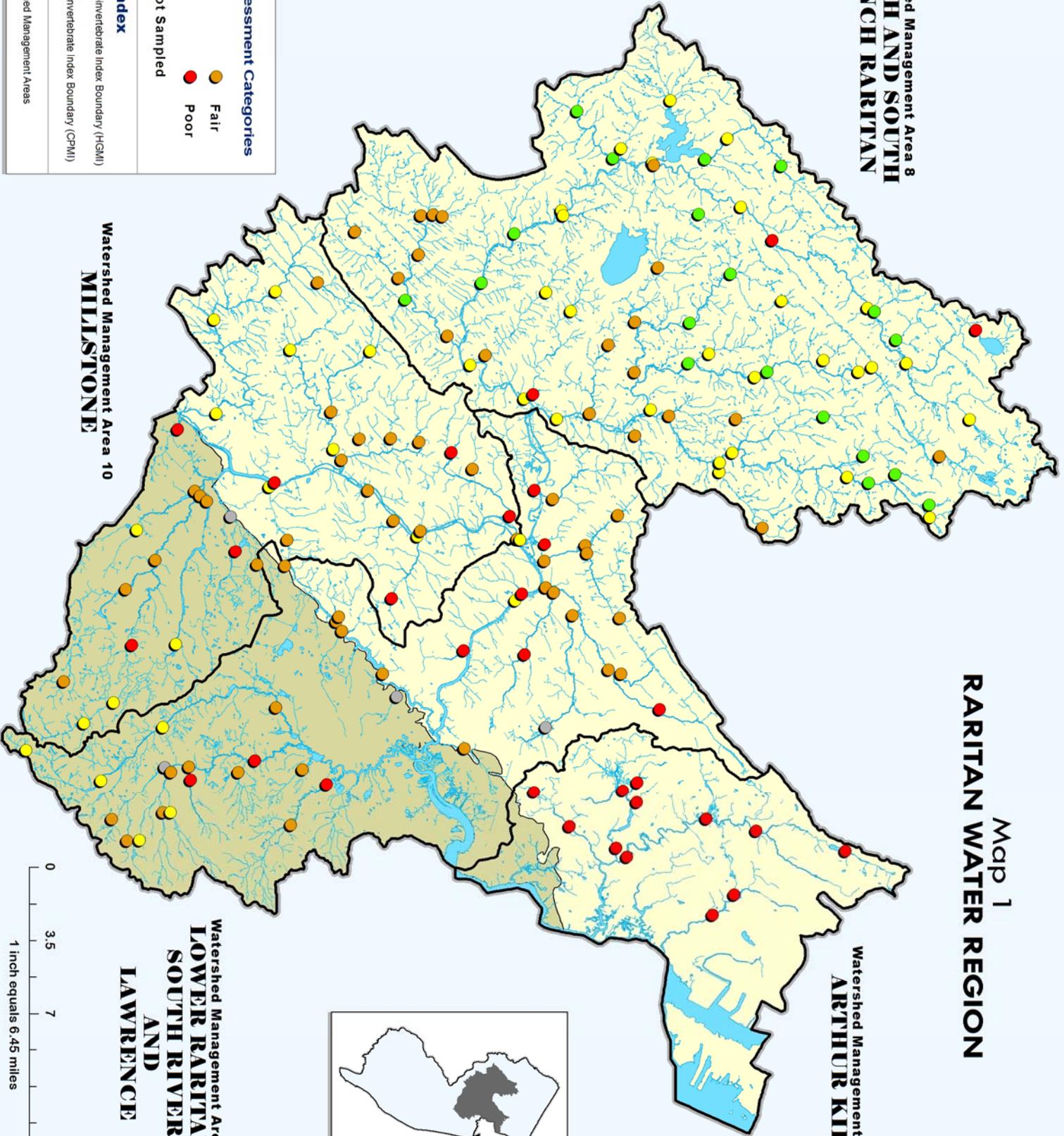


AMNET Assessment Categories

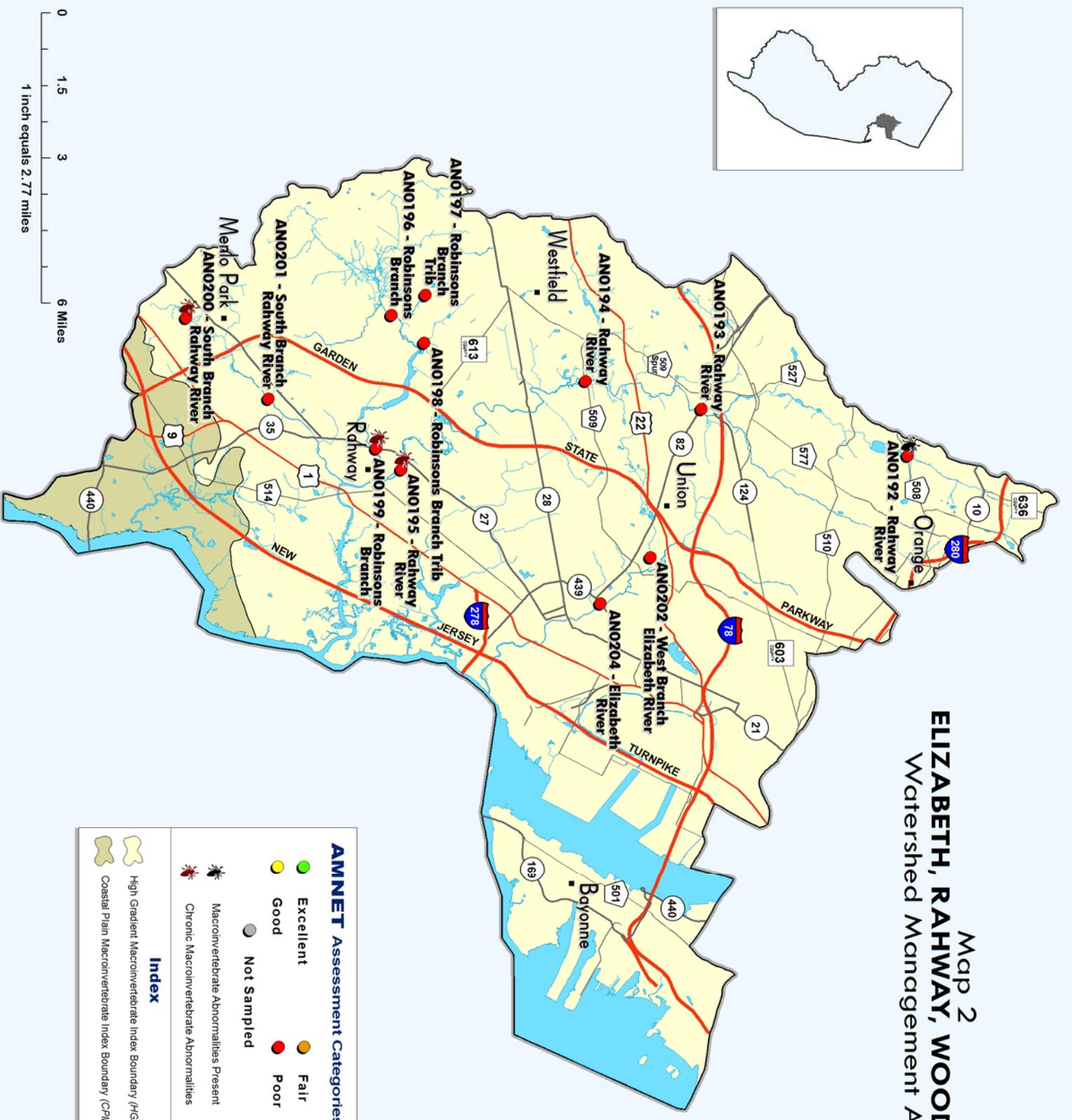
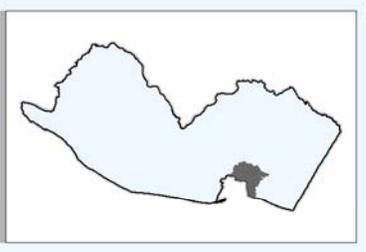
- Excellent
- Good
- Fair
- Poor
- Not Sampled

Index

- High Gradient Macroinvertebrate Index Boundary (HGMI)
- Coastal Plain Macroinvertebrate Index Boundary (CPMI)
- Watershed Management Areas



Map 2 ELIZABETH, RAHWAY, WOODBRIDGE Watershed Management Area 7



0 1.5 3 6 Miles
1 inch equals 2.77 miles

AMNET Assessment Categories	
	Excellent
	Good
	Fair
	Poor
	Not Sampled
	Macroinvertebrate Abnormalities Present
	Chronic Macroinvertebrate Abnormalities
Index	
	High Gradient Macroinvertebrate Index Boundary (HGM)
	Coastal Plain Macroinvertebrate Index Boundary (CPMI)

Map 3
**NORTH BRANCH
 RARITAN RIVER**
 Watershed Management Area 8 (Part)



AMNET Assessment Categories

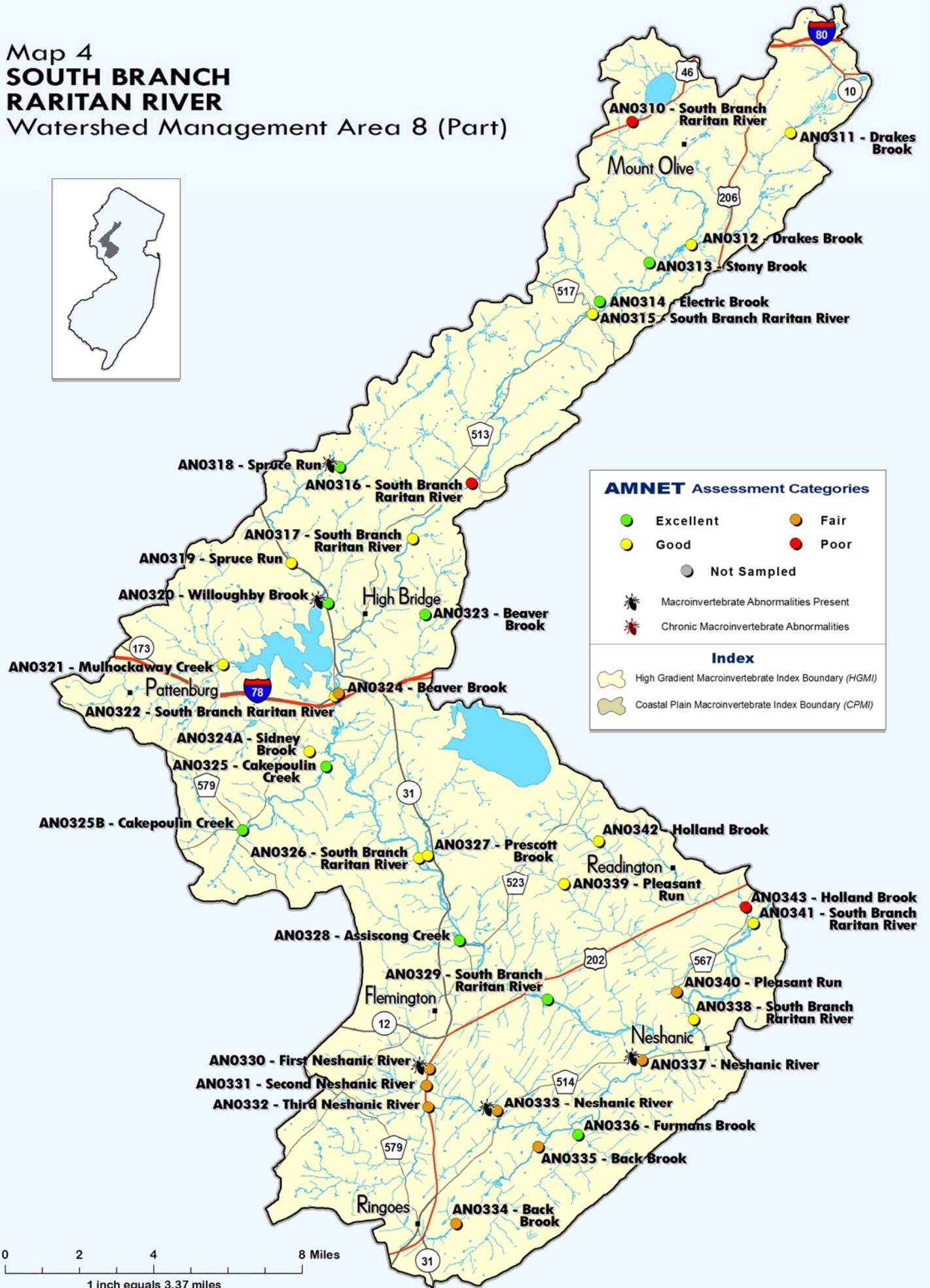
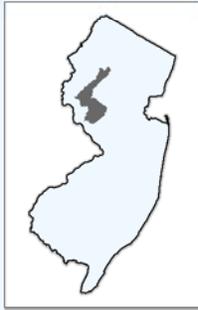
- Excellent
- Good
- Fair
- Poor
- Not Sampled
- Macroinvertebrate Abnormalities Present
- Chronic Macroinvertebrate Abnormalities

Index

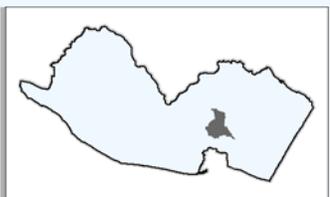
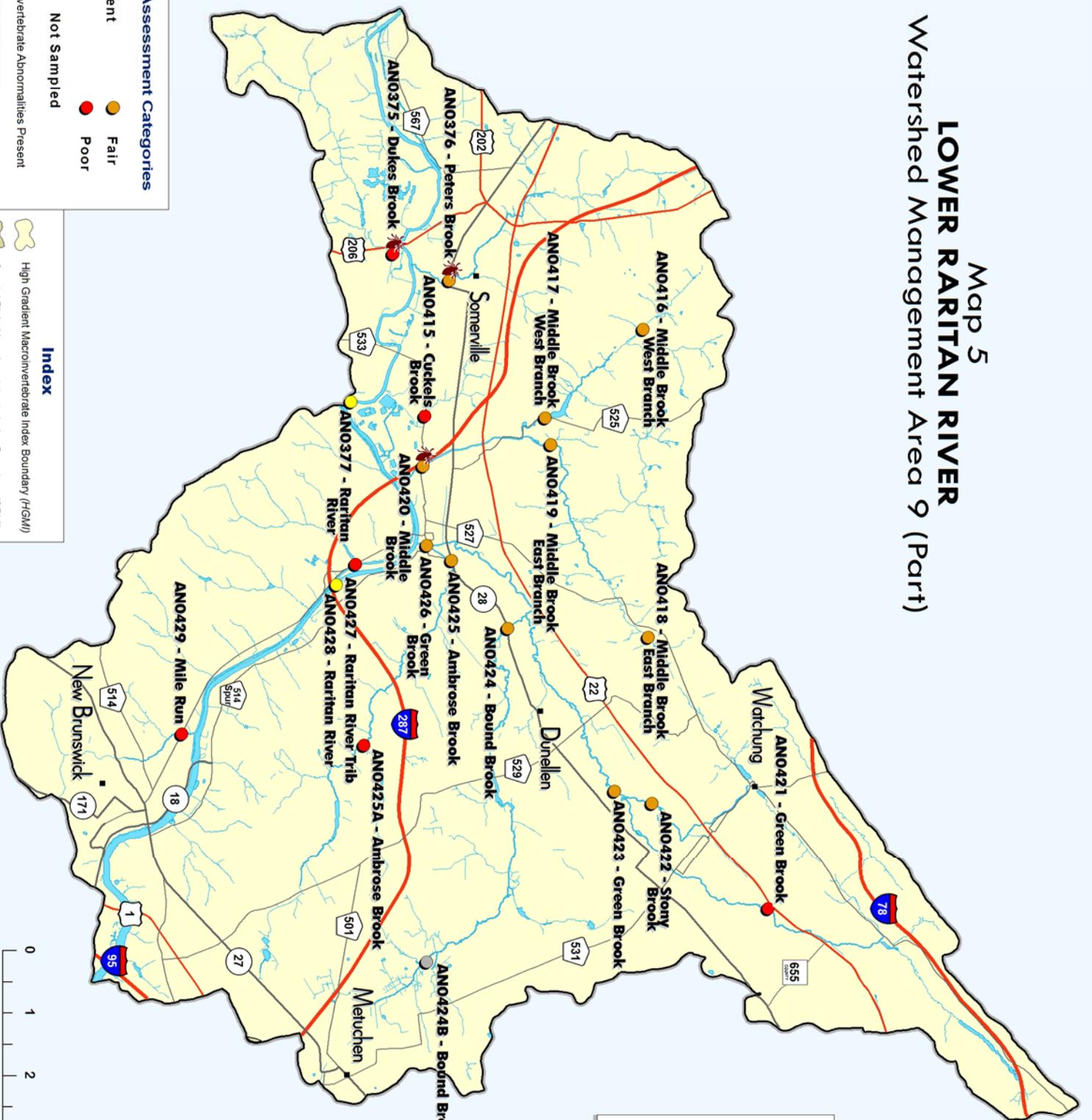
- High Gradient Macroinvertebrate Index Boundary (HGMIB)
- Coastal Plain Macroinvertebrate Index Boundary (CPMI)



Map 4
SOUTH BRANCH RARITAN RIVER
 Watershed Management Area 8 (Part)



Map 5 LOWER RARITAN RIVER Watershed Management Area 9 (Part)



AMNET Assessment Categories

- Excellent
- Good
- Fair
- Poor
- Not Sampled

Macroinvertebrate Abnormalities Present

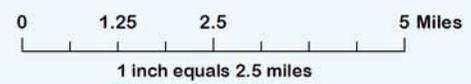
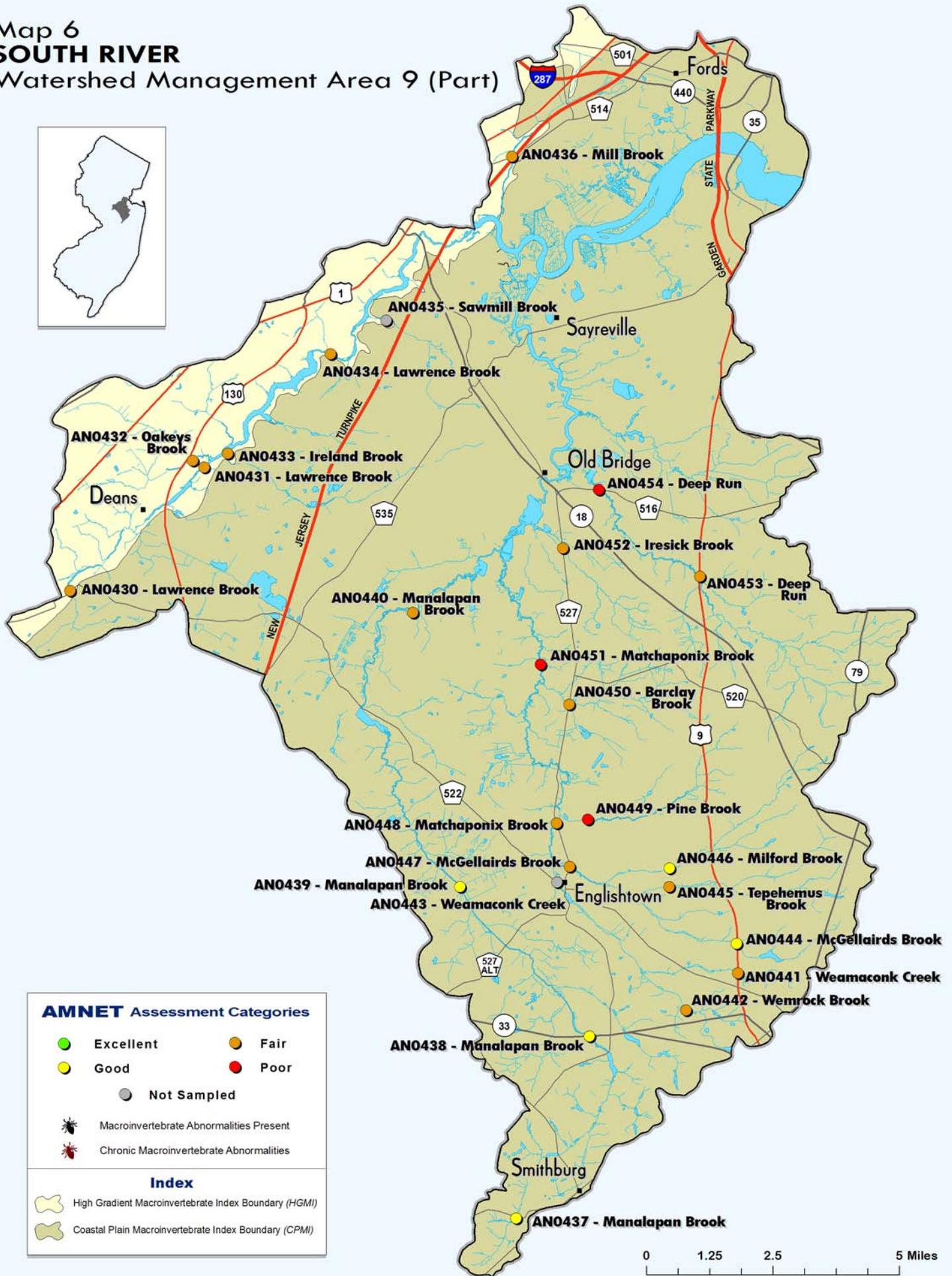
Chronic Macroinvertebrate Abnormalities

Index

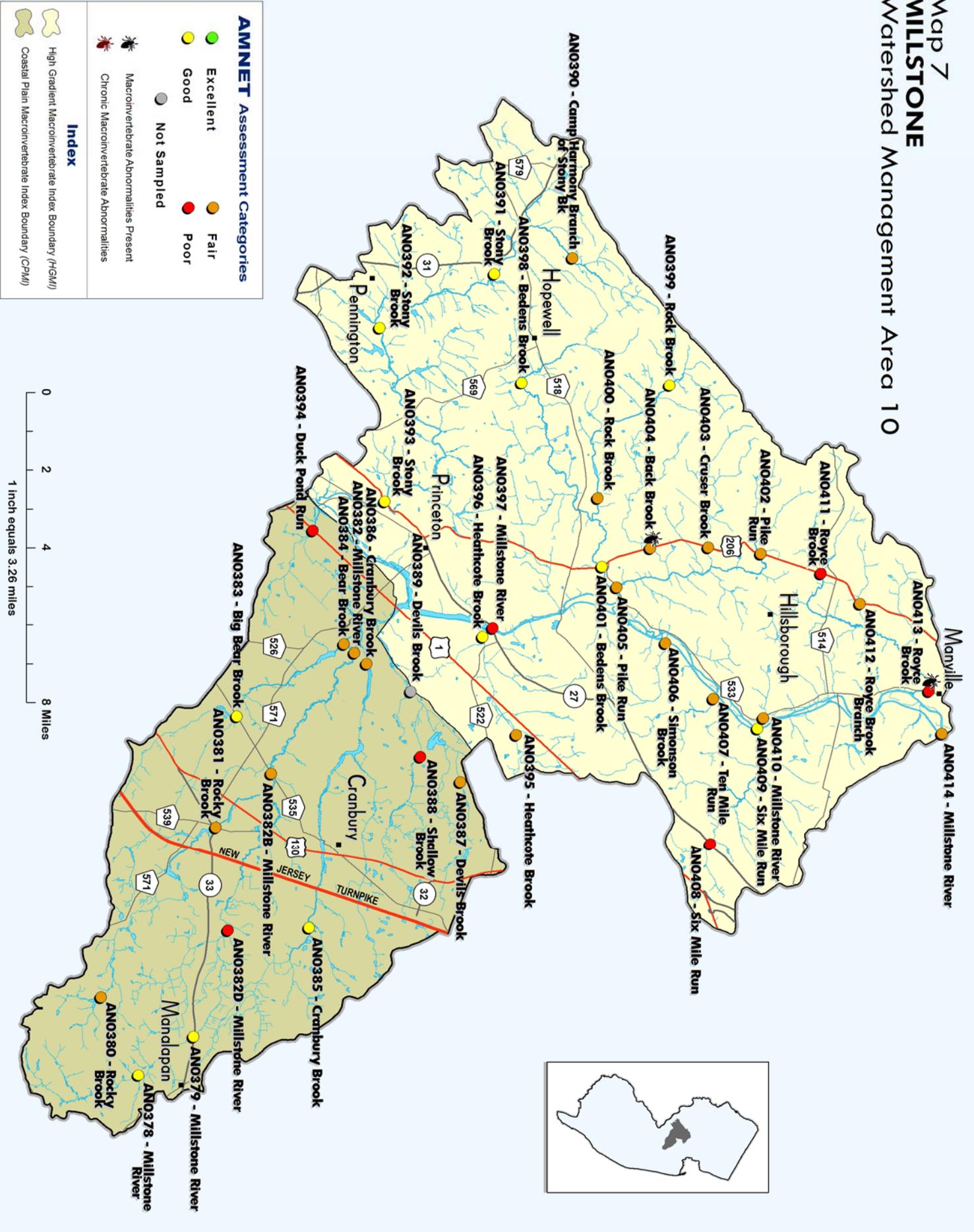
- High Gradient Macroinvertebrate Index Boundary (HGMI)
- Coastal Plain Macroinvertebrate Index Boundary (CPMI)



Map 6
SOUTH RIVER
 Watershed Management Area 9 (Part)



Map 7 MILLSTONE Watershed Management Area 10



New Jersey AMNET Study — Round 4 Raritan Water Region

Table 2
Comparative Scores / Ratings (see notes)

Watershed Management Areas 7, 8, 9, and 10

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
192	HGMI	18.25	18.52	Poor	Poor	/	105	07	336	HGMI	63.65	69.09	Excellent	Excellent	/	149	08
193	HGMI	24.19	8.92	Fair	Poor	—	121	07	337	HGMI	46.12	32.99	Good	Fair	—	149	08
194	HGMI	12.57	20.55	Poor	Poor	/	119	07	338	HGMI	54.86	51.60	Good	Good	/	140	08
195	HGMI	24.90	14.17	Fair	Poor	—	135	07	339	HGMI	52.90	46.49	Good	Good	/	131	08
196	HGMI	14.71	15.15	Poor	Poor	/	113	07	340	HGMI	50.32	24.20	Good	Fair	—	86	08
197	HGMI	20.78	18.79	Poor	Poor	/	120	07	341	HGMI	38.14	44.91	Fair	Good	+	120	08
198	HGMI	10.26	14.37	Poor	Poor	/	128	07	342	HGMI	68.00	57.47	Excellent	Good	—	118	08
199	HGMI	14.62	18.38	Poor	Poor	/	123	07	343	HGMI	28.78	20.24	Fair	Poor	—	85	08
200	HGMI	17.72	16.02	Poor	Poor	/	111	07	344	HGMI	53.30	73.78	Good	Excellent	+	159	08
201	HGMI	25.23	11.82	Fair	Poor	—	107	07	344A	HGMI	65.13	45.34	Excellent	Good	—	122	08
202	HGMI	nd	19.92	no sample	Poor	nd	126	07	345	HGMI	90.88	82.65	Excellent	Excellent	/	178	08
204	HGMI	20.86	9.59	Poor	Poor	/	119	07	346	HGMI	50.86	49.74	Good	Good	/	144	08
310	HGMI	23.01	20.10	Fair	Poor	—	125	08	347	HGMI	84.83	63.28	Excellent	Excellent	/	164	08
311	HGMI	51.23	52.62	Good	Good	/	143	08	348	HGMI	84.42	75.78	Excellent	Excellent	/	167	08
312	HGMI	44.32	45.04	Good	Good	/	157	08	349	HGMI	78.82	76.95	Excellent	Excellent	/	165	08
313	HGMI	76.19	79.13	Excellent	Excellent	/	159	08	350	HGMI	59.72	51.80	Good	Good	/	141	08
314	HGMI	36.70	74.95	Fair	Excellent	+	153	08	351	HGMI	55.85	60.35	Good	Good	/	157	08
315	HGMI	49.19	52.02	Good	Good	/	135	08	352	HGMI	18.91	33.32	Poor	Fair	+	134	08
316	HGMI	52.42	14.04	Good	Poor	—	111	08	353	HGMI	46.15	50.30	Good	Good	/	130	08
317	HGMI	68.82	46.73	Excellent	Good	—	172	08	354	HGMI	31.58	34.45	Fair	Fair	/	150	08
318	HGMI	73.04	71.28	Excellent	Excellent	/	177	08	355	HGMI	51.68	31.24	Good	Fair	—	135	08
319	HGMI	67.02	45.03	Excellent	Good	—	167	08	356	HGMI	8.95	26.53	Poor	Fair	+	140	08
320	HGMI	73.04	81.62	Excellent	Excellent	/	154	08	357	HGMI	52.51	51.19	Good	Good	/	147	08
321	HGMI	53.74	57.54	Good	Good	/	172	08	358	HGMI	36.39	46.02	Fair	Good	+	180	08
322	HGMI	50.19	51.26	Good	Good	/	126	08	359	HGMI	64.98	47.19	Excellent	Good	—	166	08
323	HGMI	73.54	74.81	Excellent	Excellent	/	170	08	360	HGMI	85.32	66.04	Excellent	Excellent	/	156	08
324	HGMI	37.04	38.66	Fair	Fair	/	134	08	361	HGMI	66.54	61.94	Excellent	Good	—	148	08
324A	HGMI	75.95	45.51	Excellent	Good	—	140	08	362	HGMI	60.89	42.01	Good	Good	/	153	08
325	HGMI	67.91	63.82	Excellent	Excellent	/	161	08	363	HGMI	80.06	73.73	Excellent	Excellent	/	149	08
325B	HGMI	69.00	74.36	Excellent	Excellent	/	138	08	364	HGMI	82.17	61.08	Excellent	Good	—	153	08
326	HGMI	64.80	45.10	Excellent	Good	—	157	08	365	HGMI	81.45	86.67	Excellent	Excellent	/	150	08
327	HGMI	61.50	48.74	Good	Good	/	157	08	366	HGMI	80.62	69.03	Excellent	Excellent	/	159	08
328	HGMI	63.30	66.54	Excellent	Excellent	/	147	08	367	HGMI	44.90	33.63	Good	Fair	—	160	08
329	HGMI	37.69	63.98	Fair	Excellent	+	122	08	368	HGMI	23.79	24.96	Fair	Fair	/	159	08
330	HGMI	25.07	23.75	Fair	Fair	/	130	08	369	HGMI	35.16	37.71	Fair	Fair	/	133	08
331	HGMI	51.04	36.46	Good	Fair	—	150	08	370	HGMI	62.58	47.81	Good	Good	/	157	08
332	HGMI	63.38	22.83	Excellent	Fair	—	117	08	371	HGMI	20.79	24.22	Poor	Fair	+	131	08
333	HGMI	36.52	26.76	Fair	Fair	/	111	08	372	HGMI	49.08	39.65	Good	Fair	—	126	08
334	HGMI	34.06	37.08	Fair	Fair	/	153	08	373	HGMI	28.48	41.97	Fair	Fair	/	139	08
335	HGMI	48.77	41.52	Good	Fair	—	149	08	374	HGMI	54.54	54.38	Good	Good	/	165	08

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	PMI	Value	HGMI	Value	Habitat Score	Value
Excellent	22.0-30.0	Excellent	63.0-100.0	Excellent	63.0-100.0	Optimal	160 - 200
Good	11.0-21.0	Good	56.0-62.99	Good	42.0-62.99	Sub-optimal	110 - 159
Fair	6.0-10.0	Fair	34.0-55.99	Fair	21.0-41.99	Marginal	60 - 109
Poor	0-5.99	Poor	0-33.99	Poor	0-20.99	Poor	< 60

New Jersey AMNET Study — Round 4 Raritan Water Region

Table 2
Comparative Scores / Ratings (see notes)

Watershed Management Areas 7, 8, 9, and 10

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
375	HGMI	18.22	15.92	Poor	Poor	/	140	09	409	HGMI	29.70	43.70	Fair	Good	+	133	10
376	HGMI	21.62	26.97	Fair	Fair	/	126	09	410	HGMI	24.83	34.08	Fair	Fair	/	137	10
377	HGMI	28.30	53.62	Fair	Good	+	134	09	411	HGMI	25.99	19.40	Fair	Poor	—	149	10
378	CPMI	22	18	Excellent	Good	—	137	10	412	HGMI	18.46	24.08	Poor	Fair	+	125	10
379	CPMI	6	14	Fair	Good	+	112	10	413	HGMI	16.41	16.02	Poor	Poor	/	113	10
380	CPMI	12	10	Good	Fair	—	130	10	414	HGMI	35.25	26.65	Fair	Fair	/	142	10
381	CPMI	8	8	Fair	Fair	/	115	10	415	HGMI	31.84	20.69	Fair	Poor	—	125	09
382	CPMI	6	8	Fair	Fair	/	167	10	416	HGMI	32.35	27.63	Fair	Fair	/	157	09
382B	CPMI	6	6	Fair	Fair	/	149	10	417	HGMI	33.86	21.98	Fair	Fair	/	141	09
382D	CPMI	nd	4	no sample	Poor	nd	125	10	418	HGMI	22.73	32.48	Fair	Fair	/	141	09
383	CPMI	8	14	Fair	Good	+	163	10	419	HGMI	35.37	39.13	Fair	Fair	/	158	09
384	CPMI	10	10	Fair	Fair	/	159	10	420	HGMI	38.95	33.71	Fair	Fair	/	144	09
385	CPMI	4	12	Poor	Good	+	144	10	421	HGMI	26.40	20.68	Fair	Poor	—	122	09
386	CPMI	10	8	Fair	Fair	/	153	10	422	HGMI	27.47	34.99	Fair	Fair	/	146	09
387	CPMI	8	8	Fair	Fair	/	152	10	423	HGMI	30.39	30.78	Fair	Fair	/	129	09
388	CPMI	6	4	Fair	Poor	—	119	10	424	HGMI	16.55	24.58	Poor	Fair	+	131	09
389	CPMI	nd	nd	no sample	no sample	nd		10	424B	HGMI	9.15	nd	Poor	no sample	nd		09
390	HGMI	46.32	40.70	Good	Fair	—	166	10	425	HGMI	18.34	22.52	Poor	Fair	+	143	09
391	HGMI	51.97	47.33	Good	Good	/	147	10	425A	HGMI	23.66	10.37	Fair	Poor	—	102	09
392	HGMI	45.70	42.10	Good	Good	/	157	10	426	HGMI	14.58	23.01	Poor	Fair	+	117	09
393	HGMI	41.56	46.04	Fair	Good	+	154	10	427	HGMI	23.46	15.38	Fair	Poor	—	134	09
394	HGMI	15.83	20.02	Poor	Poor	/	116	10	428	HGMI	31.54	45.84	Fair	Good	+	156	09
395	HGMI	19.39	23.46	Poor	Fair	+	120	10	429	HGMI	8.72	17.87	Poor	Poor	/	128	09
396	HGMI	28.19	43.74	Fair	Good	+	140	10	430	HGMI	12.03	29.42	Poor	Fair	+	101	09
397	HGMI	18.86	18.81	Poor	Poor	/	169	10	431	HGMI	29.27	24.85	Fair	Fair	/	101	09
398	HGMI	30.76	43.73	Fair	Good	+	147	10	432	HGMI	43.60	31.87	Good	Fair	—	154	09
399	HGMI	48.92	57.95	Good	Good	/	176	10	433	HGMI	38.88	24.98	Fair	Fair	/	162	09
400	HGMI	44.48	41.56	Good	Fair	—	145	10	434	HGMI	26.64	27.19	Fair	Fair	/	113	09
401	HGMI	48.62	52.11	Good	Good	/	156	10	435	HGMI	16.52	nd	Poor	no sample	nd		09
402	HGMI	39.15	29.14	Fair	Fair	/	149	10	436	HGMI	27.64	32.18	Fair	Fair	/	130	09
403	HGMI	45.26	36.51	Good	Fair	—	143	10	437	CPMI	14	14	Good	Good	/	142	09
404	HGMI	36.63	35.66	Fair	Fair	/	137	10	438	CPMI	16	18	Good	Good	/	122	09
405	HGMI	41.88	33.27	Fair	Fair	/	131	10	439	CPMI	20	14	Good	Good	/	115	09
406	HGMI	24.29	34.83	Fair	Fair	/	128	10	440	CPMI	6	10	Fair	Fair	/	136	09
407	HGMI	45.09	41.05	Good	Fair	—	150	10	441	CPMI	6	10	Fair	Fair	/	117	09
408	HGMI	14.18	11.91	Poor	Poor	/	147	10	442	CPMI	6	10	Fair	Fair	/	118	09

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

<u>CPMI</u>	<u>Value</u>	<u>PMI</u>	<u>Value</u>	<u>HGMI</u>	<u>Value</u>	<u>Habitat Score</u>	<u>Value</u>
Excellent	22.0-30.0	Excellent	63.0-100.0	Excellent	63.0-100.0	Optimal	160 - 200
Good	11.0-21.0	Good	56.0-62.99	Good	42.0-62.99	Sub-optimal	110 - 159
Fair	6.0-10.0	Fair	34.0-55.99	Fair	21.0-41.99	Marginal	60 - 109
Poor	0-5.99	Poor	0-33.99	Poor	0-20.99	Poor	< 60

Table 3

Macroinvertebrate Abnormalities (see notes)

Watershed Management Areas 7, 8, 9, and 10

Station	Round 3	Round 4	WMA		Station	Round 3	Round 4	WMA				
192		1/31	07		426	3/70		09				
194	+1		07		427	1/19		09				
195	+3	3/77	07		435	1/14		09				
199	+1	1	07		436	1/26		09				
200	1/8	3/45	07		439	1/22		09				
316	1/48		08		440	1/59		09				
317	1/28		08		447	+1		09				
318		1/32	08		448	+2		09				
320		1/27	08		449	1/60		09				
326	+1		08		451	1/70		09				
330		1/63	08									
333		1/89	08									
337		+1	08									
349	1/9		08									
355	2/37		08									
356	+2	1/37	08									
358	1/38		08									
362		1/33	08									
366	1/15		08									
374	+1		08									
375	+1	+1	09									
376	+1	+1	09									
384	1/53		10									
385	3/114		10									
396	1/36		10									
397	1/58		10									
403	2/18		10									
404		2/23	10									
407	1/56		10									
409	+1		10									
413		1/5	10									
419	1/43		09									
420	2/41	+1	09									
421	+1, 3/19		09									
422	1/23		09									
423	1/43		09									

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 <u>not</u> 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)	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. Note: determine left or right side by facing downstream.	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 Raritan Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0192	Rahway River	40 46'11.022"N 74 16'59.605"W	7
AN0193	Rahway River	40 42'28.817"N 74 18'06.441"W	7
AN0194	Rahway River	40 40'24.010"N 74 18'46.508"W	7
AN0195	Rahway River	40 37'05.443"N 74 16'42.076"W	7
AN0196	Robinsons Br	40 36'55.135"N 74 20'20.659"W	7
AN0197	UNT to Robinsons Br	40 37'31.702"N 74 20'49.072"W	7
AN0198	UNT to Robinsons Br	40 37'29.941"N 74 19'41.278"W	7
AN0199	Robinsons Br	40 36'38.305"N 74 17'11.475"W	7
AN0200	South Br Rahway River	40 33'13.769"N 74 20'17.255"W	7
AN0201	South Br Rahway River	40 34'56.816"N 74 18'00.962"W	7
AN0202	West Br Elizabeth River	40 41'33.989"N 74 14'32.817"W	7
AN0204	Elizabeth River	40 40'39.173"N 74 13'32.202"W	7
AN0310	S Br Raritan River	40 51'37.094"N 74 45'35.854"W	8
AN0311	Drakes Bk	40 51'21.932"N 74 40'41.956"W	8
AN0312	Drakes Bk	40 48'43.555"N 74 43'45.689"W	8
AN0313	Stony Bk	40 48'18.444"N 74 45'03.008"W	8
AN0314	Electric Bk	40 47'23.423"N 74 46'34.952"W	8
AN0315	S Br Raritan River	40 47'06.051"N 74 46 48.068"W	8
AN0316	S Br Raritan River	40 43 07.160"N 74 50 30.437"W	8
AN0317	S Br Raritan River	40 41 48.921"N 74 52'18.904"W	8
AN0318	Spruce Run	40 43'29.440"N 74 54'33.994"W	8
AN0319	Spruce Run	40 41'13.965"N 74 56'02.431"W	8
AN0320	Willoughby Bk	40 40'17.910"N 74 54'54.388"W	8
AN0321	Mulhockaway Ck	40 38'50.889"N 74 58'07.677"W	8

Site	Stream	Latitude Longitude	Watershed Management Area
AN0322	S Br Raritan River	40 38'06.966"N 74 54'41.665"W	8
AN0323	Beaver Bk	40 40'03.182"N 74 51'55.159"W	8
AN0324	Beaver Bk	40 38'10.799"N 74 54'34.759"W	8
AN0325	Cakepoulin Ck	40 36'28.147"N 74 54'56.769"W	8
AN0325B	Cakepoulin Ck	40 34'58.880"N 74 57'30.385"W	8
AN0326	S Br Raritan River	40 34'20.716"N 74 52'04.310"W	8
AN0327	Prescott Bk	40 34'24.249"N 74 51'48.234"W	8
AN0328	Assiscong Ck	40 32'23.181"N 74 50 49.303"W	8
AN0329	S Br Raritan River	40 31'01.180"N 74 48'06.911"W	8
AN0330	First Neshanic River	40 29'22.982"N 74 51'44.174"W	8
AN0331	Second Neshanic River	40 28'59.461"N 74 51'49.423"W	8
AN0332	Third Neshanic River	40 28'29.339"N 74 51'46.023"W	8
AN0333	Neshanic River	40 28'24.360"N 74 49'39.483"W	8
AN0334	Back Bk	40 25'46.280"N 74 50'50.907"W	8
AN0335	Back Bk	40 27'33.733"N 74 48'22.644"W	8
AN0336	Furmans Bk	40 27'50.648"N 74 47'09.998"W	8
AN0337	Neshanic River	40 29'36.452"N 74 45'11.866"W	8
AN0338	S Br Raritan River	40 30'33.765"N 74 43'37.036"W	8
AN0339	Pleasant Run	40 33'42.941"N 74 47'37.118"W	8
AN0340	Pleasant Run	40 31'12.166"N 74 44'08.481"W	8
AN0341	S Br Raritan River	40 32'48.659"N 74 41'47.348"W	8
AN0342	Holland Bk	40 34'44.840"N 74 46'33.607"W	8
AN0343	Holland Bk	40 33'11.473"N 74 42'01.971"W	8
AN0344	UNT to India Bk	40 49'41.598"N 74 36'00.921"W	8

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

Site	Stream	Latitude Longitude	Watershed Management Area
AN0344A	India Bk	40 49'42.514"N 74 35'20.931"W	8
AN0345	India Bk	40 47'10.332"N 74 37'13.896"W	8
AN0346	N Br Raritan River	40 46'16.431"N 74 37'32.833"W	8
AN0347	Dawsons Bk	40 48'15.845"N 74 37'41.071"W	8
AN0348	Burnett Bk	40 46'57.039"N 74 38'42.290"W	8
AN0349	Peapack Bk	40 45'16.418"N 74 40'50.428"W	8
AN0350	Peapack Bk	40 41'29.592"N 74 38'52.271"W	8
AN0351	N Br Raritan River	40 40'58.337"N 74 38'18.657"W	8
AN0352	Mine Bk	40 42'44.667"N 74 34'45.474"W	8
AN0353	Mine Bk	40 40'56.332"N 74 37'48.227"W	8
AN0354	Middle Bk	40 41'37.919"N 74 40'42.730"W	8
AN0355	Middle Bk	40 38'50.859"N 74 40'51.794"W	8
AN0356	Lamington River	40 50'06.932"N 74 38'40.546"W	8
AN0357	Tanners Bk	40 47'17.943"N 74 43'32.431"W	8
AN0358	Lamington River	40 46'43.453"N 74 43'18.019"W	8
AN0359	Trout Bk	40 45'16.396"N 74 43'55.187"W	8
AN0360	Lamington River	40 42'56.246"N 74 43'17.630"W	8
AN0361	UNT to Lamington River	40 42'24.643"N 74 42'59.361"W	8
AN0362	Cold Bk	40 40'30.024"N 74 44'16.069"W	8
AN0363	Lamington River	40 39'38.381"N 74 43'44.250"W	8
AN0364	N Br Rockaway Ck	40 43'31.244"N 74 47'10.077"W	8
AN0365	N Br Rockaway Ck	40 41'23.540"N 74 48'39.928"W	8
AN0366	N Br Rockaway Ck	40 39'42.387"N 74 45'57.240"W	8
AN0367	S Br Rockaway Ck	40 38'22.213"N 74 48'58.420"W	8

Site	Stream	Latitude Longitude	Watershed Management Area
AN0368	S Br Rockaway Ck	40 37'24.551"N 74 45'59.963"W	8
AN0369	Rockaway Ck	40 37'23.975"N 74 43'15.131"W	8
AN0370	Lamington River	40 38'04.804"N 74 41'12.197"W	8
AN0371	Chambers(B) Bk	40 37'26.183"N 74 39'46.916"W	8
AN0372	Chambers(A) Bk	40 36'18.705"N 74 44'43.402"W	8
AN0373	Chambers(A) Bk	40 35'32.488"N 74 40'58.840"W	8
AN0374	N Br Raritan River	40 34'11.002"N 74 40'41.493"W	8
AN0375	Dukes Bk	40 33'14.314"N 74 36'48.227"W	9
AN0376	Peters Bk	40 34'01.277"N 74 36'18.868"W	9
AN0377	Raritan River	40 32'39.200"N 74 34'05.421"W	9
AN0378	Millstone River	40 14'28.495"N 74 24'04.832"W	10
AN0379	Millstone River	40 15'43.051"N 74 25'12.305"W	10
AN0380	Rocky Bk	40 13'38.371"N 74 26'22.149"W	10
AN0381	Rocky Bk	40 16'13.026"N 74 31'21.855"W	10
AN0382	Millstone River	40 19'19.653"N 74 36'28.695"W	10
AN0382B	Millstone River	40 17'27.435"N 74 32'58.014"W	10
AN0382D	Millstone River	40 16'28.620"N 74 28'20.525"W	10
AN0383	Big Bear Bk	40 16'41.201"N 74 34'36.982"W	10
AN0384	Bear Bk	40 19'05.323"N 74 36'44.554"W	10
AN0385	Cranbury Bk	40 18'18.858"N 74 28'23.669"W	10
AN0386	Cranbury Bk	40 19'35.979"N 74 36'09.714"W	10
AN0387	Devils Bk	40 21'42.428"N 74 32'42.028"W	10
AN0388	Shallow Bk	40 20'48.608"N 74 33'25.879"W	10
AN0389	Devils Bk	40 20'35.129"N 74 35'21.073"W	10

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

Site	Stream	Latitude Longitude	Watershed Management Area
AN0390	Camp Harmony Br of Stony Bk	40 24'12.202"N 74 48'06.008"W	10
AN0391	Stony Bk	40 22'26.598"N 74 47'37.479"W	10
AN0392	Stony Bk	40 19'52.630"N 74 46'01.800"W	10
AN0393	Stony Bk	40 19'59.682"N 74 40'55.949"W	10
AN0394	Duck Pond Run	40 18'23.496"N 74 40'04.668"W	10
AN0395	Heathcote Bk	40 22'57.502"N 74 34'04.740"W	10
AN0396	Heathcote Bk	40 22'11.952"N 74 36'56.978"W	10
AN0397	Millstone River	40 22'25.677"N 74 37'12.787"W	10
AN0398	Bedens Bk	40 23'03.999"N 74 44'25.474"W	10
AN0399	Rock Bk	40 26'23.130"N 74 44'21.646"W	10
AN0400	Rock Bk	40 24'46.881"N 74 41'02.493"W	10
AN0401	Bedens Bk	40 24'52.520"N 74 39 01.533"W	10
AN0402	Pike Run	40 28'26.673"N 74 39'25.494"W	10
AN0403	Cruser Bk	40 27'15.949"N 74 39'36.505"W	10
AN0404	Back Bk	40 25'57.702"N 74 39'34.796"W	10
AN0405	Pike Run	40 25'12.408"N 74 38'25.663"W	10
AN0406	Simonson Bk	40 26'18.513"N 74 36'46.689"W	10
AN0407	Ten Mile Run	40 27'23.093"N 74 35'08.581"W	10
AN0408	Six Mile Run	40 27'18.952"N 74 30'52.166"W	10
AN0409	Six Mile Run	40 28'22.389"N 74 34'16.033"W	10
AN0410	Millstone River	40 28'30.495"N 74 34'34.587"W	10
AN0411	Royce Bk	40 29'47.714"N 74 38'50.800"W	10
AN0412	Royce Bk Br	40 30'40.115"N 74 37'57.560"W	10
AN0413	Royce Bk	40 32'13.363"N 74 35'22.668"W	10

Site	Stream	Latitude Longitude	Watershed Management Area
AN0414	Millstone River	40 32'30.924"N 74 34'07.554"W	10
AN0415	Cuckels Bk	40 34'07.355"N 74 34'10.841"W	9
AN0416	W Br Middle Bk	40 36'43.383"N 74 35'25.710"W	9
AN0417	W Br Middle Bk	40 35'21.701"N 74 33'48.395"W	9
AN0418	E Br Middle Bk	40 36'47.621"N 74 29'47.454"W	9
AN0419	E Br Middle Bk	40 35'29.891"N 74 33'18.072"W	9
AN0420	Middle Bk	40 34'05.056"N 74 33'12.661"W	9
AN0421	Green Bk	40 38'27.731"N 74 24'49.425"W	9
AN0422	Stony Bk	40 36'50.903"N 74 26'45.891"W	9
AN0423	Green Bk	40 36'19.635"N 74 26'59.268"W	9
AN0424	Bound Bk	40 34'50.497"N 74 29'57.414"W	9
AN0424B	Bound Bk	40 33'42.614"N 74 23'51.312"W	9
AN0425	Ambrose Bk	40 34'03.434"N 74 31'12.003"W	9
AN0425A	Ambrose Bk	40 32'50.115"N 74 27'51.059"W	9
AN0426	Green Bk	40 33'42.746"N 74 31'28.350"W	9
AN0427	UNT to Raritan River	40 32'43.133"N 74 31'08.009"W	9
AN0428	Raritan River	40 32'27.225"N 74 30'45.415"W	9
AN0429	Mile Run	40 30'20.042"N 74 28'02.071"W	9
AN0430	Lawrence Bk	40 22'51.506"N 74 32'37.700"W	9
AN0431	Lawrence Bk	40 24'58.850"N 74 29'36.930"W	9
AN0432	Oakeys Bk	40 25'06.100"N 74 29'52.230"W	9
AN0433	Ireland Bk	40 25'13.409"N 74 29'05.490"W	9
AN0434	Lawrence Bk	40 26'55.734"N 74 26'46.339"W	9
AN0435	Sawmill Bk	40 27'30.816"N 74 25'31.092"W	9

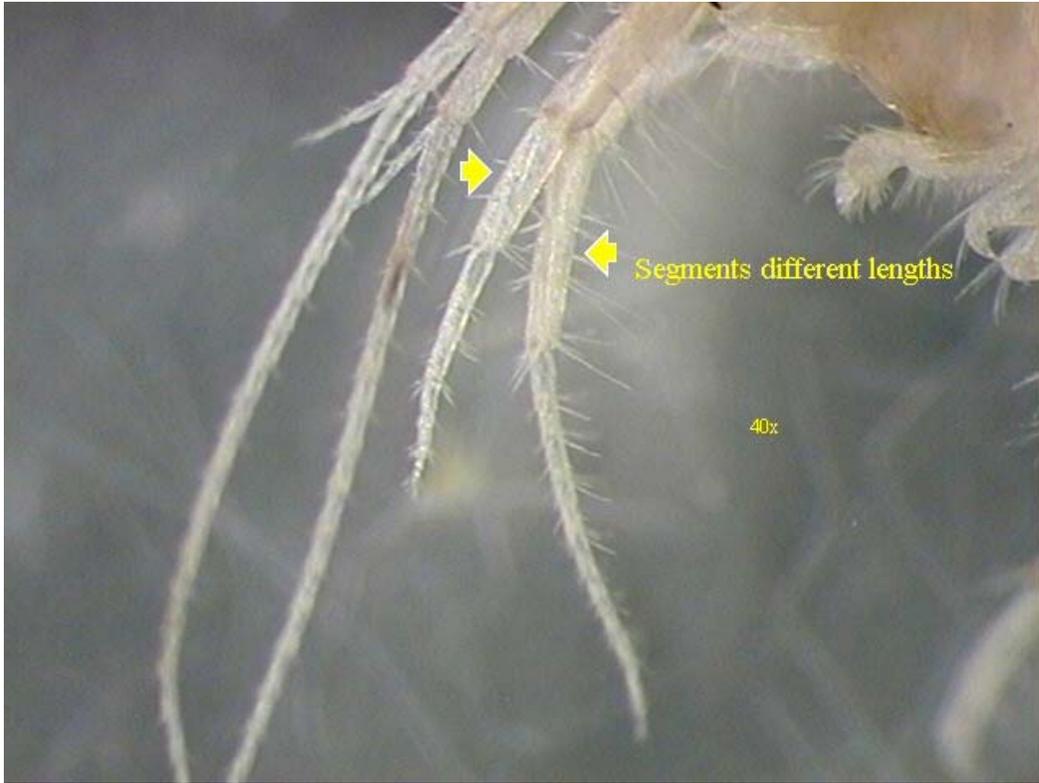
Appendix A — Station Numbers and Locations for the Round 4 Raritan Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0436	Mill Bk	40 30'19.531"N 74 22'41.572"W	9
AN0437	Manalapan Bk	40 12'03.912"N 74 22'37.976"W	9
AN0438	Manalapan Bk	40 15'11.336"N 74 20'58.593"W	9
AN0439	Manalapan Bk	40 17'46.133"N 74 23'52.302"W	9
AN0440	Manalapan Bk	40 22'29.077"N 74 24'55.526"W	9
AN0441	Weamaconk Ck	40 16'16.554"N 74 17'39.011"W	9
AN0442	Wemrock Bk	40 15'38.376"N 74 18'48.562"W	9
AN0443	Weamaconk Ck	40 17'50.467"N 74 21'41.881"W	9
AN0444	McGellairds Bk	40 16'46.999"N 74 17'40.200"W	9
AN0445	Tepehemus Bk	40 17'45.840"N 74 19'11.045"W	9
AN0446	Milford Bk	40 18'04.840"N 74 19'10.375"W	9
AN0447	McGellairds Bk	40 18'06.501"N 74 21'24.895"W	9
AN0448	Matchaponix Bk	40 18'51.593"N 74 21'42.425"W	9
AN0449	Pine Bk	40 18'55.566"N 74 21'00.198"W	9
AN0450	Barclay Bk	40 20'54.059"N 74 21'25.188"W	9
AN0451	Matchaponix Bk	40 21'35.558"N 74 22'03.691"W	9
AN0452	Iresick Bk	40 23'35.113"N 74 21'33.397"W	9
AN0453	Deep Run	40 23'05.771"N 74 18'28.741"W	9
AN0454	Deep Run	40 24'35.749"N 74 20'45.052"W	9

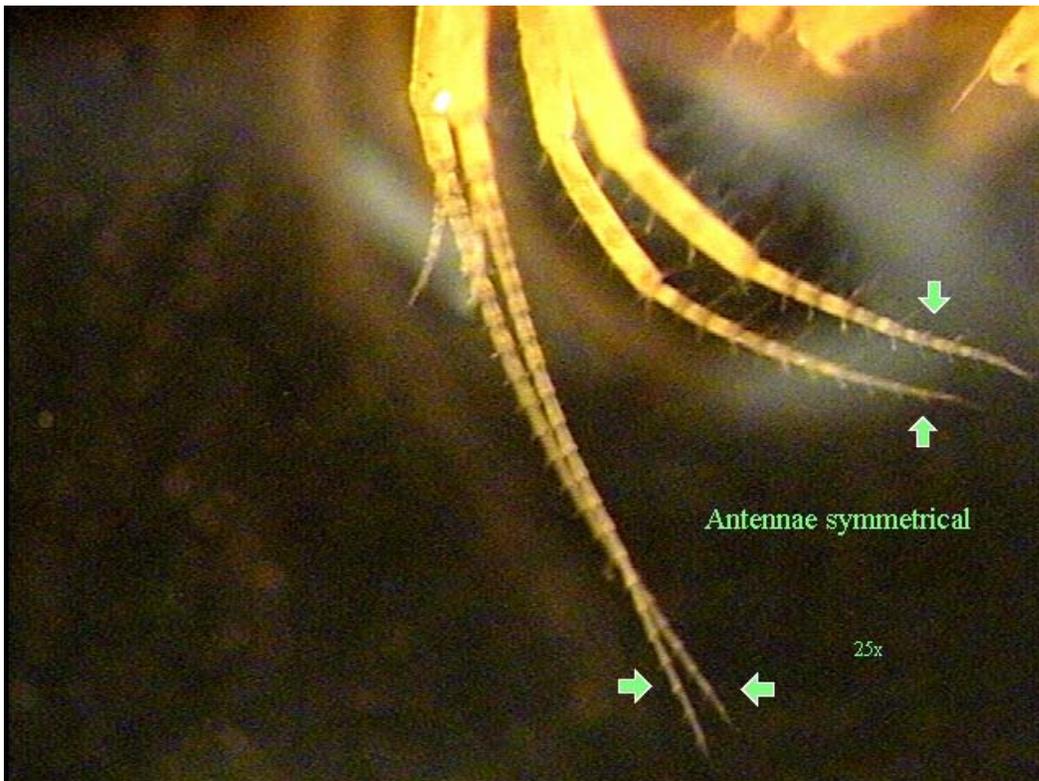
APPENDIX B

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

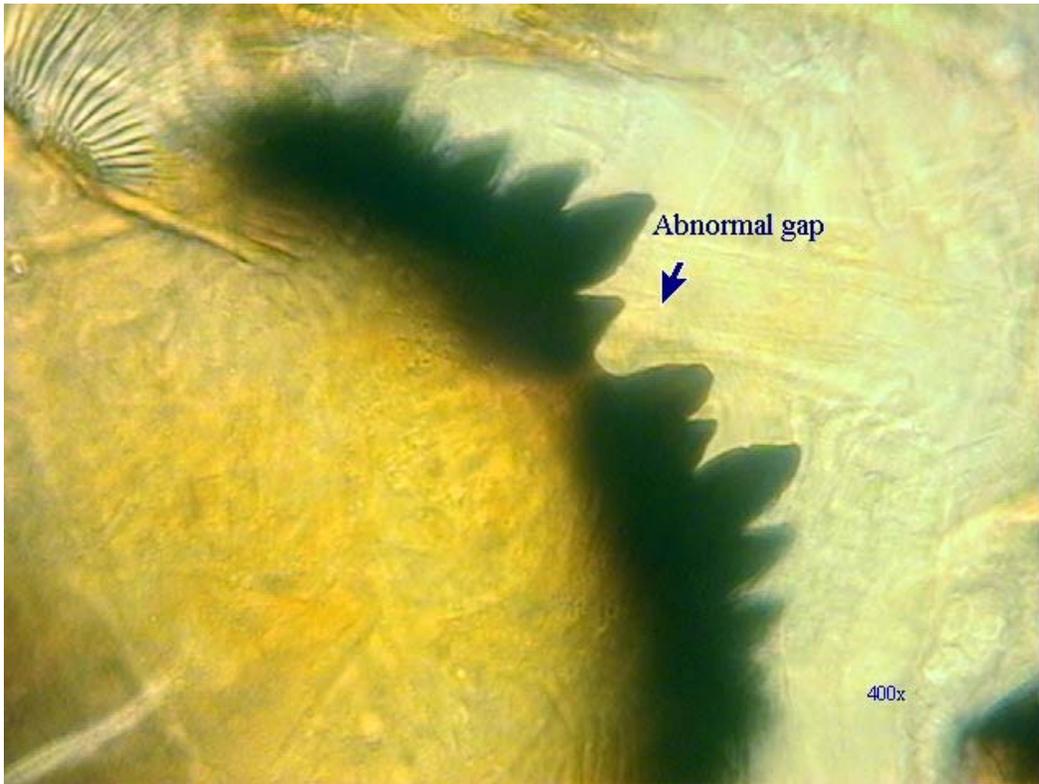
Gammarus fasciatus with second antennae showing different lengths



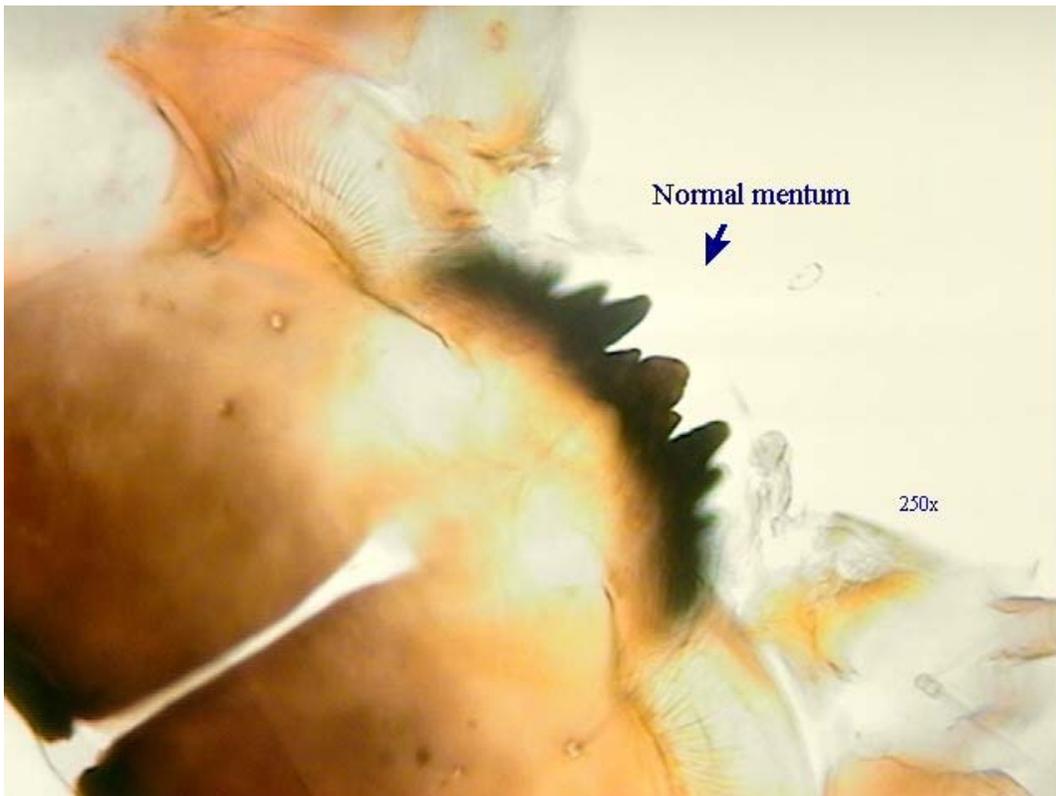
Gammarus fasciatus with normal antennae (showing antennal pairs of same length)



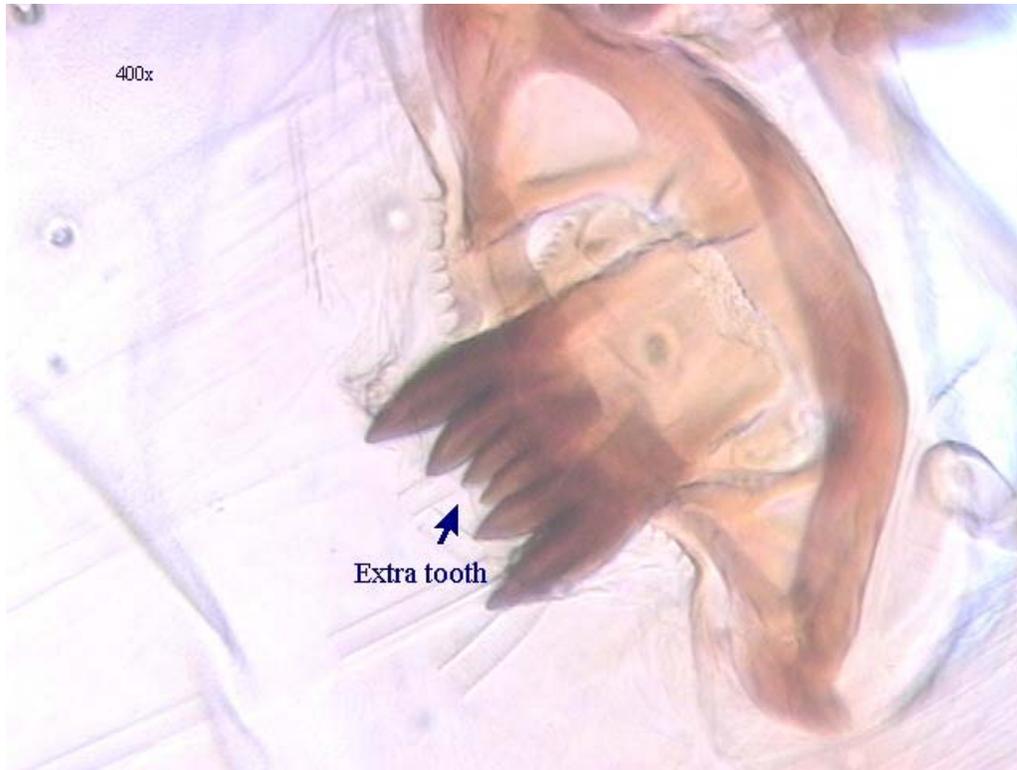
Chironomus species with mentum abnormality



Chironomus species with normal mentum



Procladius species with abnormal ligula



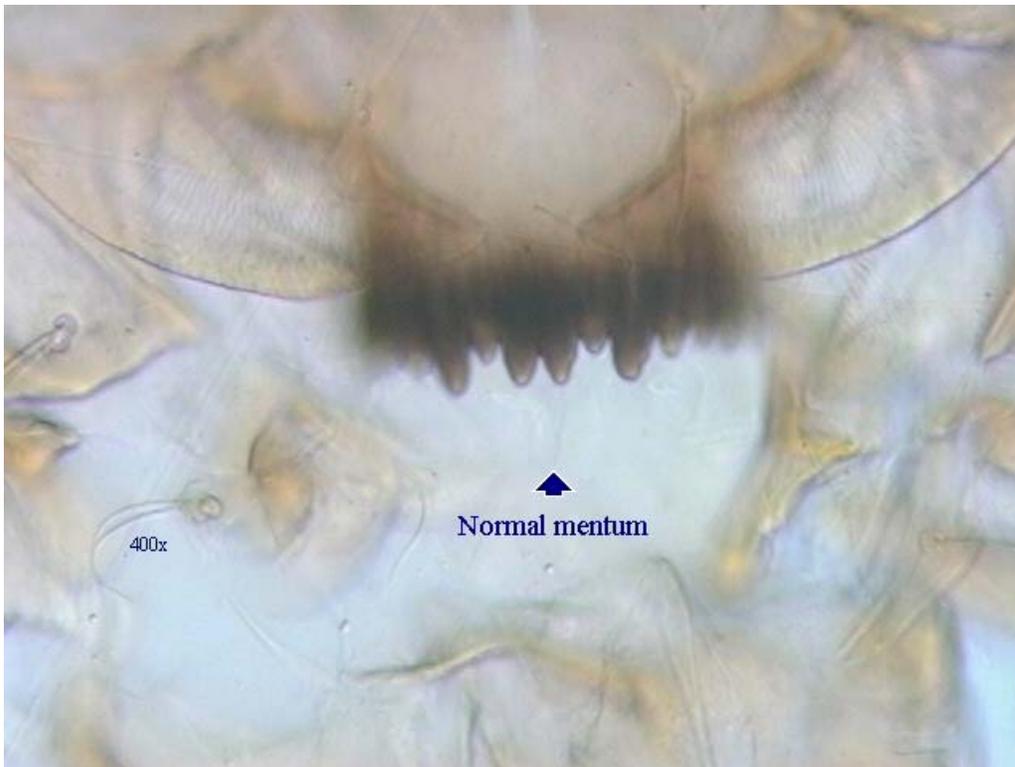
Procladius species with normal ligula



Polypedilum species with abnormal mentum



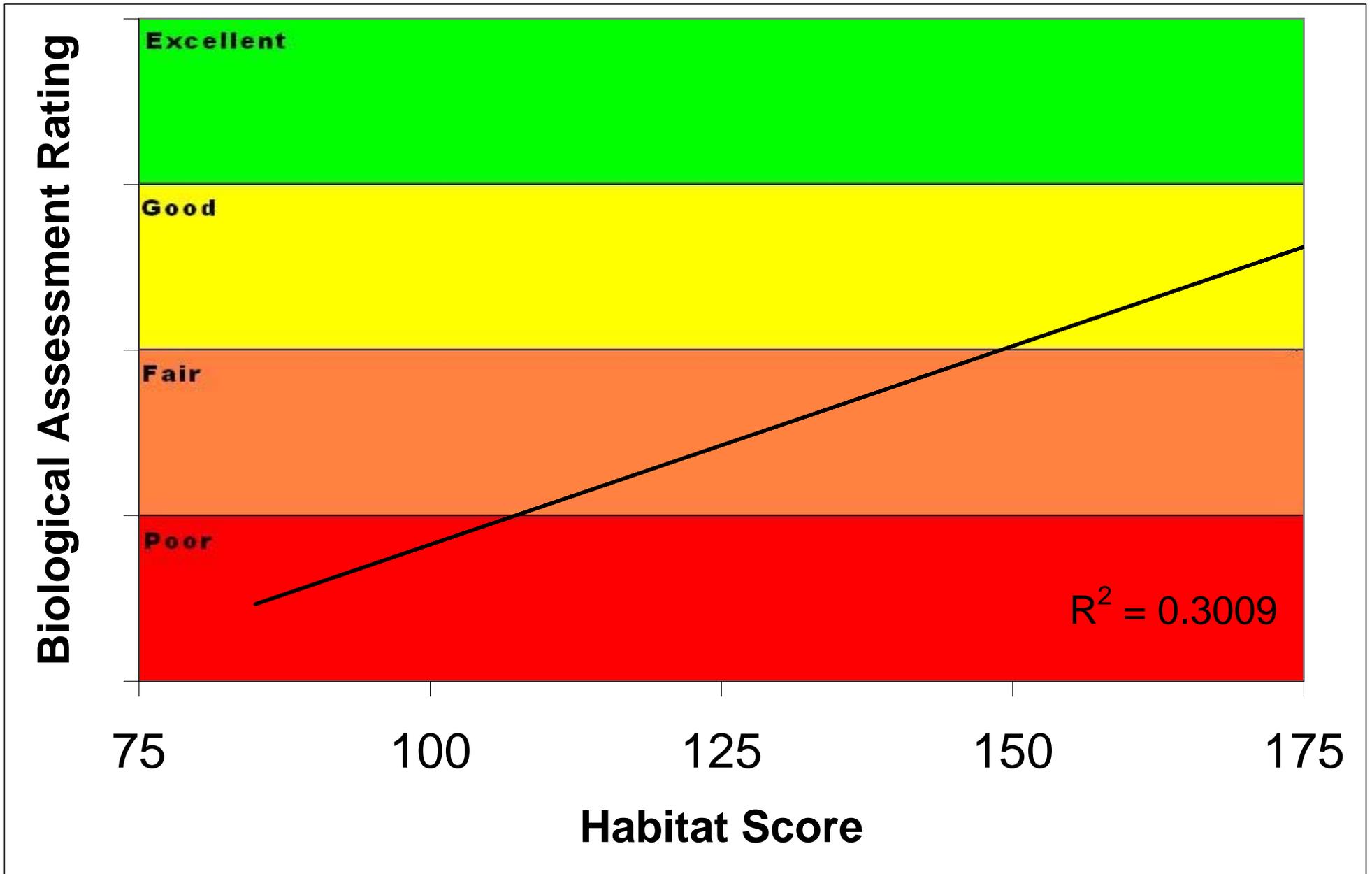
Polypedilum species with normal mentum



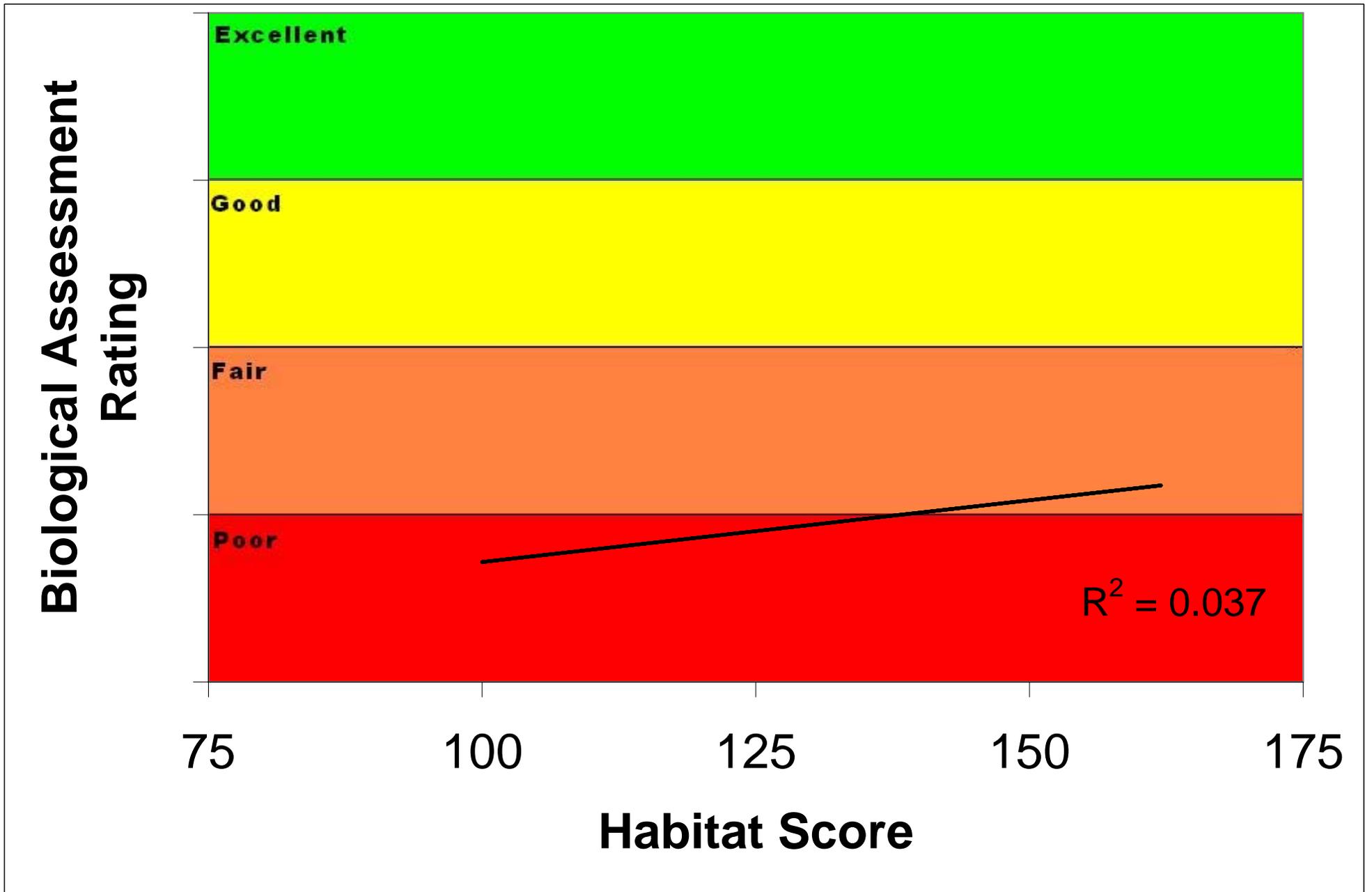
APPENDIX C

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

Comparative Scores of
Biological Assessment Rating vs. Habitat Score
WMA 8
Round 4

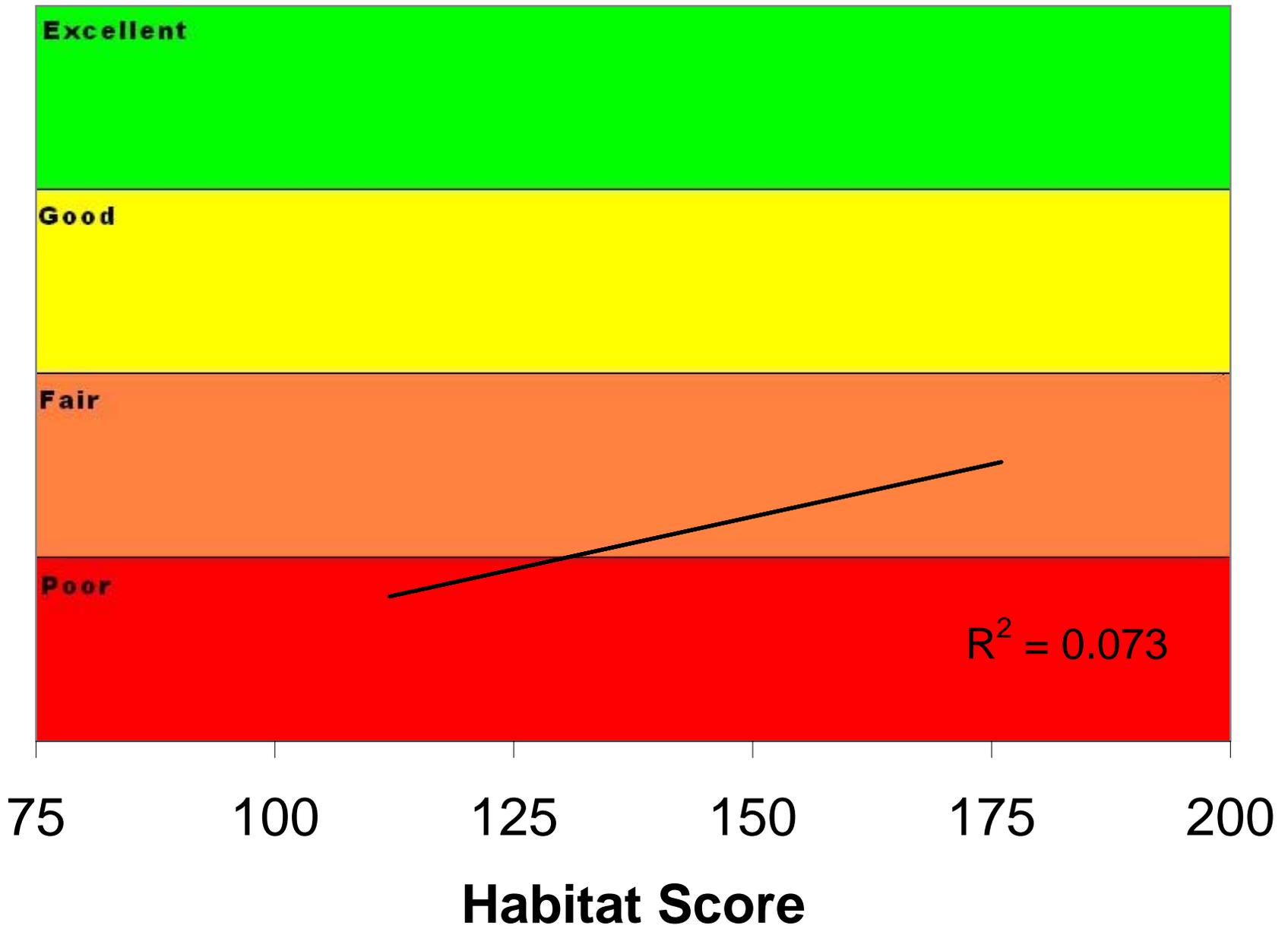


Comparative Scores of
Biological Assessment Rating vs. Habitat Score
WMA 9
Round 4



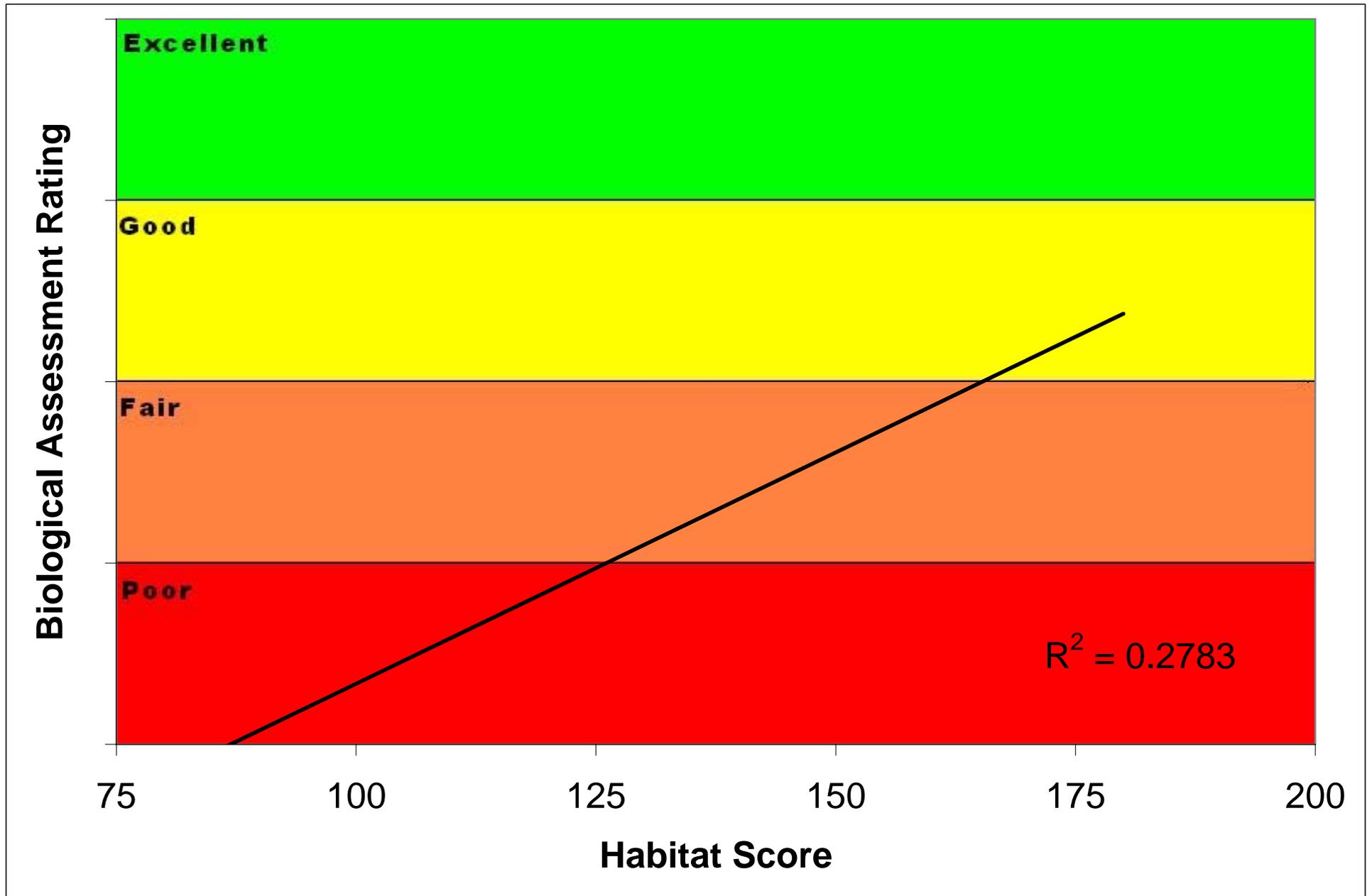
Comparative Scores of
Biological Assessment Rating vs. Habitat Score
WMA 10
Round 4

Biological Assessment
Rating



Comparative Scores of
Biological Assessment Rating vs. Habitat Score

Combined
Round 4



APPENDIX D

Taxonomic and Statistical Data, Biological Assessments, Habitat Assessment Scores and Observations from the Round 4 Raritan 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
<ol style="list-style-type: none"> 1. Total # of Taxa 2. # of EPT taxa 3. % Ephemeroptera 4. Hilsenhoff Biotic Index (HBI) 5. % clingers 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 # AN0192 **Stream Name: Rahway River**
Location: Northfield Ave; West Orange; Essex County
Collection Date: 4/7/2009 **USGS Topo Map: Caldwell**

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Orthocladius	6	8
Dicrotendipes	8	6
Tanytarsus	6	6
Ischnura	9	4
Limnodrilus	10	4
Planorbidae	6	3
Caecidotea	8	2
Hydrobaenus	8	2
Nais	8	2
Paratendipes	8	2
Phaenopsectra	7	2
Stictochironomus	9	2
Cricotopus	7	1
Enchytraeidae	10	1
Gammarus	6	1
Glyptotendipes	10	1
* Hydropsyche	4	1
Mooreobdella	7.8	1
Polypedilum	6	1

* (*EPT organism*) *Taxa Richness:* 19 *Population:* 50

Hilsenhoff Biotic Index (HBI): 7.46 *# Scrapers:* 3

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 36.8% *Attribute 3 genera:* 0

HGMI Rating: 18.52 Poor

Habitat Analysis: 105 Marginal USEPA Protocol

Observations: Water temp: 7.74 C; Cond: 1327 umhos; DO: 10.03 mg/L; pH: 7.62 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 27' / 2 - 3'; Substrate: sand, mud, snags

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

Stream Gradient: Low Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: trash; adjacent to Orange Reservoir

AMNET Site # AN0193 **Stream Name: Rahway River**
Location: Rt 82 (Morris Ave); Springfield Twp; Union County
Collection Date: 4/16/2009 **USGS Topo Map: Roselle**

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	78
Polypedilum	6	7
Nais	8	5
Branchiura	10	3
Slavina	7	2
Tanytarsus	6	2
Chironomus	10	1
Rheotanytarsus	6	1
Stictochironomus	9	1

* (*EPT organism*) *Taxa Richness:* 9 *Population:* 100

Hilsenhoff Biotic Index (HBI): 9.43 *# Scrapers:* 0

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 44.4% *Attribute 3 genera:* 0

HGMI Rating: 8.92 Poor

Habitat Analysis: 121 Suboptimal USEPA Protocol

Observations: Water temp: 8.08 C; Cond: 920 umhos; DO: 11.25 mg/L; pH: 7.58 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 40' / 3'; Substrate: mud, silt, undercut banks

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: waterfowl, trash; "Trout stocked waters"

AMNET Site # AN0194

Stream Name: Rahway River

Location: Rt 509 Kenilworth Blvd; Cranford Twp; Union County

Collection Date: 4/16/2009

USGS Topo Map: Roselle

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	29
Cricotopus	7	18
Polypedilum	6	17
Limnodrilus	10	11
Tanytarsus	6	7
Saetheria	4	4
Gammarus	6	3
Dicrotendipes	8	2
Stylodrilus	10	2
Ancyronyx	2	1
* Cheumatopsyche	5	1
Cryptochironomus	8	1
Nanocladius	3	1
Paratendipes	8	1
Rheotanytarsus	6	1
Simulium	6	1

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

Hilsenhoff Biotic Index (HBI): 7.20 # Scrapers: 0

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 25.0% Attribute 3 genera: 0

HGMI Rating: 20.55 Poor

Habitat Analysis: 119 Suboptimal USEPA Protocol

Observations: Water temp: 8.42 C; Cond: 751 umhos; DO: 11.82 mg/L; pH: 7.62 SU

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

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, community park

Other: macrophytes, great blue heron

AMNET Site # AN0195

Stream Name: Rahway River

Location: River Rd & Church St; Rahway; Union County

Collection Date: 4/20/2009

USGS Topo Map: Perth Amboy

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Cricotopus	7	68
Nais	8	9
Gammarus	6	6
Caecidotea	8	4
Slavina	7	3
Stenelmis	5	3
Polypedilum	6	2
Prostoma	7	2
* Hydroptila	6	1
Rheotanytarsus	6	1
Tanytarsus	6	1

* (*EPT organism*) *Taxa Richness:* 11 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.96 *# Scrapers:* 2

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 45.5% *Attribute 3 genera:* 0

HGMI Rating: 14.17 Poor

Habitat Analysis: 135 Suboptimal USEPA Protocol

Observations: Water temp: 13.17 C; Cond: 710 umhos; DO: 9.39 mg/L; pH: 7.99 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 37' / 2'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, waterfowl, periphytes, filamentous algae; dead snapping turtle

AMNET Site # AN0196

Stream Name: Robinsons Br

Location: Goodmans Crossing; Scotch Plains Twp; Union County

Collection Date: 4/16/2009

USGS Topo Map: Perth Amboy

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	28
Hydroilimax	4	14
Paratendipes	8	14
Polypedilum	6	12
Amnicola	4.8	6
Musculium	5	6
Phaenopsectra	7	5
Pisidium	6.8	5
Tanytarsus	6	3
Crangonyx	8	1
Cryptotendipes	6	1
Dicrotendipes	8	1
Menetus	6	1
Nematoda	6	1
Tipula	4	1
Tubifex	10	1

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

Hilsenhoff Biotic Index (HBI): 7.14 # Scrapers: 3

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 56.3% Attribute 3 genera: 1

HGMI Rating: 15.15 Poor

Habitat Analysis: 113 Suboptimal USEPA Protocol

Observations: Water temp: 6.62 C; Cond: 435 umhos; DO: 9.54 mg/L; pH: 7.39 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 26' / 2 - 3'; Substrate: cobble, gravel, silt, mud, snags

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

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: periphytes, trash

AMNET Site # AN0197

Stream Name: UNT to Robinsons Br

Location: Raritan Rd (Terrell Rd) (Rt 611); Scotch Plains Twp; Union County

Collection Date: 4/16/2009

USGS Topo Map: Perth Amboy/Roselle

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	56
Polypedilum	6	7
Slavina	7	5
Caecidotea	8	4
Cura	4	4
Cricotopus	7	3
Phaenopsectra	7	3
Tanytarsus	6	3
Orthocladus	6	2
* Cheumatopsyche	5	1
Diamesa	5	1
Dicrotendipes	8	1
Glyptotendipes	10	1
Hemerodromia	6	1
Limnodrilus	10	1
Musculium	5	1
Paratendipes	8	1
Rheotanytarsus	6	1
Tubificidae	10	1

* (EPT organism) Taxa Richness: 19 Population: 97

Hilsenhoff Biotic Index (HBI): 7.40 # Scrapers: 1

% Sensitive EPT: 0.0% Attribute 2 genera: 1

% Non-Insect Taxa: 36.8% Attribute 3 genera: 0

HGMI Rating: 18.79 Poor

Habitat Analysis: 120 Suboptimal USEPA Protocol

Observations: Water temp: 12.20 C; Cond: 425 umhos; DO: 13.51 mg/L; pH: 8.30 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly open; Bank Stability: poor; Bank Vegetation: trees, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Downstream of Impoundment: Shackamaxon Lake

Other: fish, periphytes, trash

AMNET Site # AN0198

Stream Name: UNT to Robinsons Br

Location: Lamberts Mill Rd (Rt 606); Westfield Twp; Union County

Collection Date: 4/16/2009

USGS Topo Map: Perth Amboy/Roselle

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	29
Limnodrilus	10	17
Nais	8	14
Cricotopus	7	8
Orthocladius	6	8
Pisidium	6.8	6
Tanytarsus	6	5
Diamesa	5	4
Eclipidrilus	8	3
Pristinella	10	2
Stylo-drilus	10	2
Cryptochironomus	8	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 7.27 # Scrapers: 0

% Sensitive EPT: 0.0% Attribute 2 genera: 1

% Non-Insect Taxa: 46.2% Attribute 3 genera: 1

HGMI Rating: 14.37 Poor

Habitat Analysis: 128 Suboptimal USEPA Protocol

Observations: Water temp: 12.55 C; Cond: 431 umhos; DO: 15.14 mg/L; pH: 8.28 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 12' / < 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds, vines, lawn

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

Other: fish; construction debris from old retaining wall in stream

AMNET Site # AN0199

Stream Name: Robinsons Br

Location: Rt 27; Rahway; Union County

Collection Date: 4/20/2009

USGS Topo Map: Perth Amboy

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	64
Polypedilum	6	14
Caecidotea	8	3
* Stenacron	4	3
Dicrotendipes	8	2
Gammarus	6	2
Slavina	7	2
Amnicola	4.8	1
* Ceraclea	3	1
Chironomus	10	1
Cura	4	1
Gyraulus	6	1
Peltodytes	5	1
Pisidium	6.8	1
Prostoma	7	1
Rheotanytarsus	6	1
Stenelmis	5	1

* (EPT organism) *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.32 *# Scrapers:* 4

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

% Non-Insect Taxa: 52.9% *Attribute 3 genera:* 1

HGMI Rating: 18.38 Poor

Habitat Analysis: 123 Suboptimal USEPA Protocol

Observations: Water temp: 12.20 C; Cond: 475 umhos; DO: 10.28 mg/L; pH: 8.01 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 31' / 1'; Substrate: cobble, gravel, sand, silt

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, turtle, waterfowl, periphytes, filamentous algae, oil sheen, trash

AMNET Site # AN0200 Stream Name: South Br Rahway River

Location: Parsonage Rd; Edison Twp; Middlesex County

Collection Date: 4/20/2009 USGS Topo Map: Perth Amboy

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	31
Polypedilum	6	25
Cricotopus	7	12
Musculium	5	9
Glyptotendipes	10	3
Limnodrilus	10	3
Alboglossiphonia	8	2
* Cheumatopsyche	5	2
Cura	4	2
Orthocladius	6	2
Amnicola	4.8	1
Chironomus	10	1
Eclipidrilus	8	1
Enchytraeidae	10	1
* Hydropsyche	4	1
Muscidae	6	1
Phaenopsectra	7	1
Physella	9.1	1
Stylaria	8	1

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

Hilsenhoff Biotic Index (HBI): 7.00 # Scrapers: 3

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 52.6% Attribute 3 genera: 0

HGMI Rating: 16.02 Poor

Habitat Analysis: 111 Suboptimal USEPA Protocol

Observations: Water temp: 12.48 C; Cond: 1051 umhos; DO: 11.88 mg/L; pH: 9.24 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: suburban, County park

Downstream of Impoundment: lake

Other: periphytes, filamentous algae, waterfowl, trash, oil sheen & odor

AMNET Site # AN0201

Stream Name: South Br Rahway River

Location: in Merrill Park off Fairview Rd; Woodbridge Twp; Middlesex County

Collection Date: 4/20/2009

USGS Topo Map: Perth Amboy

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	90
Cricotopus	7	3
Polypedilum	6	3
* Cheumatopsyche	5	1
Limnodrilus	10	1
Orthocladius	6	1
Tanytarsus	6	1

* (*EPT organism*) *Taxa Richness:* 7 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.86 *# Scrapers:* 0

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 28.6% *Attribute 3 genera:* 0

HGMI Rating: 11.82 Poor

Habitat Analysis: 107 Marginal USEPA Protocol

Observations: Water temp: 9.93 C; Cond: 683 umhos; DO: 12.53 mg/L; pH: 8.34 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 36' / 2'; Substrate: cobble, gravel, sand, silt

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

Stream Gradient: High Gradient Stream; Land Uses: suburban, community park

Other: periphytes, filamentous algae, waterfowl, petting zoo

AMNET Site # AN0202 Stream Name: West Br Elizabeth River

Location: Vaux Hall Rd; Union Twp; Union County

Collection Date: 4/7/2009 USGS Topo Map: Elizabeth

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Tanytarsus	6	27
Cricotopus	7	19
* Cheumatopsyche	5	17
Limnodrilus	10	10
Pisidium	6.8	6
Micropsectra	7	4
Thienemannimyia	6	3
Bezzia	6	2
Lumbricidae	10	2
Polypedilum	6	2
Diamesa	5	1
Gyraulus	6	1
Hemerodromia	6	1
* Hydropsyche	4	1
Mooreobdella	7.8	1
Phaenopsectra	7	1
Prostoma	7	1
Tubifex	10	1

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

Hilsenhoff Biotic Index (HBI): 6.64 # Scrapers: 2

% Sensitive EPT: 0.0% Attribute 2 genera: 1

% Non-Insect Taxa: 38.9% Attribute 3 genera: 0

HGMI Rating: 19.92 Poor

Habitat Analysis: 126 Suboptimal USEPA Protocol

Observations: Water temp: 9.98 C; Cond: 690 umhos; DO: 10.40 mg/L; pH: 7.58 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 6' / < 1.0'; Substrate: cobble, gravel, snags

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

Stream Gradient: High Gradient Stream; Land Uses: suburban, small ball park

Pipes / Ditches: storm sewers (18" concrete)

Other: trash

AMNET Site # AN0204 Stream Name: Elizabeth River
 Location: North Ave; Union Twp; Union County
 Collection Date: 4/7/2009 USGS Topo Map: Elizabeth

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Cricotopus	7	40
Nais	8	26
Limnodrilus	10	9
Polypedilum	6	7
Cura	4	3
Hemerodromia	6	3
Rheopelopia	4	3
Nematoda	6	2
Placobdella	8	2
Cryptochironomus	8	1
Enchytraeidae	10	1
Gloiobdella	6	1
Phaenopsectra	7	1
Stylo-drilus	10	1

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

Hilsenhoff Biotic Index (HBI): 7.31 # Scrapers: 1

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 57.1% Attribute 3 genera: 0

HGMI Rating: 9.59 Poor

Habitat Analysis: 119 Suboptimal USEPA Protocol

Observations: Water temp: 9.68 C; Cond: 572 umhos; DO: 8.85 mg/L; pH: 7.58 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 42' / 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, grasses, weeds

Stream Gradient: Low Gradient Stream; Land Uses: urban, suburban

Other: periphytes, filamentous algae, trash

AMNET Site # AN0310 Stream Name: S Br Raritan River

Location: Smithtown Rd; Mt Olive Twp; Morris County

Collection Date: 4/22/2009 USGS Topo Map: Hackettstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	21
Nais	8	15
Prostoma	7	13
Caecidotea	8	8
Limnodrilus	10	8
Amnicola	4.8	6
Musculium	5	4
Heterotrissocladius	0	3
* Caenis	7	2
Cura	4	2
Polypedilum	6	2
Stenelmis	5	2
Tubificidae	10	2
Bezzia	6	1
Chelifera	6	1
Cladopelma	8	1
Cricotopus	7	1
Gyraulus	6	1
Helisoma	7	1
Helobdella	8	1
Nematoda	6	1
Orthocladius	6	1
Physella	9.1	1
Rheopelopia	4	1
Stylo-drilus	10	1

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

Hilsenhoff Biotic Index (HBI): 6.77 # Scrapers: 5

% Sensitive EPT: 2.0% Attribute 2 genera: 0

% Non-Insect Taxa: 60.0% Attribute 3 genera: 0

HGMI Rating: 20.10 Poor

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 10.42 C; Cond: 370 umhos; DO: 9.00 mg/L; pH: 7.16 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Downstream of Impoundment: Budd Lake

Other: periphytes

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	9
Tanytarsus	6	9
Rheotanytarsus	6	8
Cricotopus	7	7
* Mystacides	4	6
Macronychus	2	5
Gomphus	5	4
* Oecetis	8	4
* Cheumatopsyche	5	3
Dubiraphia	6	3
Limnodrilus	10	3
Amnicola	4.8	2
Calopteryx	6	2
Chelifera	6	2
Cladotanytarsus	7	2
Nigronia	2	2
Promoresia	2	2
Quistradrius	10	2
Stenelmis	5	2
* Triaenodes	6	2
Argia	6	1
* Caenis	7	1
Dicrotendipes	8	1
* Eurytophella	4	1
Hydrolimax	4	1
* Hydropsyche	4	1
Ischnura	9	1
* Limnephilidae	4	1
Limnophyes	8	1
Manayunkia	6	1
Nais	8	1
Paratanytarsus	6	1
Paratendipes	8	1
Planorbidae	6	1
Polypedilum	6	1
Prosimulium	2	1
Simulium	6	1
Slavina	7	1
Stylogomphus	1	1
Thienemanniella	6	1
Thienemannimyia	6	1

* (EPT organism) *Taxa Richness:* 41 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.74 *# Scrapers:* 7

% Sensitive EPT: 15.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 22.0% *Attribute 3 genera:* 6

HGMI Rating: 52.62 Good

Habitat Analysis: 143 Suboptimal USEPA Protocol

Observations: Water temp: 11.02 C; Cond: 546 umhos; DO: 9.63 mg/L; pH: 7.70 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: periphytes

AMNET Site # AN0312

Stream Name: Drakes Bk

Location: Bartley Rd; Washington Twp; Morris County

Collection Date: 4/22/2009

USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	36
Cricotopus	7	9
* Micrasema	2	8
* Hydropsyche	4	7
Prosimulium	2	5
* Neophylax	3	4
Stenelmis	5	4
* Cheumatopsyche	5	3
Clinocera	6	3
Polypedilum	6	3
Rheotanytarsus	6	3
Simulium	6	3
* Ceratopsyche	4	2
* Chimarra	4	2
* Protophila	1	2
Tanytarsus	6	2
Antocha	3	1
Dugesia	4	1
Macronychus	2	1
Psephenus	4	1

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

Hilsenhoff Biotic Index (HBI): 5.67 # Scrapers: 5

% Sensitive EPT: 16.0% Attribute 2 genera: 1

% Non-Insect Taxa: 10.0% Attribute 3 genera: 3

HGMI Rating: 45.04 Good

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 10.95 C; Cond: 408 umhos; DO: 12.47 mg/L; pH: 8.76 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 33' / 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, filamentous algae; school on left bank

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Clinocera	6	14
* Epeorus	0	13
Micropsectra	7	7
Prosimulium	2	7
Polypedilum	6	6
* Lepidostoma	1	5
Microtendipes	7	4
* Acroneuria	0	3
Diamesa	5	3
Hexatoma	2	3
Stylogomphus	1	3
* Taeniopteryx	2	3
* Haploperla	1	2
Lumbriculus	8	2
Orthocladus	6	2
Stenelmis	5	2
Thienemannimyia	6	2
Antocha	3	1
* Baetis	6	1
* Ceratopsyche	4	1
* Cheumatopsyche	5	1
* Diplectrona	0	1
* Dolophilodes	0	1
Eukiefferiella	8	1
* Eurylophella	4	1
Optioservus	4	1
Oulimnius	4	1
Pisidium	6.8	1
Promoresia	2	1
Rheocricotopus	6	1
Rheotanytarsus	6	1
* Rhyacophila	1	1
Simulium	6	1
Stempellinella	6	1
Sublettea	6	1
* Sweltsa	0	1

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

Hilsenhoff Biotic Index (HBI): 3.76 *# Scrapers:* 5

% Sensitive EPT: 32.0% *Attribute 2 genera:* 7

% Non-Insect Taxa: 5.6% *Attribute 3 genera:* 9

HGMI Rating: 79.13 Excellent

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 9.67 C; Cond: 150 umhos; DO: 10.96 mg/L; pH: 7.82 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 19' / 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: crayfish, periphytes

AMNET Site # AN0314

Stream Name: Electric Bk

Location: Fairview Ave; Washington Twp; Morris County

Collection Date: 5/13/2009

USGS Topo Map: Hackettstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Dolophilodes	0	24
Micropsectra	7	18
Brillia	5	7
Nais	8	6
* Diplectrona	0	5
Tvetenia	5	5
* Baetis	6	4
* Amphinemura	3	3
* Eurylophella	4	3
* Acentrella	4	2
Gammarus	6	2
Lumbriculus	8	2
* Pycnopsyche	4	2
Simulium	6	2
Chelifera	6	1
Enchytraeidae	10	1
Hydrobaenus	8	1
* Hydropsyche	4	1
* Leuctra	0	1
* Maccaffertium	3	1
Microvelia	6	1
* Neophylax	3	1
Orthoclaadiinae	5	1
Parametrioctenus	5	1
Physella	9.1	1
Polypedilum	6	1
* Rhyacophila	1	1
Stenelmis	5	1
Stylogomphus	1	1

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

Hilsenhoff Biotic Index (HBI): 4.07 *# Scrapers:* 6

% Sensitive EPT: 47.0% *Attribute 2 genera:* 5

% Non-Insect Taxa: 17.2% *Attribute 3 genera:* 8

HGMI Rating: 74.95 Excellent

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 12.42 C; Cond: 296 umhos; DO: 10.23 mg/L; pH: 7.70 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 12' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, periphytes; new home construction upstream and downstream of site

AMNET Site # AN0315 Stream Name: S Br Raritan River

Location: Rt 517; Washington Twp; Morris County

Collection Date: 5/13/2009 USGS Topo Map: Hackettstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Ephemerella	1	20
Gammarus	6	16
Cricotopus	7	12
Lumbriculus	8	12
Micropsectra	7	8
* Eurylophella	4	6
Antocha	3	4
Dugesia	4	4
Nais	8	3
Polypedilum	6	3
Thienemannimyia	6	2
* Acentrella	4	1
* Acroneuria	0	1
Brillia	5	1
* Hydropsyche	4	1
* Lepidostoma	1	1
* Micrasema	2	1
* Neophylax	3	1
Optioservus	4	1
Stenelmis	5	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 4.91 # Scrapers: 3

% Sensitive EPT: 31.0% Attribute 2 genera: 2

% Non-Insect Taxa: 19.0% Attribute 3 genera: 5

HGMI Rating: 52.02 Good

Habitat Analysis: 135 Suboptimal USEPA Protocol

Observations: Water temp: 11.46 C; Cond: 358 umhos; DO: 11.26 mg/L; pH: 7.82 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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes; parking lots adj to both stream banks

AMNET Site # AN0316

Stream Name: S Br Raritan River

Location: off Raritan River Rd (Rt 512); Califon Boro; Hunterdon County

Collection Date: 5/13/2009

USGS Topo Map: Califon

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	21
Amnicola	4.8	16
Valvata	2	15
Chironomus	10	13
Specaria	7	8
Dicrotendipes	8	7
Tubifex	10	4
Gammarus	6	3
Lumbriculus	8	3
Paratendipes	8	2
Polypedilum	6	2
Musculium	5	1
Paratanytarsus	6	1
Physella	9.1	1
Prostoma	7	1
Stylaria	8	1
Tanytarsus	6	1

* (*EPT organism*) *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.10 *# Scrapers:* 3

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 64.7% *Attribute 3 genera:* 0

HGMI Rating: 14.04 Poor

Habitat Analysis: 111 Suboptimal USEPA Protocol

Observations: Water temp: 14.63 C; Cond: 334 umhos; DO: 9.28 mg/L; pH: 7.59 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 138' / 2'; Substrate: cobble, silt

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: fish, macrophytes, waterfowl; upstream of a dam

AMNET Site # AN0317 Stream Name: S Br Raritan River

Location: River Rd; Lebanon Twp; Hunterdon County

Collection Date: 4/28/2009 USGS Topo Map: Califon

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Cricotopus	7	23
* Acentrella	4	15
Lumbriculus	8	9
Nais	8	9
* Cheumatopsyche	5	8
* Ephemerella	1	5
Psephenus	4	5
Optioservus	4	4
Diamesa	5	3
Antocha	3	2
Eukiefferiella	8	2
Macronychus	2	2
* Micrasema	2	2
Orthocladus	6	2
Prostoma	7	2
Tanytarsus	6	2
* Ceratopsyche	4	1
* Chimarra	4	1
* Hydropsyche	4	1
* Serratella	2	1
Stenelmis	5	1

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

Hilsenhoff Biotic Index (HBI): 5.48 # Scrapers: 3

% Sensitive EPT: 24.0% Attribute 2 genera: 2

% Non-Insect Taxa: 14.3% Attribute 3 genera: 3

HGMI Rating: 46.73 Good

Habitat Analysis: 172 Optimal USEPA Protocol

Observations: Water temp: 18.19 C; Cond: 312 umhos; DO: 9.30 mg/L; pH: 8.14 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 75' / <1'; Substrate: cobble, gravel, sand, snags

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, crayfish, periphytes

AMNET Site # AN0318

Stream Name: Spruce Run

Location: Newport Rd; Lebanon Twp; Hunterdon County

Collection Date: 4/28/2009

USGS Topo Map: High Bridge

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Amphinemura	3	14
Cricotopus	7	11
* Ephemerella	1	10
* Drunella	1	9
* Acentrella	4	8
Orthocladius	6	8
Nais	8	6
* Hydropsyche	4	5
* Isonychia	2	3
Polypedilum	6	3
* Cheumatopsyche	5	2
* Heterocloeon	2	2
Optioservus	4	2
Simulium	6	2
Thienemannimyia	6	2
* Ameletus	0	1
Antocha	3	1
* Chimarra	4	1
* Diplectrona	0	1
* Epeorus	0	1
* Eurylophella	4	1
Musculium	5	1
Planariidae	4	1
Prostoma	7	1
Rheotanytarsus	6	1
* Rhyacophila	1	1
Tanytarsus	6	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 4.00 *# Scrapers:* 3

% Sensitive EPT: 52.0% *Attribute 2 genera:* 7

% Non-Insect Taxa: 14.3% *Attribute 3 genera:* 5

HGMI Rating: 71.28 Excellent

Habitat Analysis: 177 Optimal USEPA Protocol

Observations: Water temp: 18.14 C; Cond: 141 umhos; DO: 9.75 mg/L; pH: 8.36 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 16' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, filamentous algae; gage: 3'

AMNET Site # AN0319

Stream Name: Spruce Run

Location: Rt 31; Glen Gardner Boro; Hunterdon County

Collection Date: 4/28/2009

USGS Topo Map: High Bridge

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Cricotopus	7	31
* Acentrella	4	24
Diamesa	5	11
Orthocladius	6	8
Clinocera	6	6
Stylodrilus	10	5
Cura	4	3
* Ceratopsyche	4	2
* Amphinemura	3	1
Antocha	3	1
* Baetis	6	1
* Ephemerella	1	1
* Maccaffertium	3	1
Nais	8	1
Polypedilum	6	1
Prosimulium	2	1
Rheopelopia	4	1
Simulium	6	1

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

Hilsenhoff Biotic Index (HBI): 5.64 *# Scrapers:* 1

% Sensitive EPT: 28.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 16.7% *Attribute 3 genera:* 5

HGMI Rating: 45.03 Good

Habitat Analysis: 167 Optimal USEPA Protocol

Observations: Water temp: 17.04 C; Cond: 218 umhos; DO: 9.68 mg/L; pH: 7.97 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: crayfish, macrophytes, periphytes, trash; "trout stocked stream" sign

AMNET Site # AN0320 Stream Name: Willoughby Bk

Location: Rt 31; Clinton Twp; Hunterdon County

Collection Date: 4/28/2009 USGS Topo Map: High Bridge

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Acentrella	4	14
Cricotopus	7	11
* Amphinemura	3	10
Psephenus	4	7
* Agapetus	0	6
* Ephemerella	1	6
* Eurylophella	4	6
Lumbriculus	8	6
Simulium	6	6
* Drunella	1	3
* Epeorus	0	3
Clinocera	6	2
Prostoma	7	2
Thienemannimyia	6	2
* Acroneuria	0	1
Antocha	3	1
* Ceratopsyche	4	1
* Cheumatopsyche	5	1
Diamesa	5	1
Eukiefferiella	8	1
* Glossosoma	0	1
* Isonychia	2	1
* Lepidostoma	1	1
Micropsectra	7	1
* Neophylax	3	1
Orthoclaadiinae	5	1
Polypedilum	6	1
* Pteronarcys	0	1
* Sweltsa	0	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 4.01 # Scrapers: 6

% Sensitive EPT: 55.0% Attribute 2 genera: 8

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

HGMI Rating: 81.62 Excellent

Habitat Analysis: 154 Suboptimal USEPA Protocol

Observations: Water temp: 19.56 C; Cond: 178 umhos; DO: 7.80 mg/L; pH: 7.95 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 29' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, vines

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Other: fish, salamander, waterfowl (nesting Canadian goose), macrophytes, filamentous algae, trash

AMNET Site # AN0321

Stream Name: Mulhockaway Ck

Location: Van Syckel Rd (Rt 635); Union Twp; Hunterdon County

Collection Date: 4/28/2009

USGS Topo Map: High Bridge

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Amphinemura	3	17
Nais	8	11
Orthocladius	6	11
Prosimulium	2	10
Simulium	6	8
Cricotopus	7	7
* Glossosoma	0	4
Stylogrilus	10	3
Tvetenia	5	3
* Cheumatopsyche	5	2
Diamesa	5	2
Dubiraphia	6	2
Eclipidrilus	8	2
Gammarus	6	2
* Stenacron	4	2
Tanytarsus	6	2
* Acentrella	4	1
* Baetis	6	1
Caecidotea	8	1
* Ceraclea	3	1
* Ceratopsyche	4	1
Clinocera	6	1
Eukiefferiella	8	1
Heterotrissocladius	0	1
Limnodrilus	10	1
* Maccaffertium	3	1
Polypedilum	6	1
* Rhyacophila	1	1

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

Hilsenhoff Biotic Index (HBI): 5.06 # Scrapers: 4

% Sensitive EPT: 28.0% Attribute 2 genera: 4

% Non-Insect Taxa: 21.4% Attribute 3 genera: 5

HGMI Rating: 57.54 Good

Habitat Analysis: 172 Optimal USEPA Protocol

Observations: Water temp: 19.72 C; Cond: 270 umhos; DO: 9.54 mg/L; pH: 8.16 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand, root mats

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, periphytes, metal floc; USGS gage station: 0.70

AMNET Site # AN0322 Stream Name: S Br Raritan River

Location: Rt 173 (CR 513); Clinton; Hunterdon County

Collection Date: 5/13/2009 USGS Topo Map: High Bridge

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	25
* Ephemerella	1	16
Cura	4	9
Nais	8	8
Stenelmis	5	7
Tvetenia	5	7
Cricotopus	7	5
* Baetis	6	4
Orthocladus	6	4
* Paragnetina	1	2
Polypedilum	6	2
Simulium	6	2
* Acentrella	4	1
* Ceratopsyche	4	1
Dubiraphia	6	1
Hemerodromia	6	1
* Hydropsyche	4	1
* Hydroptila	6	1
* Micrasema	2	1
Optioservus	4	1
Pleurocera	7	1

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

Hilsenhoff Biotic Index (HBI): 4.63 # Scrapers: 4

% Sensitive EPT: 25.0% Attribute 2 genera: 2

% Non-Insect Taxa: 14.3% Attribute 3 genera: 3

HGMI Rating: 51.26 Good

Habitat Analysis: 126 Suboptimal USEPA Protocol

Observations: Water temp: 14.69 C; Cond: 305 umhos; DO: 11.28 mg/L; pH: 8.05 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 105' / 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Downstream of Impoundment: dam

Other: fish, periphytes, waterfowl; parking lots on both banks

AMNET Site # AN0323

Stream Name: Beaver Bk

Location: Herman Thau Rd; Clinton Twp; Hunterdon County

Collection Date: 5/13/2009

USGS Topo Map: Califon

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Ephemerella	1	47
* Acentrella	4	11
* Dolophilodes	0	6
* Amphinemura	3	5
Promoresia	2	4
* Rhyacophila	1	4
* Isoperla	2	3
Tvetenia	5	3
Lumbriculus	8	2
* Acroneuria	0	1
* Baetis	6	1
* Diplectrona	0	1
Gammarus	6	1
Lumbricidae	10	1
Micropsectra	7	1
Nais	8	1
Pisidium	6.8	1
Polypedilum	6	1
Psephenus	4	1
* Pteronarcys	0	1
Simulium	6	1
Stylogomphus	1	1
Thienemannimyia	6	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 2.26 # Scrapers: 2

% Sensitive EPT: 80.0% Attribute 2 genera: 6

% Non-Insect Taxa: 20.8% Attribute 3 genera: 6

HGMI Rating: 74.81 Excellent

Habitat Analysis: 170 Optimal USEPA Protocol

Observations: Water temp: 11.17 C; Cond: 181 umhos; DO: 11.01 mg/L; pH: 7.64 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: periphytes

AMNET Site # AN0324

Stream Name: Beaver Bk

Location: Leigh St; Clinton; Hunterdon County

Collection Date: 5/13/2009

USGS Topo Map: High Bridge

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	27
Dicrotendipes	8	17
Micropsectra	7	12
Cricotopus	7	8
* Hydroptila	6	7
Simulium	6	5
Brillia	5	3
Crangonyx	8	3
* Baetis	6	2
Caecidotea	8	2
* Ephemerella	1	2
Gammarus	6	2
* Mystacides	4	2
Agabus	5	1
Calopteryx	6	1
Dubiraphia	6	1
* Eurylophella	4	1
Hemerodromia	6	1
Parametriochnemus	5	1
Psephenus	4	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 6.95 # Scrapers: 4

% Sensitive EPT: 14.0% Attribute 2 genera: 0

% Non-Insect Taxa: 19.0% Attribute 3 genera: 5

HGMI Rating: 38.66 Fair

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 13.39 C; Cond: 554 umhos; DO: 13.00 mg/L; pH: 8.37 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, periphytes, filamentous algae; "trout stocked" stream; parking lot and Rt 173 along banks

AMNET Site # AN0324A Stream Name: Sidney Bk

Location: Rt. 617 (Sidney Rd); Franklin Twp; Hunterdon County

Collection Date: 5/19/2009 USGS Topo Map: Pittstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	44
Cricotopus	7	17
* Baetis	6	9
* Maccaffertium	3	5
Microtendipes	7	3
Rheotanytarsus	6	3
Gammarus	6	2
* Hydropsychidae	4	2
Micropsectra	7	2
Polypedilum	6	2
Argia	6	1
* Ceraclea	3	1
* Ephemerella	1	1
* Glossosoma	0	1
Optioservus	4	1
* Perlesta	4	1
Psephenus	4	1
Rheocricotopus	6	1
Stenelmis	5	1
Sublettea	6	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 6.69 # Scrapers: 4

% Sensitive EPT: 18.0% Attribute 2 genera: 1

% Non-Insect Taxa: 9.5% Attribute 3 genera: 6

HGMI Rating: 45.51 Good

Habitat Analysis: 140 Suboptimal USEPA Protocol

Observations: Water temp: 12.85 C; Cond: 260 umhos; DO: 11.51 mg/L; pH: 8.48 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 28' / < 1'; Substrate: cobble, gravel, sand

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

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

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

AMNET Site # AN0325

Stream Name: Cakepoulin Ck

Location: Lower Lands Down Rd; Franklin Twp; Hunterdon County

Collection Date: 5/19/2009

USGS Topo Map: Pittstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Ephemerella	1	58
Lumbriculus	8	16
* Cheumatopsyche	5	7
* Glossosoma	0	3
Psephenus	4	3
* Ceratopsyche	4	2
* Helicopsyche	3	2
Stenelmis	5	2
* Baetis	6	1
Clinocera	6	1
Diamesa	5	1
* Drunella	1	1
* Hydropsyche	4	1
Optioservus	4	1
Orthocladius	6	1

* (EPT organism) Taxa Richness: 15 Population: 100

Hilsenhoff Biotic Index (HBI): 2.89 # Scrapers: 5

% Sensitive EPT: 65.0% Attribute 2 genera: 3

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

HGMI Rating: 63.82 Excellent

Habitat Analysis: 161 Optimal USEPA Protocol

Observations: Water temp: 10.20 C; Cond: 179 umhos; DO: 11.64 mg/L; pH: 8.15 SU

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

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

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

Other: macrophytes, fish; "trout stocked"

AMNET Site # AN0325B Stream Name: Cakepoulin Ck

Location: Rt 513; Franklin Twp; Hunterdon County

Collection Date: 5/19/2009 USGS Topo Map: Pittstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Ephemerella	1	24
* Baetis	6	13
* Maccaffertium	3	8
Psephenus	4	8
Micropsectra	7	6
Nais	8	5
Parametriochnemus	5	5
Optioservus	4	3
Stenelmis	5	3
Cricotopus	7	2
Rheotanytarsus	6	2
Slavina	7	2
Tvetenia	5	2
* Acentrella	4	1
Brillia	5	1
Caecidotea	8	1
* Ceraclaea	3	1
* Cheumatopsyche	5	1
* Chimarra	4	1
* Drunella	1	1
* Glossosoma	0	1
Lumbriculus	8	1
Nematoda	6	1
Oulimnius	4	1
* Platycentropus	4	1
Polypedilum	6	1
* Psilotreta	0	1
* Rhyacophila	1	1
Simulium	6	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 4.13 # Scrapers: 7

% Sensitive EPT: 53.0% Attribute 2 genera: 5

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

HGMI Rating: 74.36 Excellent

Habitat Analysis: 138 Suboptimal USEPA Protocol

Observations: Water temp: 12.19 C; Cond: 198 umhos; DO: 11.69 mg/L; pH: 7.72 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: macrophytes, periphytes

AMNET Site # AN0326 Stream Name: S Br Raritan River

Location: Stanton Rd; Readington Twp; Hunterdon County

Collection Date: 5/19/2009 USGS Topo Map: Flemington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	26
Optioservus	4	11
* Agnetina	2	9
Stylodrilus	10	9
* Anthopotamus	4	7
Musculium	5	5
* Ephemerella	1	4
* Perlesta	4	4
Stenelmis	5	4
Cura	4	3
Prostoma	7	3
* Cheumatopsyche	5	2
* Glossosoma	0	2
Physella	9.1	2
* Ceratopsyche	4	1
Gillia	8	1
Nais	8	1
Nematoda	6	1
Ophiogomphus	1	1
Paraponyx	5	1
Pisidium	6.8	1
Psephenus	4	1
* Stenonema	3	1

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

Hilsenhoff Biotic Index (HBI): 5.08 # Scrapers: 5

% Sensitive EPT: 27.0% Attribute 2 genera: 2

% Non-Insect Taxa: 43.5% Attribute 3 genera: 3

HGMI Rating: 45.10 Good

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 13.35 C; Cond: 262 umhos; DO: 12.19 mg/L; pH: 8.15 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 101' / 2'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: forested (So. Branch Reservation Nature Preserve)

Other: fish, macrophytes, periphytes, filamentous algae; "trout stocked"; USGS gage station

AMNET Site # AN0327

Stream Name: Prescott Bk

Location: Stanton Rd; Readington Twp; Hunterdon County

Collection Date: 5/19/2009

USGS Topo Map: Flemington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Parametriochnemus	5	19
Eukiefferiella	8	12
Stenelmis	5	12
* Ephemerella	1	10
Tanytarsus	6	8
* Baetis	6	5
* Chimarra	4	5
Polypedilum	6	5
Psephenus	4	4
* Acroneuria	0	3
* Cheumatopsyche	5	3
Nais	8	3
Optioservus	4	3
* Agnetina	2	2
Gammarus	6	2
Eclipidrilus	8	1
* Maccaffertium	3	1
Nematoda	6	1
* Rhyacophila	1	1

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

Hilsenhoff Biotic Index (HBI): 4.90 # Scrapers: 3

% Sensitive EPT: 27.0% Attribute 2 genera: 2

% Non-Insect Taxa: 21.1% Attribute 3 genera: 5

HGMI Rating: 48.74 Good

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 9.66 C; Cond: 246 umhos; DO: 11.83 mg/L; pH: 7.62 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Other: fish, crayfish, salamander, periphytes

AMNET Site # AN0328

Stream Name: Assiscong Ck

Location: River Rd; Raritan Twp; Hunterdon County

Collection Date: 5/19/2009

USGS Topo Map: Flemington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Baetis	6	32
* Amphinemura	3	9
* Epeorus	0	6
Micropsectra	7	6
Tvetenia	5	6
* Acentrella	4	5
Lumbriculidae	8	4
* Maccaffertium	3	3
Nais	8	3
* Polycentropus	6	3
Psephenus	4	3
Caecidotea	8	2
* Cheumatopsyche	5	2
* Isoperla	2	2
* Leuctra	0	2
* Alloperla	0	1
* Caenis	7	1
* Ceratopsyche	4	1
* Chimarra	4	1
Chironomini	6	1
Cricotopus	7	1
Gammarus	6	1
Parametrioctenus	5	1
* Perlesta	4	1
Stenelmis	5	1
Tanytarsus	6	1
Thienemannimyia	6	1

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

Hilsenhoff Biotic Index (HBI): 4.96 # Scrapers: 3

% Sensitive EPT: 66.0% Attribute 2 genera: 5

% Non-Insect Taxa: 14.8% Attribute 3 genera: 5

HGMI Rating: 66.54 Excellent

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 13.36 C; Cond: 307 umhos; DO: 9.42 mg/L; pH: 7.34 SU

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

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

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

Pipes / Ditches: farm ditch flowing into stream

Other: fish, salamander, macrophytes

AMNET Site # AN0329

Stream Name: S Br Raritan River

Location: Rt 613 (Old York Rd); Readington Twp; Hunterdon County

Collection Date: 5/19/2009

USGS Topo Map: Flemington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Anthopotamus	4	26
Gammarus	6	22
Stenelmis	5	9
Nais	8	6
* Ephemerella	1	5
* Agnetina	2	4
Cricotopus	7	4
* Helicopsyche	3	3
Optioservus	4	3
* Apatania	3	2
* Baetis	6	2
Microtendipes	7	2
Psephenus	4	2
* Ceraclaea	3	1
Fossaria	6	1
Lanthus	5	1
Limnodrilus	10	1
* Maccaffertium	3	1
Musculium	5	1
* Perlinella	2	1
Physella	9.1	1
* Stenacron	4	1
Stylaria	8	1

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

Hilsenhoff Biotic Index (HBI): 4.86 *# Scrapers:* 8

% Sensitive EPT: 46.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 30.4% *Attribute 3 genera:* 7

HGMI Rating: 63.98 Excellent

Habitat Analysis: 122 Suboptimal USEPA Protocol

Observations: Water temp: 18.81 C; Cond: 320 umhos; DO: 14.92 mg/L; pH: 9.17 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 93' / 1-2'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: forested, rural (small farm on left bank)

Other: fish, clams, macrophytes, periphytes, filamentous algae, great blue heron; "South Branch Reservation" sign

AMNET Site # AN0330 Stream Name: First Neshanic River

Location: Rt 31; Raritan Twp; Hunterdon County

Collection Date: 7/9/2009 USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Stictochironomus	9	31
Stenelmis	5	17
Dicrotendipes	8	16
Gammarus	6	7
Limnodrilus	10	6
Paratanytarsus	6	3
Physella	9.1	3
Planariidae	4	3
* Mystacides	4	2
Peltodytes	5	2
Ablabesmyia	8	1
Agabus	5	1
* Lepidostoma	1	1
Lumbricidae	10	1
Lumbriculidae	8	1
Ophidonais	7	1
Phaenopsectra	7	1
Sialis	4	1
Tanytarsus	6	1
Thienemannimyia	6	1

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

Hilsenhoff Biotic Index (HBI): 7.31 # Scrapers: 3

% Sensitive EPT: 3.0% Attribute 2 genera: 1

% Non-Insect Taxa: 35.0% Attribute 3 genera: 1

HGMI Rating: 23.75 Fair

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 18.79 C; Cond: 462 umhos; DO: 7.09 mg/L; pH: 7.52 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 24' / 1 - 4'; Substrate: cobble, gravel, sand, boulder

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

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

Other: fish, macrophytes

AMNET Site # AN0331 Stream Name: Second Neshanic River

Location: Rt 31; Raritan Twp; Hunterdon County

Collection Date: 7/9/2009 USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Stenelmis	5	24
Rheotanytarsus	6	15
Gammarus	6	8
* Cheumatopsyche	5	6
Polypedilum	6	6
Tvetenia	5	6
Psephenus	4	5
Caecidotea	8	4
Dugesia	4	4
Stictochironomus	9	4
Micropsectra	7	3
Microtendipes	7	2
Parametrioctenus	5	2
Simulium	6	2
* Baetis	6	1
Cricotopus	7	1
Dicrotendipes	8	1
Hemerodromia	6	1
* Hydropsyche	4	1
* Hydroptila	6	1
Lumbriculidae	8	1
Thienemannimyia	6	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 5.70 # Scrapers: 3

% Sensitive EPT: 2.0% Attribute 2 genera: 0

% Non-Insect Taxa: 17.4% Attribute 3 genera: 3

HGMI Rating: 36.46 Fair

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 18.55 C; Cond: 384 umhos; DO: 6.61 mg/L; pH: 7.64 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 46' / 1- 3'; Substrate: cobble, gravel, sand, bedrock, boulder

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

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

Other: fish, snapping turtle, periphytes

AMNET Site # AN0332 Stream Name: Third Neshanic River

Location: Rt 31; Raritan Twp; Hunterdon County

Collection Date: 7/9/2009 USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Microtendipes	7	24
Aulodrilus	8	19
Stictochironomus	9	12
Limnodrilus	10	9
Rheotanytarsus	6	9
Helobdella	8	5
Dicrotendipes	8	4
* Cheumatopsyche	5	3
Lumbriculus	8	2
Tanytarsus	6	2
Ancyronyx	2	1
Caecidotea	8	1
* Chimarra	4	1
Cricotopus	7	1
* Mystacides	4	1
Natarsia	8	1
Paratanytarsus	6	1
Polypedilum	6	1
Sialis	4	1
Stenelmis	5	1
* Tricorythodes	4	1

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

Hilsenhoff Biotic Index (HBI): 7.45 # Scrapers: 1

% Sensitive EPT: 3.0% Attribute 2 genera: 0

% Non-Insect Taxa: 23.8% Attribute 3 genera: 1

HGMI Rating: 22.83 Fair

Habitat Analysis: 117 Suboptimal USEPA Protocol

Observations: Water temp: 18.45 C; Cond: 248 umhos; DO: 8.96 mg/L; pH: 7.88 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 46' / 1 - 2'; Substrate: mud, boulder

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes

AMNET Site # AN0333

Stream Name: Neshanic River

Location: Everitt Rd; East Amwell Twp; Hunterdon County

Collection Date: 7/9/2009

USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Rheotanytarsus	6	30
Gammarus	6	12
Cricotopus	7	10
Paratanytarsus	6	10
Dicrotendipes	8	8
Polypedilum	6	7
Aulodrilus	8	3
Limnodrilus	10	3
Tanytarsus	6	3
Helisoma	7	2
* Plauditus	4	2
Stictochironomus	9	2
Dubiraphia	6	1
Micropsectra	7	1
Microtendipes	7	1
Musculium	5	1
Nais	8	1
Peltodytes	5	1
* Stenacron	4	1
* Tricorythodes	4	1

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

Hilsenhoff Biotic Index (HBI): 6.46 # Scrapers: 4

% Sensitive EPT: 4.0% Attribute 2 genera: 0

% Non-Insect Taxa: 30.0% Attribute 3 genera: 0

HGMI Rating: 26.76 Fair

Habitat Analysis: 111 Suboptimal USEPA Protocol

Observations: Water temp: 20.83 C; Cond: 299 umhos; DO: 12.60 mg/L; pH: 8.90 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 69' / 2 - 3'; Substrate: cobble, gravel, sand, silt, boulder

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

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

Pipes / Ditches: storm sewers

Other: fish, frogs, crayfish, tadpoles, macrophytes, filamentous algae; USGS gage: 2.64

AMNET Site # AN0334

Stream Name: Back Bk

Location: Wertsville Rd (Rt 602); East Amwell Twp; Hunterdon County

Collection Date: 8/5/2009

USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Chimarra	4	23
Stenelmis	5	19
Dugesia	4	14
* Cheumatopsyche	5	11
* Hydropsyche	4	9
Rheotanytarsus	6	7
Polypedilum	6	6
* Baetis	6	3
Simulium	6	3
Caecidotea	8	1
Dubiraphia	6	1
Paratanytarsus	6	1
Psephenus	4	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 4.78 # Scrapers: 3

% Sensitive EPT: 26.0% Attribute 2 genera: 0

% Non-Insect Taxa: 14.3% Attribute 3 genera: 1

HGMI Rating: 37.08 Fair

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 20.16 C; Cond: 319 umhos; DO: 7.29 mg/L; pH: 7.04 SU

Clarity: slightly turbid, brown; Flow Rate: slow; Width/Depth: 20' / 2'; Substrate: cobble, gravel, sand, root mats

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

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

Other: fish, crayfish, macrophytes, periphytes, purple loosestrife; recent flooding

AMNET Site # AN0335

Stream Name: Back Bk

Location: Manners Rd (Rt 609); East Amwell Twp; Hunterdon County

Collection Date: 8/5/2009

USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	14
* Cheumatopsyche	5	12
* Baetis	6	11
Rheotanytarsus	6	7
Stenelmis	5	7
Microtendipes	7	6
Polypedilum	6	6
Simulium	6	6
Crangonyx	8	4
Paratanytarsus	6	4
Caecidotea	8	2
* Chimarra	4	2
Dugesia	4	2
* Hydroptila	6	2
* Maccaffertium	3	2
Stictochironomus	9	2
* Caenis	7	1
* Hydropsyche	4	1
Ischnura	9	1
Micropsectra	7	1
Orconectes	6	1
Physella	9.1	1
Psephenus	4	1
* Stenacron	4	1
Stylogomphus	1	1
Tanytarsus	6	1
Unionidae	8	1

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

Hilsenhoff Biotic Index (HBI): 5.90 # Scrapers: 6

% Sensitive EPT: 19.0% Attribute 2 genera: 0

% Non-Insect Taxa: 25.9% Attribute 3 genera: 2

HGMI Rating: 41.52 Fair

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 20.65 C; Cond: 245 umhos; DO: 7.67 mg/L; pH: 7.10 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 58' / 2'; Substrate: cobble, gravel, sand, root mats, undercut banks

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

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

Pipes / Ditches: storm sewers

Other: fish, crayfish, mussels, macrophytes, periphytes, purple loosestrife; recent flooding

AMNET Site # AN0336

Stream Name: Furmans Bk

Location: Welisewitz Rd; East Amwell Twp; Hunterdon County

Collection Date: 8/5/2009 USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Stenelmis	5	16
* Cheumatopsyche	5	9
* Baetis	6	7
* Hydropsyche	4	6
Micropsectra	7	6
Simulium	6	5
Rheotanytarsus	6	4
* Chimarra	4	3
* Maccaffertium	3	3
* Neophylax	3	3
Phaenopsectra	7	3
* Polycentropus	6	3
Polypedilum	6	3
Psephenus	4	3
Tipula	4	3
Dicrotendipes	8	2
Tanytarsus	6	2
Thienemannimyia	6	2
* Acentrella	4	1
* Acroneuria	0	1
Brillia	5	1
* Centropatilum	2	1
Chelifera	6	1
Enchytraeidae	10	1
Gammarus	6	1
Gomphidae	1	1
Hexatoma	2	1
* Hydroptila	6	1
* Leuctra	0	1
* Mystacides	4	1
Paratanytarsus	6	1
Prostoma	7	1
* Stenacron	4	1
Stylogomphus	1	1
Tvetenia	5	1

* (*EPT organism*) *Taxa Richness:* 35 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.07 *# Scrapers:* 7

% Sensitive EPT: 26.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 8.6% *Attribute 3 genera:* 8

HGMI Rating: 69.09 Excellent

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 20.07 C; Cond: 207 umhos; DO: 7.93 mg/L; pH: 7.21 SU

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

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

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

Other: fish, crayfish, eel, periphytes; eroded banks; recent flooding

AMNET Site # AN0337

Stream Name: Neshanic River

Location: Rt 514 (Amwell Rd.); Hillsborough Twp; Somerset County

Collection Date: 8/5/2009

USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	30
Stenelmis	5	16
Simulium	6	9
* Cheumatopsyche	5	8
Polypedilum	6	7
Caecidotea	8	4
Rheotanytarsus	6	4
* Chimarra	4	3
* Maccaffertium	3	3
* Ceratopsyche	4	2
Lumbriculus	8	2
Ancyronyx	2	1
* Baetis	6	1
* Caenis	7	1
Corbicula	4	1
Dicrotendipes	8	1
Menetus	6	1
Microtendipes	7	1
Mooreobdella	7.8	1
Optioservus	4	1
Paratanytarsus	6	1
Pisidium	6.8	1
Planariidae	4	1

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

Hilsenhoff Biotic Index (HBI): 5.66 # Scrapers: 3

% Sensitive EPT: 8.0% Attribute 2 genera: 0

% Non-Insect Taxa: 34.8% Attribute 3 genera: 2

HGMI Rating: 32.99 Fair

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 21.17 C; Cond: 256 umhos; DO: 8.09 mg/L; pH: 7.30 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 105' / 1 - 2'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees

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

Pipes / Ditches: ditches, storm sewers flowing

Other: fish, frogs, macrophytes, periphytes; recent flooding; new bridge 2009

AMNET Site # AN0338 Stream Name: S Br Raritan River

Location: Elm St; Hillsborough Twp; Somerset County

Collection Date: 5/21/2009 USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	43
Stenelmis	5	16
Polypedilum	6	6
Psephenus	4	5
* Agnetina	2	4
Tanytarsus	6	4
* Ceraclaea	3	3
* Anthopotamus	4	2
Cricotopus	7	2
Musculium	5	2
Thienemanniella	6	2
* Acentrella	4	1
* Acroneuria	0	1
* Baetis	6	1
Berosus	5	1
Dubiraphia	6	1
* Helicopsyche	3	1
Microtendipes	7	1
Nais	8	1
* Serratella	2	1
Simulium	6	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 5.31 # Scrapers: 4

% Sensitive EPT: 14.0% Attribute 2 genera: 2

% Non-Insect Taxa: 13.6% Attribute 3 genera: 5

HGMI Rating: 51.60 Good

Habitat Analysis: 140 Suboptimal USEPA Protocol

Observations: Water temp: 18.14 C; Cond: 329 umhos; DO: 10.15 mg/L; pH: 8.78 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers (flowing)

Other: fish, crayfish, clams / mussels, macrophytes, periphytes

AMNET Site # AN0339

Stream Name: Pleasant Run

Location: Pleasant Run Rd (Rt 629); Readington Twp; Hunterdon County

Collection Date: 5/21/2009

USGS Topo Map: Flemington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Simulium	6	14
Nais	8	13
Amnicola	4.8	9
Gammarus	6	7
Dicrotendipes	8	6
Slavina	7	6
Cricotopus	7	5
Stenelmis	5	5
Psephenus	4	4
Stictochironomus	9	4
Cura	4	3
Physella	9.1	3
Tanytarsus	6	3
* Acentrella	4	2
* Amphinemura	3	2
Fossaria	6	2
Menetus	6	2
* Baetis	6	1
* Caenis	7	1
Diamesa	5	1
Heterotrissocladius	0	1
* Hydroptila	6	1
Macronychus	2	1
Orthocladius	6	1
Paratanytarsus	6	1
* Perlesta	4	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 6.16 # Scrapers: 8

% Sensitive EPT: 8.0% Attribute 2 genera: 2

% Non-Insect Taxa: 29.6% Attribute 3 genera: 4

HGMI Rating: 46.49 Good

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 14.12 C; Cond: 258 umhos; DO: 11.15 mg/L; pH: 8.29 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 16' / < 1'; Substrate: cobble, gravel, sand, root mats

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

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: fish, water snake, periphytes, filamentous algae; lawn on RB

AMNET Site # AN0340

Stream Name: Pleasant Run

Location: South Branch Rd; Branchburg Twp; Somerset County

Collection Date: 5/21/2009

USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	21
Nais	8	12
* Caenis	7	11
Enallagma	9	11
Dicrotendipes	8	9
Stictochironomus	9	7
Limnodrilus	10	5
Paratanytarsus	6	4
Cura	4	3
Stylogrilus	10	3
Tanytarsus	6	3
Tubifex	10	3
Ancyronyx	2	1
Bezzia	6	1
Cricotopus	7	1
* Maccaffertium	3	1
Peltodytes	5	1
Rheotanytarsus	6	1
Stenelmis	5	1
Thienemanniella	6	1

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

Hilsenhoff Biotic Index (HBI): 7.37 *# Scrapers:* 2

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

% Non-Insect Taxa: 30.0% *Attribute 3 genera:* 1

HGMI Rating: 24.20 **Fair**

Habitat Analysis: 86 Marginal USEPA Protocol

Observations: Water temp: 16.24 C; Cond: 289 umhos; DO: 11.00 mg/L; pH: 8.08 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 23' / 1'; Substrate: cobble, silt, root mats, undercut banks

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, grasses, weeds

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

Other: fish, turtle, tadpoles, macrophytes, periphytes

AMNET Site # AN0341 **Stream Name: S Br Raritan River**
Location: Studdiford Drive; Hillsborough Twp; Somerset County
Collection Date: 5/21/2009 **USGS Topo Map: Raritan**

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Anthopotamus	4	33
Gammarus	6	24
Stenelmis	5	7
* Caenis	7	5
Microtendipes	7	5
Tanytarsus	6	5
Cricotopus	7	3
Limnodrilus	10	3
Nais	8	2
Tubifex	10	2
Ablabesmyia	8	1
Argia	6	1
Caecidotea	8	1
* Ceraclaea	3	1
* Hydropsyche	4	1
* Maccaffertium	3	1
* Perlarella	2	1
Pleurocera	7	1
Polypedilum	6	1
Psephenus	4	1
Stictochironomus	9	1

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

Hilsenhoff Biotic Index (HBI): 5.58 *# Scrapers:* 4

% Sensitive EPT: 41.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 28.6% *Attribute 3 genera:* 2

HGMI Rating: 44.91 Good

Habitat Analysis: 120 Suboptimal USEPA Protocol

Observations: Water temp: 18.29 C; Cond: 337 umhos; DO: 8.80 mg/L; pH: 8.41 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 159' / 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: agriculture (cropland, livestock), suburban

Pipes / Ditches: storm sewers

Other: fish, clams / mussels, waterfowl, macrophytes, periphytes; "trout stocked" waters

AMNET Site # AN0342

Stream Name: Holland Bk

Location: Holland Brook Rd; Readington Twp; Hunterdon County

Collection Date: 5/21/2009

USGS Topo Map: Flemington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Caenis	7	22
Cricotopus	7	17
* Baetis	6	13
Micropsectra	7	8
* Maccaffertium	3	6
Nais	8	6
Stenelmis	5	6
Dicrotendipes	8	4
* Hydroptila	6	4
* Cheumatopsyche	5	3
* Eurylophella	4	3
Agabus	5	1
* Amphinemura	3	1
Boyeria	2	1
Brillia	5	1
* Isoperla	2	1
Psephenus	4	1
Stempellinella	6	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 6.17 *# Scrapers:* 5

% Sensitive EPT: 50.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 5.3% *Attribute 3 genera:* 7

HGMI Rating: 57.47 Good

Habitat Analysis: 118 Suboptimal USEPA Protocol

Observations: Water temp: 17.79 C; Cond: 279 umhos; DO: 11.65 mg/L; pH: 8.79 SU

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

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

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

Pipes / Ditches: storm sewers

Other: fish, salamander, macrophytes, periphytes, filamentous algae, waterfowl

AMNET Site # AN0343

Stream Name: Holland Bk

Location: South Branch Rd; Branchburg Twp; Somerset County

Collection Date: 5/21/2009

USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	21
Cricotopus	7	14
Nais	8	11
Dicrotendipes	8	9
Simulium	6	6
Stictochironomus	9	6
Tanytarsus	6	6
Tubifex	10	6
Limnodrilus	10	3
Trichocorixa	9	3
Eukiefferiella	8	2
Musculium	5	2
Rheotanytarsus	6	2
* Caenis	7	1
Orthocladus	6	1
Parakiefferiella	4	1
Paratanytarsus	6	1
Peltodytes	5	1
Pisidium	6.8	1
Prostoma	7	1
* Stenacron	4	1
Thienemanniella	6	1

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

Hilsenhoff Biotic Index (HBI): 7.17 # Scrapers: 1

% Sensitive EPT: 2.0% Attribute 2 genera: 0

% Non-Insect Taxa: 31.8% Attribute 3 genera: 0

HGMI Rating: 20.24 Poor

Habitat Analysis: 85 Marginal USEPA Protocol

Observations: Water temp: 17.39 C; Cond: 357 umhos; DO: 10.87 mg/L; pH: 8.17 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 35' / 1'; Substrate: cobble, mud, silt

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, shrubs, grasses

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

Pipes / Ditches: storm sewers

Other: fish, tadpoles, macrophytes, periphytes; stream flows through cow pasture

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Eurylophella	4	13
Cricotopus	7	11
Eukiefferiella	8	11
Nais	8	9
Polypedilum	6	7
* Baetis	6	5
Chellifera	6	3
* Chimarra	4	3
* Haploperla	1	3
* Pycnopsyche	4	3
Simulium	6	3
* Acerpenna	4	2
* Acroneuria	0	2
Diamesa	5	2
Ectopria	5	2
Parametricnemus	5	2
Promoresia	2	2
Prosimulium	2	2
* Allocapnia	3	1
Anchytarsus	1	1
Boyeria	2	1
Calopteryx	6	1
Clinocera	6	1
Cordulegaster	3	1
Corynoneura	4	1
Enchytraeidae	10	1
Heterotrissocladius	0	1
* Hydropsyche	4	1
* Maccaffertium	3	1
Rheotanytarsus	6	1
* Rhyacophila	1	1
* Siphonurus	7	1
Stenelmis	5	1

* (EPT organism) Taxa Richness: 33 Population: 100

Hilsenhoff Biotic Index (HBI): 5.31 # Scrapers: 6

% Sensitive EPT: 35.0% Attribute 2 genera: 7

% Non-Insect Taxa: 6.1% Attribute 3 genera: 10

HGMI Rating: 73.78 Excellent

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 12.70 C; Cond: 173 umhos; DO: 9.69 mg/L; pH: 6.94 SU

Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 15' / 1'; Substrate: cobble, snags

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Downstream of Impoundment: Lake Cherokee

Other: periphytes

AMNET Site # AN0344A Stream Name: India Bk

Location: Calais Rd; Randolph Twp; Morris County

Collection Date: 7/23/2009 USGS Topo Map: Mendham

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Tvetenia	5	19
Parametriochemus	5	9
Prosimulium	2	8
Micropsectra	7	7
Simulium	6	7
* Chimarra	4	6
Polypedilum	6	6
Tanytarsus	6	5
* Cheumatopsyche	5	4
Nais	8	4
Pedicia	6	4
Rheotanytarsus	6	4
* Hydropsyche	4	3
Optioservus	4	3
Dubiraphia	6	2
Gammarus	6	2
* Acerpenna	4	1
Corydalus	4	1
* Glossosoma	0	1
* Hydroptila	6	1
* Leuctra	0	1
Rheopelopia	4	1
Stylodrilus	10	1

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

Hilsenhoff Biotic Index (HBI): 5.13 # Scrapers: 3

% Sensitive EPT: 10.0% Attribute 2 genera: 3

% Non-Insect Taxa: 13.0% Attribute 3 genera: 3

HGMI Rating: 45.34 Good

Habitat Analysis: 122 Suboptimal USEPA Protocol

Observations: Water temp: 17.20 C; Cond: 491 umhos; DO: 7.62 mg/L; pH: 6.96 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 18' / 1 - 2'; Substrate: cobble, gravel, sand, snags, root mats

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, salamander, periphytes, filamentous algae

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Lumbriculus	8	24
* Eurylophella	4	9
* Lepidostoma	1	7
* Ephemerella	1	6
* Acentrella	4	5
* Baetis	6	5
* Ameletus	0	4
* Maccaffertium	3	4
* Amphinemura	3	3
Polypedilum	6	3
Caecidotea	8	2
* Epeorus	0	2
* Ephemerellidae	1	2
Gammarus	6	2
Thienemannimyia	6	2
Clinocera	6	1
Cricotopus	7	1
Diamesa	5	1
* Diplectrona	0	1
* Dolophilodes	0	1
Micropsectra	7	1
Molophilus	3	1
* Neophylax	3	1
Orthoclaadiinae	5	1
Promoesia	2	1
Prosimulium	2	1
Psephenus	4	1
* Pycnopsyche	4	1
Simulium	6	1
* Siphonurus	7	1
Stempellinella	6	1
Stylogomphus	1	1
* Sweltsa	0	1
Tanytarsus	6	1
Tipula	4	1

* (EPT organism) *Taxa Richness:* 35 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.50 *# Scrapers:* 5

% Sensitive EPT: 53.0% *Attribute 2 genera:* 8

% Non-Insect Taxa: 8.6% *Attribute 3 genera:* 11

HGMI Rating: 82.65 Excellent

Habitat Analysis: 178 Optimal USEPA Protocol

Observations: Water temp: 13.13 C; Cond: 133 umhos; DO: 9.76 mg/L; pH: 7.32 SU

Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 21' / 1 - 2'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

AMNET Site # AN0346 Stream Name: N Br Raritan River

Location: Rt 24; Mendham Twp; Morris County

Collection Date: 5/27/2009 USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Baetis	6	53
Nais	8	12
Cricotopus	7	11
* Dolophilodes	0	9
Parametriochnemus	5	3
Diamesa	5	2
Polypedilum	6	2
Stenelmis	5	2
Dicranota	3	1
* Hydroptila	6	1
* Maccaffertium	3	1
Planariidae	4	1
Rheocricotopus	6	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 5.65 # Scrapers: 3

% Sensitive EPT: 64.0% Attribute 2 genera: 2

% Non-Insect Taxa: 14.3% Attribute 3 genera: 3

HGMI Rating: 49.74 Good

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 12.26 C; Cond: 288 umhos; DO: 10.24 mg/L; pH: 7.64 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, gage

AMNET Site # AN0347

Stream Name: Dawsons Bk

Location: Ironia Rd off South Rd; Mendham Twp; Morris County

Collection Date: 5/7/2009

USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	17
* Maccaffertium	3	9
* Pycnopsyche	4	9
* Acentrella	4	7
* Chimarra	4	7
Cricotopus	7	5
Diamesa	5	5
* Amphinemura	3	4
* Baetis	6	4
* Hydropsyche	4	4
Psephenus	4	4
Tanytarsus	6	4
* Rhyacophila	1	3
Enchytraeidae	10	2
Orthocladus	6	2
Polypedilum	6	2
* Acroneuria	0	1
* Alloperla	0	1
Ectopria	5	1
Eukiefferiella	8	1
Parametricnemus	5	1
Pisidium	6.8	1
Planorbula	7	1
Pseudolimnophila	2	1
Tipula	4	1

* (EPT organism) Taxa Richness: 25 Population: 97

Hilsenhoff Biotic Index (HBI): 5.07 # Scrapers: 4

% Sensitive EPT: 46.4% Attribute 2 genera: 4

% Non-Insect Taxa: 16.0% Attribute 3 genera: 7

HGMI Rating: 63.28 Excellent

Habitat Analysis: 164 Optimal USEPA Protocol

Observations: Water temp: 15.36 C; Cond: 302 umhos; DO: 9.12 mg/L; pH: 7.41 SU

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

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

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

Pipes / Ditches: storm sewers

Other: frogs, snake, periphytes

AMNET Site # AN0348

Stream Name: Burnett Bk

Location: Old Mill Rd; Mendham Twp; Morris County

Collection Date: 5/27/2009

USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Baetis	6	23
Lumbriculus	8	17
* Dolophilodes	0	7
* Ephemerella	1	6
Psephenus	4	5
Tvetenia	5	5
* Dannella	2	3
Micropsectra	7	3
Oulimnius	4	3
Parametricnemus	5	3
* Acentrella	4	2
Diamesa	5	2
Dicranota	3	2
* Glossosoma	0	2
Hexatoma	2	2
Polypedilum	6	2
* Alloperla	0	1
Brillia	5	1
* Centroptilum	2	1
* Diplectrona	0	1
* Hydroptila	6	1
* Maccaffertium	3	1
Nais	8	1
Orthocladus	6	1
* Perlidae	1	1
* Polycentropus	6	1
Prostoma	7	1
Stenelmis	5	1
Thienemannimyia	6	1

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

Hilsenhoff Biotic Index (HBI): 4.74 # Scrapers: 6

% Sensitive EPT: 50.0% Attribute 2 genera: 7

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

HGMI Rating: 75.78 Excellent

Habitat Analysis: 167 Optimal USEPA Protocol

Observations: Water temp: 11.70 C; Cond: 275 umhos; DO: 9.83 mg/L; pH: 7.57 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

AMNET Site # AN0349

Stream Name: Peapack Bk

Location: Fox Chase Rd; Chester Twp; Morris County

Collection Date: 5/27/2009

USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Baetis	6	28
* Dolophilodes	0	12
Parametriochnemus	5	8
* Glossosoma	0	6
Lumbriculus	8	6
Nais	8	6
Tvetenia	5	5
Micropsectra	7	4
* Acentrella	4	2
* Acroneuria	0	2
* Hydroptila	6	2
* Plauditus	4	2
* Rhyacophila	1	2
Simulium	6	2
* Amphinemura	3	1
* Apatania	3	1
Brillia	5	1
Cricotopus	7	1
Diamesa	5	1
* Diplectrona	0	1
* Ephemerella	1	1
Eukiefferiella	8	1
* Lepidostoma	1	1
Lumbricidae	10	1
Oulimnius	4	1
Polypedilum	6	1
Stenelmis	5	1

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

Hilsenhoff Biotic Index (HBI): 4.57 # Scrapers: 6

% Sensitive EPT: 61.0% Attribute 2 genera: 7

% Non-Insect Taxa: 11.1% Attribute 3 genera: 6

HGMI Rating: 76.95 Excellent

Habitat Analysis: 165 Optimal USEPA Protocol

Observations: Water temp: 12.35 C; Cond: 322 umhos; DO: 10.18 mg/L; pH: 7.60 SU

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

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

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

Pipes / Ditches: storm sewers

Other: fish, periphytes

AMNET Site # AN0350

Stream Name: Peapack Bk

Location: Old Dutch Rd off Rt 512; Bedminster Twp; Somerset County

Collection Date: 6/2/2009

USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	21
Eukiefferiella	8	14
* Baetis	6	11
Stenelmis	5	11
Optioservus	4	7
Psephenus	4	6
* Cheumatopsyche	5	4
Bezzia	6	3
Cardiocladius	5	3
* Chimarra	4	3
* Acroneuria	0	2
Oulimnius	4	2
Stylogrilus	10	2
* Acentrella	4	1
Antocha	3	1
Cricotopus	7	1
Cura	4	1
Dubiraphia	6	1
* Glossosoma	0	1
* Hydropsyche	4	1
* Perlesta	4	1
Prosimulium	2	1
Simulium	6	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 5.50 # Scrapers: 5

% Sensitive EPT: 19.0% Attribute 2 genera: 2

% Non-Insect Taxa: 8.3% Attribute 3 genera: 4

HGMI Rating: 51.80 Good

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 15.01 C; Cond: 347 umhos; DO: 8.92 mg/L; pH: 7.81 SU

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

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

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

AMNET Site # AN0351 Stream Name: N Br Raritan River

Location: Rt 202; Far Hills Boro; Somerset County

Collection Date: 6/2/2009 USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Baetis	6	18
Lumbriculus	8	11
Polypedilum	6	11
Tvetenia	5	6
Gammarus	6	5
Microtendipes	7	5
Stenelmis	5	5
* Hydropsychidae	4	4
* Acentrella	4	3
* Ceratopsyche	4	3
Nais	8	3
Cricotopus	7	2
Oulimnius	4	2
Prostoma	7	2
Rheocricotopus	6	2
Rheotanytarsus	6	2
Bezzia	6	1
* Cheumatopsyche	5	1
* Helicopsyche	3	1
* Isonychia	2	1
Lumbricidae	10	1
* Maccaffertium	3	1
Micropsectra	7	1
Nematoda	6	1
* Neophylax	3	1
Optioservus	4	1
* Perlesta	4	1
Promoresia	2	1
Psephenus	4	1
Simulium	6	1
Synorthocladius	2	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 5.79 # Scrapers: 7

% Sensitive EPT: 26.0% Attribute 2 genera: 1

% Non-Insect Taxa: 18.8% Attribute 3 genera: 7

HGMI Rating: 60.35 Good

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 16.53 C; Cond: 269 umhos; DO: 8.90 mg/L; pH: 7.75 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 45' / < 1' - 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: suburban, adj to community park

Pipes / Ditches: storm sewers

Other: fish; "trout stocked" stream

AMNET Site # AN0352

Stream Name: Mine Bk

Location: Bernardsville Rd (Old Quarry Rd); Bernardsville Boro; Somerset County

Collection Date: 5/27/2009

USGS Topo Map: Bernardsville

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	20
Cura	4	13
Gammarus	6	7
Rheotanytarsus	6	7
Nais	8	5
Parametricnemus	5	5
Simulium	6	5
Tanytarsus	6	5
* Cheumatopsyche	5	4
Microtendipes	7	4
Stenelmis	5	4
* Baetis	6	3
Cricotopus	7	3
Stylogrilus	10	3
Rheocricotopus	6	2
Rheopelopia	4	2
Agabus	5	1
* Ceraclaea	3	1
Diamesa	5	1
Dicrotendipes	8	1
Enchytraeidae	10	1
* Hydropsyche	4	1
Nematoda	6	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 5.84 *# Scrapers:* 1

% Sensitive EPT: 4.0% *Attribute 2 genera:* 1

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

HGMI Rating: 33.32 Fair

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 17.20 C; Cond: 607 umhos; DO: 8.84 mg/L; pH: 7.31 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock, industrial (rock quarry)

Pipes / Ditches: STP, storm sewers

AMNET Site # AN0353

Stream Name: Mine Bk

Location: Far Hills Rd (Rt 512); Far Hills Boro; Somerset County

Collection Date: 6/2/2009

USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	24
* Hydropsychidae	4	10
* Cheumatopsyche	5	8
Stenelmis	5	8
Psephenus	4	4
Slavina	7	4
Thienemannimyia	6	4
Brillia	5	3
* Dolophilodes	0	3
Tvetenia	5	3
* Chimarra	4	2
Eukiefferiella	8	2
* Hydropsyche	4	2
* Maccaffertium	3	2
Microtendipes	7	2
Nais	8	2
Optioservus	4	2
Phaenopsectra	7	2
Prostoma	7	2
Tanytarsus	6	2
* Baetis	6	1
Bezzia	6	1
Cricotopus	7	1
Micropsectra	7	1
Oulimnius	4	1
* Paraleptophlebia	1	1
Parametrioctenus	5	1
Rheocricotopus	6	1
Stylogomphus	1	1

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

Hilsenhoff Biotic Index (HBI): 5.21 # Scrapers: 5

% Sensitive EPT: 9.0% Attribute 2 genera: 2

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

HGMI Rating: 50.30 Good

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 15.47 C; Cond: 246 umhos; DO: 8.27 mg/L; pH: 7.57 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock (horse farm)

Other: fish, filamentous algae

AMNET Site # AN0354

Stream Name: Middle Bk

Location: Spook Hollow Rd; Bedminster Twp; Somerset County

Collection Date: 6/2/2009

USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	18
Polypedilum	6	17
Nais	8	16
Cricotopus	7	15
Tvetenia	5	8
Simulium	6	6
Micropsectra	7	4
Tanytarsus	6	3
Dicranota	3	2
Phaenopsectra	7	2
* Amphinemura	3	1
* Hydroptila	6	1
Oulimnius	4	1
Parametricnemus	5	1
Rheocricotopus	6	1
Rheotanytarsus	6	1
Slavina	7	1
Thienemannimyia	6	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 6.14 # Scrapers: 3

% Sensitive EPT: 2.0% Attribute 2 genera: 0

% Non-Insect Taxa: 10.5% Attribute 3 genera: 3

HGMI Rating: 34.45 Fair

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 15.77 C; Cond: 217 umhos; DO: 6.79 mg/L; pH: 7.61 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / < 1'; Substrate: cobble, gravel, sand, silt

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, periphytes, filamentous algae

AMNET Site # AN0355

Stream Name: Middle Bk

Location: Cutting Witney Rd (River Rd); Bedminster Twp.; Somerset County

Collection Date: 6/2/2009

USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Stenelmis	5	31
Lumbriculus	8	9
Gammarus	6	8
Optioservus	4	7
* Perlesta	4	7
* Cheumatopsyche	5	5
Planariidae	4	5
Psephenus	4	5
Corynoneura	4	3
Microtendipes	7	3
Cricotopus	7	2
Dicrotendipes	8	2
Limnodrilus	10	2
Nais	8	2
Antocha	3	1
* Ceratopsyche	4	1
* Chimarra	4	1
Micropsectra	7	1
Procladius	9	1
Rheotanytarsus	6	1
Slavina	7	1
Stictochironomus	9	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 5.50 *# Scrapers:* 2

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

% Non-Insect Taxa: 26.1% *Attribute 3 genera:* 1

HGMI Rating: 31.24 **Fair**

Habitat Analysis: 135 Suboptimal USEPA Protocol

Observations: Water temp: 17.73 C; Cond: 279 umhos; DO: 5.92 mg/L; pH: 7.46 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 29' / < 1'; Substrate: cobble, sand, silt, snags

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

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

Other: fish, macrophytes, periphytes, filamentous algae

AMNET Site # AN0356 Stream Name: Lamington River

Location: Ironia Rd; Chester Twp; Morris County

Collection Date: 4/29/2009 USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	16
Amnicola	4.8	12
Cricotopus	7	12
Polypedilum	6	8
Caecidotea	8	7
Limnodrilus	10	6
Chironomus	10	5
Gyraulus	6	5
Phaenopsectra	7	4
Tribelos	5	4
Ischnura	9	3
Macronychus	2	2
* Oecetis	8	2
Paratendipes	8	2
Tubifex	10	2
* Cheumatopsyche	5	1
Clinotanytus	8	1
Dugesia	4	1
Empididae	6	1
Hydrolix	4	1
* Ironoquia	3	1
Physella	9.1	1
Pisidium	6.8	1
Thienemannimyia	6	1
Valvata	2	1

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

Hilsenhoff Biotic Index (HBI): 6.66 # Scrapers: 6

% Sensitive EPT: 3.0% Attribute 2 genera: 0

% Non-Insect Taxa: 44.0% Attribute 3 genera: 0

HGMI Rating: 26.53 Fair

Habitat Analysis: 140 Suboptimal USEPA Protocol

Observations: Water temp: 19.25 C; Cond: 591 umhos; DO: 9.63 mg/L; pH: 7.51 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 25' / 2.0'; Substrate: silt

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

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

Pipes / Ditches: Roxbury Twp - Ajax Terrace STP discharge upstream

Other: site located in Wildlife Management Area

AMNET Site # AN0357

Stream Name: Tanners Bk

Location: Tanners Brook Rd; Chester Twp; Morris County

Collection Date: 5/28/2009

USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	26
Cricotopus	7	22
Eukiefferiella	8	7
* Glossosoma	0	4
Nais	8	4
Simulium	6	4
Tanytarsus	6	4
* Amphinemura	3	3
* Pycnopsyche	4	3
Optioservus	4	2
Pisidium	6.8	2
Polypedilum	6	2
Prosimulium	2	2
* Apatania	3	1
* Baetis	6	1
Boyeria	2	1
Brillia	5	1
* Chimarra	4	1
Corydalus	4	1
Cryptochironomus	8	1
Eclipidrilus	8	1
* Maccaffertium	3	1
Parametriochnemus	5	1
Paratendipes	8	1
Promoresia	2	1
Prostoma	7	1
Rheotanytarsus	6	1
Stylogrilus	10	1

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

Hilsenhoff Biotic Index (HBI): 5.86 # Scrapers: 4

% Sensitive EPT: 14.0% Attribute 2 genera: 1

% Non-Insect Taxa: 21.4% Attribute 3 genera: 10

HGMI Rating: 51.19 Good

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 15.03 C; Cond: 208 umhos; DO: 8.35 mg/L; pH: 8.00 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 8' / 1'; Substrate: cobble, gravel, sand, silt

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

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

Other: fish, macrophytes, purple loosestrife

AMNET Site # AN0358

Stream Name: Lamington River

Location: Rt 24 (Cooper Mill Park); Chester Twp; Morris County

Collection Date: 5/28/2009

USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Rheotanytarsus	6	14
* Baetis	6	13
Gammarus	6	13
* Micrasema	2	8
Polypedilum	6	8
Eukiefferiella	8	6
Cardiocladius	5	5
Simulium	6	5
* Heterocloeon	2	4
Microtendipes	7	4
Prosimulium	2	4
Cricotopus	7	3
* Brachycentrus	1	2
Caecidotea	8	2
Tanytarsus	6	2
* Apatania	3	1
Cura	4	1
* Hydropsyche	4	1
Pisidium	6.8	1
Planariidae	4	1
Stenelmis	5	1
Stylogrilus	10	1

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

Hilsenhoff Biotic Index (HBI): 5.39 # Scrapers: 3

% Sensitive EPT: 28.0% Attribute 2 genera: 2

% Non-Insect Taxa: 27.3% Attribute 3 genera: 4

HGMI Rating: 46.02 Good

Habitat Analysis: 180 Optimal USEPA Protocol

Observations: Water temp: 16.11 C; Cond: 405 umhos; DO: 7.45 mg/L; pH: 7.21 SU

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

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

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

Other: water snake, periphytes, brown foam; "trout stocked waters"

AMNET Site # AN0359

Stream Name: Trout Bk

Location: State Pk Rd; Chester Twp; Morris County

Collection Date: 5/28/2009

USGS Topo Map: Chester

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Parametriochnemus	5	24
Nais	8	18
* Hydroptila	6	10
* Dolophilodes	0	9
Pagastia	1	8
Gammarus	6	6
Micropsectra	7	4
Tvetenia	5	4
* Baetis	6	2
Brillia	5	2
* Dannella	2	2
* Eurylophella	4	2
Simulium	6	2
* Cheumatopsyche	5	1
Lumbriculus	8	1
* Plauditus	4	1
Stylogomphus	1	1
Tanytarsus	6	1
Thienemanniella	6	1
Thienemannimyia	6	1

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

Hilsenhoff Biotic Index (HBI): 4.98 *# Scrapers:* 3

% Sensitive EPT: 26.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 15.0% *Attribute 3 genera:* 4

HGMI Rating: 47.19 Good

Habitat Analysis: 166 Optimal USEPA Protocol

Observations: Water temp: 13.55 C; Cond: 265 umhos; DO: 8.95 mg/L; pH: 7.63 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 12' / < 1'; Substrate: cobble, gravel

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

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

Other: periphytes, salamander

AMNET Site # AN0360

Stream Name: Lamington River

Location: Rt 512; Tewksbury Twp; Hunterdon & Somerset County

Collection Date: 5/28/2009

USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Brachycentrus	1	28
Tanytarsus	6	12
Nais	8	8
Brillia	5	7
Parametriochnemus	5	6
Gammarus	6	5
Eukiefferiella	8	4
* Lepidostoma	1	4
* Cheumatopsyche	5	3
* Paragnetina	1	3
* Apatania	3	2
* Baetis	6	2
Microtendipes	7	2
Musculium	5	2
* Pteronarcys	0	2
Rheotanytarsus	6	2
Stenelmis	5	2
* Acentrella	4	1
* Acroneuria	0	1
* Ephemerella	1	1
* Hydropsyche	4	1
* Micrasema	2	1
Polypedilum	6	1

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

Hilsenhoff Biotic Index (HBI): 3.94 # Scrapers: 2

% Sensitive EPT: 45.0% Attribute 2 genera: 5

% Non-Insect Taxa: 13.0% Attribute 3 genera: 6

HGMI Rating: 66.04 Excellent

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 15.65 C; Cond: 339 umhos; DO: 9.14 mg/L; pH: 8.04 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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: periphytes

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Cricotopus	7	25
Tvetenia	5	8
Nais	8	6
Parametrioconemus	5	6
* Baetis	6	4
* Eurylophella	4	4
Simulium	6	4
Prostoma	7	3
Rheotanytarsus	6	3
Stenelmis	5	3
Bezzia	6	2
* Ceratopsyche	4	2
* Chimarra	4	2
* Hydroptila	6	2
Orthocladus	6	2
Promoresia	2	2
Rheocricotopus	6	2
Thienemanniella	6	2
* Apatania	3	1
Dubiraphia	6	1
* Glossosoma	0	1
Hemerodromia	6	1
* Hydropsyche	4	1
* Isoperla	2	1
Limnodrilus	10	1
Lumbriculus	8	1
Micropsectra	7	1
Microtendipes	7	1
Ophiogomphus	1	1
Optioservus	4	1
Oulimnius	4	1
Polypedilum	6	1
* Rhyacophila	1	1
Tanytarsus	6	1
Thienemannimyia	6	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 5.76 *# Scrapers:* 8

% Sensitive EPT: 16.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 11.1% *Attribute 3 genera:* 6

HGMI Rating: 61.94 Good

Habitat Analysis: 148 Suboptimal USEPA Protocol

Observations: Water temp: 14.95 C; Cond: 232 umhos; DO: 9.24 mg/L; pH: 7.95 SU

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

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

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

Pipes / Ditches: storm sewers

Other: fish, macrophytes, filamentous algae

AMNET Site # AN0362

Stream Name: Cold Bk

Location: Vliettown Rd; Tewksbury Twp; Hunterdon County

Collection Date: 6/2/2009

USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Simulium	6	24
Stenelmis	5	12
Polypedilum	6	9
Cricotopus	7	7
Gammarus	6	7
Micropsectra	7	5
* Baetis	6	4
Nais	8	4
* Ephemerella	1	3
Tvetenia	5	3
Antocha	3	2
Microtendipes	7	2
Optioservus	4	2
Psephenus	4	2
* Tricorythodes	4	2
Bezzia	6	1
* Ceratopsyche	4	1
Cladotanytarsus	7	1
Eukiefferiella	8	1
Hemerodromia	6	1
* Hydropsyche	4	1
* Hydroptila	6	1
Phaenopsectra	7	1
Potthastia	2	1
Rheocricotopus	6	1
Tanytarsus	6	1
Thienemanniella	6	1

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

Hilsenhoff Biotic Index (HBI): 5.70 # Scrapers: 4

% Sensitive EPT: 10.0% Attribute 2 genera: 0

% Non-Insect Taxa: 7.4% Attribute 3 genera: 2

HGMI Rating: 42.01 Good

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 15.72 C; Cond: 270 umhos; DO: 9.29 mg/L; pH: 8.03 SU

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

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

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

Other: fish

AMNET Site # AN0363

Stream Name: Lamington River

Location: Rt 523; Bedminster Twp; Somerset & Hunterdon County

Collection Date: 6/2/2009

USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Microtendipes	7	17
* Baetis	6	11
Tvetenia	5	11
Polypedilum	6	10
* Brachycentrus	1	9
Cricotopus	7	4
Optioservus	4	4
* Helicopsyche	3	3
Lumbriculus	8	3
Potthastia	2	3
* Serratella	2	3
* Ceratopsyche	4	2
* Glossosoma	0	2
* Perlesta	4	2
* Acentrella	4	1
Antocha	3	1
Blepharicera	0	1
* Chimarra	4	1
Cladotanytarsus	7	1
Eukiefferiella	8	1
Gammarus	6	1
* Isonychia	2	1
* Lepidostoma	1	1
* Leucrocota	1	1
* Maccaffertium	3	1
* Micrasema	2	1
Nais	8	1
* Plauditus	4	1
Prostoma	7	1
Stenelmis	5	1

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

Hilsenhoff Biotic Index (HBI): 4.79 # Scrapers: 7

% Sensitive EPT: 38.0% Attribute 2 genera: 5

% Non-Insect Taxa: 13.3% Attribute 3 genera: 7

HGMI Rating: 73.73 Excellent

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 18.51 C; Cond: 261 umhos; DO: 8.98 mg/L; pH: 8.20 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 70' / < 1'; Substrate: cobble, gravel, sand, root mats

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

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

Other: fish, macrophytes

AMNET Site # AN0364 Stream Name: N Br Rockaway Ck
 Location: Fairmount Rd (Rt 512); Tewksbury Twp; Hunterdon County
 Collection Date: 6/8/2009 USGS Topo Map: Califon

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Tvetenia	5	10
Nais	8	8
Rheocricotopus	6	7
Rheotanytarsus	6	7
* Baetis	6	6
* Hydropsyche	4	5
Parametrioctonus	5	5
* Chimarra	4	4
* Leuctra	0	4
Macronychus	2	4
* Serratella	2	4
Optioservus	4	3
Pristinella	10	3
Stempellinella	6	3
Ancyronyx	2	2
Antocha	3	2
* Apatania	3	2
Cricotopus	7	2
Microtendipes	7	2
Polypedilum	6	2
Stylodrilus	10	2
Cardiocladius	5	1
* Ceratopsyche	4	1
Chelifera	6	1
Corynoneura	4	1
Cura	4	1
Dubiraphia	6	1
* Ephemerella	1	1
* Glossosoma	0	1
Heterotrissocladius	0	1
* Isoperla	2	1
* Pteronarcys	0	1
Simulium	6	1
Stylogomphus	1	1

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

Hilsenhoff Biotic Index (HBI): 4.86 # Scrapers: 4

% Sensitive EPT: 24.0% Attribute 2 genera: 4

% Non-Insect Taxa: 11.8% Attribute 3 genera: 6

HGMI Rating: 61.08 Good

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 15.68 C; Cond: 162 umhos; DO: 7.34 mg/L; pH: 6.78 SU

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

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

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

Other: fish, periphytes

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	12
Lumbriculus	8	9
Brillia	5	5
Micropsectra	7	5
* Dolophilodes	0	4
* Lepidostoma	1	4
Microtendipes	7	4
Psephenus	4	4
* Acroneuria	0	3
* Apatania	3	3
* Baetis	6	3
* Ephemerella	1	3
* Mystacides	4	3
* Perlesta	4	3
Tvetenia	5	3
Diamesa	5	2
* Eurylophella	4	2
Nais	8	2
Optioservus	4	2
Phaenopsectra	7	2
* Polycentropus	6	2
Stenelmis	5	2
Tanytarsus	6	2
* Agapetus	0	1
* Chimarra	4	1
* Dannella	2	1
* Diplectrona	0	1
* Drunella	1	1
* Glossosoma	0	1
Gomphidae	1	1
* Hydropsyche	4	1
* Leuctra	0	1
* Maccaffertium	3	1
* Nyctiophylax	5	1
Parametriocnemus	5	1
Planorbidae	6	1
Prostoma	7	1
Stylogomphus	1	1
Sublettea	6	1

* (EPT organism) *Taxa Richness:* 39 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.56 *# Scrapers:* 10

% Sensitive EPT: 39.0% *Attribute 2 genera:* 8

% Non-Insect Taxa: 10.3% *Attribute 3 genera:* 12

HGMI Rating: 86.67 **Excellent**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 16.49 C; Cond: 134 umhos; DO: 8.59 mg/L; pH: 7.46 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 44' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, periphytes

AMNET Site # AN0366

Stream Name: N Br Rockaway Ck

Location: Rockaway Rd (@Taylor's Mill Rd); Readington Twp; Hunterdon County

Collection Date: 6/8/2009

USGS Topo Map: Califon

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	11
Gammarus	6	9
Psephenus	4	8
Lumbriculus	8	7
* Baetis	6	6
Caecidotea	8	5
* Eurylophella	4	5
Stenelmis	5	5
* Acentrella	4	4
* Ephemerella	1	4
Tvetenia	5	4
* Maccaffertium	3	3
Optioservus	4	3
* Perlidae	1	3
Argia	6	2
* Glossosoma	0	2
Antocha	3	1
Bezzia	6	1
Calopteryx	6	1
* Cheumatopsyche	5	1
Corixidae	9	1
* Dolophilodes	0	1
Dubiraphia	6	1
Erpobdellidae	8	1
Hydroporus	5	1
* Hydroptila	6	1
Micropsectra	7	1
Microtendipes	7	1
Oulimnius	4	1
* Paragnetina	1	1
Physella	9.1	1
Pisidium	6.8	1
* Serratella	2	1
Simulium	6	1
* Tricorythodes	4	1

* (EPT organism) Taxa Richness: 35 Population: 100

Hilsenhoff Biotic Index (HBI): 5.06 # Scrapers: 9

% Sensitive EPT: 32.0% Attribute 2 genera: 4

% Non-Insect Taxa: 17.1% Attribute 3 genera: 5

HGMI Rating: 69.03 Excellent

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 16.78 C; Cond: 152 umhos; DO: 8.83 mg/L; pH: 7.60 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 25' / < 1'; Substrate: cobble, gravel, sand, root mats

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

Stream Gradient: High Gradient Stream; Land Uses: forested, industrial (Oldwich Materials Corp)

Pipes / Ditches: storm sewers; pipe flowing

Other: fish, crayfish, filamentous algae; foam

AMNET Site # AN0367 **Stream Name: S Br Rockaway Ck**
Location: Windy Acres Farm; Lebanon Boro; Hunterdon County
Collection Date: 5/12/2009 **USGS Topo Map: Califon**

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	34
Tanytarsus	6	19
Gammarus	6	7
Optioservus	4	7
Parametriochnemus	5	5
Stylogrilus	10	5
Chaetogaster	6	3
Cricotopus	7	3
* Chimarra	4	2
Stenelmis	5	2
Tvetenia	5	2
* Baetis	6	1
* Ceratopsyche	4	1
Dicrotendipes	8	1
Endochironomus	10	1
* Eurylophella	4	1
* Hydropsyche	4	1
Limnodrilus	10	1
Macronychus	2	1
Psectrocladius	8	1
Psephenus	4	1
Rheopelopia	4	1

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

Hilsenhoff Biotic Index (HBI): 6.62 *# Scrapers:* 4

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

% Non-Insect Taxa: 22.7% *Attribute 3 genera:* 3

HGMI Rating: 33.63 Fair

Habitat Analysis: 160 Optimal USEPA Protocol

Observations: Water temp: 11.95 C; Cond: 384 umhos; DO: 10.65 mg/L; pH: 8.25 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 8-10' / 1'; Substrate: cobble, gravel, sand, bedrock

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

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

Other: crayfish, fish, salamanders

AMNET Site # AN0368 Stream Name: S Br Rockaway Ck

Location: Rt 22; Readington Twp; Hunterdon County

Collection Date: 5/12/2009 USGS Topo Map: Flemington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Stenelmis	5	20
Polypedilum	6	8
Gammarus	6	7
Nais	8	7
Tvetenia	5	7
Ophidonais	7	6
Psephenus	4	6
Rheotanytarsus	6	6
Cricotopus	7	4
Elimia	2	4
Slavina	7	4
Corbicula	4	3
Dugesia	4	3
Limnodrilus	10	3
Simulium	6	3
Caecidotea	8	2
* Cheumatopsyche	5	2
* Chimarra	4	2
Physella	9.1	2
* Perlesta	4	1

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

Hilsenhoff Biotic Index (HBI): 5.75 # Scrapers: 4

% Sensitive EPT: 3.0% Attribute 2 genera: 0

% Non-Insect Taxa: 50.0% Attribute 3 genera: 1

HGMI Rating: 24.96 Fair

Habitat Analysis: 174 Optimal USEPA Protocol

Observations: Water temp: 18.2 C; Cond: 369 umhos; DO: 9.19 mg/L; pH: 8.1 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 20' / 1.5'; Substrate: cobble, gravel, sand, silt

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

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

Pipes / Ditches: storm sewers

Other: clams / mussels, filamentous algae

AMNET Site # AN0369

Stream Name: Rockaway Ck

Location: Island Rd; Readington Twp; Hunterdon County

Collection Date: 6/8/2009

USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	20
* Anthopotamus	4	17
Dicrotendipes	8	10
Dubiraphia	6	10
Microtendipes	7	9
Physella	9.1	7
Caecidotea	8	4
Limnodrilus	10	4
* Tricorythodes	4	4
* Perlesta	4	3
Cryptochironomus	8	2
Macronychus	2	2
Cladotanytarsus	7	1
Ischnura	9	1
Lumbriculidae	8	1
Phaenopsectra	7	1
Pisidium	6.8	1
Psephenus	4	1
* Stenacron	4	1
Stenelmis	5	1

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

Hilsenhoff Biotic Index (HBI): 6.25 # Scrapers: 7

% Sensitive EPT: 25.0% Attribute 2 genera: 0

% Non-Insect Taxa: 30.0% Attribute 3 genera: 1

HGMI Rating: 37.71 Fair

Habitat Analysis: 133 Suboptimal USEPA Protocol

Observations: Water temp: 19.68 C; Cond: 244 umhos; DO: 9.14 mg/L; pH: 7.89 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 67' / 1 - 2'; Substrate: cobble, gravel, sand, silt

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

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, agriculture-livestock (cows)

Other: fish, macrophytes; eroded banks

AMNET Site # AN0370

Stream Name: Lamington River

Location: Cowperthwaite Rd; Branchburg Twp; Somerset County

Collection Date: 6/8/2009

USGS Topo Map: Gladstone

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	36
* Anthopotamus	4	15
* Perlesta	4	7
Caecidotea	8	5
Limnodrilus	10	5
Stenelmis	5	5
Microtendipes	7	4
Physella	9.1	4
* Ephemerella	1	3
Phaenopsectra	7	2
Pisidium	6.8	2
* Caenis	7	1
Cambaridae	5	1
* Ceraclaea	3	1
* Cheumatopsyche	5	1
Crangonyx	8	1
* Dannella	2	1
* Maccaffertium	3	1
* Neoperla	1	1
* Plauditus	4	1
Slavina	7	1
Thienemannimyia	6	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 5.69 *# Scrapers:* 5

% Sensitive EPT: 31.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 34.8% *Attribute 3 genera:* 6

HGMI Rating: 47.81 Good

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 20.01 C; Cond: 240 umhos; DO: 9.10 mg/L; pH: 7.96 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 72' / 1'; Substrate: cobble, gravel, sand

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

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

Other: macrophytes; "Trout stocked" waters; USGS gage station

AMNET Site # AN0371 Stream Name: Chambers(B) Bk

Location: Love Rd; Bedminster Twp; Somerset County

Collection Date: 6/4/2009 USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Dicrotendipes	8	31
Gammarus	6	18
Physella	9.1	6
Stictochironomus	9	6
Ischnura	9	5
Rheotanytarsus	6	4
Argia	6	3
Nais	8	3
Polypedilum	6	3
Aulodrilus	8	2
* Caenis	7	2
Curculionidae	7	2
Psephenus	4	2
Ablabesmyia	8	1
Caecidotea	8	1
Hydra	5	1
Lumbriculus	8	1
Mooreobdella	7.8	1
Paratendipes	8	1
* Perlesta	4	1
Phaenopsectra	7	1
Prostoma	7	1
Slavina	7	1
Stenelmis	5	1
Tanytarsus	6	1

* (EPT organism) Taxa Richness: 25 Population: 99

Hilsenhoff Biotic Index (HBI): 7.34 # Scrapers: 4

% Sensitive EPT: 3.0% Attribute 2 genera: 0

% Non-Insect Taxa: 40.0% Attribute 3 genera: 1

HGMI Rating: 24.22 Fair

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 16.73 C; Cond: 503 umhos; DO: 8.00 mg/L; pH: 7.47 SU

Clarity: turbid, brown; Flow Rate: moderate; Width/Depth: 20' / 1'; Substrate: gravel, sand, mud, undercut banks

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

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

Pipes / Ditches: ditches

Other: macrophytes, filamentous algae

AMNET Site # AN0372 Stream Name: Chambers(A) Bk
 Location: Coddington Rd; Readington Twp; Hunterdon County
 Collection Date: 6/4/2009 USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Nais	8	12
Tanytarsus	6	11
* Cheumatopsyche	5	8
Aulodrilus	8	7
Stenelmis	5	7
Micropsectra	7	5
* Perlesta	4	5
Polypedilum	6	5
Bezzia	6	4
Microtendipes	7	4
* Caenis	7	3
Physella	9.1	3
* Amphinemura	3	2
Paratanytarsus	6	2
Pisidium	6.8	2
Stictochironomus	9	2
Stylogomphus	1	2
Thienemannimyia	6	2
Tvetenia	5	2
Chironomus	10	1
Corixidae	9	1
Corynoneura	4	1
Dubiraphia	6	1
Hydroporus	5	1
Ischnura	9	1
Phaenopsectra	7	1
Prostoma	7	1
Pseudochironomus	5	1
Rheotanytarsus	6	1
Slavina	7	1
* Stenacron	4	1

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

Hilsenhoff Biotic Index (HBI): 6.31 # Scrapers: 5

% Sensitive EPT: 11.0% Attribute 2 genera: 0

% Non-Insect Taxa: 19.4% Attribute 3 genera: 2

HGMI Rating: 39.65 Fair

Habitat Analysis: 126 Suboptimal USEPA Protocol

Observations: Water temp: 14.92 C; Cond: 190 umhos; DO: 8.68 mg/L; pH: 7.18 SU

Clarity: turbid, brown; Flow Rate: slow; Width/Depth: 12' / < 1 - 1.5'; Substrate: cobble, gravel, sand, mud, root mats

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: crayfish, macrophytes, periphytes, salamander; dead deer in stream

AMNET Site # AN0373 Stream Name: Chambers(A) Bk

Location: Station Rd; Branchburg Twp; Somerset County

Collection Date: 6/4/2009 USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	29
Gammarus	6	20
Polypedilum	6	8
Stenelmis	5	6
Nais	8	4
Stictochironomus	9	4
* Chimarra	4	3
Simulium	6	3
* Baetis	6	2
Lumbricina	6	2
Physella	9.1	2
Rheotanytarsus	6	2
Stylogomphus	1	2
Aulodrilus	8	1
Bezzia	6	1
* Caenis	7	1
Corbicula	4	1
Dubiraphia	6	1
* Isonychia	2	1
Lymnaeidae	6	1
* Maccaffertium	3	1
Microtendipes	7	1
* Perlesta	4	1
Prostoma	7	1
Psephenus	4	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 5.66 # Scrapers: 6

% Sensitive EPT: 9.0% Attribute 2 genera: 0

% Non-Insect Taxa: 30.8% Attribute 3 genera: 4

HGMI Rating: 41.97 Fair

Habitat Analysis: 139 Suboptimal USEPA Protocol

Observations: Water temp: 15.21 C; Cond: 209 umhos; DO: 8.48 mg/L; pH: 7.34 SU

Clarity: turbid, brown; Flow Rate: moderate; Width/Depth: 20' / 1'; Substrate: cobble, gravel, sand, snags

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

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

Pipes / Ditches: storm sewers

Other: fish, periphytes, filamentous algae

AMNET Site # AN0374 Stream Name: N Br Raritan River

Location: Rt 202; Branchburg Twp; Somerset County

Collection Date: 6/16/2009 USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Anthopotamus	4	37
Gammarus	6	13
Stenelmis	5	11
Tvetenia	5	6
Psephenus	4	5
* Cheumatopsyche	5	4
Cricotopus	7	3
Musculium	5	3
* Perlesta	4	3
Physella	9.1	3
Eclipidrilus	8	2
* Agnetina	2	1
Amnicola	4.8	1
* Baetis	6	1
Corydalis	4	1
Cura	4	1
Optioservus	4	1
Prosimulium	2	1
* Serratella	2	1
Stagnicola	7	1
* Stenacron	4	1

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

Hilsenhoff Biotic Index (HBI): 4.82 # Scrapers: 6

% Sensitive EPT: 44.0% Attribute 2 genera: 1

% Non-Insect Taxa: 33.3% Attribute 3 genera: 5

HGMI Rating: 54.38 Good

Habitat Analysis: 165 Optimal USEPA Protocol

Observations: Water temp: 18.05 C; Cond: 273 umhos; DO: 7.22 mg/L; pH: 7.53 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 120' / < 1'; Substrate: cobble, gravel, sand, mud

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes, filamentous algae; trash; USGS gage: 1.3

AMNET Site # AN0375

Stream Name: Dukes Bk

Location: Dukes Pkwy; Hillsborough Twp; Somerset County

Collection Date: 6/4/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	44
Caecidotea	8	23
Stenelmis	5	7
Pisidium	6.8	5
Polypedilum	6	4
Crangonyx	8	3
Physella	9.1	3
Dugesia	4	2
Corbicula	4	1
Dubiraphia	6	1
Limnodrilus	10	1
Lumbricina	6	1
Microtendipes	7	1
Nais	8	1
Paratanytarsus	6	1
Paratendipes	8	1
Tipula	4	1

* (EPT organism) Taxa Richness: 17 Population: 100

Hilsenhoff Biotic Index (HBI): 6.59 # Scrapers: 3

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 58.8% Attribute 3 genera: 1

HGMI Rating: 15.92 Poor

Habitat Analysis: 140 Suboptimal USEPA Protocol

Observations: Water temp: 16.62 C; Cond: 198 umhos; DO: 8.27 mg/L; pH: 7.28 SU

Clarity: turbid, brown; Flow Rate: moderate; Width/Depth: 29' / 1-2'; Substrate: gravel, sand, silt, snags, root mats

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

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

Pipes / Ditches: ditch

Other: macrophytes, periphytes, filamentous algae

AMNET Site # AN0376

Stream Name: Peters Bk

Location: Rt 28 (E. Main St); Somerville Boro; Somerset County

Collection Date: 6/16/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	23
Nais	8	17
Stenelmis	5	9
Chironomus	10	7
Paratendipes	8	6
Dicrotendipes	8	4
Limnodrilus	10	4
Physella	9.1	4
Stictochironomus	9	4
Aulodrilus	8	3
Polypedilum	6	3
Ischnura	9	2
Pisidium	6.8	2
* Baetis	6	1
Crangonyx	8	1
Hemerodromia	6	1
* Hydroptila	6	1
Macronychus	2	1
Micropsectra	7	1
Ophidonais	7	1
Paratanytarsus	6	1
Peltodytes	5	1
Phaenopsectra	7	1
Slavina	7	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 7.28 *# Scrapers:* 5

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

% Non-Insect Taxa: 36.0% *Attribute 3 genera:* 1

HGMI Rating: 26.97 **Fair**

Habitat Analysis: 126 Suboptimal USEPA Protocol

Observations: Water temp: 17.59 C; Cond: 699 umhos; DO: 7.00 mg/L; pH: 7.54 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 22' / < 1' - 2'; Substrate: cobble, gravel, sand, mud, root mats

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, periphytes; trash

AMNET Site # AN0377

Stream Name: Raritan River

Location: abv. Millstone Confl. @ Rt 206; Manville Boro; Somerset County

Collection Date: 7/9/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Anthopotamus	4	34
Gammarus	6	9
Microtendipes	7	9
Stenelmis	5	6
Elimia	2	4
Pisidium	6.8	4
* Caenis	7	3
Dubiraphia	6	3
* Hydropsyche	4	3
* Lepidostoma	1	3
Limnodrilus	10	3
* Maccaffertium	3	2
* Mystacides	4	2
Optioservus	4	2
Thienemannimyia	6	2
Ablabesmyia	8	1
* Baetis	6	1
Caecidotea	8	1
* Cheumatopsyche	5	1
Corbicula	4	1
* Leucrocuta	1	1
Rheotanytarsus	6	1
Tanytarsus	6	1
Tribelos	5	1
* Tricorythodes	4	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 4.94 # Scrapers: 5

% Sensitive EPT: 47.0% Attribute 2 genera: 1

% Non-Insect Taxa: 23.1% Attribute 3 genera: 3

HGMI Rating: 53.62 Good

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 22.43 C; Cond: 319 umhos; DO: 7.26 mg/L; pH: 7.87 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 126' / 3 - 4'; Substrate: cobble, gravel, sand

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

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

Other: fish, macrophytes

AMNET Site # AN0378

Stream Name: Millstone River

Location: Baird Rd; Millstone Twp; Monmouth County

Collection Date: 8/25/2009 USGS Topo Map: Roosevelt

Genus	Tolerance Value	Amount
Polypedilum	6	16
* Cheumatopsyche	5	14
* Maccaffertium	3	11
Sphaeriidae	8	11
Macronychus	2	10
Simulium	6	7
* Hydropsyche	4	6
Nais	8	6
Dubiraphia	6	4
Aulodrilus	8	2
Brillia	5	2
Calopteryx	6	2
Rheocricotopus	6	2
Stenelmis	5	2
Ancyronyx	2	1
* Lype	2	1
Phaenopsectra	7	1
Rheotanytarsus	6	1
Thienemannimyia	6	1

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

%Dominance / Dominant Taxon(s): 16.0% Polypedilum

Hilsenhoff Biotic Index (HBI): 5.28

%Clingers: 58.00%

* E+P+T: 4 (1) Ephemeroptera, () Plecoptera, (3) Trichoptera

%Ephemeroptera: 11.00%

CPMI Rating: 18 Good

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 21.57 C; Cond: 155 umhos; DO: 7.02 mg/L; pH: 6.65 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 11' / < 1'; Substrate: sand, silt, snags, root mats, undercut banks

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

Stream Gradient: Low Gradient Stream; Land Uses: rural

Other: crayfish

AMNET Site # AN0379

Stream Name: Millstone River

Location: Rt 33; Millstone Twp; Monmouth County

Collection Date: 8/25/2009 USGS Topo Map: Jamesburg

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	15
Spirosperma	10	12
Pisidium	6.8	11
* Maccaffertium	3	10
Caecidotea	8	7
Simulium	6	5
Tanytarsus	6	5
Macronychus	2	4
Brillia	5	3
Gomphus	5	3
* Hydropsyche	4	3
Prostoma	7	3
* Cheumatopsyche	5	2
Dubiraphia	6	2
Phaenopsectra	7	2
Rheopelopia	4	2
Tubifex	10	2
Cardiocladius	5	1
Cryptochironomus	8	1
Cura	4	1
Hemerodromia	6	1
Nais	8	1
* Oecetis	8	1
Oulimnius	4	1
* Polycentropus	6	1
Rhagovelia	9	1

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

%Dominance / Dominant Taxon(s): 15.0% Polypedilum

Hilsenhoff Biotic Index (HBI): 6.24 %Clingers: 31.00%

* E+P+T: 5 (1) Ephemeroptera, () Plecoptera, (4) Trichoptera %Ephemeroptera: 10.00%

CPMI Rating: 14 Good

Habitat Analysis: 112 Suboptimal USEPA Protocol

Observations: Water temp: 20.83 C; Cond: 169 umhos; DO: 6.41 mg/L; pH: 6.42 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 21' / 2'; Substrate: sand, mud, silt, snags, root mats

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

Stream Gradient: Low Gradient Stream; Land Uses: rural

Other: crayfish, beaver dam

AMNET Site # AN0380

Stream Name: Rocky Bk

Location: Perrineville Rd (Sweetman's Ln); Millstone Twp; Monmouth County

Collection Date: 8/25/2009 USGS Topo Map: Roosevelt

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Amnicola	4.8	21
Gammarus	6	21
Dugesia	4	13
Polypedilum	6	9
Musculium	5	6
* Cheumatopsyche	5	5
* Hydroptila	6	4
Tanytarsus	6	4
* Caenis	7	2
Nais	8	2
Stylaria	8	2
* Callibaetis	9	1
Campeloma	7	1
Dero	10	1
Dicrotendipes	8	1
Hyalella	8	1
Lirceus	8	1
* Mystacides	4	1
* Oxyethira	3	1
Pedicia	6	1
Prostoma	7	1
Slavina	7	1

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

%Dominance / Dominant Taxon(s): 21.0% Amnicola & Gammarus

Hilsenhoff Biotic Index (HBI): 5.59

%Clingers: 9.00%

* E+P+T: 6 (2) Ephemeroptera, () Plecoptera, (4) Trichoptera

%Ephemeroptera: 3.00%

CPMI Rating: 10 Fair

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 26.40 C; Cond: 169 umhos; DO: 7.58 mg/L; pH: 7.01 SU

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

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

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

Downstream of Impoundment: below dam

Other: fish, frogs, clams / mussels, macrophytes

AMNET Site # AN0381

Stream Name: Rocky Bk

Location: Main St; Hightstown Boro; Mercer County

Collection Date: 9/22/2009 USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	19
Amnicola	4.8	16
Pisidium	6.8	14
Musculium	5	13
Dugesia	4	10
Rheotanytarsus	6	7
* Cheumatopsyche	5	5
Corbicula	4	5
Hemerodromia	6	2
Limnodrilus	10	2
Coenagrionidae	9	1
Dero	10	1
* Hydropsyche	4	1
Menetus	6	1
Paratanytarsus	6	1
Planorbidae	6	1
Prostoma	7	1

* (EPT organism) *Taxa Richness:* 17 *Population:* 100

%Dominance / Dominant Taxon(s): 19.0% Gammarus

Hilsenhoff Biotic Index (HBI): 5.58

%Clingers: 13.00%

* *E+P+T:* 2 () Ephemeroptera, () Plecoptera, (2) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 8 Fair

Habitat Analysis: 115 Suboptimal USEPA Protocol

Observations: Water temp: 18.99 C; Cond: 217 umhos; DO: 8.73 mg/L; pH: 7.08 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 27' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: Low Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Downstream of Impoundment: Peddie Lake

Other: fish, clams / mussels, macrophytes, periphytes, waterfowl (ducks); parking lots on both banks

AMNET Site # AN0382

Stream Name: Millstone River

Location: Grovers Mill Rd; West Windsor Twp; Mercer & Middlesex County

Collection Date: 9/29/2009 USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	40
Planorbidae	6	9
Dubiraphia	6	8
Amnicola	4.8	5
Corbicula	4	4
Ischnura	9	4
Physella	9.1	4
* Pseudocloeon	4	4
Argia	6	3
Paraponyx	5	3
* Acentrella	4	2
Calopteryx	6	2
Pisidium	6.8	2
Tribelos	5	2
Labrundinia	7	1
Libellulidae	9	1
Limnodrilus	10	1
Macronychus	2	1
* Nectopsyche	3	1
Paratanytarsus	6	1
Prostoma	7	1
Tubifex	10	1

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

%Dominance / Dominant Taxon(s): 40.0% Gammarus

Hilsenhoff Biotic Index (HBI): 6.01

%Clingers: 12.00%

* E+P+T: 3 (2) Ephemeroptera, () Plecoptera, (1) Trichoptera

%Ephemeroptera: 6.00%

CPMI Rating: 8 Fair

Habitat Analysis: 167 Optimal USEPA Protocol

Observations: Water temp: 17.23 C; Cond: 190 umhos; DO: 5.97 mg/L; pH: 6.59 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 90' / > 3'; Substrate: gravel, sand, undercut banks

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

Stream Gradient: Low Gradient Stream; Land Uses: forested

Other: turtle, macrophytes; flooded banks, Gage: 3.70

AMNET Site # AN0382B Stream Name: Millstone River

Location: Rt 535; East Windsor Twp; Mercer & Middlesex County

Collection Date: 9/29/2009 USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	21
Gammarus	6	17
Dubiraphia	6	13
Tribelos	5	10
Amnicola	4.8	5
Corbicula	4	5
Tubifex	10	5
Ischnura	9	3
Pisidium	6.8	3
Corixidae	9	2
Dugesia	4	2
Quistradrilus	10	2
* Triaenodes	6	2
* Cheumatopsyche	5	1
Chrysops	6	1
Clinotanypus	8	1
Erpobdellidae	8	1
Lumbriculidae	8	1
Lymnaeidae	6	1
Macronychus	2	1
* Oecetis	8	1
Paraponyx	5	1
Planorbidae	6	1

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

%Dominance / Dominant Taxon(s): 21.0% Limnodrilus

Hilsenhoff Biotic Index (HBI): 7.01

%Clingers: 16.00%

* E+P+T: 3 () Ephemeroptera, () Plecoptera, (3) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 6 Fair

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 16.46 C; Cond: 183 umhos; DO: 5.93 mg/L; pH: 6.47 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 61' / > 4'; Substrate: mud

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

Stream Gradient: Low Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: macrophytes; trash, floatables

AMNET Site # AN0382D Stream Name: Millstone River

Location: Applegarth Rd; Monroe Twp; Middlesex County

Collection Date: 9/22/2009 USGS Topo Map: Jamesburg

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Ischnura	9	19
Sphaeriidae	8	17
Culicoides	10	12
Limnodrilus	10	11
Tribelos	5	8
Clinotanypus	8	4
Dugesia	4	4
Libellulidae	9	4
Berosus	5	3
Tubifex	10	3
Aulodrilus	8	1
Caecidotea	8	1
Cladopelma	8	1
Corixidae	9	1
Cryptochironomus	8	1
Culex	8	1
Dicrotendipes	8	1
Dubiraphia	6	1
Nanocladius	3	1
* Neureclipsis	7	1
Perithemis	4	1
Physella	9.1	1
Prostoma	7	1
Tanytarsus	6	1
Tetragoneuria	8.5	1

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

%Dominance / Dominant Taxon(s): 19.0% Ischnura

Hilsenhoff Biotic Index (HBI): 8.14 %Clingers: 2.00%

* E+P+T: 1 () Ephemeroptera, () Plecoptera, (1) Trichoptera %Ephemeroptera: 0.00%

CPMI Rating: 4 Poor

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 16.03 C; Cond: 204 umhos; DO: 7.45 mg/L; pH: 6.28 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 33' / > 3'; Substrate: sand, silt, snags, root mats

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

Stream Gradient: Low Gradient Stream; Land Uses: rural

Other: macrophytes, waterfowl (geese); Fire station on left bank

AMNET Site # AN0383

Stream Name: Big Bear Bk

Location: Old Trenton Rd; West Windsor Twp; Mercer County

Collection Date: 9/29/2009 USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	35
Amnicola	4.8	12
Valvata	2	12
* Hydropsyche	4	10
* Mystacides	4	6
Enallagma	9	4
Stenelmis	5	4
Cura	4	3
Tribelos	5	3
Polypedilum	6	2
Tipula	4	2
Berosus	5	1
Chironomus	10	1
Cryptochironomus	8	1
Helisoma	7	1
Limnodrilus	10	1
Microtendipes	7	1
Rheotanytarsus	6	1

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

%Dominance / Dominant Taxon(s): 35.0% Cheumatopsyche

Hilsenhoff Biotic Index (HBI): 4.77

%Clingers: 51.00%

* E+P+T: 3 () Ephemeroptera, () Plecoptera, (3) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 14 Good

Habitat Analysis: 163 Optimal USEPA Protocol

Observations: Water temp: 15.65 C; Cond: 160 umhos; DO: 6.74 mg/L; pH: 6.69 SU

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

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

Stream Gradient: Low Gradient Stream; Land Uses: suburban, forested, agriculture-cropland

Pipes / Ditches: storm sewers

Other: macrophytes, periphytes; new bridge in 2008

AMNET Site # AN0384

Stream Name: Bear Bk

Location: Cranbury Rd (Rt 615); West Windsor Twp; Mercer County

Collection Date: 9/29/2009 USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	44
* Cheumatopsyche	5	17
Rheotanytarsus	6	11
Corbicula	4	5
Glyptotendipes	10	3
Musculium	5	3
Pisidium	6.8	3
Amnicola	4.8	2
Caecidotea	8	2
Stenelmis	5	2
Clinocera	6	1
Cura	4	1
Gloiobdella	6	1
* Hydropsyche	4	1
Limnodrilus	10	1
Menetus	6	1
Physa	8	1
Polypedilum	6	1

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

%Dominance / Dominant Taxon(s): 44.0% Gammarus

Hilsenhoff Biotic Index (HBI): 5.86 %Clingers: 32.00%

* E+P+T: 2 () Ephemeroptera, () Plecoptera, (2) Trichoptera %Ephemeroptera: 0.00%

CPMI Rating: 10 Fair

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 18.06 C; Cond: 148 umhos; DO: 7.11 mg/L; pH: 6.56 SU

Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 30' / < 1'; Substrate: cobble, gravel, sand

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

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

Pipes / Ditches: storm sewers

Other: macrophytes

AMNET Site # AN0385

Stream Name: Cranbury Bk

Location: Applegarth Rd; Monroe Twp; Middlesex County

Collection Date: 9/22/2009 USGS Topo Map: Jamesburg

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Tribelos	5	36
Stylaria	8	25
Phaenopsectra	7	6
Microtendipes	7	3
Ancyronyx	2	2
Caecidotea	8	2
Coenagrionidae	9	2
Cricotopus	7	2
Dubiraphia	6	2
* Mystacides	4	2
* Oecetis	8	2
Ablabesmyia	8	1
Brillia	5	1
Calopteryx	6	1
* Cheumatopsyche	5	1
Dicrotendipes	8	1
Glyptotendipes	10	1
Hyaella	8	1
Polypedilum	6	1
Procladius	9	1
* Pseudocloeon	4	1
* Ptilostomis	5	1
Rheotanytarsus	6	1
Sphaeriidae	8	1
Stenochironomus	5	1
Tanytarsus	6	1
Thienemannimyia	6	1

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

%Dominance / Dominant Taxon(s): 36.0% Tribelos

Hilsenhoff Biotic Index (HBI): 6.36 %Clingers: 19.00%

* E+P+T: 5 (1) Ephemeroptera, () Plecoptera, (4) Trichoptera %Ephemeroptera: 1.00%

CPMI Rating: 12 Good

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 15.50 C; Cond: 227 umhos; DO: 8.19 mg/L; pH: 6.35 SU

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

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

Stream Gradient: Low Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: frogs, macrophytes, periphytes, filamentous algae, orange floc

AMNET Site # AN0386

Stream Name: Cranbury Bk

Location: Maple Ave; Plainsboro Twp; Middlesex County

Collection Date: 9/29/2009 USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Glyptotendipes	10	27
Rheotanytarsus	6	20
Cura	4	11
Nais	8	9
Prostoma	7	6
Gammarus	6	4
Nematoda	6	4
Simulium	6	4
Amnicola	4.8	3
Musculium	5	3
Tubifex	10	2
* Cheumatopsyche	5	1
Dicrotendipes	8	1
Helisoma	7	1
Phaenopsectra	7	1
Pristina	8	1
Sphaerium	8	1
Stenelmis	5	1

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

%Dominance / Dominant Taxon(s): 27.0% Glyptotendipes

Hilsenhoff Biotic Index (HBI): 7.17

%Clingers: 27.00%

* E+P+T: 1 () Ephemeroptera, () Plecoptera, (1) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 8 Fair

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 17.69 C; Cond: 181 umhos; DO: 7.30 mg/L; pH: 6.48 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 23' / 2-3'; Substrate: gravel

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

Stream Gradient: Low Gradient Stream; Land Uses: suburban, park

Downstream of Impoundment: Plainsboro Pond

Other: macrophytes; fishermen, flooded banks, gabion along LB

AMNET Site # AN0387

Stream Name: Devils Bk

Location: New Rd; South Brunswick Twp; Middlesex County

Collection Date: 9/22/2009 USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	23
Caecidotea	8	16
Paratanytarsus	6	12
Pristina	8	10
Rheotanytarsus	6	8
Stylaria	8	5
Tanytarsus	6	5
Dubiraphia	6	4
* Cheumatopsyche	5	3
Tribelos	5	3
Musculium	5	2
Nais	8	2
Ablabesmyia	8	1
* Caenis	7	1
Enallagma	9	1
Microtendipes	7	1
Rheopelopia	4	1
Stenelmis	5	1
Stenochironomus	5	1

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

%Dominance / Dominant Taxon(s): 23.0% Gammarus

Hilsenhoff Biotic Index (HBI): 6.61

%Clingers: 17.00%

* E+P+T: 2 (1) Ephemeroptera, () Plecoptera, (1) Trichoptera

%Ephemeroptera: 1.00%

CPMI Rating: 8 Fair

Habitat Analysis: 152 Suboptimal USEPA Protocol

Observations: Water temp: 14.92 C; Cond: 136 umhos; DO: 2.12 mg/L; pH: 6.36 SU

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

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

Stream Gradient: Low Gradient Stream; Land Uses: rural, forested, "South Brunswick Open Space"

Other: fish, frogs, macrophytes, periphytes; gravel parking lot on LB; baseball field on RB

AMNET Site # AN0388

Stream Name: Shallow Bk

Location: Scotts Corner Rd; South Brunswick Twp; Middlesex County

Collection Date: 9/22/2009 USGS Topo Map: Hightstown

Genus	Tolerance Value	Amount
Hyaella	8	37
Enallagma	9	16
Chironomus	10	9
Polypedilum	6	6
Aedes	8	3
Erythemis	10	3
Nais	8	3
Sympetrum	4	3
* Baetis	6	2
Bezzia	6	2
Dero	10	2
Musculium	5	2
Tubifex	10	2
Alboglossiphonia	8	1
* Caenis	7	1
Helobdella	8	1
Nematoda	6	1
Omisis	6	1
Peltodytes	5	1
Pisidium	6.8	1
Pristinella	10	1
Procladius	9	1
Tanytarsus	6	1

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

%Dominance / Dominant Taxon(s): 37.0% Hyaella

Hilsenhoff Biotic Index (HBI): 8.02

%Clingers: 0.00%

* E+P+T: 2 (2) Ephemeroptera, () Plecoptera, () Trichoptera

%Ephemeroptera: 3.00%

CPMI Rating: 4 Poor

Habitat Analysis: 119 Suboptimal USEPA Protocol

Observations: Water temp: 17.14 C; Cond: 107 umhos; DO: 0.36 mg/L; pH: 5.91 SU

Clarity: clear, cedar brown; Flow Rate: slow; Width/Depth: 12' / 2'; Substrate: gravel, sand, silt, snags

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

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

Pipes / Ditches: storm sewers

Downstream of Impoundment: small dam

Other: macrophytes; surrounded by wetlands, power line easement crosses stream

AMNET Site # AN0390 Stream Name: Camp Harmony Br of Stony Bk

Location: VanDyke Rd; Hopewell Twp; Mercer County

Collection Date: 10/19/2009 USGS Topo Map: Hopewell

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Sphaeriidae	8	27
* Cheumatopsyche	5	14
Psephenus	4	11
Stenelmis	5	9
Tipulidae	3	5
Microtendipes	7	4
* Hydropsyche	4	3
Limnodrilus	10	3
* Stenacron	4	3
Thienemannimyia	6	3
* Centroptilum	2	2
Chironomini	6	2
Nigronia	2	2
Tanytarsini	6	2
Tvetenia	5	2
Brillia	5	1
* Chimarra	4	1
Crangonyx	8	1
Lumbriculidae	8	1
* Lype	2	1
* Paraleptophlebia	1	1
Parametriochnemus	5	1
Sialis	4	1

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

Hilsenhoff Biotic Index (HBI): 5.69 # Scrapers: 3

% Sensitive EPT: 8.0% Attribute 2 genera: 2

% Non-Insect Taxa: 17.4% Attribute 3 genera: 3

HGMI Rating: 40.70 Fair

Habitat Analysis: 166 Optimal USEPA Protocol

Observations: Water temp: 6.72 C; Cond: 186 umhos; DO: 7.82 mg/L; pH: 8.07 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: macrophytes, periphytes

AMNET Site # AN0391

Stream Name: Stony Bk

Location: Mine Rd; Hopewell Twp; Mercer County

Collection Date: 10/19/2009

USGS Topo Map: Pennington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Chimarra	4	25
Dugesia	4	17
* Baetis	6	15
* Cheumatopsyche	5	13
Stenelmis	5	8
* Hydropsyche	4	7
Microtendipes	7	2
Antocha	3	1
* Ceratopsyche	4	1
Crangonyx	8	1
Cricotopus	7	1
Gammarus	6	1
Hemerodromia	6	1
* Heptageniidae	4	1
* Maccaffertium	3	1
Nais	8	1
Psephenus	4	1
Simulium	6	1
* Stenacron	4	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 4.73 # Scrapers: 5

% Sensitive EPT: 43.0% Attribute 2 genera: 0

% Non-Insect Taxa: 20.0% Attribute 3 genera: 2

HGMI Rating: 47.33 Good

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 6.69 C; Cond: 220 umhos; DO: 10.87 mg/L; pH: 7.24 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 58' / 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: rural (horse farm on RB)

Other: crayfish, periphytes, filamentous algae

AMNET Site # AN0392

Stream Name: Stony Bk

Location: Old Mill Rd; Pennington Boro; Mercer County

Collection Date: 10/19/2009

USGS Topo Map: Pennington

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	22
* Hydropsyche	4	18
* Chimarra	4	15
Stenelmis	5	10
* Maccaffertium	3	8
Cura	4	6
Psephenus	4	4
Pisidium	6.8	3
* Baetis	6	2
Gammarus	6	2
* Isonychia	2	2
Dicrotendipes	8	1
Eclipidrilus	8	1
Helobdella	8	1
Laevapex	6	1
Orthoclaadiinae	5	1
* Polycentropus	6	1
Polypedilum	6	1
Simulium	6	1

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

Hilsenhoff Biotic Index (HBI): 4.57 *# Scrapers:* 4

% Sensitive EPT: 28.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 31.6% *Attribute 3 genera:* 3

HGMI Rating: 42.10 Good

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 7.36 C; Cond: 267 umhos; DO: 9.99 mg/L; pH: 7.79 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 56' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, crayfish, waterfowl (ducks); "trout stocked" stream sign, bridge closed to traffic

AMNET Site # AN0393

Stream Name: Stony Bk

Location: Rt 206; Princeton Twp; Mercer County

Collection Date: 10/19/2009

USGS Topo Map: Princeton

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	22
Cricotopus	7	15
* Baetis	6	11
* Maccaffertium	3	10
* Chimarra	4	9
Stenelmis	5	8
Simulium	6	6
* Hydropsyche	4	4
* Isonychia	2	2
Rheotanytarsus	6	2
Amnicola	4.8	1
Argia	6	1
* Ceratopsyche	4	1
Dugesia	4	1
Gammarus	6	1
Optioservus	4	1
Pisidium	6.8	1
Psephenus	4	1
* Stenacron	4	1
Stylaria	8	1
Tvetenia	5	1

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

Hilsenhoff Biotic Index (HBI): 5.12 # Scrapers: 5

% Sensitive EPT: 33.0% Attribute 2 genera: 0

% Non-Insect Taxa: 23.8% Attribute 3 genera: 3

HGMI Rating: 46.04 Good

Habitat Analysis: 154 Suboptimal USEPA Protocol

Observations: Water temp: 7.27 C; Cond: 264 umhos; DO: 11.48 mg/L; pH: 7.64 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 69' / < 1 - 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: periphytes; USGS gage station

AMNET Site # AN0394 **Stream Name: Duck Pond Run**

Location: Rt 1; West Windsor Twp; Mercer County

Collection Date: 10/8/2009 **USGS Topo Map: Princeton**

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	59
* Cheumatopsyche	5	16
Rheotanytarsus	6	8
Amnicola	4.8	6
Calopteryx	6	5
Polypedilum	6	3
Stenelmis	5	2
Simulium	6	1

* (*EPT organism*) *Taxa Richness:* 8 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.75 *# Scrapers:* 2

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 25.0% *Attribute 3 genera:* 0

HGMI Rating: 20.02 Poor

Habitat Analysis: 116 Suboptimal USEPA Protocol

Observations: Water temp: 13.20 C; Cond: 271 umhos; DO: 7.20 mg/L; pH: 6.58 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: urban

Other: fish, salamander, macrophytes, periphytes, heron

AMNET Site # AN0395

Stream Name: Heathcote Bk

Location: Stouts Ln; South Brunswick Twp; Middlesex County

Collection Date: 10/29/2009

USGS Topo Map: Monmouth Junction

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Hydropsyche	4	51
* Cheumatopsyche	5	19
* Chimarra	4	10
Gammarus	6	7
Physella	9.1	5
Tipula	4	4
Lumbricidae	10	3
Microvelia	6	1

* (EPT organism) *Taxa Richness:* 8 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.79 *# Scrapers:* 1

% Sensitive EPT: 10.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 37.5% *Attribute 3 genera:* 2

HGMI Rating: 23.46 **Fair**

Habitat Analysis: 120 Suboptimal USEPA Protocol

Observations: Water temp: 13.23 C; Cond: 370 umhos; DO: 9.17 mg/L; pH: 7.35 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: salamander, periphytes, filamentous algae; site adjacent to new shopping center

AMNET Site # AN0396

Stream Name: Heathcote Bk

Location: Academy St; South Brunswick Twp; Middlesex County

Collection Date: 10/29/2009

USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	20
Stenelmis	5	14
* Hydropsyche	4	11
* Cheumatopsyche	5	9
* Chimarra	4	9
Amnicola	4.8	7
Nais	8	5
Dugesia	4	3
Dubiraphia	6	2
* Glossosoma	0	2
* Lepidostoma	1	2
Microtendipes	7	2
Optioservus	4	2
Rheotanytarsus	6	2
Caecidotea	8	1
Corynoneura	4	1
Naididae	7	1
Orthoclaadiinae	5	1
Oulimnius	4	1
Planorbidae	6	1
Psephenus	4	1
Tanytarsini	6	1
Tipula	4	1
Tribelos	5	1

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

Hilsenhoff Biotic Index (HBI): 5.02 # Scrapers: 7

% Sensitive EPT: 13.0% Attribute 2 genera: 2

% Non-Insect Taxa: 29.2% Attribute 3 genera: 1

HGMI Rating: 43.74 Good

Habitat Analysis: 140 Suboptimal USEPA Protocol

Observations: Water temp: 12.32 C; Cond: 161 umhos; DO: 7.23 mg/L; pH: 6.43 SU

Clarity: clear, brownish; Flow Rate: fast; Width/Depth: 35' / 3'; Substrate: cobble, gravel, sand, root mats

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: clams / mussels, macrophytes; USGS gage

AMNET Site # AN0397

Stream Name: Millstone River

Location: outlet of Carnegie Lake off Rt 27; South Brunswick Twp; Middlesex & Mercer County

Collection Date: 11/17/2009

USGS Topo Map: Hightstown

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	38
Lirceus	8	16
Musculium	5	15
* Cheumatopsyche	5	7
* Hydropsyche	4	6
Dugesia	4	3
Rheotanytarsus	6	3
Corbicula	4	2
Menetus	6	2
Stenelmis	5	2
Caecidotea	8	1
Glyptotendipes	10	1
Hemerodromia	6	1
Laevapex	6	1
Ripistes	8	1
Simulium	6	1

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

Hilsenhoff Biotic Index (HBI): 5.94 # Scrapers: 3

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 56.3% Attribute 3 genera: 0

HGMI Rating: 18.81 Poor

Habitat Analysis: 169 Optimal USEPA Protocol

Observations: Water temp: 11.27 C; Cond: 267 umhos; DO: 10.59 mg/L; pH: 6.75 SU

Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 30' / 2 - 3'; Substrate: cobble, gravel, sand, mud, snags, root mats

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

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

Downstream of Impoundment: Carnegie Lake

Other: fish, turtle, clams / mussels

AMNET Site # AN0398

Stream Name: Bedens Bk

Location: Aunt Molly Rd; Hopewell Twp; Mercer County

Collection Date: 10/19/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	12
Rheotanytarsus	6	12
Microtendipes	7	10
Cricotopus	7	8
* Hydropsyche	4	7
Micropsectra	7	7
* Stenacron	4	7
Simulium	6	6
* Baetis	6	3
Nais	8	3
Parametrioctenus	5	3
Polypedilum	6	3
Bezzia	6	2
Branchiura	10	2
* Chimarra	4	2
Psephenus	4	2
Tvetenia	5	2
* Caenis	7	1
* Ceratopsyche	4	1
Dicrotendipes	8	1
Eclipidrilus	8	1
* Eurylophella	4	1
* Maccaffertium	3	1
Planariidae	4	1
Stictochironomus	9	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 5.85 # Scrapers: 4

% Sensitive EPT: 15.0% Attribute 2 genera: 0

% Non-Insect Taxa: 15.4% Attribute 3 genera: 4

HGMI Rating: 43.73 Good

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 7.41 C; Cond: 258 umhos; DO: 10.48 mg/L; pH: 7.48 SU

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

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

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

Other: fish, crayfish, macrophytes, periphytes, filamentous algae; near STP

AMNET Site # AN0399

Stream Name: Rock Bk

Location: Long Hill Rd; Montgomery Twp; Somerset County

Collection Date: 8/5/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Hydropsyche	4	30
Stenelmis	5	11
* Acroneuria	0	10
Psephenus	4	10
* Cheumatopsyche	5	8
Simulium	6	5
* Maccaffertium	3	4
Polypedilum	6	4
* Chimarra	4	3
* Baetis	6	2
Cambarus	6	2
Antocha	3	1
Eclipidrilus	8	1
Eukiefferiella	8	1
* Glossosoma	0	1
Hemerodromia	6	1
* Leuctra	0	1
* Micrasema	2	1
* Mystacides	4	1
Pisidium	6.8	1
Rhagovelia	9	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 4.08 # Scrapers: 4

% Sensitive EPT: 23.0% Attribute 2 genera: 2

% Non-Insect Taxa: 13.6% Attribute 3 genera: 7

HGMI Rating: 57.95 Good

Habitat Analysis: 176 Optimal USEPA Protocol

Observations: Water temp: 20.82 C; Cond: 115 umhos; DO: 8.41 mg/L; pH: 7.45 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 10' / < 1'; Substrate: cobble, gravel, sand

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

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

Other: fish, crayfish, periphytes, "trout stocked" water; recent flooding

AMNET Site # AN0400

Stream Name: Rock Bk

Location: Burnt Mill Rd; Montgomery Twp; Somerset County

Collection Date: 8/5/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	18
Polypedilum	6	13
Rheotanytarsus	6	8
* Caenis	7	5
Menetus	6	5
Caecidotea	8	4
Dubiraphia	6	4
Trichocorixa	9	4
Dicrotendipes	8	3
Ischnura	9	3
* Maccaffertium	3	3
Stenelmis	5	3
Trepobates	8	3
* Cheumatopsyche	5	2
* Hydropsyche	4	2
Phaenopsectra	7	2
* Stenacron	4	2
Curculionidae	7	1
Eclipidrilus	8	1
Enchytraeidae	10	1
Hemerodromia	6	1
Hydrovatus	5	1
Musculium	5	1
* Mystacides	4	1
Nais	8	1
Prostoma	7	1
Psephenus	4	1
Somatochlora	1	1

* (EPT organism) Taxa Richness: 28 Population: 95

Hilsenhoff Biotic Index (HBI): 6.26 # Scrapers: 7

% Sensitive EPT: 11.6% Attribute 2 genera: 1

% Non-Insect Taxa: 28.6% Attribute 3 genera: 2

HGMI Rating: 41.56 Fair

Habitat Analysis: 145 Suboptimal USEPA Protocol

Observations: Water temp: 23.21 C; Cond: 190 umhos; DO: 7.54 mg/L; pH: 7.27 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 77' / 1 - 3'; Substrate: cobble, gravel, sand, root mats

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: ditches

Other: fish (large carp), macrophytes; recent flooding

AMNET Site # AN0401

Stream Name: Bedens Bk

Location: Rt 206; Montgomery Twp; Somerset County

Collection Date: 8/5/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Chimarra	4	33
Stenelmis	5	24
Simulium	6	8
Cura	4	6
* Cheumatopsyche	5	4
Gammarus	6	4
Hemerodromia	6	3
Caecidotea	8	2
Optioservus	4	2
Prostoma	7	2
Psephenus	4	2
Rheotanytarsus	6	2
* Caenis	7	1
* Lepidostoma	1	1
* Maccaffertium	3	1
Parametricnemus	5	1
Polypedilum	6	1
Prosimulium	2	1
Rhagovelia	9	1
* Stenonema	3	1

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

Hilsenhoff Biotic Index (HBI): 4.80 # Scrapers: 4

% Sensitive EPT: 37.0% Attribute 2 genera: 1

% Non-Insect Taxa: 20.0% Attribute 3 genera: 5

HGMI Rating: 52.11 Good

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 22.71 C; Cond: 243 umhos; DO: 8.92 mg/L; pH: 7.38 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 53' / 1 - 2'; Substrate: cobble, gravel, sand

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

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

Pipes / Ditches: storm sewers

Other: fish, macrophytes, filamentous algae; recent flooding

AMNET Site # AN0402

Stream Name: Pike Run

Location: Rt 206; Montgomery Twp; Somerset County

Collection Date: 6/16/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Physella	9.1	28
Gammarus	6	10
Micropsectra	7	7
Pisidium	6.8	7
Ophidonais	7	5
Polypedilum	6	5
Stenelmis	5	5
Caecidotea	8	4
Tvetenia	5	4
* Cheumatopsyche	5	2
Lumbricina	6	2
Musculium	5	2
Parametriochnemus	5	2
Psephenus	4	2
Ancyronyx	2	1
Brillia	5	1
* Chimarra	4	1
Corbicula	4	1
Dicrotendipes	8	1
Dugesia	4	1
Enchytraeidae	10	1
Eukiefferiella	8	1
Nais	8	1
Orthocladus	6	1
Phaenopsectra	7	1
Rheotanytarsus	6	1
Simulium	6	1
Thienemannimyia	6	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 6.91 *# Scrapers:* 4

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 37.9% *Attribute 3 genera:* 2

HGMI Rating: 29.14 **Fair**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 17.04 C; Cond: 224 umhos; DO: 8.87 mg/L; pH: 7.12 SU

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

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

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

Pipes / Ditches: ditches

Other: mussels, periphytes; adj to pumping station

AMNET Site # AN0403

Stream Name: Crusier Bk

Location: Rt 206; Montgomery Twp; Somerset County

Collection Date: 6/16/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	41
* Perlesta	4	15
Stictochironomus	9	11
* Cheumatopsyche	5	6
Corixidae	9	5
Dicrotendipes	8	3
Macronychus	2	2
Ophidonais	7	2
Peltodytes	5	2
Ancyronyx	2	1
Caecidotea	8	1
* Caenis	7	1
Ectopria	5	1
Erpobdellidae	8	1
Ischnura	9	1
Lymnaeidae	6	1
Microtendipes	7	1
Phaenopsectra	7	1
Physella	9.1	1
Planorbidae	6	1
Psephenus	4	1
Stenelmis	5	1

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

Hilsenhoff Biotic Index (HBI): 6.15 *# Scrapers:* 8

% Sensitive EPT: 16.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 31.8% *Attribute 3 genera:* 1

HGMI Rating: 36.51 Fair

Habitat Analysis: 143 Suboptimal USEPA Protocol

Observations: Water temp: 16.72 C; Cond: 157 umhos; DO: 9.28 mg/L; pH: 7.24 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / 1'; Substrate: gravel, sand, mud

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: ditches

Other: crayfish

AMNET Site # AN0404

Stream Name: Back Bk

Location: Rt 206; Montgomery Twp; Somerset County

Collection Date: 6/16/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Amnicola	4.8	23
Stenelmis	5	18
Caecidotea	8	10
Polypedilum	6	7
Pisidium	6.8	6
* Chimarra	4	4
Micropsectra	7	4
Microtendipes	7	4
Argia	6	2
* Cheumatopsyche	5	2
Gammarus	6	2
Psephenus	4	2
* Stenacron	4	2
Stictochironomus	9	2
* Caenis	7	1
Dugesia	4	1
Ectopria	5	1
Gomphidae	1	1
Ischnura	9	1
Macronychus	2	1
Nais	8	1
Orthoclaadiinae	5	1
Physella	9.1	1
Prostoma	7	1
Slavina	7	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 5.73 # Scrapers: 7

% Sensitive EPT: 7.0% Attribute 2 genera: 0

% Non-Insect Taxa: 34.6% Attribute 3 genera: 1

HGMI Rating: 35.66 Fair

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 17.36 C; Cond: 235 umhos; DO: 9.19 mg/L; pH: 7.17 SU

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

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

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

Pipes / Ditches: ditch

Other: fish, eels, salamander, periphytes

AMNET Site # AN0405

Stream Name: Pike Run

Location: Rt 533; Montgomery Twp; Somerset County

Collection Date: 8/6/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	62
Polypedilum	6	6
* Maccaffertium	3	5
Stenelmis	5	5
* Stenacron	4	3
Caecidotea	8	2
Corbicula	4	2
Dubiraphia	6	2
Dugesia	4	2
Tanytarsus	6	2
Amnicola	4.8	1
Ancyronyx	2	1
Argia	6	1
Aulodrilus	8	1
* Cheumatopsyche	5	1
Helisoma	7	1
Phaenopsectra	7	1
Rheotanytarsus	6	1
Tetragoneuria	8.5	1

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

Hilsenhoff Biotic Index (HBI): 5.70 *# Scrapers:* 7

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

% Non-Insect Taxa: 36.8% *Attribute 3 genera:* 1

HGMI Rating: 33.27 **Fair**

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 20.45 C; Cond: 292 umhos; DO: 8.46 mg/L; pH: 7.31 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 42' / 1 - 2'; Substrate: cobble, gravel, sand, mud

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

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

Pipes / Ditches: storm sewers, ditch on RB

Other: clams / mussels

AMNET Site # AN0406

Stream Name: Simonson Bk

Location: Canal Rd; Franklin Twp; Somerset County

Collection Date: 8/6/2009

USGS Topo Map: Monmouth Junction

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Stenelmis	5	36
Caecidotea	8	13
Gammarus	6	11
Tubifex	10	7
Physella	9.1	4
* Stenacron	4	4
* Lepidostoma	1	3
Pisidium	6.8	3
* Cheumatopsyche	5	2
Phaenopsectra	7	2
Trichocorixa	9	2
* Chimarra	4	1
Cryptochironomus	8	1
Dicrotendipes	8	1
Eclipidrilus	8	1
Hetaerina	6	1
Menetus	6	1
Parametricnemus	5	1
* Phryganeidae	4	1
Polypedilum	6	1
Prostoma	7	1
Rheocricotopus	6	1
Rheotanytarsus	6	1
Stylogomphus	1	1

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

Hilsenhoff Biotic Index (HBI): 6.13 # Scrapers: 5

% Sensitive EPT: 9.0% Attribute 2 genera: 1

% Non-Insect Taxa: 33.3% Attribute 3 genera: 2

HGMI Rating: 34.83 Fair

Habitat Analysis: 128 Suboptimal USEPA Protocol

Observations: Water temp: 18.97 C; Cond: 225 umhos; DO: 8.75 mg/L; pH: 7.27 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 16' / < 1'; Substrate: cobble, gravel, sand

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

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

Pipes / Ditches: storm sewers

Other: fish, periphytes

AMNET Site # AN0407

Stream Name: Ten Mile Run

Location: Canal Rd; Franklin Twp; Somerset County

Collection Date: 8/6/2009

USGS Topo Map: Monmouth Junction

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	22
Stenelmis	5	18
Psephenus	4	8
* Caenis	7	6
* Stenonema	3	5
Tanytarsus	6	4
* Cheumatopsyche	5	3
Cura	4	3
* Lepidostoma	1	3
Rheotanytarsus	6	3
* Stenacron	4	3
Caecidotea	8	2
* Chimarra	4	2
Dubiraphia	6	2
Paratanytarsus	6	2
Prostoma	7	2
Corynoneura	4	1
Dicrotendipes	8	1
Limnodrilus	10	1
Microtendipes	7	1
* Nyctiophylax	5	1
Polypedilum	6	1
Slavina	7	1
Stylodrilus	10	1
Stylogomphus	1	1
Trepobates	8	1
Trichocorixa	9	1
Tubificidae	10	1

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

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

% Sensitive EPT: 20.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 28.6% *Attribute 3 genera:* 1

HGMI Rating: 41.05 Fair

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 19.61 C; Cond: 280 umhos; DO: 8.37 mg/L; pH: 7.41 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 25' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, weeds

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

Other: fish, periphytes

AMNET Site # AN0408

Stream Name: Six Mile Run

Location: Rt 27; Franklin Twp; Somerset & Middlesex County

Collection Date: 8/13/2009 USGS Topo Map: Monmouth Junction

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	43
Gammarus	6	23
Aulodrilus	8	8
Paratanytarsus	6	6
Paratendipes	8	3
Polypedilum	6	2
Ablabesmyia	8	1
Brillia	5	1
Caecidotea	8	1
* Caenis	7	1
Dero	10	1
Dicrotendipes	8	1
Helobdella	8	1
Lumbriculus	8	1
Pisidium	6.8	1
Planariidae	4	1
Planorbidae	6	1
Prostoma	7	1
Rheotanytarsus	6	1
Trepobates	8	1
Tubifex	10	1

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

Hilsenhoff Biotic Index (HBI): 8.14 # Scrapers: 1

% Sensitive EPT: 1.0% Attribute 2 genera: 0

% Non-Insect Taxa: 57.1% Attribute 3 genera: 0

HGMI Rating: 11.91 Poor

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 21.43 C; Cond: 370 umhos; DO: 6.01 mg/L; pH: 7.15 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: commercial, suburban, forested, adj to graveyard

Pipes / Ditches: storm sewers

Other: fish, turtle, periphytes; sewage odor from adj pumping station

AMNET Site # AN0409

Stream Name: Six Mile Run

Location: Canal Rd; Franklin Twp; Somerset County

Collection Date: 8/6/2009

USGS Topo Map: Monmouth Junction

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	45
Paratanytarsus	6	9
Rheotanytarsus	6	6
Tanytarsus	6	6
Phaenopsectra	7	5
Dicrotendipes	8	3
Stenelmis	5	3
* Stenonema	3	3
Ancyronyx	2	2
* Lepidostoma	1	2
Oulimnius	4	2
Prostoma	7	2
Amnicola	4.8	1
Caecidotea	8	1
* Cheumatopsyche	5	1
Fossaria	6	1
* Maccaffertium	3	1
Macronychus	2	1
Micropsectra	7	1
* Mystacides	4	1
Nais	8	1
Optioservus	4	1
Stylogrilus	10	1
Thienemanniella	6	1

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

Hilsenhoff Biotic Index (HBI): 5.75 # Scrapers: 8

% Sensitive EPT: 7.0% Attribute 2 genera: 1

% Non-Insect Taxa: 29.2% Attribute 3 genera: 3

HGMI Rating: 43.70 Good

Habitat Analysis: 133 Suboptimal USEPA Protocol

Observations: Water temp: 19.44 C; Cond: 281 umhos; DO: 8.28 mg/L; pH: 7.28 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 25' / 1'; Substrate: cobble, gravel, sand, mud

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, open field

Other: fish, clams / mussels, purple loosestrife; trash; eroded banks

AMNET Site # AN0410

Stream Name: Millstone River

Location: Blackwells Mills Rd; Hillsborough Twp; Somerset County

Collection Date: 8/6/2009 USGS Topo Map: Monmouth Junction

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	27
Valvata	2	11
Limnodrilus	10	9
Polypedilum	6	9
Sphaerium	8	8
Caecidotea	8	5
Corbicula	4	3
Procladius	9	3
Tubifex	10	3
Corydalis	4	2
Dubiraphia	6	2
Elimia	2	2
Gillia	8	2
Macronychus	2	2
Stenochironomus	5	2
Tanytarsus	6	2
Ancyronyx	2	1
Brillia	5	1
Dicrotendipes	8	1
Menetus	6	1
Parametrioctenus	5	1
* Phylocentropus	5	1
* Stenacron	4	1
Tribelos	5	1

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

Hilsenhoff Biotic Index (HBI): 6.07 # Scrapers: 6

% Sensitive EPT: 2.0% Attribute 2 genera: 0

% Non-Insect Taxa: 41.7% Attribute 3 genera: 2

HGMI Rating: 34.08 Fair

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 23.44 C; Cond: 215 umhos; DO: 5.37 mg/L; pH: 6.88 SU

Clarity: turbid; Flow Rate: fast; Width/Depth: 101' / 3 - 4'; Substrate: mud

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

Stream Gradient: High Gradient Stream; Land Uses: rural, forested, Blackwells Mills Park

Pipes / Ditches: storm sewers

Other: macrophytes, garter snake, purple loosestrife; USGS gage: 2.20

AMNET Site # AN0411

Stream Name: Royce Bk

Location: Rt 206; Hillsborough Twp; Somerset County

Collection Date: 6/16/2009

USGS Topo Map: Rocky Hill

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	43
* Cheumatopsyche	5	15
Polypedilum	6	11
Stenelmis	5	8
Caecidotea	8	4
Physella	9.1	4
Ferrissia	7	3
Simulium	6	3
Menetus	6	2
Rheotanytarsus	6	2
Cambaridae	5	1
* Hydropsyche	4	1
Nais	8	1
Tanytarsus	6	1
Tvetenia	5	1

* (EPT organism) Taxa Richness: 15 Population: 100

Hilsenhoff Biotic Index (HBI): 5.98 # Scrapers: 4

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 46.7% Attribute 3 genera: 0

HGMI Rating: 19.40 Poor

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 18.04 C; Cond: 285 umhos; DO: 8.27 mg/L; pH: 7.19 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand, mud, snags

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: crayfish, clams / mussels, periphytes, geese

AMNET Site # AN0412

Stream Name: Royce Bk Br

Location: Rt 206; Hillsborough Twp; Somerset County

Collection Date: 6/16/2009

USGS Topo Map: Raritan

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	44
Tanytarsus	6	9
Nais	8	6
Paratanytarsus	6	6
Stictochironomus	9	6
Physella	9.1	3
Ischnura	9	2
Limnodrilus	10	2
Micropsectra	7	2
Parametriochnemus	5	2
Polypedilum	6	2
Slavina	7	2
* Anthopotamus	4	1
Aulodrilus	8	1
Chironomus	10	1
Cladotanytarsus	7	1
Dero	10	1
Dicrotendipes	8	1
Dugesia	4	1
Lumbricina	6	1
Paratendipes	8	1
Phaenopsectra	7	1
Pisidium	6.8	1
Prostoma	7	1
Psephenus	4	1
Trepobates	8	1

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

Hilsenhoff Biotic Index (HBI): 6.69 # Scrapers: 3

% Sensitive EPT: 1.0% Attribute 2 genera: 0

% Non-Insect Taxa: 42.3% Attribute 3 genera: 1

HGMI Rating: 24.08 Fair

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 16.93 C; Cond: 448 umhos; DO: 7.18 mg/L; pH: 7.40 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 17' / 1'; Substrate: gravel, sand, silt, root mats, undercut banks

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

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

Pipes / Ditches: ditches

Other: fish, macrophytes

AMNET Site # AN0413 Stream Name: Royce Bk

Location: Rt 533; Manville Boro; Somerset County

Collection Date: 8/6/2009 USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	42
Limnodrilus	10	19
Stenelmis	5	19
Amnicola	4.8	6
Corbicula	4	3
Paratendipes	8	3
Pisidium	6.8	2
Crangonyx	8	1
Dubiraphia	6	1
Dugesia	4	1
Physella	9.1	1
* Stenacron	4	1
Xylotopus	2	1

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

Hilsenhoff Biotic Index (HBI): 6.49 # Scrapers: 5

% Sensitive EPT: 1.0% Attribute 2 genera: 0

% Non-Insect Taxa: 61.5% Attribute 3 genera: 0

HGMI Rating: 16.02 Poor

Habitat Analysis: 113 Suboptimal USEPA Protocol

Observations: Water temp: 21.42 C; Cond: 338 umhos; DO: 7.96 mg/L; pH: 7.35 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: fish, crayfish, clams / mussels, waterfowl (ducks), periphytes, trash

AMNET Site # AN0414

Stream Name: Millstone River

Location: abv. Raritan Confl.; Manville Boro; Somerset County

Collection Date: 7/8/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	18
Dubiraphia	6	12
Pisidium	6.8	10
Caecidotea	8	8
Chironomus	10	8
Gammarus	6	7
Polypedilum	6	7
Amnicola	4.8	6
Tanytarsus	6	6
Physella	9.1	4
Aulodrilus	8	2
Tubifex	10	2
* Acentrella	4	1
Corbicula	4	1
* Oecetis	8	1
Phaenopsectra	7	1
* Phylocentropus	5	1
Placobdella	8	1
Procladius	9	1
Sialis	4	1
* Stenacron	4	1
Stenelmis	5	1

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

Hilsenhoff Biotic Index (HBI): 7.43 # Scrapers: 6

% Sensitive EPT: 4.0% Attribute 2 genera: 1

% Non-Insect Taxa: 45.5% Attribute 3 genera: 0

HGMI Rating: 26.65 Fair

Habitat Analysis: 142 Suboptimal USEPA Protocol

Observations: Water temp: 23.66 C; Cond: 247 umhos; DO: 5.36 mg/L; pH: 6.92 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 90' / 3'; Substrate: cobble, mud, silt

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: turtle (red bellied), clams / mussels

AMNET Site # AN0415

Stream Name: Cuckels Bk

Location: E. Main St; Bridgewater Twp; Somerset County

Collection Date: 7/8/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	12
Menetus	6	12
Slavina	7	12
Nais	8	10
Stylodrilus	10	8
Physella	9.1	6
Helobdella	8	4
Pristinella	10	4
Argia	6	3
Enallagma	9	3
Stenelmis	5	3
Branchiura	10	2
Chironomus	10	2
* Hydropsyche	4	2
Musculium	5	2
Ophidonais	7	2
Rheopelopia	4	2
Rheotanytarsus	6	2
Tribelos	5	2
Tubifex	10	2
* Baetis	6	1
Caecidotea	8	1
Erpobdellidae	8	1
Phaenopsectra	7	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 7.80 # Scrapers: 4

% Sensitive EPT: 1.0% Attribute 2 genera: 0

% Non-Insect Taxa: 56.0% Attribute 3 genera: 1

HGMI Rating: 20.69 Poor

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 19.21 C; Cond: 570 umhos; DO: 5.49 mg/L; pH: 7.17 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: commercial

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes, filamentous algae; trash

AMNET Site # AN0416 **Stream Name: W Br Middle Bk**
Location: Crim Rd; Bridgewater Twp; Somerset County
Collection Date: 7/8/2009 **USGS Topo Map: Bound Brook**

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Dicrotendipes	8	34
Micropsectra	7	11
* Baetis	6	7
Polypedilum	6	6
* Cheumatopsyche	5	5
Cricotopus	7	5
Paratanytarsus	6	5
Chironomus	10	3
Dugesia	4	3
Stictochironomus	9	3
Nais	8	2
Phaenopsectra	7	2
Planorbidae	6	2
Tanytarsus	6	2
Tipula	4	2
Gerris	8	1
Hydrobaenus	8	1
Limnodrilus	10	1
Lumbricina	6	1
Lumbriculus	8	1
Peltodytes	5	1
Physella	9.1	1
Slavina	7	1

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

Hilsenhoff Biotic Index (HBI): 7.09 *# Scrapers:* 4

% Sensitive EPT: 7.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 34.8% *Attribute 3 genera:* 2

HGMI Rating: 27.63 Fair

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 16.72 C; Cond: 352 umhos; DO: 7.74 mg/L; pH: 7.24 SU
 Clarity: clear; Flow Rate: slow; Width/Depth: 16' / < 1'; Substrate: cobble, gravel, sand
 Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, lawn
 Stream Gradient: High Gradient Stream; Land Uses: suburban, school, community park
 Pipes / Ditches: storm sewers
 Other: fish, tadpoles, periphytes, filamentous algae; USGS gage: 2.2

AMNET Site # AN0417

Stream Name: W Br Middle Bk

Location: Chimney Rock Rd; Bridgewater Twp; Somerset County

Collection Date: 7/8/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	28
Caecidotea	8	20
Rheotanytarsus	6	10
Physella	9.1	8
Musculium	5	7
Psephenus	4	6
Amnicola	4.8	4
Polypedilum	6	4
Helisoma	7	3
Gyraulus	6	2
Prostoma	7	2
Dubiraphia	6	1
Helobdella	8	1
Limnodrilus	10	1
* Mystacides	4	1
Optioservus	4	1
Stenelmis	5	1

* (EPT organism) *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.47 *# Scrapers:* 7

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 58.8% *Attribute 3 genera:* 1

HGMI Rating: 21.98 Fair

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 22.85 C; Cond: 268 umhos; DO: 5.94 mg/L; pH: 7.64 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, undercut banks

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Downstream of Impoundment: small lake

Other: fish, garter snake, snails, macrophytes, purple loosestrife; "Active Quarry" sign

AMNET Site # AN0418

Stream Name: E Br Middle Bk

Location: Top of the World Way; Warren Twp; Somerset County

Collection Date: 8/18/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	30
Paratanytarsus	6	11
* Hydroptila	6	10
Cura	4	8
Cricotopus	7	7
* Hydropsyche	4	5
Polypedilum	6	4
Tanytarsus	6	3
Chironomus	10	2
Dicrotendipes	8	2
Enallagma	9	2
Physella	9.1	2
Rheopelopia	4	2
Stenelmis	5	2
* Baetis	6	1
* Cheumatopsyche	5	1
Eukiefferiella	8	1
Ferrissia	7	1
Helisoma	7	1
Limnodrilus	10	1
Microtendipes	7	1
Prostoma	7	1
Stenochironomus	5	1
Tribelos	5	1

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

Hilsenhoff Biotic Index (HBI): 6.06 *# Scrapers:* 5

% Sensitive EPT: 11.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 29.2% *Attribute 3 genera:* 1

HGMI Rating: 32.48 Fair

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 20.43 C; Cond: 760 umhos; DO: 8.19 mg/L; pH: 7.56 SU

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

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, snapping turtle, macrophytes, filamentous algae, waterfowl (ducks), trash

AMNET Site # AN0419

Stream Name: E Br Middle Bk

Location: Gilbride Rd; Bridgewater Twp; Somerset County

Collection Date: 7/8/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Cricotopus	7	21
Gammarus	6	17
Polypedilum	6	9
Tanytarsus	6	9
Dicrotendipes	8	7
Rheotanytarsus	6	6
* Cheumatopsyche	5	4
* Chimarra	4	4
Phaenopsectra	7	3
* Baetis	6	2
Limnodrilus	10	2
Nais	8	2
Promoresia	2	2
Prostoma	7	2
Slavina	7	2
* Ceratopsyche	4	1
* Heterocloeon	2	1
* Hydropsyche	4	1
* Lepidostoma	1	1
Peltodytes	5	1
Rheopelopia	4	1
Stylogomphus	1	1
Tipula	4	1

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

Hilsenhoff Biotic Index (HBI): 6.11 # Scrapers: 3

% Sensitive EPT: 8.0% Attribute 2 genera: 2

% Non-Insect Taxa: 21.7% Attribute 3 genera: 3

HGMI Rating: 39.13 Fair

Habitat Analysis: 158 Suboptimal USEPA Protocol

Observations: Water temp: 18.45 C; Cond: 410 umhos; DO: 7.97 mg/L; pH: 7.77 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand, undercut banks, bedrock

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, frogs, crayfish, periphytes, filamentous algae; "trout stocked waters"

AMNET Site # AN0420

Stream Name: Middle Bk

Location: Talmadge Ave (Rt 533) near Tea St; Bridgewater Twp; Somerset County

Collection Date: 8/6/2009 USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	36
Dugesia	4	34
Stenelmis	5	12
Hemerodromia	6	5
* Cheumatopsyche	5	2
* Baetis	6	1
Caecidotea	8	1
* Caenis	7	1
Erpobdellidae	8	1
* Hydropsyche	4	1
* Lepidostoma	1	1
* Leucotrichia	3	1
Physella	9.1	1
Psephenus	4	1
* Stenacron	4	1
Stylogomphus	1	1

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

Hilsenhoff Biotic Index (HBI): 5.07 # Scrapers: 5

% Sensitive EPT: 5.0% Attribute 2 genera: 1

% Non-Insect Taxa: 31.3% Attribute 3 genera: 1

HGMI Rating: 33.71 Fair

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 22.46 C; Cond: 367 umhos; DO: 8.99 mg/L; pH: 8.25 SU

Clarity: slightly turbid, milky; Flow Rate: fast; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: crayfish, periphytes, purple loosestrife, egret

AMNET Site # AN0421

Stream Name: Green Bk

Location: Raymond Ave; Watchung Twp; Somerset & Union County

Collection Date: 8/18/2009

USGS Topo Map: Chatham

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	35
Gammarus	6	25
Rheotanytarsus	6	14
Rhagovelia	9	6
Cricotopus	7	4
Tanytarsus	6	4
Stenelmis	5	3
* Ceratopsyche	4	2
Phaenopsectra	7	2
Corynoneura	4	1
Eclipidrilus	8	1
Limnodrilus	10	1
Lumbriculus	8	1
Prostoma	7	1

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

Hilsenhoff Biotic Index (HBI): 6.24 *# Scrapers:* 2

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 35.7% *Attribute 3 genera:* 1

HGMI Rating: 20.68 Poor

Habitat Analysis: 122 Suboptimal USEPA Protocol

Observations: Water temp: 22.51 C; Cond: 762 umhos; DO: 6.27 mg/L; pH: 7.59 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 2' / < 1'; Substrate: cobble, gravel, sand

Canopy: closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes; trash

AMNET Site # AN0422

Stream Name: Stony Bk

Location: West End Ave; North Plainfield Boro; Union County

Collection Date: 8/13/2009

USGS Topo Map: Plainfield

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Hydropsyche	4	29
Stenelmis	5	15
* Ceratopsyche	4	11
Polypedilum	6	10
Dugesia	4	9
* Glossosoma	0	3
Limnodrilus	10	3
Microtendipes	7	3
* Baetis	6	2
* Cheumatopsyche	5	2
Rheotanytarsus	6	2
Stictochironomus	9	2
Antocha	3	1
* Chimarra	4	1
Gammarus	6	1
Lumbricina	6	1
Nematoda	6	1
Parametrioctenus	5	1
Paratanytarsus	6	1
Prostoma	7	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 4.83 # Scrapers: 2

% Sensitive EPT: 6.0% Attribute 2 genera: 1

% Non-Insect Taxa: 28.6% Attribute 3 genera: 2

HGMI Rating: 34.99 Fair

Habitat Analysis: 146 Suboptimal USEPA Protocol

Observations: Water temp: 22.19 C; Cond: 371 umhos; DO: 7.56 mg/L; pH: 7.45 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 37' / < 1'; Substrate: cobble, gravel, sand

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: trash, invasive plants

AMNET Site # AN0423

Stream Name: Green Bk

Location: Clinton Ave; Plainfield; Union & Somerset County

Collection Date: 8/13/2009

USGS Topo Map: Plainfield

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Cricotopus	7	18
* Ceratopsyche	4	16
Polypedilum	6	11
Stenelmis	5	9
Microtendipes	7	6
Tanytarsus	6	6
Hemerodromia	6	4
Stictochironomus	9	4
Gammarus	6	3
* Baetis	6	2
Cryptochironomus	8	2
Lumbricina	6	2
Paratanytarsus	6	2
Pisidium	6.8	2
Rheotanytarsus	6	2
Saetheria	4	2
Antocha	3	1
* Cheumatopsyche	5	1
Dicrotendipes	8	1
Dolichopodidae	4	1
Erpobdella	7.8	1
* Hydroptila	6	1
Limnodrilus	10	1
Lumbriculidae	8	1
Stratiomyidae	10	1

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

Hilsenhoff Biotic Index (HBI): 6.04 # Scrapers: 2

% Sensitive EPT: 3.0% Attribute 2 genera: 0

% Non-Insect Taxa: 24.0% Attribute 3 genera: 1

HGMI Rating: 30.78 Fair

Habitat Analysis: 129 Suboptimal USEPA Protocol

Observations: Water temp: 21.91 C; Cond: 380 umhos; DO: 7.30 mg/L; pH: 7.35 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 42' / 2'; Substrate: gravel, sand, silt

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

Stream Gradient: High Gradient Stream; Land Uses: suburban, Green Brook Park

Other: trash, large concrete blocks

AMNET Site # AN0424

Stream Name: Bound Bk

Location: Bound Brook Rd (Rt 28); Middlesex Boro; Middlesex County

Collection Date: 8/18/2009

USGS Topo Map: Plainfield

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	24
Tanytarsus	6	17
Polypedilum	6	16
Paratanytarsus	6	15
Rheotanytarsus	6	10
Gyraulus	6	4
Laevapex	6	2
Pisidium	6.8	2
Ancyronyx	2	1
Boyeria	2	1
* Cheumatopsyche	5	1
Chironomus	10	1
Dicrotendipes	8	1
Menetus	6	1
Musculium	5	1
Prostoma	7	1
Rheumatobates	8	1
Stenochironomus	5	1

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

Hilsenhoff Biotic Index (HBI): 6.00 # Scrapers: 3

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 38.9% Attribute 3 genera: 1

HGMI Rating: 24.58 Fair

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 24.81 C; Cond: 533 umhos; DO: 5.82 mg/L; pH: 7.33 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 35' / < 1'; Substrate: cobble, gravel, sand, mud, snags, undercut banks

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, crayfish, clams / mussels, periphytes, filamentous algae

AMNET Site # AN0425

Stream Name: Ambrose Bk

Location: Raritan Ave (Rt 514 spur); Middlesex Boro; Middlesex County

Collection Date: 8/13/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	30
Limnodrilus	10	12
Valvata	2	12
Cura	4	7
Amnicola	4.8	5
Elimia	2	5
Musculium	5	5
* Hydropsyche	4	3
Stenelmis	5	3
Caecidotea	8	2
Pisidium	6.8	2
Rheotanytarsus	6	2
Slavina	7	2
Tubifex	10	2
Antocha	3	1
* Cheumatopsyche	5	1
Chironomus	10	1
Menetus	6	1
Nematoda	6	1
Paratanytarsus	6	1
Prostoma	7	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 5.63 # Scrapers: 5

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 63.6% Attribute 3 genera: 0

HGMI Rating: 22.52 Fair

Habitat Analysis: 143 Suboptimal USEPA Protocol

Observations: Water temp: 24.30 C; Cond: 583 umhos; DO: 5.59 mg/L; pH: 7.35 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 48' / < 1'; Substrate: cobble, gravel, sand

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

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

Pipes / Ditches: storm sewers

Other: fish, clams, periphytes, purple loosestrife; trash

AMNET Site # AN0425A Stream Name: Ambrose Bk
Location: Behmer Rd; Piscataway Twp; Middlesex County
Collection Date: 8/18/2009 USGS Topo Map: Plainfield

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	57
Limnodrilus	10	13
Pisidium	6.8	8
Polypedilum	6	5
Caecidotea	8	3
Ferrissia	7	3
Helobdella	8	3
Dubiraphia	6	2
Tubifex	10	2
Nais	8	1
Paratanytarsus	6	1
Paratendipes	8	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 6.85 *# Scrapers:* 2

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 61.5% *Attribute 3 genera:* 0

***HGMI Rating:* 10.37 Poor**

Habitat Analysis: 102 Marginal USEPA Protocol

Observations: Water temp: 25.56 C; Cond: 585 umhos; DO: 5.87 mg/L; pH: 7.43 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 20' / 1- 2'; Substrate: cobble, silt, snags, undercut banks

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

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Downstream of Impoundment: golf course pond

Other: fish, crayfish, clams / mussels, periphytes, filamentous algae; trash

AMNET Site # AN0426

Stream Name: Green Bk

Location: Lincoln Blvd (Rt 607); Bound Brook Boro; Somerset & Middlesex County

Collection Date: 8/13/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	22
Tanytarsus	6	21
Polypedilum	6	16
Gammarus	6	9
Paratendipes	8	5
Phaenopsectra	7	5
Microtendipes	7	4
Paratanytarsus	6	4
Dicrotendipes	8	2
Tribelos	5	2
Caecidotea	8	1
Cricotopus	7	1
Cura	4	1
Empididae	6	1
Ferrissia	7	1
Leptoxis	1.6	1
Musculium	5	1
Optioservus	4	1
Paralauterborniella	8	1
Parametriochnemus	5	1

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

Hilsenhoff Biotic Index (HBI): 7.05 *# Scrapers:* 2

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 35.0% *Attribute 3 genera:* 1

HGMI Rating: 23.01 **Fair**

Habitat Analysis: 117 Suboptimal USEPA Protocol

Observations: Water temp: 22.21 C; Cond: 329 umhos; DO: 6.24 mg/L; pH: 7.15 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 63' / 2 - 3'; Substrate: gravel, sand, silt, snags

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

Stream Gradient: High Gradient Stream; Land Uses: suburban, community park (RB)

Pipes / Ditches: storm sewers

Other: waterfowl, purple loosestrife, trash,

AMNET Site # AN0427

Stream Name: UNT to Raritan River

Location: Rt 527 (Main St); South Bound Brook Boro; Somerset County

Collection Date: 8/13/2009

USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	37
Caecidotea	8	18
Stenelmis	5	13
* Cheumatopsyche	5	11
* Chimarra	4	5
Cura	4	5
Polypedilum	6	4
Corbicula	4	1
Eclipidrilus	8	1
Erpobdella	7.8	1
* Hydropsyche	4	1
Laevapex	6	1
Menetus	6	1
Pisidium	6.8	1

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

Hilsenhoff Biotic Index (HBI): 5.93 *# Scrapers:* 3

% Sensitive EPT: 5.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 64.3% *Attribute 3 genera:* 0

HGMI Rating: 15.38 Poor

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 23.24 C; Cond: 488 umhos; DO: 5.82 mg/L; pH: 7.24 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 17' / < 1'; Substrate: cobble, gravel, sand

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

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

Pipes / Ditches: storm sewers

Other: fish; trash

AMNET Site # AN0428

Stream Name: Raritan River

Location: Bakelite Park; Edison Twp; Middlesex & Somerset County

Collection Date: 8/18/2009 USGS Topo Map: Bound Brook

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	22
Elimia	2	16
* Glossosomatidae	0	12
Stenelmis	5	11
* Cheumatopsyche	5	6
Corbicula	4	6
* Hydroptila	6	4
Polypedilum	6	4
* Leucrocuta	1	3
Optioservus	4	3
Ancylidae	6	2
* Plauditus	4	2
* Stenacron	4	2
Collembola	10	1
Hemerodromia	6	1
* Hydropsyche	4	1
Petrophila	5	1
Physella	9.1	1
Rheotanytarsus	6	1
Simulium	6	1

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

Hilsenhoff Biotic Index (HBI): 4.10 # Scrapers: 10

% Sensitive EPT: 23.0% Attribute 2 genera: 0

% Non-Insect Taxa: 30.0% Attribute 3 genera: 0

HGMI Rating: 45.84 Good

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 28.02 C; Cond: 437 umhos; DO: 8.24 mg/L; pH: 7.60 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 210' / 1 - 3'; Substrate: cobble, gravel, sand, bedrock

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

Stream Gradient: High Gradient Stream; Land Uses: suburban, community park

Other: fish, frogs, toad, clams / mussels, macrophytes, periphytes

AMNET Site # AN0429

Stream Name: Mile Run

Location: Franklin Blvd & Easton Ave; New Brunswick; Middlesex & Somerset County

Collection Date: 8/13/2009

USGS Topo Map: Plainfield

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Gammarus	6	19
Eclipidrilus	8	15
Polypedilum	6	12
Prostoma	7	10
* Hydropsyche	4	7
* Cheumatopsyche	5	6
Cura	4	6
Nais	8	5
Caecidotea	8	4
Limnodrilus	10	4
Pentaneura	6	3
Tanytarsus	6	2
Antocha	3	1
* Baetis	6	1
Batracobdella	8	1
Erpobdella	7.8	1
Hemerodromia	6	1
Nematoda	6	1
Parametriochnemus	5	1

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

Hilsenhoff Biotic Index (HBI): 6.42 # Scrapers: 0

% Sensitive EPT: 1.0% Attribute 2 genera: 0

% Non-Insect Taxa: 52.6% Attribute 3 genera: 2

HGMI Rating: 17.87 Poor

Habitat Analysis: 128 Suboptimal USEPA Protocol

Observations: Water temp: 21.61 C; Cond: 513 umhos; DO: 7.18 mg/L; pH: 7.55 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 21' / < 1'; Substrate: cobble, gravel, sand, red shale

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

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: snapping turtle, trash

AMNET Site # AN0430

Stream Name: Lawrence Bk

Location: Ridge Rd / Rt 522; South Brunswick Twp; Middlesex County

Collection Date: 8/19/2009

USGS Topo Map: Monmouth Junction

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Callibaetis	9	29
Nais	8	12
Stylaria	8	7
* Caenis	7	6
Limnodrilus	10	6
Naididae	7	6
Corixidae	9	4
Thienemannimyia	6	4
Peltodytes	5	3
Tanypus	10	3
Dero	10	2
Planorbidae	6	2
Polypedilum	6	2
Stenelmis	5	2
Ablabesmyia	8	1
Amnicola	4.8	1
Ancyronyx	2	1
Aulodrilus	8	1
Caecidotea	8	1
Coenagrionidae	9	1
Culicidae	8	1
Ectopria	5	1
Gammarus	6	1
Simulium	6	1
Sphaeriidae	8	1
Tanypodinae	7	1

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

Hilsenhoff Biotic Index (HBI): 7.96 # Scrapers: 4

% Sensitive EPT: 35.0% Attribute 2 genera: 0

% Non-Insect Taxa: 42.3% Attribute 3 genera: 0

HGMI Rating: 29.42 Fair

Habitat Analysis: 101 Marginal USEPA Protocol

Observations: Water temp: 22.64 C; Cond: 100 umhos; DO: 0.98 mg/L; pH: 6.73 SU

Clarity: turbid, brown; Flow Rate: slow; Width/Depth: 100' / 3'; Substrate: gravel, sand, mud

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

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

Other: turtle, macrophytes, filamentous algae, waterfowl

AMNET Site # AN0431

Stream Name: Lawrence Bk

Location: Davidson Mill Rd; South Brunswick Twp; Middlesex County

Collection Date: 8/19/2009

USGS Topo Map: New Brunswick

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Caecidotea	8	27
Hydrolimax	4	12
Ablabesmyia	8	6
Amnicola	4.8	6
* Caenis	7	6
Polypedilum	6	6
Sphaeriidae	8	5
Limnodrilus	10	4
Tanypus	10	3
Campeloma	7	2
* Cheumatopsyche	5	2
Planariidae	4	2
Procladius	9	2
Tanytarsus	6	2
Tribelos	5	2
Aulodrilus	8	1
Cladopelma	8	1
Clinotanypus	8	1
Corbicula	4	1
Corixidae	9	1
Gammarus	6	1
Microtendipes	7	1
Naididae	7	1
Nanocladius	3	1
Paratendipes	8	1
Physella	9.1	1
Stenelmis	5	1
Tubifex	10	1

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

Hilsenhoff Biotic Index (HBI): 6.93 # Scrapers: 4

% Sensitive EPT: 6.0% Attribute 2 genera: 0

% Non-Insect Taxa: 46.4% Attribute 3 genera: 0

HGMI Rating: 24.85 Fair

Habitat Analysis: 101 Marginal USEPA Protocol

Observations: Water temp: 26.56 C; Cond: 221 umhos; DO: 3.36 mg/L; pH: 6.48 SU

Clarity: slightly turbid, brown; Flow Rate: slow; Width/Depth: 120' / 4'; Substrate: mud, silt

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

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

Other: macrophytes, filamentous algae

AMNET Site # AN0432

Stream Name: Oakeys Bk

Location: Davidson Mill Rd; South Brunswick Twp; Middlesex County

Collection Date: 8/19/2009

USGS Topo Map: New Brunswick

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Stenelmis	5	68
Cura	4	6
Rheotanytarsus	6	6
* Hydropsyche	4	4
Optioservus	4	3
Simulium	6	2
Calopteryx	6	1
* Cheumatopsyche	5	1
Ectopria	5	1
Erpobdellidae	8	1
Gerris	8	1
Hemerodromia	6	1
Microvelia	6	1
Nematoda	6	1
Prostoma	7	1
* Stenacron	4	1
Tipula	4	1

* (*EPT organism*) *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.05 *# Scrapers:* 3

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 23.5% *Attribute 3 genera:* 2

***HGMI Rating:* 31.87 Fair**

Habitat Analysis: 154 Suboptimal USEPA Protocol

Observations: Water temp: 23.97 C; Cond: 386 umhos; DO: 5.97 mg/L; pH: 7.15 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 25' / 1 - 2'; Substrate: cobble, gravel, sand

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

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

Pipes / Ditches: storm sewers (flowing)

Other: fish, periphytes

AMNET Site # AN0433

Stream Name: Ireland Bk

Location: Riva Rd; North Brunswick Twp; Middlesex County

Collection Date: 8/19/2009 USGS Topo Map: New Brunswick

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Stenelmis	5	51
* Hydropsyche	4	18
* Cheumatopsyche	5	12
Simulium	6	4
Planariidae	4	3
Calopteryx	6	2
Polypedilum	6	2
Tvetenia	5	2
Lumbriculidae	8	1
Nais	8	1
Rhagovelia	9	1
Rheotanytarsus	6	1
Stylaria	8	1
Tanytarsus	6	1

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

Hilsenhoff Biotic Index (HBI): 5.02 # Scrapers: 1

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 28.6% Attribute 3 genera: 1

HGMI Rating: 24.98 Fair

Habitat Analysis: 162 Optimal USEPA Protocol

Observations: Water temp: 22.05 C; Cond: 318 umhos; DO: 7.69 mg/L; pH: 6.39 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 25' / < 1'; Substrate: cobble, gravel, sand, bedrock

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

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: periphytes

AMNET Site # AN0434

Stream Name: Lawrence Bk

Location: Riva Rd; Milltown Boro; Middlesex County

Collection Date: 8/19/2009

USGS Topo Map: New Brunswick

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	33
Cura	4	25
Glyptotendipes	10	15
Rheotanytarsus	6	7
Polypedilum	6	6
Cricotopus	7	4
Dicrotendipes	8	3
* Hydropsyche	4	3
Hemerodromia	6	1
Microtendipes	7	1
Parachironomus	10	1
Tanytarsus	6	1

* (EPT organism) Taxa Richness: 12 Population: 100

Hilsenhoff Biotic Index (HBI): 5.86 # Scrapers: 0

% Sensitive EPT: 0.0% Attribute 2 genera: 0

% Non-Insect Taxa: 8.3% Attribute 3 genera: 0

HGMI Rating: 27.19 Fair

Habitat Analysis: 113 Suboptimal USEPA Protocol

Observations: Water temp: 28.20 C; Cond: 193 umhos; DO: 4.74 mg/L; pH: 6.96 SU

Clarity: turbid, brown; Flow Rate: slow; Width/Depth: 45' / < 1'; Substrate: cobble, gravel, sand, mud

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

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

Pipes / Ditches: storm sewers

Other: fish, macrophytes, waterfowl (geese)

AMNET Site # AN0436

Stream Name: Mill Bk

Location: nr. Rt 514 (Woodbridge Ave); Edison Twp; Middlesex County

Collection Date: 8/19/2009

USGS Topo Map: Plainfield

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Hydropsyche	4	39
* Baetis	6	16
Lumbriculidae	8	13
Prostoma	7	10
Antocha	3	6
Polypedilum	6	4
* Cheumatopsyche	5	3
Cricotopus	7	2
Tanytarsini	6	2
Coenagrionidae	9	1
Parametriochnemus	5	1
Simulium	6	1
Stenelmis	5	1
Thienemannimyia	6	1

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

Hilsenhoff Biotic Index (HBI): 5.40 # Scrapers: 1

% Sensitive EPT: 16.0% Attribute 2 genera: 0

% Non-Insect Taxa: 14.3% Attribute 3 genera: 2

HGMI Rating: 32.18 Fair

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 22.43 C; Cond: 520 umhos; DO: 7.54 mg/L; pH: 7.30 SU

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

Canopy: closed; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

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

Pipes / Ditches: storm sewers, ditches

Other: fish, periphytes, filamentous algae; trailer park on RB

AMNET Site # AN0437

Stream Name: Manalapan Bk

Location: Rt 524; Millstone Twp; Monmouth County

Collection Date: 8/25/2009 USGS Topo Map: Roosevelt

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Simulium	6	25
Musculium	5	21
Pisidium	6.8	10
Limnodrilus	10	5
Polypedilum	6	4
Trichocorixa	9	4
Procladius	9	3
Cura	4	2
Helisoma	7	2
* Hydropsyche	4	2
Nais	8	2
* Phryganeidae	4	2
Prostoma	7	2
Slavina	7	2
Spirosperma	10	2
Corynoneura	4	1
Cricotopus	7	1
Gomphus	5	1
* Neureclipsis	7	1
* Oecetis	8	1
* Paraleptophlebia	1	1
* Polycentropus	6	1
Prosimulium	2	1
Rheotanytarsus	6	1
* Siphonurus	7	1
Stagnicola	7	1
Stylodrilus	10	1

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

%Dominance / Dominant Taxon(s): 25.0% Simulium

Hilsenhoff Biotic Index (HBI): 6.32 %Clingers: 33.00%

* E+P+T: 7 (2) Ephemeroptera, () Plecoptera, (5) Trichoptera %Ephemeroptera: 2.00%

CPMI Rating: 14 Good

Habitat Analysis: 142 Suboptimal USEPA Protocol

Observations: Water temp: 18.99 C; Cond: 283 umhos; DO: 6.54 mg/L; pH: 5.77 SU

Clarity: clear, cedar brown; Flow Rate: slow; Width/Depth: 11' / < 1'; Substrate: gravel, sand, mud, snags, root mats

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

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

Other: fish, frogs, macrophytes, wild turkeys

AMNET Site # AN0438

Stream Name: Manalapan Bk

Location: Rt 33; Manalapan Twp; Monmouth County

Collection Date: 8/25/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Tribelos	5	44
* Maccaffertium	3	19
Polypedilum	6	8
Macronychus	2	3
Pisidium	6.8	3
Rheotanytarsus	6	3
Simulium	6	3
Aulodrilus	8	2
* Cheumatopsyche	5	2
Dubiraphia	6	2
Ischnura	9	2
Argia	6	1
* Caenis	7	1
Dineutus	4	1
Dugesia	4	1
Gomphus	5	1
Limnodrilus	10	1
* Oecetis	8	1
Prostoma	7	1
Tanytarsus	6	1

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

%Dominance / Dominant Taxon(s): 44.0% Tribelos

Hilsenhoff Biotic Index (HBI): 5.00

%Clingers: 34.00%

* E+P+T: 4 (2) Ephemeroptera, () Plecoptera, (2) Trichoptera

%Ephemeroptera: 20.00%

CPMI Rating: 18 Good

Habitat Analysis: 122 Suboptimal USEPA Protocol

Observations: Water temp: 24.52 C; Cond: 257 umhos; DO: 6.29 mg/L; pH: 6.71 SU

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

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

Stream Gradient: Low Gradient Stream; Land Uses: rural, agriculture-cropland, nursery

Other: iron floc

AMNET Site # AN0439

Stream Name: Manalapan Bk

Location: Federal Rd; Monroe Twp; Middlesex County

Collection Date: 8/25/2009 USGS Topo Map: Jamesburg

Genus	Tolerance Value	Amount
Polypedilum	6	24
* Hydroptila	6	11
* Maccaffertium	3	8
Macronychus	2	7
Rheotanytarsus	6	7
Tribelos	5	7
Thienemannimyia	6	6
* Cheumatopsyche	5	5
Calopteryx	6	4
Ancyronyx	2	3
Prostoma	7	3
* Hydropsyche	4	2
Simulium	6	2
Tanytarsus	6	2
Aulodrilus	8	1
Boyeria	2	1
Gomphus	5	1
Nigronia	2	1
* Oecetis	8	1
Paratanytarsus	6	1
Paratendipes	8	1
Physella	9.1	1
Sphaeriidae	8	1

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

%Dominance / Dominant Taxon(s): 24.0% Polypedilum

Hilsenhoff Biotic Index (HBI): 5.25

%Clingers: 48.00%

* E+P+T: 5 (1) Ephemeroptera, () Plecoptera, (4) Trichoptera

%Ephemeroptera: 8.00%

CPMI Rating: 14 Good

Habitat Analysis: 115 Suboptimal USEPA Protocol

Observations: Water temp: 22.14 C; Cond: 264 umhos; DO: 7.47 mg/L; pH: 6.75 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 19' / < 1'; Substrate: gravel, sand, silt, root mats, undercut banks

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

Stream Gradient: Low Gradient Stream; Land Uses: agriculture-cropland, agriculture-livestock

Pipes / Ditches: ditches, flowing

Other: frogs, macrophytes

AMNET Site # AN0440

Stream Name: Manalapan Bk

Location: Old Forge Rd; Helmetta Boro; Middlesex County

Collection Date: 9/1/2009 USGS Topo Map: Jamesburg

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Tribelos	5	24
Sphaeriidae	8	20
* Cheumatopsyche	5	10
Limnodrilus	10	8
Dugesia	4	7
Lumbriculus	8	7
Polypedilum	6	6
Ablabesmyia	8	3
Ancyronyx	2	2
Dubiraphia	6	2
Rheotanytarsus	6	2
Simulium	6	2
Hemerodromia	6	1
* Hydropsyche	4	1
* Lype	2	1
* Maccaffertium	3	1
Macromia	2	1
Nigronia	2	1
* Triaenodes	6	1

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

%Dominance / Dominant Taxon(s): 24.0% Tribelos

Hilsenhoff Biotic Index (HBI): 6.19

%Clingers: 23.00%

* E+P+T: 5 (1) Ephemeroptera, () Plecoptera, (4) Trichoptera

%Ephemeroptera: 1.00%

CPMI Rating: 10 Fair

Habitat Analysis: 136 Suboptimal USEPA Protocol

Observations: Water temp: 18.61 C; Cond: 227 umhos; DO: 7.70 mg/L; pH: 6.21 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 35' / 1'; Substrate: sand, mud, silt, root mats

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

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

Pipes / Ditches: storm sewers

Other: frogs

AMNET Site # AN0441

Stream Name: Weamaconk Ck

Location: Rt 9 (South); Freehold; Middlesex County

Collection Date: 9/1/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Polypedilum	6	21
Simulium	6	19
Rheotanytarsus	6	14
Tanytarsus	6	7
Hemerodromia	6	6
Rhagovelia	9	6
Limnodrilus	10	5
Gammarus	6	4
Tipulidae	3	4
Thienemannimyia	6	3
Aulodrilus	8	1
Brillia	5	1
Calopteryx	6	1
Enchytraeidae	10	1
Natarsia	8	1
Parametrioctonus	5	1
Physella	9.1	1
Rheocricotopus	6	1

* (EPT organism) Taxa Richness: 18 Population: 97

%Dominance / Dominant Taxon(s): 21.6% Polypedilum

Hilsenhoff Biotic Index (HBI): 6.36

%Clingers: 34.02%

* E+P+T: 0 () Ephemeroptera, () Plecoptera, () Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 10 Fair

Habitat Analysis: 117 Suboptimal USEPA Protocol

Observations: Water temp: 16.60 C; Cond: 301 umhos; DO: 9.09 mg/L; pH: 6.66 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 8' / < 1'; Substrate: gravel, sand, snags, undercut banks

Canopy: closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: Low Gradient Stream; Land Uses: commercial (Rt 9), forested

Other: frogs; trash, extensive bank erosion

AMNET Site # AN0442

Stream Name: Wemrock Bk

Location: Wemrock Rd; Freehold Twp; Monmouth County

Collection Date: 8/25/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Rheotanytarsus	6	22
Pisidium	6.8	12
Calopteryx	6	10
Gammarus	6	9
Aulodrilus	8	8
Limnodrilus	10	4
Polypedilum	6	4
Rhagovelia	9	4
Boyeria	2	3
Campeloma	7	3
Dineutus	4	2
Hemerodromia	6	2
Macronychus	2	2
Paratanytarsus	6	2
Thienemannimyia	6	2
Ancyronyx	2	1
Caecidotea	8	1
Gomphus	5	1
* Hydropsyche	4	1
Lumbriculus	8	1
Paratendipes	8	1
Prostoma	7	1
Simulium	6	1
Tanytarsus	6	1
Tipula	4	1
Tribelos	5	1

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

%Dominance / Dominant Taxon(s): 22.0% Rheotanytarsus

Hilsenhoff Biotic Index (HBI): 6.30

%Clingers: 27.00%

* E+P+T: 1 () Ephemeroptera, () Plecoptera, (1) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 10 Fair

Habitat Analysis: 118 Suboptimal USEPA Protocol

Observations: Water temp: 21.29 C; Cond: 411 umhos; DO: 5.63 mg/L; pH: 6.64 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 9' / < 1'; Substrate: sand, silt, root mats, undercut banks

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

Stream Gradient: Low Gradient Stream; Land Uses: rural, forested, agriculture-cropland (orchards)

Other: fish, crayfish

AMNET Site # AN0444

Stream Name: McGellairds Bk

Location: Rt 9 (South); Freehold Twp; Monmouth County

Collection Date: 9/1/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Cheumatopsyche	5	39
Rheotanytarsus	6	8
Polypedilum	6	7
Stenelmis	5	4
Amnicola	4.8	3
Hetaerina	6	3
Simulium	6	3
Tubifex	10	3
Cura	4	2
Dubiraphia	6	2
Gyraulus	6	2
Nais	8	2
Phaenopsectra	7	2
Prostoma	7	2
* Stenonema	3	2
Tanytarsus	6	2
Tribelos	5	2
Campeloma	7	1
Helisoma	7	1
Hydrobaenus	8	1
* Hydropsyche	4	1
Limnodrilus	10	1
Musculium	5	1
Oulimnius	4	1
Pisidium	6.8	1
* Polycentropodidae	6	1
Prosimulium	2	1
Rheopelopia	4	1
Slavina	7	1

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

%Dominance / Dominant Taxon(s): 39.0% Cheumatopsyche

Hilsenhoff Biotic Index (HBI): 5.60 %Clingers: 64.00%

* E+P+T: 4 (1) Ephemeroptera, () Plecoptera, (3) Trichoptera %Ephemeroptera: 2.00%

CPMI Rating: 18 Good

Habitat Analysis: 138 Suboptimal USEPA Protocol

Observations: Water temp: 22.51 C; Cond: 225 umhos; DO: 6.64 mg/L; pH: 6.80 SU

Clarity: slightly turbid, milky-white; Flow Rate: moderate; Width/Depth: 20' / < 1'; Substrate: gravel, sand

Canopy: closed; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

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

Other: trash

AMNET Site # AN0445

Stream Name: Tepehemus Bk

Location: Tennent Rd; Manalapan Twp; Monmouth County

Collection Date: 10/8/2009 USGS Topo Map: Freehold

Genus	Tolerance Value	Amount
Tribelos	5	23
Limnodrilus	10	17
Calopteryx	6	12
Hetaerina	6	7
Tubifex	10	7
Enallagma	9	5
Prostoma	7	5
Ancyronyx	2	4
Pisidium	6.8	4
Trichocorixa	9	3
Argia	6	2
* Cheumatopsyche	5	1
Cricotopus	7	1
Cura	4	1
Curculionidae	7	1
Dubiraphia	6	1
* Hydropsyche	4	1
Macromia	2	1
Menetus	6	1
Microvelia	6	1
Nanocladius	3	1
Rheotanytarsus	6	1

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

%Dominance / Dominant Taxon(s): 23.0% Tribelos

Hilsenhoff Biotic Index (HBI): 6.79

%Clingers: 12.00%

* E+P+T: 2 () Ephemeroptera, () Plecoptera, (2) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 6 Fair

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 13.43 C; Cond: 271 umhos; DO: 8.61 mg/L; pH: 6.69 SU

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

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

Stream Gradient: Low Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, macrophytes

AMNET Site # AN0446

Stream Name: Milford Bk

Location: Pease Rd; Manalapan Twp; Monmouth County

Collection Date: 10/8/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
* Hydropsyche	4	70
* Cheumatopsyche	5	18
Calopteryx	6	3
Polypedilum	6	2
Simulium	6	2
Ancyronyx	2	1
Boyeria	2	1
Curculionidae	7	1
Nais	8	1
Rhagovelia	9	1

* (EPT organism) Taxa Richness: 10 Population: 100

%Dominance / Dominant Taxon(s): 70.0% Hydropsyche

Hilsenhoff Biotic Index (HBI): 4.40

%Clingers: 92.00%

* E+P+T: 2 () Ephemeroptera, () Plecoptera, (2) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 14 Good

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 13.14 C; Cond: 271 umhos; DO: 9.16 mg/L; pH: 5.93 SU

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

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

Stream Gradient: Low Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: macrophytes, periphytes; house on left bank, invasive plants

AMNET Site # AN0447

Stream Name: McGellairds Bk

Location: Rt 527; Englishtown Boro; Monmouth County

Collection Date: 10/26/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Amnicola	4.8	32
Limnodrilus	10	19
Sphaerium	8	7
* Cheumatopsyche	5	6
Eclipidrilus	8	5
Calopteryx	6	4
Prostoma	7	3
Ancyronyx	2	2
Argia	6	2
Boyeria	2	2
Cura	4	2
Nais	8	2
Spirosperma	10	2
Tribelos	5	2
Tubifex	10	2
Dromogomphus	4	1
Dubiraphia	6	1
Hetaerina	6	1
Macromia	2	1
Paratendipes	8	1
Physella	9.1	1
Rheotanytarsus	6	1
Stylodrilus	10	1

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

%Dominance / Dominant Taxon(s): 32.0% Amnicola

Hilsenhoff Biotic Index (HBI): 6.60

%Clingers: 12.00%

* E+P+T: 1 () Ephemeroptera, () Plecoptera, (1) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 6 Fair

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 11.08 C; Cond: 226 umhos; DO: 8.44 mg/L; pH: 6.79 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 30' / 1'; Substrate: sand, mud, silt, root mats

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

Stream Gradient: Low Gradient Stream; Land Uses: suburban

AMNET Site # AN0448

Stream Name: Matchaponix Bk

Location: Rt 527; Manalapan Twp; Monmouth County

Collection Date: 10/26/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Amnicola	4.8	16
Physella	9.1	16
Campeloma	7	13
Limnodrilus	10	11
Sphaeriidae	8	10
Tribelos	5	9
Aulodrilus	8	5
Ancyronyx	2	4
Gammarus	6	3
Calopteryx	6	2
* Cheumatopsyche	5	2
Macronychus	2	2
Coenagrionidae	9	1
* Hydropsyche	4	1
Lumbriculidae	8	1
Macromia	2	1
Orconectes	6	1
Prostoma	7	1
Tubifex	10	1

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

%Dominance / Dominant Taxon(s): 16.0% Amnicola & Physella

Hilsenhoff Biotic Index (HBI): 6.86

%Clingers: 9.00%

* E+P+T: 2 () Ephemeroptera, () Plecoptera, (2) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 6 Fair

Habitat Analysis: 146 Suboptimal USEPA Protocol

Observations: Water temp: 11.76 C; Cond: 222 umhos; DO: 8.17 mg/L; pH: 6.66 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 28' / 2'; Substrate: sand, mud, root mats

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

Stream Gradient: Low Gradient Stream; Land Uses: forested, wetlands

Other: crayfish, invasive plants, trash; adj to flea market

AMNET Site # AN0449

Stream Name: Pine Bk

Location: Pension Rd; Manalapan Twp; Monmouth County

Collection Date: 10/26/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	3
Lumbriculus	8	2
Tribelos	5	2
Amnicola	4.8	1
Chironomus	10	1
Polypedilum	6	1

* (*EPT organism*) *Taxa Richness:* 6 *Population:* 10

%Dominance / Dominant Taxon(s): 30.0% Limnodrilus

Hilsenhoff Biotic Index (HBI): 7.68

%Clingers: 0.00%

* *E+P+T:* 0 () Ephemeroptera, () Plecoptera, () Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 0 Poor

Habitat Analysis: 132 Suboptimal USEPA Protocol

Observations: Water temp: 11.74 C; Cond: 259 umhos; DO: 8.52 mg/L; pH: 5.02 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 19' / < 1'; Substrate: sand, silt

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

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

Pipes / Ditches: storm sewers (flowing)

Other: orange colored silt

AMNET Site # AN0450

Stream Name: Barclay Bk

Location: Rt 527; Madison Twp; Middlesex County

Collection Date: 10/8/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Tribelos	5	74
* Polycentropus	6	5
Limnodrilus	10	4
Calopteryx	6	3
Polypedilum	6	3
Ceratopogonidae	6	2
Microvelia	6	2
Sialis	4	2
Cricotopus	7	1
Hydroporus	5	1
Stenochironomus	5	1
Thienemannimyia	6	1
Tropisternus	10	1

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

%Dominance / Dominant Taxon(s): 74.0% Tribelos

Hilsenhoff Biotic Index (HBI): 5.41

%Clingers: 6.00%

* *E+P+T:* 1 () Ephemeroptera, () Plecoptera, (1) Trichoptera

%Ephemeroptera: 0.00%

***CPMI Rating:* 6 Fair**

Habitat Analysis: 133 Suboptimal USEPA Protocol

Observations: Water temp: 13.56 C; Cond: 241 umhos; DO: 7.84 mg/L; pH: 3.95 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 17' / < 1'; Substrate: gravel, sand, mud

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

Stream Gradient: Low Gradient Stream; Land Uses: rural

Other: fish, macrophytes; sheen on surface

AMNET Site # AN0451

Stream Name: Matchaponix Bk

Location: Texas Rd; Madison Twp; Middlesex County

Collection Date: 10/8/2009 USGS Topo Map: Freehold

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	43
Tribelos	5	26
Tubifex	10	6
Gammarus	6	4
Rheotanytarsus	6	4
Stylodrilus	10	4
Cricotopus	7	3
Dromogomphus	4	2
Prostoma	7	2
Argia	6	1
Dubiraphia	6	1
Fossaria	6	1
Menetus	6	1
Musculium	5	1
Paratendipes	8	1

* (EPT organism) Taxa Richness: 15 Population: 100

%Dominance / Dominant Taxon(s): 43.0% Limnodrilus

Hilsenhoff Biotic Index (HBI): 7.88

%Clingers: 9.00%

* E+P+T: 0 () Ephemeroptera, () Plecoptera, () Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 2 Poor

Habitat Analysis: 100 Marginal USEPA Protocol

Observations: Water temp: 15.11 C; Cond: 454 umhos; DO: 8.13 mg/L; pH: 6.81 SU

Clarity: clear, milky color; Flow Rate: slow; Width/Depth: 45' / 1'; Substrate: gravel, sand, silt

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

Stream Gradient: Low Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: crayfish, macrophytes; powerline easement near RB, invasive plants along banks

AMNET Site # AN0452

Stream Name: Iresick Bk

Location: Rt 527; Madison Twp; Middlesex County

Collection Date: 10/8/2009 USGS Topo Map: South Amboy

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Tribelos	5	44
Sialis	4	7
Calopteryx	6	5
Enchytraeidae	10	5
Apsectrotanypus	5	4
Cryptochironomus	8	4
Lumbriculus	8	4
* Ptilostomis	5	4
Tipula	4	4
Ablabesmyia	8	3
Polypedilum	6	3
Bezzia	6	2
Phaenopsectra	7	2
Caacidotea	8	1
Ceratopogonidae	6	1
Chironomus	10	1
Glyptotendipes	10	1
* Leptophlebia	4	1
Limnodrilus	10	1
Orthoclaadiinae	5	1
Sphaeriidae	8	1
Thienemannimyia	6	1

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

%Dominance / Dominant Taxon(s): 44.0% Tribelos

Hilsenhoff Biotic Index (HBI): 5.83

%Clingers: 2.00%

* E+P+T: 2 (1) Ephemeroptera, () Plecoptera, (1) Trichoptera

%Ephemeroptera: 1.00%

CPMI Rating: 8 Fair

Habitat Analysis: 110 Suboptimal USEPA Protocol

Observations: Water temp: 12.02 C; Cond: 155 umhos; DO: 5.68 mg/L; pH: 6.04 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / < 1'; Substrate: cobble, gravel, sand, silt

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

Stream Gradient: Low Gradient Stream; Land Uses: suburban

Other: periphytes, orange floc, trash; parking lot on RB, auto repair shop and houses on LB

AMNET Site # AN0453

Stream Name: Deep Run

Location: Rt 9; Madison Twp; Middlesex County

Collection Date: 9/1/2009 USGS Topo Map: South Amboy

Genus	Tolerance Value	Amount
Rheopelopia	4	21
Limnodrilus	10	12
Calopteryx	6	11
Hetaerina	6	8
* Phryganeidae	4	8
Tribelos	5	7
* Polycentropus	6	5
Polypedilum	6	5
Corydalus	4	3
Lumbriculus	8	3
* Mystacides	4	3
Enallagma	9	2
Tubifex	10	2
Ablabesmyia	8	1
Ancyronyx	2	1
Bezzia	6	1
Cryptochironomus	8	1
Erythemis	10	1
Gerris	8	1
Nematoda	6	1
* Ptilostomis	5	1
Stenochironomus	5	1
Tanytarsus	6	1

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

%Dominance / Dominant Taxon(s): 21.0% Rheopelopia

Hilsenhoff Biotic Index (HBI): 5.95

%Clingers: 9.00%

* E+P+T: 4 () Ephemeroptera, () Plecoptera, (4) Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 10 Fair

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 17.24 C; Cond: 343 umhos; DO: 8.66 mg/L; pH: 4.37 SU

Clarity: slightly turbid, brown; Flow Rate: slow; Width/Depth: 31' / 2'; Substrate: gravel, sand, root mats, undercut banks

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

Stream Gradient: Low Gradient Stream; Land Uses: commercial, suburban

Pipes / Ditches: storm sewers, ditches (from adj parking lot)

AMNET Site # AN0454

Stream Name: Deep Run

Location: Rt 516; Madison Twp; Middlesex County

Collection Date: 9/1/2009 USGS Topo Map: South Amboy

<i>Genus</i>	<i>Tolerance Value</i>	<i>Amount</i>
Limnodrilus	10	57
Tribelos	5	28
Tubifex	10	9
Ischnura	9	2
Polypedilum	6	2
Rheotanytarsus	6	2

* (*EPT organism*) *Taxa Richness:* 6 *Population:* 100

%Dominance / Dominant Taxon(s): 57.0% Limnodrilus

Hilsenhoff Biotic Index (HBI): 8.42

%Clingers: 2.00%

* *E+P+T:* 0 () Ephemeroptera, () Plecoptera, () Trichoptera

%Ephemeroptera: 0.00%

CPMI Rating: 0 Poor

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 18.37 C; Cond: 255 umhos; DO: 7.29 mg/L; pH: 4.96 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 34' / > 4'; Substrate: mud, silt

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

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

Other: macrophytes, purple loosestrife, metal floc, gabion on bank