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LOCKHEED MARTIN

Foothills Parkway Section 8B
Final Environmental Report

Volume 3

Appendix D

Stream Biology

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VOLUME 3 SUMMARY

In 1994, Oak Ridge National Laboratory (ORNL) was tasked by the National Park Service (NPS) to prepare an Environmental Report (ER) for Section 8B of the Foothills Parkway in the Great Smoky Mountains National Park (GSMNP). Section 8B represents 27.7 km (14.2 miles) of a total of 115 km (72 miles) of the planned Foothills Parkway and would connect the Cosby community on the east to the incorporated town of Pittman Center to the west. The major deliverables for the project are listed below.

Study Plan	August 1994
First Field/Progress Report	October 1994
Second Progress Report	February 1995
Third Progress Report	June 1995
Draft Environmental Report	April 1997
Final Environmental Report	July 1999

From August 1995 through October 1996, NPS, GSMNP, and ORNL staff interacted with Federal Highway Administration staff to develop a conceptual design plan for Section 8B with the intent of protecting critical resources identified during the ER process to the extent possible. In addition, ORNL arranged for bioengineering experts to discuss techniques that might be employed on Section 8B with NPS, GSMNP, and ORNL staff during September 1996.

For the purposes of this ER, there are two basic alternatives under consideration: (1) a build alternative and (2) a no-build alternative. Within the build alternative are a number of options including constructing Section 8B with no interchanges, constructing Section 8B with an interchange at SR 416 or U.S. 321, constructing Section 8B with a spur road on Webb Mountain, and considering operation of Section 8B both before and after the operation of Section 8C. The no-build alternative is considered the no-action alternative and is not to construct Section 8B.

This volume of the ER inventories the fishes and benthic macroinvertebrates inhabiting the aquatic ecosystems potentially affected by the proposed construction of Section 8B. Stream biological surveys were completed at 31 stream sites during the Fall of 1994. The sampling strategy for both invertebrates and fish was to survey the different taxa from all available habitats. For benthic invertebrates, a standardized qualitative manual collection technique was employed for all 31 stations. For fish, all streams of sufficient water were sampled using various methods of electroshocking.

Two listed species were identified during the surveys: the Allegheny snaketail dragonfly (formerly a C2 federal candidate species found at six of the stream survey sites) and the tangerine darter (a Tennessee state special concern species found at two of the stream survey sites).

Recommendations given in the ER that resulted from the analysis of the stream biology data included the following:

- All mitigation measures identified to protect water resources should be instituted.
- Delays in paving road surfaces should be minimized to reduce soil erosion, and turbidity and sedimentation in the streams.
- Culverts or other structures should be constructed in such a way as to ensure that fish movements are not blocked, especially for Copeland Creek, Lindsey Creek, Mill Dam Branch, Warden Branch, Butler Branch, Matthew Creek, Carson Branch, Chavis Creek, and Sandy Hollow Creek.

Appendix D

STREAM BIOLOGY

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PART 1

INTRODUCTION

The proposed extension of the Foothills Parkway (Section 8B) from U.S. Highway 321, Cosby, Cocke County, Tennessee, to Pittman Center, Sevier County, Tennessee, has potential for adversely impacting aquatic ecosystems along and downstream of the new right-of-way. A biological assessment of fishes and benthic macroinvertebrates currently inhabiting the streams potentially impacted by construction and maintenance activities associated with this new road was carried out during 1994 by the author and his colleagues. The study was designed to provide an inventory of the fishes and benthic macroinvertebrates currently inhabiting these areas. We also attempted to describe our methodology with sufficient detail so future comparisons can be made.

METHODS

Fishes and benthic macroinvertebrates were sampled at 31 stations located along the proposed parkway route. Each station was given an abbreviation derived from the name of the creek followed by a hyphen and an A, B, or W (for Above, Below, or Within the right-of-way. For instance, LP-B = Little Pigeon River below right-of-way. For both taxonomic groups, the overriding sampling strategy was to describe and document the present biological diversity at these stations. Essentially, this means that we attempted to collect specimens of all taxa present by utilizing a variety of collecting techniques in all available habitats. While we might approximate this goal with the fishes, it seems reasonable to expect that we can collect only approximately 50–70% of the resident macroinvertebrate taxa per sample. Much of this work was qualitative in nature, but notes on methods and effort for the qualitative work are believed to be sufficiently detailed to allow the work to be duplicated in future years, and comparisons of relative abundance between years should allow a reasonable assessment of changes that might occur in these systems. Sampling sites for stream biota were coordinated with water quality sampling stations as appropriate. Steve Moore, GSMNP, provided input on location of sampling sites, periodicity of sampling for both fishes and macroinvertebrates, and stations where quantitative fish samples would be taken.

Fishes

Fishes were sampled only once at each station, during late summer or early fall, using back-pack electrofishing gear as the primary method. A small seine was used occasionally, especially in conjunction with the shocker for collecting riffle fishes. A stream reach of about 100 to 200 meters was sampled, depending on stream size and habitat complexity, and the upper and lower limits of the station and the time spent collecting were recorded. Fishes were collected from all available habitats (pools, riffles, undercut banks, etc.). Voucher specimens of virtually all species collected have been deposited in the research collection of fishes at the University of Tennessee. Many specimens of species easily identified in the field were recorded and released. All fishes were identified to species by the author or one of his qualified students.

Qualitative assessments of fish populations were carried out at 18 of the 31 stations. Five stations completely lacked fishes when sampled, or contained only blacknose dace (*Rhinichthys atratulus*) in small numbers in the deepest pools. At stations where significant fish populations occurred, the sample was taken by employing a single upstream run with the backpack shocker and a crew of two to four people. As was true for the quantitative samples, an effort was made to capture all fish in the reach during this run. Block nets were not used to prevent fish movement. Fishes captured were placed in a bucket of water for later identification, release, and/or preservation.

Four larger streams in the study area (Cosby Creek, Dunn Creek, Little Pigeon River, Webb Creek) were quantitatively sampled at two sites each using electrofishing gear and a three-pass depletion methodology as described by Van Deventer and Platts (1983). The station to be sampled was measured for width at 10- to 20-m intervals, and surface area was estimated by multiplying the length of the reach times the average of the ten or so width measurements. A block net was placed at the upper and lower limits of the reach to prevent emigration or immigration of fishes during the sample period. Using this system, a crew equipped with back-pack electrofishing gear spans the width of the stream and moves upstream, attempting to collect all fishes between the lowermost block seine and the uppermost block seine, a reach of approximately 100 to 200 m. This strategy was repeated until three passes were completed. The three samples for each site were completed during a single day. Fishes were dip-netted and kept in buckets for subsequent identification and recording of length and weight data, after which they were kept in mesh "cribs" near the identification area—typically upstream or downstream from the study reach. If the

identification area was near the center of the reach, the holding cribs were located in the study reach and moved short distances to avoid the electrofishing gear while collections were being made. For each of the three runs, number of specimens, aggregate weight in grams, and range in total length (millimeters) were recorded for non-game species. Game fish were enumerated and weighed and measured individually for each run. Except for specimens preserved for laboratory identification or eventual incorporation into the University of Tennessee research collection, fishes were released after the third pass had been completed. Population estimates for each species in the reach were generated using the "Fisheries Population and Statistical Package" software system described in Van Deventer and Platts (1989). Assumptions necessary to this technique include (1) no movement of fishes into or out of the study reach during sampling, (2) a uniform capture probability for each species for all runs, and (3) a uniform sampling effort by the collectors for each run. Population estimates are generated by multiple estimates of capture probability and population size for each species, and the maximum likelihood estimate for both are ultimately achieved. A variance around the maximum likelihood estimate can also be calculated, allowing confidence intervals to be determined. The method is very sensitive to how well the above assumptions are met, and performs poorly when the number of individuals captured per species does not get progressively smaller on each run. If no specimens of a species are caught on the final run, it is assumed that all have been caught and the population estimate is the actual number caught. If more individuals of a species are caught on the final pass than on the first pass, the program arbitrarily estimates the population to be 1.5 times the total number captured; meaningful confidence limits can not be calculated when this occurs. All data from this study were input by J. T. Baxter, University of Tennessee Department of Zoology.

Benthic Macroinvertebrates

Collections were made by hand-picking rocks, logs, and leaf packs, coarse screening soft substrates for burrowing organisms, kicking in riffles with a fine-mesh screen as the downstream collecting device, and dip-netting in vegetation, undercut banks, and root mats. Tiny invertebrates, such as elmid beetles, baetid and caenid mayflies, and midges (Ceratopogonidae, Chironomidae) were collected by fine-screening and emptying the screen contents into a water-filled white enamel pan. Small organisms otherwise easily overlooked become obvious as they move around over the white background of the enamel pan. When terrestrial adults of aquatic taxa were noted, they were collected opportunistically; they can be extremely useful in finalizing larval identifications.

Collections were typically made by a crew of four to six (extremes two to nine) persons with considerable experience in collecting aquatic insects. Our approach was to have each person in the group attempt to maximize the number of taxa they collected by varying techniques and habitats sampled. The number of organisms of each general type selectively preserved by each collector was dependent upon the taxonomic precision we were achieving with that group and the potential for multiple identifiable taxa to be included in what appeared to be a single taxon in the field. For example, the megalopteran *Corydalus* and the large common *Tipula* are easily identified in the field; the former is monotypic while the latter, although possibly representing a complex of similar species, was always considered as a single taxon during our laboratory identifications. For stoneflies other than *Pteronarcys*, mayflies other than *Isonychia* and *Ephemera*, odonates other than *Calopteryx* and *Hagenius*, heteropterans other than *Rhagovelia*, megalopterans other than *Corydalus* and *Sialis*, and dipterans other than simuliids and the large *Tipula*, all specimens were typically kept if the potential for many taxa was present (e.g., heptageniid and baetid mayflies, hydropsychid caddisflies), or each collector preserved 20 specimens or so if the field-identifiable taxon had potential for representing two or three species (e.g., the two species of *Boyeria* and *Nigronia* can not be field identified, and we preserved an adequate number to reveal whether the site contained one or both species). Only one or two oligochaetes were kept by each collector, and crayfishes were examined in the field, with only one or two specimens, preferably Form I males, of each apparent taxon being preserved. All specimens were preserved in isopropanol, with beginning concentration of about 70% to allow for dilution by specimen fluids. In order to minimize damage to delicate specimens such as mayflies and to make sorting easier, each collector carried two collecting bottles—one for large or heavy taxa such as odonate larvae and snails and the other for small or delicate taxa.

In addition to the qualitative sample, a sample of approximately 100 benthic macroinvertebrates (Hilsenhoff 1982) was taken from a shallow riffle area, ideally about 0.5 ft deep over coarse to medium gravel substrate. This sample was taken by kicking into a fine-mesh screen and processing the contents in a white enamel pan. Collectors attempted to limit the number of specimens in the initial sample to about 100 organisms. If there were fewer than 100, additional samples of approximately the appropriate size were taken to bring the total up to about 100. If there were too many organisms in the sample, it was either discarded immediately and a new smaller sample was taken, or the pan was subdivided, and all organisms taken from a single subdivision of the pan until about 100 organisms had been preserved. Samples of 100 were taken in conjunction with the

much larger qualitative samples to provide information on the reliability of this rapid bioassay method in streams in east Tennessee.

Sampling was terminated when the collectors began to experience difficulty in finding new taxa, with effort varying from as little as 1.5 hours in an intermittent stream to 16 hours in the spring sample from the largest stream collected, the Little Pigeon River. Careful notes of person-hours expended were kept for each sample. Identifications are to the lowest practical taxon and are about as follows: Mollusca—bivalves to species; gastropods to genus or species; Annelida—aquatic oligochaetes are identified only as oligochaetes, leeches are identified to genus, if possible; Crustacea—most identifications are to species; Insecta—species-level identifications predominate in the orders Odonata, Trichoptera, Megaloptera, Plecoptera, Heteroptera, and Ephemeroptera. In Coleoptera and Diptera, taxa are identified to genus or genus and species with about equal frequency. Throughout, if genera are found to be represented by two or more taxa, data were recorded separately for each presumptive taxon, even if species identification was not possible.

Numerous Trichoptera taxa have been incorporated into the research collection at the University of Tennessee, and most chironomid specimens are being cared for by John A. Wojtowicz. Other specimens have been retained in alcohol (by sample) at the University of Tennessee.

Identification was supervised by the author, with initial sorting and identification by John T. Baxter, David A. and Elizabeth L. Etnier, R. Brian Evans, Stephen J. Fraley, Kelly L. Harpster, Charles H. Heacock, Mark H. Hughes, and Chris E. Skelton, all associated with the University of Tennessee. John A. Wojtowicz, Knoxville, identified all Chironomidae from the qualitative samples, while subfamily and tribe identifications of chironomids from the samples of 100 were by D. A. Etnier and C. H. Heacock.

The general references used for identifying insects other than chironomids were *Aquatic Insects and Oligochaetes of North and South Carolina* (Brigham et al. 1982), and *An Introduction to the Aquatic Insects* (Merritt and Cummins 1988) plus literature cited in those volumes. Figures cited for descriptive purposes in species lists, especially for Tipulidae, are from appropriate chapters in these two volumes. Additional references used for various groups were: Gastropoda—Burch 1982; crayfishes—Hobbs 1976; Plecoptera—Stewart and Stark 1993, and references therein; Ephemeroptera—McCafferty and Waltz 1990; Odonata—Louton 1982 (Anisoptera);

Trichoptera—Chapin 1978 (Brachycentridae: *Micrasema*); Parker and Wiggins 1987 (Odontoceridae: *Psilotreta*); Vineyard 1990 (Uenoidae: *Neophylax*); Wojtowicz 1982 (Limnephilidae: *Pycnopsyche*). References used in identification of chironomid larvae included Simpson and Bode 1980; Bode 1983; and Wiederholm 1983.

DATA INTERPRETATION

Both the qualitative and quantitative data sets for fishes are reasonably self explanatory. I feel confident that virtually all fish species present were captured using both methodologies, and the quantitative population estimates appear to be realistic; their associated confidence intervals, however, often seem a bit optimistic (narrower than they should be). A summary of methods and results by site appear in Table 1.

The benthic invertebrate data is hardly self explanatory. All stations sampled have vigorous and diverse communities that are typical of undisturbed or little disturbed ecosystems. Many of the entries should be considered as merely presence/absence data, with little indication of relative abundance. For these taxa (listed below), each worker preserved only a few specimens, so a numerical entry equal to, or up to about three times the number of collectors would indicate a common taxon. A numerical entry of only one or two specimens taken by five or six collectors would be indicative of an uncommon taxon. Among such field-identifiable taxa are crayfishes, snails, Hydracarina, oligochaetes, *Caenis, Isonychia, Ephemera, Neoephemera, Macromia, Gerris, Rhagovelia, Corydalus, Lepidostoma, Pycnopsyche luculenta* group, *Rhyacophila fuscula, Psephenus herricki, Ectopria, Atherix,* Blephariceridae, Simuliidae, *Hexatoma,* and the large *Tipula.*

For other taxa, it was possible to determine in the field that a specimen represented one of only two or three possible taxa. In these cases workers preserved enough specimens (about 10–20 per person) to determine how many of the potential taxa were present, and numerical entries of ten or fewer for these taxa (listed below) would again be indicative of relative rarity. Such taxa include Leuctridae, Nemouridae, Peltoperlidae, Pteronarcyidae, *Baetisca, Calopteryx, Boyeria, Cordulegaster, Lanthus/Stylogomphus, Nigronia, Pycnopsyche* other than the *P. lepida* group, and *Psilotreta.*

Table 1. Summary of the fish survey results from the 8B stream sites

Site identifier and sampling date	Fish totals		Collection information		Stream channel data	
	Total # taxa	Total # specimens	Stream reach sampled [meters]	Collection method	Total collection time [minutes]	Max. depth/ mean width (range)[a]
1-LP-A	26	3335	179.6	Qualitative S-PE	—	
2-LP-B	28	2916	179.6	Quantitative T-PE	—	
3-CP-A 11 Sep 94	6	178	100	Qualitative S-PE[b]	15	0.7/3
4-CP-B 11 Sep 94	10	277	100	Qualitative S-PE	40	NA[c]
5-LN-A 11 Sep 94	4	41	50	Qualitative S-PE	15	0.5/1
6-LN-B	4	41	80	Qualitative S-PE	25	
7-WB-A	15	1266	107.2	Quantitative T-PE	—	
8-WB-B	14	851	100	Quantitative T-PE	—	
10-MD-B	1	33	125	Quantitative S-PE	35	
11-WR-B	2	47+	76	Qualitative S-PE	25	
12-BT-B	1	42+	68	Qualitative S-PE	20	

Table 1. continued

Site identifier and sampling date	Fish totals: Total # taxa	Fish totals: Total # specimens	Collection information: Stream reach sampled [meters]	Collection information: Collection method	Stream channel data: Total collection time [minutes]	Stream channel data: Max. depth/ mean width (range)[a]
13-MA-B 24 Sep 94	4	71	100	Qualitative Seine	30	0.1/1.8 (1.2-2.5)
13.5		0 (first)				
14		0 (first)				
15-MAT2-B 24 Sep 94	3	36	77	Qualitative S-PE	35	0.1/1.5 (1.2-1.8)
16-DNE-A 28 Aug 94	7	130	259	Qualitative S-PE	30	0.7/3 (3-7.5)
17-DN-B 10 Sep 94	10	218	150	Qualitative S-PE[d]	90	0.8/6 (5-9)
18-OG-A 1 Oct 94	2	29	51	Qualitative S-PE	40	0.2/1.5
19-OG-B 10 Sep 94	2	56	144	Qualitative S-PE	65	0.5/3 (2.5-3.7)
20-CR-A	1	28	134	Qualitative S-PE	—	
21-CR-B 10 Sep 94	2	43	93	Qualitative S-PE	35	NA
22-CH-B 25 Sep 94	4	295	100	Qualitative S-PE	25	0.5/1.5
23-IC-B 28 Aug 94	7	296	127	Qualitative S-PE	40	0.8 (5.5-8.5)

Table 1. continued

Site identifier and sampling date	Fish totals: Total # taxa	Fish totals: Total # specimens	Collection information: Stream reach sampled [meters]	Collection information: Collection method	Stream channel data: Total collection time [minutes]	Stream channel data: Max. depth/ mean width (range)[a]
24-SH-B 28 Aug 94	7	439	100[e]	Qualitative S-PE	50	6.7;52
25-CB-A	13	2462	115	Quantitative T-PE	—	
26-CB-B	18	2610	120	Quantitative T-PE	—	
27-WBT1-B	4	24	100	Qualitative S-PE	20	
28		0 (first)				
31		0 (first)				
32	4	47	300	Qualitative S-PE	30	

[a]Maximum depth and mean width in meters at the stream sampling site.
[b]S-PE = Single-pass electroshocking; T-PE = Triple-pas electroshocking.
[c]NA = not available.
[d]Stream too large for single backpack unit to be effective in depletion.
[e]100 meters actually represents 90 meters above confluence with Indian Camp Creek plus spot shocking in several pools in next 50 meters.

Large numbers of caddisfly cases were preserved if the cases were closed (indicating pupation) in order to have an opportunity to find a pupa sufficiently developed to allow for species identification based on developing male genitalia. Empty caddisfly cases were also preserved if they were the only ones available for a taxon, but the numerical entry in the tables for these was consistently "1".

For potentially speciose groups that could not be field-identified, each worker preserved many specimens, concentrating especially on getting reasonable numbers (at least ten or so) of all obvious size groups and from all different habitats collected. Such taxa include Chloroperlidae, Perlidae, Perlodidae, Baetidae, Ephemerellidae, Heptageniidae, Leptophlebiidae, Gomphidae, Brachycentridae, Hydropsychidae, Leptoceridae, Limnephilidae except for *Pycnopsyche*, Polycentropodidae, Rhyacophilidae other than *R. fuscula*, Coleoptera other than *Psephenus* and *Ectopria*, Ceratopogonidae, Chironomidae, and Tipulidae other than *Hexatoma* and *Tipula "abdominalis"*. Small numerical entries for any of these is indicative of relative rarity for that sample.

When tabulating numbers of taxa, conservative entries such as *Stenonema* sp. (early instars) are not counted as a separate taxon if other *Stenonema* in the sample have been identified to species.

Species diversity indices would be rather meaningless when applied to these data because of their qualitative nature. It would be possible to apply a "biotic index" approach (Hilsenhoff 1987; Herring 1992; Lenat, in Litt.) to these data, but that analysis would be far beyond the scope of this project. An alternate that is fast and quite useful is to compare the number of taxa in orders than contain mostly sensitive taxa (Ephemeroptera, Plecoptera, Trichoptera, or EPTs) to total taxa, assuming that the higher the proportion of supposedly sensitive taxa the healthier the ecosystem. This approach is less sensitive to stream size than looking at total taxa or total EPT taxa. Additionally, a high number of taxa and individuals in the subfamily Orthocladinae of Chironomidae (especially in the genera *Cricotopus* and *Orthocladius*) relative to total chironomid taxa and specimens is indicative of stress (J.A. Wojtowicz, pers. comm.) For the four large streams sampled (Little Pigeon River, Cosby, Dunn, and Webb creeks), meaningful comparisons can be made with various stations in the Abrams Creek watershed in Great Smoky Mountains National Park, where our group has generated a large benthic macroinvertebrate data set using an identical sampling strategy. For smaller creeks, occasional meaningful comparisons can be made with

streams we sampled using a similar strategy for the Foothills Parkway section 8D from Wears Cove to Pigeon Forge during 1991 (ORNL 1992).

RESULTS

No federal- or state-listed Endangered or Threatened fish or invertebrate species were found at any of the sites. *Percina aurantiaca*, the tangerine darter, a state Special Concern species (Starnes and Etnier 1980), was taken at both sites in Little Pigeon River.

The rich invertebrate fauna found at most of the sites did contain numerous noteworthy taxa. Spring samples produced more taxa than fall samples at 21 sites, with a maximum difference of 34 taxa (OGT-B) and 33 taxa (BT-B). In all stations that contained only one or two fish species, dominated by blacknose dace (*Rhinichthys atratulus*), spring samples contained more EPT taxa and total taxa than did fall samples. Fall samples contained more taxa at only 8 sites, with the maximum difference of 14 taxa occurring at MAT1-B. Conducting both spring and fall collections resulted in a mean of 37% more total taxa (range = 22–73%) for the site than were present in a single collection (grand total taxa minus mean of total taxa for spring and fall, divided by mean of total taxa for spring and fall). Species richness increased with stream size, from a low of 27 total taxa in the intermittent WBT3-B that was not sampled during the fall because it was dry, to 174 total taxa at each of the Little Pigeon River sites. Overall, the apparent internal consistency of the data set is sufficient to suggest that any large discrepancies between spring and fall samples are real, and demand at least an attempted explanation. The samples of 100 do not appear to be sensitive enough to reliably detect differences in benthic macroinvertebrate communities of the magnitude that occurred in this study.

The federal candidate perlodid stonefly species *Oconoperla innubila*, present at several sites we surveyed in 1991 for the Foothills Parkway section from Wears Cove to Pigeon Forge, was not encountered during this study. An additional perlodid, *Isogenoides hansoni*, not reported from Tennessee by Stewart and Stark (1988), was present at both Cosby Creek sites, the upper Little Pigeon River site, and the lower Webb Creek site. The rich baetid mayfly fauna of the area continues to resist our efforts to confidently associate the obviously different taxa with a species name. We have separated the taxa in what we feel to be a conservative manner, and provided a

generic name (*Acentrella* or *Baetis*) plus a description of taxonomic characters that seem to be consistent. From our experiences with this study, it is apparent that the presence or absence of a distinct dark band on the cerci is not a reliable character, and that pigment patterns on the abdomen might be very useful. In the mayfly family Heptageniidae, we have specimens from lower Little Pigeon River and lower Webb Creek that are not assignable to any described genus. The taxon is characterized by having long, finger-like gills on all segments, similar to those on segment 7 of *Stenonema*, but rounded rather than pointed at their tips. All the specimens we collected of this unusual mayfly are early instars, and it is possible that there are species of *Heptagenia* (which it is most like) in which the gill shape changes dramatically from early instars to final instar. A federal candidate odonate (family Gomphidae), *Ophiogomphus incurvatus allegheniensis*, was present at Laurel Branch and five additional sites in and near the lower Webb Creek site. The glossosomatid caddisfly *Agapetus minutus*, known from New York and a single locality from the lower Hiwassee River system, Tennessee, when reported by Etnier and Schuster (1979) was present at ten of the sites sampled. This species was also present at 6 sites sampled in the 1991 survey of the Wears Cove section of the Parkway, indicating it to be a rather common species in this region. What appears to be an undescribed species in the *Hydropsyche scalaris* group was collected at both Cosby Creek sites and both Little Pigeon River sites. We have collected what appears to be the same species in lower Abrams Creek, near the Abrams Creek campground. The brachycentrid caddisfly *Micrasema bennetti*, not reported from Tennessee by Etnier and Schuster (1979) was collected at both Little Pigeon River sites and at lower Webb Creek. Additional noteworthy taxa that occurred at only one or two localities will be treated under the discussions for the individual sites.

Descriptions of stations followed by tabulations of data for invertebrates and fishes appear in Part 2 of this appendix. Following is a discussion of each station, with the stations discussed in alphabetical order of the abbreviated station name. Data in Part 2, which includes the raw data and a more complete description of the site, is arranged in the same order.

Station 12-BT-B, Butler Branch at junction of Butler Branch Road and Picadilly Lane, Cobbly Nob, Sevier County. This small stream is in an area that has been developed for private residences, and the sample site appears to have been moderately impacted by siltation from construction and adjacent roads. The spring sample (76 taxa) and the fall sample (43 taxa) difference of 33 taxa was exceeded only by the 34-taxon difference between spring and fall

samples at OGT-B. Experience of the collecting crews was virtually identical, and time spent collecting (9.5 hours in spring, 7 in fall) is not sufficiently different to explain this. In fact, taxa collected per hour (Table 3) is typically and expectedly inversely proportional to hours of effort—At BT-B taxa per hour dropped from 8.1 in spring to 6.1 in fall, in spite of the 2 hours less effort in fall. Data from the samples of 100 (Tables 2 and 4) fail to reflect this difference in community structure between the spring and fall samples. The total of 39 EPT taxa (samples combined) is not unusually low for a stream of this size, but only 19 EPT taxa were present in the fall. Eight of 14 chironomid taxa from the spring sample were orthoclads, but none of the orthoclads was *Cricotopus* or *Orthocladius*. None of the other metrics for this station (Tables 2–4) appear to be unusual for this tiny stream. The only fish species present at this station was *Rhinichthys atratulus*, the blacknose dace.

Caney Creek station CC-3 from the 1991 study of the Wears Cove section of the Parkway is a site containing blacknose dace as the only fish species, and is similar in size and substrate to BT-B; it differed from BT-B in being somewhat less silty. It also contained 86 total taxa, and 44 were EPTs (versus 39); *Hydropsyche betteni/depravata* was present; 31 more taxa were collected in the spring sample than in the fall sample (76 versus 45), and the fall sample contained only 23 EPT taxa. Five of nine chironomid taxa were orthoclads, but no *Cricotopus* or *Orthocladius* was present. The striking similarity between the invertebrate communities of these two creeks raises the possibility that a drastic decrease in taxa in fall versus spring samples in creeks containing blacknose dace as the only fish species might be a natural phenomenon. All other sites in this study with a fish community restricted to one or two species and dominated by blacknose dace had a large (9 to 34 taxa, 7 to 20 EPT taxa) decrease in taxa in fall samples. These stations were MAT1-B, MD-B, OG-A, OGT-A, OGT-B, SP-W, WBT2-W, and WR-B.

Station 25-CB-A, Cosby Creek at mouth of Indian Camp Creek, Cocke County. This site contained a very diverse benthic invertebrate community, with over 50 EPT taxa and well over 100 taxa collected during each sample. With spring and fall samples combined, 75 EPT taxa and 162 total taxa were present. These data are virtually identical to those from the nearby station CB-B. Twenty-two of 37 chironomid taxa were orthoclads, and 5 orthoclad taxa are in genera *Cricotopus* or *Orthocladius*, but these taxa were not abundant in the sample. It seems likely that there is some organic enrichment from anthropogenic activity in the area, but the community appears to be very healthy. Samples of 100 from this site and CB-B indicate far more differences

Table 2. Percent EPT taxa and EPT specimens in qualitative samples and samples of 100 (the higher the percent EPT the better the stream quality

Site ID	Qualitative				Sample of 100			
	% EPT taxa spring/fall		% EPT spec. spring/fall		% EPT taxa spring/fall		% EPT spec. spring/fall	
1-LP-A	49	52	58	68	58	72	72	84
2-LP-B	51	48	62	74	60	67	40	67
3-CP-A	45	47	61	68	68	52	53	65
4-CP-B	49	49	61	68	50	62	54	76
5-LN-A	40	45	62	67	67	48	80	84
6-LN-B	46	40	69	77	70	58	87	80
7-WB-A	48	49	64	73	61	77	83	81
8-WB-B	43	46	61	67	50	72	55	58
9-WBT2-B	52	46	65	77	56	62	65	86
10-MD-B	59	44	59	66	45	74	39	81
11-WR-B	53	47	67	57	52	48	58	63
12-BT-B	49	44	67	50	47	41	68	63
13-MA-B	46	42	74	56	78	52	66	45
13.5-MAT1-B	60	54	85	72	67	69	82	93
14-DNW-A	60	51	71	79	53	67	82	84
15-MAT2-B	60	53	80	82	65	64	47	90
16-DN-A	54	48	75	75	70	68	62	62
17-DN-B	52	54	76	68	75	54	94	57
18-OG-A	47	51	61	68	44	55	27	62
19-OG-B	52	55	77	77	71	59	82	79
20-CR-A	49	44	68	68	52	54	64	56
21-CR-B	49	42	67	64	41	29	71	44
22-CH-B	58	43	59	62	50	46	62	54
23-IC-B	39	51	23	70	31	67	9	54
24-SH-B	46	47	69	61	65	46	57	65
25-CB-A	41	50	62	77	56	72	36	70
26-CB-B	40	46	52	67	38	70	64	78
27-WBT1-B	44	41	58	56	60	57	69	68
28-SP-B	53	52	73	74	57	60	70	86
31-WBT3-B	44	NA	66	NA	NA	NA	NA	NA
32-LB-B	53	48	76	72	56	52	71	70

Table 3. Number of collectors, hours of effort, taxa collected per hour, and specimens collected per hour

Site ID	Collectors spring/fall		Hours of effort spring/fall		Taxa per hour spring/fall		Specimens per hour spring/fall	
1-LP-A	8	5	15	15.75	8.5	8.1	58	107
2-LP-B	8	9	16	13	8.6	10.0	82	145
3-CP-A	6	6	9.5	5.67	9.8	13.6	127	142
4-CP-B	5	5	8.75	8.5	10.2	10.2	89	79
5-LN-A	5	5	8.75	3.67	5.7	15.3	95	137
6-LN-B	5	3	8.75	5	6.7	11.4	106	84
7-WB-A	6	5	9.5	11.25	11.7	8.7	113	121
8-WB-B	8	5	17.33	15.75	7.3	7.6	78	94
9-WBT2-B	5	5	9	8	7.9	7.1	63	105
10-MD-B	6	5	8.25	9.17	9.4	7.1	64	91
11-WR-B	6	5	8.5	8.5	9.9	9.3	75	140
12-BT-B	6	4	9.5	7	8.1	7.3	80	48
13-MA-B	4	6	6.67	8.75	13.0	9.5	116	84
13.5-MAT1-B	4	6	6.67	6	7.3	10.2	82	74
14-DNW-A	6	4	8	7.25	7.2	9.8	91	90
15-MAT2-B	4	6	7.2	6.5	9.4	9.4	108	121
16-DNE-A	6	5	9	12.25	11.1	7.9	98	89
17-DN-B	6	5	9	6	11.2	12.2	113	95
18-OG-A	6	5	8	10	8.2	6.5	50	59
19-OG-B	6	5	9	5.5	8.7	11.6	100	99
20-OGT-A	6	4	10.5	8.5	8.3	8.8	105	122
21-OGT-B	6	5	10.5	6	7.6	8.5	76	56
22-CH-B	6	6	9	8	7.2	9.5	77	91
23-IC-B	5	6	6.67	9	9.1	7.8	62	64
24-SH-B	6	6	9	9	8.9	7.8	96	76
25-CB-A	5	5	11	12.5	15.3	9.0	95	123
26-CB-B	5	5	12	11.67	9.4	10.2	86	129
27-WBT1-B	3	4	6	3.67	7.7	12.3	67	107
28-SP-B	3	4	4.5	11	13.8	4.1	110	40
31-WBT3-B	2	NA	1.5	NA	18.0	NA	65	NA
32-LB-B	5	4	11.25	7.67	7.5	9.5	69	118

Table 4. Total taxa, total EPT taxa, total specimens, and sample of 100 results

Sample stations	Total taxa (spring/fall)	Total EPT taxa (spring/fall)	Total specimens, spring/fall	Sample of 100, spring/fall
1-LP-A	174 (124/126)	88 (61/65)	714/1582	31/25
2-LP-B	174 (136/130)	87 (70/63)	1194/1772	20/21
3-CP-A	130 (115/89)	62 (54/42)	1121/697	25/27
4-CP-B	115 (89/86)	54 (45/42)	696/570	24/26
5-LN-A	79 (50/56)	32 (20/25)	728/389	15/21
6-LN-B	78 (57/55)	36 (26/22)	821/311	20/19
7-WB-A	137 (111/98)	68 (53/48)	972/1243	23/26
8-WB-B	160 (125/120)	73 (54/55)	1304/1372	30/26
9-WBT2-B	82 (71/57)	39 (37/26)	473/738	18/16
10-MD-B	100 (79/63)	51 (47/28)	445/726	22/19
11-WR-B	106 (83/75)	54 (44/35)	536/1088	25/23
12-BT-B	86 (76/43)	39 (37/19)	651/237	19/17
13-MA-B	109 (82/83)	60 (38/35)	662/632	27/29
13.5-MAT1-B	73 (45/59)	37 (27/32)	439/345	25/16
14-DNW-A	91 (57/69)	51 (34/35)	635/535	19/21
15-MAT2-B	87 (67/59)	48 (40/31)	674/682	23/22
16-DNE-A	135 (100/97)	65 (54/47)	884/1092	27/22
17-DN-B	113 (100/71)	58 (52/38)	919/488	20/24
18-OG-A	87 (70/63)	42 (33/32)	502/494	27/20
19-OG-B	99 (75/62)	52 (38/34)	801/426	21/17
20-CR-A	106 (87/73)	50 (43/32)	993/936	25/26
21-CR-B	95 (79/45)	45 (39/19)	694/233	22/21
22-CH-B	99 (77/76)	52 (37/33)	598/633	20/24
23-IC-B	90 (59/67)	43 (23/34)	307/480	13/21
24-SH-B	109 (78/79)	54 (36/37)	765/578	20/28
25-CB-A	162 (127/113)	75 (52/57)	944/1440	16/18
26-CB-B	163 (113/119)	70 (45/55)	918/1388	8/27
27-WBT1-B	71 (41/41)	28 (18/17)	301/289	25/23
28-SP-B	68 (57/42)	34 (30/22)	399/338	30/20
31-WBT3-B	27 (27/--)	12 (12/--)	97/--	--/--
32-LB-B	94 (83/71)	51 (44/34)	676/801	27/21

between spring and fall samples than actually exist based on the much larger and presumably much more reliable qualitative data sets (Tables 2 and 4). Comparable sites in our study of the Abrams Creek watershed in GSMNP include Mill Creek just above Abrams Creek and Abrams Creek just below the mouth of Mill Creek in Cades Cove, and lower

Abrams Creek below Abrams Creek Campground. Total taxa/EPT taxa for those sites, respectively, from May 1994 were 53/79, 63/98, and 59/106, with the Abrams Creek samples very similar to those from CB-A, but perhaps reflecting slightly higher EPT numbers and slightly reduced total taxa numbers. Fall samples and species identifications of chironomids are not yet available for these Abrams Creek sites, and would add 20 or so total taxa to each.

Fish population size in this area was estimated using three-pass depletion technology (Attachment 1). Thirteen species were present, dominated by stonerollers (*Campostoma anomalum*), saffron shiners (*Notropis rubricroceus*), blacknose dace (*Rhinichthys atratulus*), longnose dace (*R. cataractae*), mottled sculpin (*Cottus bairdi*), and Swannanoa darter (*Etheostoma swannanoa*). Five rainbow trout (*Oncorhynchus mykiss*) and 9 rockbass (*Ambloplites rupestris*) were estimated to occur in the reach sampled. Additional species present were American brook lamprey (*Lampetra appendix*), creek chub (*Semotilus atromaculatus*), redline darter (*Etheostoma rufilineatum*), and snubnose darter (*E. simoterum*).

Station 26-CB-B, Cosby Creek at Jones Cove Road, Cocke County. With about 50 EPT taxa and well over 100 total taxa per sample, and with 70 EPT and 163 total taxa when samples were combined, this station is nearly identical to station CB-A, which is only 0.8 river miles upstream. Twenty-one of 38 chironomid taxa were orthoclads, and the 5 *Crocotopus* or *Orthocladius* taxa appear to be a bit more numerous than at CB-A. The large difference indicated between the spring and fall samples of 100 (Tables 2 and 4) are small-sample artifacts based on comparison with data from the much larger qualitative sample. The two Cosby Creek sites were similar in EPT and total taxa richness to the lower Webb Creek site, and this species richness was exceeded only in the two Little Pigeon River sites. Comparable sites in our study of the Abrams Creek watershed in GSMNP include Mill Creek just above Abrams Creek and Abrams Creek just below the mouth of Mill Creek in Cades Cove, and lower Abrams Creek below Abrams Creek Campground. Total taxa/EPT taxa for those sites, respectively, from May 1994 were 53/79, 63/98, and 59/106, with the Abrams Creek samples very similar to those from CB-B, but perhaps reflecting slightly higher

EPT numbers. Total taxa for the Abrams Creek sites will increase by 20 or so when chironomids are identified.

Eighteen fish species occurred at CB-B, dominated by stoneroller, saffron shiner, blacknose dace, northern hogsucker, mottled sculpin, snubnose darter, and Swannanoa darter. We estimated 2 rainbow trout and 17 rockbass to occur in the reach sampled. American brook lamprey, longnose dace, and redline darter, all of which occurred at CB-A, were present in small numbers at CB-B. Species present at CB-B that did not occur at CB-A were whitetail shiner (*Cyprinella galactura*), bigeye chub (*Hybopsis amblops*), telescope shiner (*Notropis telescopus*), an unidentified sunfish (*Lepomis* sp.), and fantail darter (*Etheostoma flabellare*), all of which were uncommon.

Station 22-CH-B, Chavis Creek at 4435 Ball Hollow Road, Cocke County. Spring and fall samples were virtually identical, with 37 versus 33 EPT and 77 versus 76 total taxa, respectively. For the combined samples there were 52 EPT and 99 total taxa. Ten of 20 chironomid taxa were orthoclads, with *Cricotopus* and *Orthocladius* comprising three of these, and *Cricotopus bicinctus* representing 20 of the 65 midge specimens in the fall sample. The chironomid data plus the presence of the tolerant hydropsychid *Hydropsyche betteni/depravata* in this small stream indicate a modest amount of enrichment, presumably due to runoff from adjacent roads and residential areas. The 99 total taxa and 52 EPT taxa for a stream that averages 5 ft wide indicate a healthy and diverse aquatic community that has probably gained several taxa due to moderate eutrophication, but has lost very few taxa in exchange. The samples of 100 (Tables 2 and 4), with 20 and 24 taxa, and over half of the taxa and specimens EPTs, also indicate agreement between spring and fall samples and a healthy system. Fish species present were saffron shiner, blacknose dace, creek chub, and white sucker (*Catostomus commersoni*), with creek chub (50) and blacknose dace (242) representing 292 of the 295 specimens captured. None of the stations sampled during the survey of the Wears Cove section of the Parkway in 1991 was similar to this stream.

Station 3-CP-A, Copeland Creek along Copeland Creek Road at McKinzie Way, Sevier County. The 130 total taxa contained 62 EPT taxa, with the spring sample richer (115 total/54 EPTs) than the fall sample (89/42). Disparity in species richness between spring and fall samples is likely an artifact of collection effort in this case, with 9.5 hours effort and 1121 specimens collected in spring versus 5.67 hours effort and 697 specimens in fall (Tables 3 and 4). The very similar and nearby station CP-B, with comparable spring and fall effort and specimens, does not show this

disparity. Although the site is in a grazed pasture, with a virtual absence of canopy, it contained a rich invertebrate community. Twenty-eight mayfly taxa were present, eight of them baetids. Fourteen of 28 chironomid taxa were orthoclads, and 3 of the orthoclad taxa were *Cricotopus* in the spring sample. Two taxa whose presence in small streams suggests to me that significant organic enrichment has occurred were present—the crayfish *Orconectes forceps* and the hydropsychid caddisfly *Hydropsyche betteni/depravata*. The lepidostomatid caddisfly *Lepidostoma latipenne* was previously recorded from Tennessee only from Newfound Gap in GSMNP; a single male pupa was collected at this site. Fish species present were 43 stonerollers, 31 blacknose dace, 44 creek chubs, 8 northern hogsuckers, 10 banded sculpins (*Cottus carolinae*), and 43 fantail darters. See CP-B (below) for comparisons of Copeland Creek sites with Wears Cove sites.

Station 4-CP-B, Copeland Creek along Copeland Creek Road 0.1 road mile above Little Pigeon River, Sevier County. This site is 0.2 river miles downstream from CP-A, and has a very similar invertebrate community, with 54 of 115 total taxa EPTs. Spring and fall samples were virtually identical, with 89 and 86 taxa and 45 and 42 EPT taxa, respectively. The rich mayfly fauna contained 30 taxa, 9 of which were baetids. As in CP-A, *Orconectes forceps* and *Hydropsyche betteni/depravata* were present, suggesting some organic loading. Chironomidae consisted of 15 taxa, with 8 of these orthoclads, represented by 3 *Cricotopus* taxa in small numbers. For both CP-A and CP-B, samples of 100 indicate healthy communities, but more seasonal variability than indicated by the qualitative samples (Tables 2 and 4). The same six fish species present at CP-A were present and about equally abundant here, with 4 additional species added—4 warpaint shiners (*Luxilus coccogenis*), 1 saffron shiner, 1 black redhorse (*Moxostoma duquesnei*), and 1 snubnose darter. Several or all of these additional fish species are likely emigrants from the nearby Little Pigeon River.

Stations MB-3M and MB-3R, Machine Branch and Rymel Branch just above their confluence in Wears Cove, are sites similar in size and physical characteristics, and with a similar fish fauna. The Wears Cove sites were considerably less rich, with 35 and 29 EPT taxa and 99 and 71 total taxa, respectively. Only 20 and 17 mayfly taxa were collected at these sites, respectively. Chironomid taxa were more prevalent at the Wears Cove sites, with 17 of 26 taxa at MB-3M orthoclads, and 6 of these either *Cricotopus* or *Orthocladius*. The reason for the more degraded condition of the Wears Cove sites is likely due to Copeland Creek having much of its watershed

above our upper station little impacted by agriculture, while the Wears Cove sites have seen heavier use.

Station 17-DN-B, Dunn Creek at 5229 and 5219 Mathis Branch Road, off Rocky Flats Road, Sevier County. The spring sample, with 100 taxa and 52 EPT taxa, was considerably richer than the fall sample (71/38), but this appears to be an artifact of reduced collection effort and number of specimens in the fall, with 6 (versus 9) hours of effort in the fall, and 488 (versus 919) specimens retained. Totals for the site are 58 EPT taxa and 113 total taxa, indicating a rich and healthy benthic invertebrate community. Fifteen of 23 chironomid taxa were orthoclads, with only two of these *Cricotopus* or *Orthocladius*, again indicating a diverse and rather unimpacted community. Samples of 100 from this site indicated a greater prevalence of EPT taxa and specimens in the spring sample, and were not consistent with the qualitative data. In our 1991 study in Wears Cove, station MC-5 was rather similar in size and fish community structure. That station contained 112 total taxa (spring and fall samples combined) and 52 EPT taxa; and 12 of 23 chironomid taxa were orthoclads, with two of these *Cricotopus/Orthocladius*. Both sites are interpreted as being rich, healthy, and very slightly impacted by silt and/or organics.

Nine fish species were present in the population estimates for this site, dominated by stonerollers (estimated population 78), blacknose dace (277), longnose dace (41), mottled sculpin (226), and fantail darter (32). Three rainbow trout were estimated to occur in the reach sampled, and other less common species included warpaint shiner (3 estimated), saffron shiner (13), and northern hogsucker (8). In a qualitative collection from this site taken on 10 September, and additional species, the river chub (*Nocomis micropogon*) was collected, with seven specimens taken.

Station 16-DNE-A, East Branch of Dunn Creek at Rocky Flats Road, Sevier County. Approximately 100 taxa were collected during each of the samples, with 54 EPT taxa in spring and 47 in the fall sample. With collections combined, there were 135 total taxa and 65 EPT taxa at this site. The 65 EPT taxa was exceeded only in the Little Pigeon River sites and Cosby and Webb creek sites, all of which are considerably larger than DNE-A. Twenty-three of 37 chironomid taxa were orthoclads, with the spring sample containing 3 *Cricotopus/Orthocladius* taxa with 20 specimens (out of 131 chironomids). This appears to be a very pristine, virtually unimpacted stream, and the benthic invertebrate data certainly supports that visual assessment. Because of an oversight, the "fall" sample was not taken until 19 February. Having the "fall"

sample chronologically so much closer to the spring sample did not result in increasing the similarity of the spring and "fall" samples, as the February sample increased total taxa by 37%, precisely the mean for the entire data set. Samples of 100 from this site were consistent with the quantitative data set.

Our upper Mill Creek site at Parsons Branch Road, and Anthony Creek (just above the horse camp near the Cades Cove campground), both in Cades Cove, GSMNP, are similar habitats that are virtually unimpacted. Our February 1994 collections from these sites produced 41 and 45 EPT taxa, respectively, and 65 and 62 total taxa, respectively, with chironomids not identified. Comparable figures for the February collection from DNE-A, corrected by subtracting chironomid taxa, are 47 EPT taxa and 72 total taxa—both values slightly higher than for the pristine sites in Cades Cove. This comparison certainly supports the contention that this is a virtually unimpacted stream.

Seven fish species were present at this site, dominated by stonerollers (estimated population = 36), blacknose dace (109), longnose dace (30), rainbow trout (12), and mottled sculpin (18). Single specimens of river chub and brook trout (*Salvelinus fontinalis*) were also taken. A qualitative sample at this site 28 August 1994 revealed a similar fish community, with no specimens of river chub taken but 2 northern hogsuckers collected.

Station 14-DNW-A, West Branch of Dunn Creek just below U.S. Highway 321 at mailbox address 5124, Sevier County. This tiny stream emerges from under the highway through a culvert. This was one of the few sites where the fall sample was noticeably richer than the spring sample, with 69 total and 35 EPT taxa in fall versus 57 total and 34 EPT taxa in spring. Totals for the site were 91 taxa, 51 EPT taxa. At this site and DNE-A (above), the "fall" sample was taken on 19 February due to an oversight. Combining spring and "fall" samples at this site resulted in 44% more total taxa than the mean total taxa for the two samples, only slightly more than the 37% mean for the entire data set. Benthic invertebrates might have been more diverse during the February collection, as effort (7.25 versus 8 hours) and specimens retained (535 versus 635) were actually lower for the February sample. Another possibility is that the area had been "bush-hogged" since our spring collection, and removal of this very brushy and thorny, difficult to penetrate undergrowth likely made more of the stream accessible, and removal of the low canopy made collecting and field identification easier. Nine of 12 chironomid taxa collected were

orthoclads, but none was either *Cricotopus* or *Orthocladius*. The samples of 100 are not inconsistent with the qualitative data set. Data from a comparable stream are not available. The 91 total taxa and 51 total EPT taxa appear to be very good numbers for a stream this small. Fishes were absent.

Station 23-IC-B, Indian Camp Creek at Costner Road, Sevier County. The difference between spring and fall samples at this site appears to be real. During the spring sample we noted the surprising lack of diversity and scarcity of benthic invertebrates in what appeared to be a pristine stream. We did note that boulders and cobbles were buried in the smaller substrate more deeply and firmly than is usual, and this may have resulted from a flood event, but other streams of similar size in this area did not show an impoverished invertebrate community during our spring samples. The spring sample had 59 taxa, with 23 EPT taxa, while data for fall had recovered to 67 taxa and 34 EPTs. The spring sample's 39% EPT taxa was the lowest recorded for the entire data set. I would expect a pristine stream of this size in that area to contain over 80 taxa and 40–50 EPT taxa, and have a fauna much like that at the similar DNE-A. Spring chironomid collections contained 20 taxa of which 12 were orthoclads, and 4 of the orthoclads were *Cricotopus* or *Orthocladius*, representing 36 of the 94 Orthocladinae specimens. In fall, 9 of 14 chironomid taxa were orthoclads, 2 were *Cricotopus*, and each was represented by a single specimen (out of 26 Orthocladiinae specimens). The chironomid data is consistent with the remainder of the quantitative data in indicating a system that is recovering from a recent perturbation. The samples of 100 for this site (Tables 2 and 4) indicate the same large differences between the spring and fall samples. This was the only site where the large hydropsychid caddisfly, *Arctopsyche irrorata*, a species associated with boulders in montane streams, was found.

Seven fish species were collected here, including one brook trout, 42 stonerollers, 12 blacknose dace, 95 longnose dace, 1 northern hogsucker, 141 mottled sculpins, and 4 Swannanoa darters.

Station 32-LB-B, Laurel Branch above its mouth in Little Pigeon River, Pittman Center, Sevier County. The spring sample, with 44 EPT taxa and 83 total taxa, was more diverse than the fall sample (34/71), and this difference is apparently real. More effort was expended in the spring (11.25 versus 7.67 hours), but more specimens were collected in the fall (801 versus 676). The samples of 100 are consistent with that interpretation. For spring and fall samples combined there were 51 EPT taxa and 94 total taxa. Twelve of 19 chironomid taxa were orthoclads, with only 1

Cricotopus (1 specimen) present. The invertebrate community suggests this to be a very good stream.

Fishes collected at this site were 1 stoneroller, 53 blacknose dace, 1 longnose dace, and 13 rainbow trout. This low elevation, easily accessible stream has a surprisingly good trout population.

Station 5-LN-A, Lindsey Creek 0.5 air miles ESE of Pittman Center, Sevier County. This 3-ft wide warm water, low gradient stream had 50 and 56 total taxa and 20 and 25 EPT taxa in spring and fall samples, respectively. For samples combined, there were 32 EPT taxa and 79 total taxa. The presence of large numbers of *Hydropsyche betteni/depravata* and *Stenacron interpunctatum* as the dominant *Stenacron* are suggestive of an organically enriched habitat. Percentages of EPT taxa were 40 and 45 here, and 46 and 40 at LN-B, in spring and fall, respectively, and were among the lowest for the entire data set (Table 2). These data suggest this to be a moderately disturbed habitat. The chironomid fauna, however, with only 7 of 20 taxa orthoclads, and none of these *Cricotopus* or *Orthocladius*, is indicative of excellent water quality. The samples of 100 from this site, indicating more fall than spring taxa and more spring than fall EPT taxa, are not in concordance with the qualitative sample. The 5.7 taxa per hour recorded during the spring sample (Table 3) is the lowest for the entire data set, and indicates that the 8.75 hours of effort expended on this tiny stream was more than necessary. The 3.75 hours spent taking the fall sample actually resulted in more taxa, but with only slightly more than half as many specimens (Table 4).

Fish species present were blacknose dace (19), creek chub (10), green sunfish (*Lepomis cyanellus*) (3), and bluegill (*Lepomis macrochirus*) (3). The two *Lepomis* species are likely emigrants from an adjacent farm pond.

Station 6-LN-B, Lindsey Creek below Tunis Branch Road, Pittman Center, Sevier County. This site was similar to the more upstream LN-A, with 57 taxa and 26 EPT taxa in spring and 55 taxa and 22 EPT taxa in fall. The higher number of total taxa in the spring sample is probably a reflection, at least in part, of the 821 spring versus 311 fall specimens. An *Orconectes* crayfish and abundant *Hydropsyche betteni/depravata* are again indicative of organic enrichment, as are the low percentages of EPT taxa (see LN-A, above), but there are no *Cricotopus* or *Orthocladius* among the 6 orthoclad taxa (17 total chironomid taxa). The same somewhat surprising phenomenon

occurred at LN-A, with the chironomid data indicating a less perturbed community than is indicated by the overall invertebrate assessment. Samples of 100 from this site indicate much higher ratios of EPT taxa to total taxa than in the qualitative sample.

Fishes present at this site were 1 saffron shiner, 49 blacknose dace, 21 creek chubs, and 1 brown trout (*Salmo trutta*).

Station 1-LP-A, Little Pigeon River above ford 0.3 road miles above mouth of Copeland Creek, Pittman Center, Sevier County. With 174 total taxa and 88 EPT taxa, this site (and the very similar LP-B, 174 taxa, 87 EPT taxa) were the most diverse sites sampled. The spring sample (124 taxa, 61 EPT taxa) and fall sample (126 taxa, 65 EPT taxa) were virtually identical. Our lowest Abrams Creek survey site, about 1/4 mile below Abrams Creek Campground in GSMNP, is a physically similar and comparable site, Our sample from there on 15 May 1993 contained 106 taxa exclusive of Chironomidae, and 59 EPT taxa. Subtracting chironomid taxa from the LP-A total leaves 100 taxa for the spring sample for that site. This favorable comparison with a pristine GSMNP site certainly indicates that Little Pigeon River has so far escaped any significant water quality or habitat degradation due to anthropogenic activities. This may be one of the most speciose benthic invertebrate communities in the country. Chironomid data, with 21 of 33 taxa orthoclads, 4 orthoclad taxa in the genera *Cricotopus* or *Orthocladius*, and these representing only 17 specimens, are in general agreement with the above assessment. Samples of 100 (Tables 2 and 4) also indicate this to be a diverse site, with high numbers of EPT taxa—the 31 taxa obtained in the spring sample of 100 was the highest for the study. Data in Table 4 suggest that using our methodology, samples of about 1000 specimens are sufficient to describe benthic macroinvertebrate diversity at very diverse sites such as this, with little difference noted in total taxa or EPT taxa for samples ranging from 714 to 1772 total specimens. The smallest sample, of 714 specimens, was in spring at LP-A, when high water levels made collecting difficult, with considerable effort spent just finding a place where the substrate could be sampled. The largest sample, of 1772 specimens, was in fall at LP-B, where number of specimens preserved was probably inflated by the large group of collectors (9), each of which collected at least several specimens of all common taxa.

Trichopteran taxa unknown or poorly known from Tennessee (Etnier and Schuster 1979) that were taken at this site include *Micrasema bennetti* (Brachycentridae), *Pycnopsyche divergens*

(Limnephilidae), and *Lepidostoma frosti* (Lepidostomatidae), based on a mature male pupa. The first two of these taxa are based on larval identification, and also occurred at LP-B. What appears to be the larva of an undescribed species in the *Hydropsyche scalaris* species group (Hydropsychidae) was collected here and at LP-B. Larvae referable to the leptocerid *Mystacides sepulchralis* were collected here and at LP-B. These larvae have a pale head lightly freckled with dark spots—very unlike the dark-headed larva of this species illustrated by Ross (1944) and Wiggins (1977). Adults we have seen from the nearby and similar Little River are consistent in form of male genitalia with northern *M. sepulchralis*, but differences in size and proportions we have noted may indicate that there is an undescribed southern species closely related to the mostly boreal *M. sepulchralis*. The other possibility is that this wide ranging species has a distinctly different larval pigment pattern in the southern portion of its range.

Our three-pass depletion fish population estimate at a nearby site slightly upstream was aborted due to a heavy and persistent rain occurring after the first pass had been completed. The site contained 24 fish species, dominated by stonerollers (estimated 2587 specimens), warpaint shiner (802), river chub (218), Tennessee shiner (*Notropis leuciodus*) (640), saffron shiner (71), telescope shiner (171), banded sculpin (312), greenfin darter (*Etheostoma chlorobranchium*) (43), and Swannanoa darter (62). Less common species were whitetail shiner (estimated 26), blacknose dace (26), longnose dace (40), northern hogsucker (40), black redhorse (5), channel catfish (*Ictalurus punctatus*) (1), rainbow trout (6), brook trout (1), rockbass (14), smallmouth bass (*Micropterus dolomieu*) (1), greenside darter (*Etheostoma blennioides*) (2), fantail darter (4), redline darter (4), snubnose darter (32), and tangerine darter (*Percina aurantiaca*) (4). We collected 12 specimens identified as hybrids between Tennessee shiner and saffron shiner from this site. This hybrid is not uncommon where these species co-occur.

Station 2-LP-B, Little Pigeon River at and above mouth of Laurel Creek, Pittman Center, Sevier County. With 174 total taxa and 87 EPT taxa, this site was virtually identical to LP-A, which is only about 1.4 river miles upstream. Chironomidae were more prevalent and more diverse than at LP-A, with 39 taxa, 19 of which were orthoclads, and 3 of which were either *Cricotopus* or *Orthocladius*. The 20 and 21 taxa from the spring and fall samples of 100, respectively, were surpassed in taxa by samples of 100 from many of the sites, indicating that this method might reveal gross differences in the gravel riffle community, but is not sensitive to huge differences in total community diversity. The close agreement in total taxa and EPT taxa from individual and

combined samples from the two Little Pigeon River sites offers strong support for confidence in the ability of this methodology to provide data that accurately describes benthic macroinvertebrate diversity. A heptageniid mayfly unassignable to genus, most similar to *Heptagenia*, but with slender, finger-like gills on all segments, was collected here and at lower Webb Creek. For discussion of noteworthy Trichoptera from this site, and comparison with a similar Abrams Creek site, see discussion under LP-A (above).

The quantitative fish samples from this site contained 25 species, dominated by stonerollers (estimated 1460 specimens), whitetail shiner (81), warpaint shiner (706), river chub (304), Tennessee shiner (546), saffron shiner (198), telescope shiner (395), northern hogsucker (43), black redhorse (59), banded sculpin (323), rockbass (70), smallmouth bass (41), greenside darter (60), greenfin darter (84), snubnose darter (62), and Swannanoa darter (96). Less common species were longnose dace (18), rainbow trout (8), bluegill (3), redear sunfish (*Lepomis microlophus*) (3), fantail darter (13), redline darter (21), and tangerine darter (4). Single hybrids between green sunfish and probably bluegill, and greenfin darter and redline darter, were collected. The smallmouth bass population in this reach is vigorous, with many large specimens collected.

Station 13-MA-B, Matthew Creek 100 m above second Matthew Creek ford on Mathis Road, Sevier County. Spring and fall samples were very similar, with 82 taxa and 38 EPT taxa in spring and 83 taxa with 35 EPT taxa in fall. For samples combined there were 60 EPT taxa and 109 total taxa. The 26 chironomid taxa contained mostly orthoclads (18 taxa), but only one of these was a *Cricotopus* (represented by 3 specimens in the spring sample). For its size, this is a very diverse stream. Samples of 100 had 27 taxa (spring) and 29 taxa (fall)—more than at the tremendously diverse LP-B; the higher percentage of EPT taxa and specimens in the spring sample (Table 2) was reflected to a lesser extent in the qualitative sample.

Fishes at this site were dominated by blacknose dace (61 specimens), with 1 creek chub, 6 mottled sculpins, and 3 fantail darters also present in our qualitative sample.

Station 13.5-MAT1-B, Matthew creek tributary 1.75 road miles above junction Mathis Road and Rocky Flats Road, at abandoned house 100 yards up trail along Matthew Creek, Sevier County. This intermittent stream had the highest ratio of EPT to total taxa of any in the study, with 60% EPT taxa in spring and 54% in fall. Eight of 12 chironomid taxa were orthoclads, and none was in

genus *Cricotopus* or *Orthocladius*. The fall sample of 59 taxa and 32 EPT taxa differed considerably from the 45 total taxa and 27 EPT taxa taken in the spring, and this was the largest increase noted for fall samples over spring samples. Hours of effort (6 in fall versus 6.67) and specimens collected (345 in fall versus 439) were both greater in spring, and indicate this to be a real seasonal difference. The 73 total taxa from this site was less than for any station sampled twice except for SP-W, with 68, but the total of 37 EPT taxa exceeded that of LN-A (32), LN-B (36), SP-W (34), and WBT1-W (28). The samples of 100 reflect a greater diversity in spring (25 versus 16 taxa), the opposite of the quantitative samples, but do indicate the predominance of EPT taxa at this site (Tables 2 and 4). Fishes were not present, and this tributary "sinks" into the substrate a short distance above Matthew Creek before reappearing.

Station 15-MAT2-B, Matthew Creek tributary just above ford over Matthew Creek at 4802 Mathis Road, Sevier County. This stream was not intermittent during our study, and is nearly as large as MA-B. The spring sample contained 67 taxa and 40 EPT taxa, while the fall sample had 59 taxa and 31 EPT taxa. This appears to be another blacknose dace stream in which spring benthic invertebrate diversity is greater than in the fall. In MAT1-B (above), which lacked fishes, the reverse was true, with fall samples more diverse than those from the spring. Totals, samples combined, were 48 EPT taxa and 87 total taxa. Percentages of EPT taxa were very high, virtually identical to those at MAT1-B. Nine of 12 chironomid taxa were orthoclads, but there were no *Cricotopus* or *Orthocladius* present. Samples of 100 from this site did not express above differences between spring and fall samples, but had only 47% of specimens EPTs in the spring and 90% EPT specimens in the fall—surely an artifact of small sample size (Table 2). The rather similar station CC-3, sampled in the 1991 survey for the Wears Cove section of the Parkway (ORNL 1992), contained 86 total taxa and 44 EPT taxa, numbers very similar to those for this site. The reach sampled for fishes produced 28 blacknose dace and 3 mottled sculpins.

Station 10-MD-B, Mill Dam Branch near swimming pool on Golf Creek Road, Cobbly Nob, Sevier County. This is an additional blacknose dace stream that exhibits the phenomenon of much higher total taxa and EPT taxa abundance in the spring versus the fall sample. The spring sample's 79 total taxa and 47 EPT taxa contrast sharply with the 63 total and 28 EPT taxa from the fall sample. Again, in spite of their fewer taxa, fall sampling was more intense, with 9.17 hours of effort (versus 8.25 in spring), and 726 fall versus 445 spring specimens. With samples combined, there were 100 taxa and 51 EPT taxa. Of 15 chironomid taxa, 8 were orthoclads, but none of these

was in the genus *Cricotopus* or *Orthocladius*. Samples of 100 from this site also reflect a more diverse fauna in spring (22 versus 19 taxa), but differ from the qualitative samples in indicating a much higher percentage of EPT taxa in the fall. This site appears to be slightly richer than the similar site CC-3 from the Wears Cove study (ORNL 1992), which contained only 44 EPT taxa and 86 total taxa. Apparently the rather intensive development of the area (roads, private residences, swimming pool) have not had any serious adverse affect on the benthic macroinvertabrate community. The only fish species present was blacknose dace, with 22 specimens collected in the qualitative survey.

Station 18-OG-A, Ogle Spring Branch at 430 Apple Orchard Road, Sevier County. This is also a blacknose dace stream, and again the spring sample is more diverse than the fall sample (70 vs. 63 total taxa, 33 vs. 32 EPT taxa), although the disparity is not as great as noted earlier. For samples combined, there were 42 EPT taxa and 87 total taxa, values almost identical to the comparable Wears Cove site, CC-3, which had 44 EPT taxa and 86 total taxa (ORNL 1992). Samples of 100 from OG-A indicated the same trends. The qualitative fish sample contained 28 blacknose dace and 1 largemouth bass (*Micropterus salmoides*), a probable vagrant from a small pond just upstream from the sample site.

Station 19-OG-B, Ogle Spring Branch at Rocky Flats Road, Sevier County, 0.6 river miles below OG-A. This stream is considerably larger than the upstream station, OG-A, and it contained numerous rainbow trout. The spring sample (75 taxa, 38 EPT taxa) was more diverse than the fall sample (62/34), and these trends are reflected in the samples of 100. In this case, spring effort (9 hours, 801 specimens) exceeded fall effort (5.5 hours, 426 specimens) considerably, and the apparent seasonal difference might well be an artifact of sampling intensity. For combined samples there were 52 EPT taxa and 99 total taxa, reflecting the continued excellent water quality but somewhat larger size relative to OG-A. Of 20 chironomid taxa, 11 were orthoclads, with only one of these in the genus *Cricotopus*, (spring sample, 3 specimens). In the reach sampled for fishes we captured 347 blacknose dace and 11 rainbow trout.

Station 20-CR-A, Carson Branch tributary to Ogle Spring Branch 1/4 mile north of 430 Apple Orchard Road, Sevier County. The spring sample (87 total taxa, 43 EPT taxa) was much more diverse than the fall sample (73 total, 32 EPT taxa), and this difference can not be attributed to differences in sampling effort (993 spring specimens, 936 fall specimens). This is an additional

stream dominated by blacknose dace. For samples combined, there were 50 EPT taxa and 106 total taxa. The chironomid data also indicates this to be an undisturbed stream, with 15 of 22 taxa in subfamily Orthocladiinae, but none of these either *Cricotopus* or *Orthocladius*. The samples of 100 did not indicate the large difference in diversity between spring and fall samples. Blacknose dace was the only fish species present, with 48 specimens collected in our qualitative survey.

Station 21-CR-B, Carson Branch tributary to Ogle Spring Branch at Otto Williams Road, 0.5 river miles below OGT-A, Sevier County. The spring sample (79 total taxa, 39 EPT taxa) was much more diverse than the fall sample (45 total taxa, 19 EPT taxa) In this case there is a large concordant difference in effort, with 6 hours of effort and only 233 specimens collected in fall versus 10.5 hours and 694 specimens (Tables 3 and 4). Specimens per hour dropped from 76 in spring to 56 in fall, the lowest value recorded in this study except for the fall sample from SP-W (Table 3). This indicates that invertebrates were less abundant, and this blacknose dace stream is apparently an addition to the growing list of streams of this nature that have a more diverse benthic invertebrate community in spring than in fall. For samples combined there were 45 EPT taxa and 95 total taxa, both figures somewhat lower than for the smaller but more pristine OGT-A. This site has apparently suffered some minor impacts from nearby roads and recent construction activities, and siltation was apparent, especially in the lower part of the reach sampled, near George Williams Road. The chironomid data continue to be reflective of a high quality environment, with 7 of 14 taxa orthoclads, and none of these either *Cricotopus* or *Orthocladius*. The large disparity in spring versus fall diversity was not noted in the samples of 100. Our qualitative fish collection yielded 42 blacknose dace and a single creek chub.

Station 24-SH-B, Sandy Hollow Creek near its mouth in Indian Camp Creek, Sevier County. Spring and fall samples from this stream were very similar, with 36 of 78 total taxa EPTs in spring, and 37 of 79 taxa EPTs in fall. For samples combined there were 54 EPT taxa and 109 total taxa. In the samples of 100 there were 8 more taxa in the fall than in the spring sample (Table 4). Although this stream is in a pasture, and is rather silty and organic, it continues to have a diverse fauna. The close proximity of our station to the adjacent Indian Camp Creek, a cool and relatively silt-free trout stream, may affect our results, as re-colonization from Indian Camp Creek following extirpation would be very easy. We did note Swannanoa darters in this creek on 4 June, but they were not present during our qualitative fish sample on 25 September when the water was much warmer. The chironomid data, with 11 of 22 taxa orthoclads, and 3 of these in the genus

Cricotopus, indicate some eutrophication, as do the presence of *Hydropsyche betteni/depravata* and the slightly lower than anticipated numbers of EPT taxa for a stream of its size and characteristics.

Fishes taken in our qualitative sample were stoneroller (22), blacknose dace (362), longnose dace (1), creek chub (24), northern hogsucker (2), and mottled sculpin (28).

Station 28-SP-B, Sheep Pen Branch, from Mill Dam Branch upstream, tributary to Webb Creek, Sevier County. This tiny stream appeared to be very oligotrophic, with little organic matter present, and no moss on the rocks. It appeared to have been scoured by a recent high water event. It did not appear to be intermittent, but no fishes were taken in limited sampling with a small seine. Blacknose dace probably occur here, at least seasonally. The spring sample, with 30 EPT taxa and 57 total taxa, was considerably more diverse than the fall sample of 22 EPT taxa and 42 total taxa. In spring, 399 specimens were collected with 4.5 hours of effort, while in fall, 11 hours of effort yielded only 338 specimens. Invertebrates were far less abundant in the fall, and this was reflected in the samples of 100, which contained 30 taxa in spring and only 20 in the fall. The 9 chironomid taxa included 5 orthoclads, but no *Cricotopus* or *Orthocladius*. Both total taxa and EPT taxa are lower than I would expect for this stream, but there does not appear to be any anthropogenic disturbance nearby. For samples combined there were 68 total taxa and 34 EPT taxa.

Station 7-WB-A, Webb Creek at most easterly U.S. 321 bridge, Sevier County. This is upstream from the WB-A site where our quantitative fish sample was made. The spring sample appears to be somewhat more diverse than the fall sample, containing 111 total taxa and 53 EPT taxa (972 specimens) versus 98 total taxa and 48 EPT taxa from the 1243 specimens collected in the fall. This is the single instance in the study where I feel that an apparent seasonal difference is likely an artifact of the collecting crew, with the fall crew somewhat less experienced than usual, and perhaps more likely to collect many specimens of common taxa while missing uncommon taxa (This sample was taken while two other crews were sampling fishes in Cosby Creek and Webb Creek, and manpower was being stretched rather thin). This is an excellent stream, with 68 EPT taxa and 137 total taxa when samples are combined. The 26 chironomid taxa include 16 orthoclad taxa; 3 are *Cricotopus* or *Orthocladius*, with only 16 of 176 chironomids in these genera. The early May sample from Mill Creek just above Abrams Creek in Cades Cove, GSMNP, is from a similar site. It contained 53 EPT taxa and 79 total taxa (chironomids not identified), (53 EPT taxa,

96 total taxa from WB-A spring sample when corrected for chironomid species). The slightly higher total taxa in Webb Creek, if real, may reflect the more diverse habitat at the Webb Creek site. At any rate, WB-A compares favorably to a pristine GSMNP stream of similar size. Samples of 100 from this site are concordant with the qualitative sample.

Three-pass depletion fish population estimates (Appendix D, Part 2) indicated a 15-species community dominated by stonerollers (547 estimated to occur in reach sampled), warpaint shiners (291), river chubs (133), saffron shiners (411), and sculpins (227). Based on sculpins preserved from lower Webb Creek, both *Cottus bairdi* and *C. carolinae* occurred here; all (except 3 *Cottus carolinae*) sculpin specimens were released. Game fish were not abundant, with no trout seen, and only 3 rockbass and a single juvenile smallmouth bass. Other fish present were Tennessee shiner (estimated 79), Tennessee shiner X saffron shiner hybrids (5), telescope shiner (58), longnose dace (47), northern hogsucker (18), fantail darter (39), snubnose darter (5), and Swannanoa darter (27).

Station 8-WB-B, Webb Creek just above Pittman Center school, Sevier County. This site was exceeded in invertebrate diversity only by the two Little Pigeon River sites. The spring and fall samples were very similar, with 125 total taxa and 54 EPT taxa in spring, and 119 total taxa and 55 EPT taxa in fall. For samples combined there were 160 total taxa and 73 EPT taxa (174 total taxa, 87 to 88 EPT taxa at Little Pigeon River sites). Although the stream is obviously enriched by runoff from nearby residential areas, it continues to have a very diverse invertebrate community. The 36 chironomid taxa reflect this, with 17 orthoclad taxa, 5 (with 55 specimens) of which are *Cricotopus* or *Orthocladius*. In the samples of 100, the higher percentage of EPT taxa in the fall and the higher number of taxa in the spring do not reflect the community structure apparent in the qualitative samples. The brachycentrid caddisfly *Micrasema bennetti*, not reported from Tennessee by Etnier and Schuster (1979) and a heptageniid mayfly most like Heptagenia but unassignable to a genus (all segments with long, finger-like gills) occurred here and at the lower Little Pigeon River site.

Three-pass depletion fish population estimates from this site indicated a 15-species community dominated by stonerollers (estimated 195 in reach worked), warpaint shiners (162), river chubs (173), saffron shiners (290), longnose dace (98), northern hogsuckers (33), banded and mottled sculpins (585), fantail darters (82), and Swannanoa darters (54). An estimated 6 rainbow and 4

brown trout occurred in the reach. Other fish species present were Tennessee shiner (11), telescope shiner (2), and smallmouth bass (1).

Station 27-WBT1-B, northern tributary to Webb Creek 1/4 road mile west of Volunteer Road, Sevier County. This is a very small stream, but it probably has continuous flow at least in its lower reaches. Spring and fall samples were very similar, with 41 total taxa and 18 EPT taxa in spring, and 41 total taxa and 17 EPT taxa in fall. The 7 chironomid taxa contained 3 orthoclad taxa, none of which was *Cricotopus* or *Orthocladius*. Invertebrates were apparently less abundant (but not less diverse) in spring, as it required 6 hours effort to collect 301 specimens, while in fall 289 specimens were collected in 3 2/3 hours. The low diversity at this site is not apparent in the samples of 100, which contain more taxa than samples of 100 from the most diverse site, LP-B; these samples also show a considerably higher percentage of EPT taxa than are actually present. For spring and fall samples combined there were 71 total taxa and 28 EPT taxa, both metrics the lowest for any of the stations in the study. This stream appears to have suffered from some perturbation, since if pristine it would be expected to contain more taxa and more EPT taxa than the nearby and nearly intermittent WBT2-W, which had 82 total taxa and 39 EPT taxa.

Qualitative fish samples produced 36 blackknose dace, 7 creek chubs, 1 northern hogsucker, and 1 bluegill. The bluegill may well have been a resident, as this species was not present in fish samples from either Webb Creek site.

Station 9-WBT2-B, second northern tributary to Webb Creek opposite mouth of Timothy Creek, Sevier County. This tiny but very attractive stream may become intermittent during droughts, but still contained ample water in our fall sample. Spring samples were more diverse, with 71 total taxa and 37 EPT taxa (473 total specimens) in spring versus only 57 total taxa and 26 EPT taxa from the 738 specimens collected in the fall. Combined samples had 82 total taxa and 39 EPT taxa. Although these numbers are small, they are about as expected for a good quality creek of this size. Of 16 chironomid taxa, 8 were orthoclads, with none of these either *Cricotopus* or *Orthocladius*. We sampled several of the deeper pools with a small seine, and 4 blacknose dace were taken. This is an additional blacknose dace stream that conforms to the pattern of having greater total taxon and EPT taxon diversity in the spring than in the fall. Samples of 100 from this site, with 18 taxa in spring and 16 in fall, express the low diversity at this site, but barely suggest the diversity differences between spring and fall.

Station 31-WBT3-B, third northern tributary to Webb Creek 0.15 air miles west of mouth of Timothy Creek, Sevier County. This temporary stream contained only 27 total taxa and 12 EPT taxa when sampled on 28 June. It was dry when revisited in the fall. The area sampled is sufficiently close to Webb Creek, Timothy Creek, and WBT2-W to allow for rapid colonization whenever water is present. The site was too small to even attempt a sample of 100.

Station 11-WR-B, Warden Branch from near mouth in Webb Creek upstream to large open pool area, Sevier County. The spring sample was more diverse than the fall sample, with 83 total taxa and 44 EPT taxa versus 75 total taxa and 35 EPT taxa in the fall. For samples combined there were 106 total taxa and 54 EPT taxa. These are numbers indicative of no adverse impacts to this small stream. The 18 chironomid taxa included 11 orthoclad taxa but no *Cricotopus* or *Orthocladius*, again indicating a very healthy stream. The samples of 100 suggest similar conclusions regarding seasonality, and quality of the stream. The qualitative fish sample yielded 63 blacknose dace and 7 saffron shiners, the shiners all from the pool at the upper end of the study reach. All creeks in this study that had only one or two fish species, with blacknose dace by far the dominant species, had greater diversity of total taxa and EPT taxa in the spring versus the fall sample.

LITERATURE CITED

Bode, R. W. 1983. Larvae of North American *Eukiefferiella* and *Tvetenia* (Diptera: Chironomidae). N.Y. State Bull. 452, NY. State Mus., Albany, 40 p.

Brigham, A. R., W. U. Brigham, and A. Gnilka, eds. 1982. Aquatic insects and oligochaetes of North and South Carolina. Midwest Aquatic Enterprises, Mahomet, IL 61853.

Burch, J. B. 1982. Freshwater snails (Mollusca: Gastropoda) of North America. EPA Report 600/3-82-026, 295 p.

Chapin, J. W. 1978. Systematics of Nearcitic *Micrasema* (trichoptera: Brachycentridae). Ph.D. Dissert., Clemson University, Clemson, SC, 136 p.

Etnier, D. A., and G. A. Schuster. 1979. An annotated checklist of Trichoptera (caddisflies) of Tennessee. J. Tenn. Acad. Sci. 54:15–22.

Hobbs, H. H., Jr. 1976. Crayfishes (Astacidae) of North and Middle America. U.S. E.P.A. Env. Monitoring and Support Lab., Cincinnati, OH 45268, 173 p.

Lenat, D. R. 1988. Water quality assessment of streams using a qualitative collecting method for benthic macroinvertebrates. J. N. Am. Benthol. Soc. 7:222–233.

Louton, J. A. 1982. Lotic dragonfly (Anisoptera: Odonata) nymphs of the southeastern United States. Ph.D. Dissert., Univ. of Tenn., 357 p.

McCafferty, W. P., and R. D. Waltz. 1990. Revisionary synopsis of the Baetidae (Ephemeroptera) of North and Middle America. Trans. Am. Ent. Soc. 116:769–799.

Merritt, R. W., and K. W. Cummins. 1984. An introduction to the aquatic insects of North America. 2nd ed., Kendall/Hunt Publ. Co., Dubuque, IA 52004, 736 p.

ORNL. 1992. The environmental report on the proposed construction and operation of segment 8D of the Foothills Parkway. Oak Ridge National Laboratory, Oak Ridge, TN.

Parker, C. R. and G. B. Wiggins. 1987. Revision of the caddisfly genus *Psilotreta* (Trichoptera: Odontoceridae). Life Sciences Contributions 144, Royal Ontario Museum, 55 p.

Ross, H. H. 1944. The caddis flies, or Trichoptera, of Illinois. Ill. Nat. Hist. Surv. Bull. 23:1–325.

Simpson, K. W., and R. W. Bode. 1980. Common larvae of Chironomidae (Diptera) from New York state streams and rivers with particular reference to the fauna of artificial substrates. N.Y. State Mus. Bull. 439:1–105.

Starnes, W. C., and D. A. Etnier. 1980 (date not indicated on publication). Fishes, p B-1–B-134, **In**: Tennessee's rare wildlife, D. C. Eager and R. M. Hatcher, eds. Tenn. Dept. Cons., Nashville.

Stewart, K. W., and B. P. Stark. 1988. Nymphs of North American stonefly genera (Plecoptera). The Thomas Say Foundation, Ent. Soc. Amer., 460 p.

Van Deventer, J. S., and W. S. Platts. 1983. Sampling and estimating fish populations from streams. Proc. 48th N. Am. Wildl. Conf. 349–353.

Van Deventer, J. S., and W. S. Platts. 1989. Microcomputer software system for generating population statistics from electrofishing data—users guide for MicroFish. U.S. Dept. Agric. Inter Mountain Research Sta., Gen. Tech. Rept. INT-254, Ogden, UT.

Vineyard, R. N. 1990. Systematics of the caddisfly genus *Neophylax* McLachlan (Trichoptera: Uenoidae). Ph.D. Dissert., University of Toronto, 245 p plus appendices.

Wiederholm, T., ed. 1983. Chironomidae of the Holarctic Region. Keys and diagnoses. Part I. Larvae. Ent. Scand. Suppl. 19, 457 p.

Wiggins, G. B. 1977. Larvae of the North American caddisfly genera (Trichoptera). Univ. of Toronto Press, Toronto, Ontario, Canada, 401 p.

Wojtowicz, J. A. 1982. A review of the adults and larvae of the genus *Pycnopsyche* (Trichoptera: Limnephilidae), with revision of the *Pycnopsyche scabripennis* (Rambur) and *Pycnopsyche lepida* (Hagen) complexes. Ph. D. Dissert., Univ. of Tenn., 292 p.

PART 2

By introducing a standardized artificial substrate area into a variety of sites, species diversity can be compared and a number of organisms per unit of area can be measured. Standardized artificial substrates control for substrate variability in streams and give a clearer measure of abundance for the organisms that will colonize them. The modified Hester-Dendy multiplate samplers, artificial substrates, introduce nine square tempered hardboard plates each 75 by 76 mm and spaced 3 mm apart. This quantitative field sampling method is described in OEPA (1987). Five replicate samplers were incubated for six weeks in paired upstream and downstream ROW sites in the four largest streams (Little Pigeon River, Cosby Creek, Webb Creek, and Dunn Creek). These five replicate samplers were installed within the streams matching for current, substrate, depth, presence of pools and riffle, and shading of bank cover. Preservation and taxonomic identification of samples followed the methods described for the macroinvertebrate sampling D. Etnier's report earlier in this appendix. Results are presented by ascending numerical order of the site descriptor in the Data subsection later in this appendix. A summary table and discussion of Hester-Dendy results is presented in J. Wojtowicz's report immediately following this section in this appendix.

Ohio Environmental Protection Agency (OEPA). 1987. Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities. Doc. 0046e.0013e Division of Water Quality Monitoring and Assessment, Columbus, Ohio.

PART 3

INTRODUCTION

Many methods have been utilized in analyzing and interpreting benthic macroinvertebrate data (Rosenberg and Resh 1993). In large part the method of collection, the level of identification of organisms, the type of analysis attempted on the data, and the way the data is interpreted depend on the original intent of the study. My understanding of the purpose behind the benthic macroinvertebrate study involving Section 8B of the Foothills Parkway was to provide a baseline, preconstruction record of the aquatic communities existing in streams likely to be affected by any construction activities on the Parkway. In order to detect any impacts caused by Foothills Parkway construction, an idea of the present condition of the streams in the study area, as well as the presence of other potential deleterious impacts on those waterbodies must be considered.

A frequently used method of evaluating the health of a stream is a qualitative or semi-quantitative approach which involves the collection of organisms from a stream with an attempt to, more or less, standardize the amount of effort for each stream collected. The organisms collected are then identified to the lowest feasible taxonomic level, organized into related groupings and enumerated. One of the many methods which may be utilized to evaluate such data is by looking at the presence and abundance of what are commonly known as EPT taxa. These taxa consist of the Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). Of all orders of insects and macroinvertebrates found in freshwater habitats, these three orders have been shown to be, and widely accepted as the most sensitive of all to various deleterious physical and chemical impacts on these environments. Of these orders, the stoneflies are overall the most sensitive, requiring for the most part highly oxygenated, clean water for their existence. The mayflies are also a very sensitive order ranking a close second to the stoneflies in this respect. Of the three orders the caddisflies are slightly less indicative of the level of disturbance of a waterbody. In general, the larger the number of different taxa within these orders at a site, and the more evenly balanced the number of individuals among these taxa, the healthier is the stream. A stream containing few different taxa, and a large number of individuals concentrated in only one or two of these taxa is likely displaying the effect of pollutional impacts.

An alternative to the use of qualitative or semi-quantitative techniques for evaluating the health of a waterbody is the use of some quantitative technique which provides a clearer picture of the numbers of organisms per unit area. The method utilized in the Foothills study was the placement of Hester-Dendy multiplate samplers which were placed in stream for a given period of time and allowed to be colonized by various stream organisms before being retrieved, preserved, and analyzed. Positive considerations in the use of such samplers is that they give a clearer idea of abundance of the collected organisms per unit area and, also, control for the substrate variability among streams (Simpson and Bode 1980). A downside to their use is the fact that they are fairly selective for the kinds of organisms which will colonize them (Simpson and Bode 1980).

The data which has been reviewed for this report consists of both qualitative-semiquantitative collections from various streams in the affected area, and quantitative samples (Hester-Dendy multiplate samples which were taken in selected streams in the affected area. The qualitative samples were collected during two seasons at the majority of the stations; one a late spring sample, and the other an early fall sample. The quantitative samples were collected during two seasons; again, one a late spring sample, and the other an early fall sample. The qualitative data are discussed first. To give some organization to the discussion, all the streams were listed alphabetically and are dealt with in this manner. Summary data has been tabulated in the following manner: Table 1. lists all streams alphabetically and three sets of entries are included for each stream (when available). These entries are combined data for the two sampling periods, spring sampling data, and fall sampling data. Only the numbers of EPT taxa and total numbers of organisms in each of these orders are addressed in this table. Table 2 likewise lists three entries for each stream as per Table 1. For the purpose of this report the Chironomidae (non-biting midges) treated in this table have be subdivided into the tribes Chironomini and Tanytarsini (both of subfamily Chironominae), and into the subfamilies Orthocladiinae, Tanypodinae, Diamesinae, and Prodiamesinae. For each of these six categories are listed the total number of taxa (i.e., genera and/or species) in each tribe or subfamily, and the total number of individuals for all taxa within each tribe or subfamily in a given sample. Comments on the health of each of these streams will be based on the relative numbers of EPT taxa and individuals, with presence of particular taxa noted when deemed to be of importance.

Table 1. List of streams, collection dates, total EPT taxa, and total EPT numbers of individuals for the qualitative benthic collections on Section B of the Foothills Parkway

Site identifier	Dates	Total taxa			Total specimens		
		E	P	T	E	P	T
12-BT-B Butler Branch	Combined	17	7	16	243	108	205
	06-15-94	16	6	15	190	93	154
	10-01-94	9	4	6	53	15	51
4-CP-B Copeland Creek	Combined	30	8	15	490	65	262
	06-12-94	25	6	14	243	28	158
	09-11-94	24	6	12	247	37	104
3-CP-B Copeland Creek	Combined	28	10	23	731	156	272
	06-19-94	25	8	21	428	100	161
	09-11-94	20	7	14	303	56	111
25-CB-A Cosby Creek	Combined	32	19	23	1049	240	418
	06-03-94	27	10	15	406	47	130
	10-22-94	24	16	17	643	193	288
26-CB-B Cosby Creek	Combined	27	21	20	887	255	266
	06-03-94	21	11	12	344	61	70
	10-28-94	20	16	15	543	194	196
17-DN-B Dunn Creek	Combined	31	12	15	617	191	226
	06-06-94	27	11	13	398	110	193
	09-10-94	19	9	10	219	81	33
16-DN-A Dunn Creek	Combined	26	18	22	854	236	378
	06-06-94	20	12	16	324	90	226
	02-19-95	16	13	17	530	146	152
14-DNW-A Dunn Creek	Combined	19	12	19	422	198	256
	06-12-94	13	7	14	181	94	179
	02-19-95	13	10	12	241	104	77
23-IC-B Indian Camp	Combined	18	11	14	246	47	96
	06-03-94	7	7	9	26	22	24
	09-25-94	15	7	11	220	25	72
32-LB-B Laurel Branch	Combined	22	10	19	478	257	353
	06-28-94	19	9	16	237	155	122
	10-02-94	14	9	11	241	102	231

Table 1. Continued

Site identifier	Dates	Total taxa			Total specimens		
		E	P	T	E	P	T
5-LN-A Lindsey Creek	Combined	12	6	14	331	77	300
	06-12-94	7	2	12	168	69	212
	09-11-94	10	4	10	163	8	51
6-LN-B Lindsey Creek	Combined	16	8	11	393	122	289
	06-12-94	12	4	9	252	106	206
	10-20-94	10	5	7	141	16	83
1-LP-A Little Pigeon River	Combined	34	19	34	802	293	398
	06-14-94	24	11	25	213	53	152
	10-29-94	22	16	25	589	240	246
2-LP-B Little Pigeon River	Combined	37	13	34	1108	227	714
	06-14-94	33	11	25	479	100	163
	10-08-94	22	11	28	629	127	551
13-MA-B Matthew Creek	Combined	22	13	15	477	176	187
	06-07-94	17	11	9	256	102	130
	09-24-94	15	8	13	221	74	57
13.5-MAT1-B Matthew Creek	Combined	15	8	14	243	152	227
Tributary	06-07-94	9	7	11	157	87	129
	09-24-94	13	6	12	86	65	98
15-MAT-B Matthew Creek-2nd	Combined	23	10	15	665	158	275
Tributary	06-07-94	21	8	11	323	122	92
	09-24-94	14	6	11	342	36	183
10-MD-B Mill Dam Branch	Combined	21	9	21	244	168	324
	06-15-94	19	8	20	102	47	111
	10-01-94	11	7	9	142	121	213
18-OG-A Ogle Spring Branch	Combined	16	6	21	332	50	239
	06-11-94	12	4	17	143	27	135
	10-01-94	8	4	14	189	23	104
19-OG-B Ogle Spring Branch	Combined	25	8	19	446	154	343
	06-04-94	18	5	15	303	87	224
	09-10-94	14	7	13	143	67	119

Table 1. Continued

Site identifier	Dates	Total taxa			Total specimens		
		E	P	T	E	P	T
20-CR-A	Combined	19	12	19	685	255	375
Carson Branch	06-11-94	19	8	16	362	133	181
	10-01-94	12	8	12	323	122	194
21-CR-B	Combined	18	8	18	398	107	205
Carson Branch	06-11-94	16	6	16	302	88	171
	09-10-94	6	5	9	96	19	34
24-SH-B Sandy Hollow Creek	Combined	24	11	18	431	131	322
	06-04-94	16	8	11	242	61	226
	09-25-94	15	7	13	189	70	96
28-SP-B Sheep Pen Branch	Combined	10	13	15	214	187	139
	06-23-94	9	8	13	111	96	84
	10-01-94	6	9	7	103	91	55
11-WR-B Warden Branch	Combined	22	11	21	408	215	353
	06-15-94	20	9	15	151	93	116
	10-01-94	13	9	13	257	122	237
7-WB-A Webb Creek	Combined	30	15	22	979	220	518
	06-17-94	23	10	19	430	90	195
	10-30-94	21	12	14	549	130	323
8-WB-B Webb Creek	Combined	34	17	21	938	169	597
	06-14-94	28	9	16	529	66	195
	10-29-94	23	12	20	409	103	402
27-WBT1-B Webb Creek	Combined	8	6	14	118	94	106
Tributary	06-23-94	6	4	11	45	40	70
	10-02-94	6	5	6	73	54	36
9-WBT2-B Webb Creek	Combined	14	7	18	268	213	365
Tributary	06-28-94	13	5	17	99	88	92
	10-02-94	7		11	169	125	273
31-WBT3-B Webb Creek	06-28-94	5	2	5	37	14	13
Tributary							

Table 2. Total taxa of chironomidae for each subfamily and/or tribe and total numbers for each subfamily and/or tribe for each of the qualitative sample stations in the Section B of the Foothills Parkway study

Site identifier	Dates	Total taxa						Total specimens					
		C	Tt	O	T	D	P	C	Tt	O	T	D	P
12-BT-B Butler Branch	Combined	4	1	9	1	0	0	18	1	34	6	0	0
	06-15-94	4	1	8	1	0	0	17	1	32	6	0	0
	10-01-94	1	0	2	0	0	0	1	0	2	0	0	0
A-CP-B Copeland Creek	Combined	9	3	8	2	0	1	71	8	62	9	0	1
	06-12-94	7	2	6	1	0	1	47	6	39	6	0	1
	09-11-94	5	2	7	2	0	0	24	2	23	3	0	0
3-CP-B Copeland Creek	Combined	9	3	14	3	0	0	29	12	107	18	0	0
	06-19-94	6	1	13	3	0	0	15	2	88	15	0	0
	09-11-94	6	3	5	2	0	0	14	10	19	3	0	0
25-CB-A Cosby Creek	Combined	8	2	21	1	3	1	59	16	191	13	3	1
	06-03-94	8	2	20	1	3	1	50	10	101	11	3	1
	10-22-94	3	1	16	1	0	0	9	6	90	2	0	0
26-CB-A Cosby Creek	Combined	10	4	21	1	4	2	62	27	296	12	4	3
	06-03-94	10	3	18	1	2	2	43	6	123	8	2	3
	10-28-94	3	3	17	1	2	0	19	21	173	4	2	0
17-DN-B Dunn Creek	Combined	4	2	15	1	0	1	7	6	61	5	0	1
	06-06-94	3	1	12	1	0	1	4	2	51	5	0	1
	09-10-94	1	2	8	0	0	0	3	4	10	0	0	0
16-DN-A Dunn Creek	Combined	7	2	23	3	1	1	15	18	265	7	8	1
	06-06-94	6	2	15	3	1	1	9	5	107	6	1	1
	02-19-95	3	2	18	1	1	0	6	13	158	1	7	0
14-DNW-A Dunn Creek-West Branch	Combined	0	0	9	1	1	0	0	0	37	11	12	0
	06-12-94	0	0	2	1	1	0	0	0	4	10	10	0
	02-19-95	0	0	9	1	1	0	0	0	33	1	2	0
23-IC-B Indian Camp Creek	Combined	6	1	14	1	1	1	16	2	120	17	15	1
	06-03-94	5	0	12	1	1	1	13	0	94	10	13	1
	09-25-94	2	1	9	1	1	0	3	2	26	7	2	0

Table 2. Continued

Site identifier	Dates	Total taxa						Total specimens					
		C	Tt	O	T	D	P	C	Tt	O	T	D	P
32-LB-B Laurel Branch	Combined	4	2	12	1	0	0	10	2	93	3	0	0
	06-28-94	4	1	9	1	0	0	8	1	36	3	0	0
	10-02-94	1	1	8	0	0	0	2	1	57	0	0	0
5-LN-A Lindsey Creek	Combined	7	3	7	3	0	0	37	11	22	10	0	0
	06-12-94	6	3	4	1	0	0	27	9	15	3	0	0
	09-11-94	3	1	4	3	0	0	10	2	7	7	0	0
6-LN-B Lindsey Creek	Combined	6	3	6	1	1	0	22	5	29	7	2	0
	06-12-94	5	2	5	1	1	0	20	4	26	4	2	0
	10-20-94	2	1	3	0	0	0	2	1	3	0	0	0
1-LP-A Little Pigeon River	Combined	8	2	21	2	0	0	100	16	134	13	0	0
	06-14-94	8	2	13	2	0	0	56	8	39	5	0	0
	10-29-94	5	1	17	1	0	0	44	8	95	8	0	0
2-LP-B Little Pigeon River	Combined	10	3	19	3	3	1	157	56	178	9	4	1
	06-14-94	9	3	17	1	1	1	105	17	79	6	1	1
	10-08-94	6	2	14	3	2	0	52	39	99	3	3	0
13-MA-B Matthew Creek	Combined	3	2	18	2	1	1	9	3	118	4	1	0
	06-07-94	1	2	12	2	1	1	1	2	33	3	1	0
	09-24-94	3	1	13	1	0	0	8	1	85	1	1	0
13.5-MAT1-B Matthew Creek-1st	Combined	3	0	8	1	0	0	10	0	25	1	0	0
	06-07-94	2	0	4	0	0	0	4	0	5	0	0	0
	09-24-94	2	0	6	1	0	0	6	0	20	1	0	0
15-MAT-B Matthew Creek-2nd	Combined	1	1	9	0	1	0	5	0	31	0	3	0
Tributary	06-07-94	1	0	3	0	1	0	1	0	11	0	3	0
	09-24-94	1	0	8	0	0	0	4	0	20	0	0	0
10-MD-B Mill Dam Branch	Combined	2	2	8	2	0	0	9	5	35	5	0	0
	06-15-94	1	1	4	1	0	0	1	2	10	3	0	0
	10-01-94	2	2	8	1	0	0	8	3	25	2	0	0

Table 2. Continued

Site identifier	Dates	Total taxa						Total specimens					
		C	Tt	O	T	D	P	C	Tt	O	T	D	P
18-OG-A Ogle Spring Branch	Combined	3	2	5	2	1	0	5	2	38	15	2	0
	06-11-94	2	2	4	1	1	0	4	2	28	14	2	0
	10-01-94	1	0	3	1	0	0	1	0	10	1	0	0
19-OG-B Ogle Branch	Combined	4	2	11	1	1	1	7	3	76	2	2	1
	06-04-94	4	1	9	1	1	1	6	1	53	2	1	1
	09-10-94	1	1	6	0	1	0	1	2	23	0	1	0
20-CR-A Carson Branch	Combined	1	3	15	2	1	0	11	8	159	6	1	1
	06-11-94	1	3	11	2	1	0	5	5	66	6	1	0
	10-01-94	1	2	14	0	0	0	6	3	93	0	0	0
21-CR-B Carson Branch	Combined	4	2	7	1	0	0	4	5	49	2	0	0
	06-11-94	0	2	5	1	0	0	0	5	36	2	0	0
	09-10-94	4	0	4	0	0	0	4	0	13	0	0	0
24-SH-B Sandy Hollow Creek	Combined	6	1	11	3	1	0	14	1	96	7	1	0
	06-04-94	4	0	10	2	1	0	10	0	74	4	1	0
	09-25-94	3	1	5	2	0	0	4	1	22	3	0	0
28-SP-B Sheep Pen Branch	Combined	2	0	5	1	0	0	6	0	27	11	0	0
	06-23-94	2	0	2	1	0	0	6	0	13	11	0	0
	10-01-94	0	0	4	0	0	0	0	0	14	0	0	0
11-WR-B Warden Branch	Combined	4	1	11	1	0	1	26	4	96	3	0	1
	06-15-94	4	1	8	1	0	1	18	2	24	2	0	1
	10-01-94	2	1	9	1	0	0	8	2	72	1	0	0
7-WB-A Webb Creek	Combined	7	1	16	1	1	0	56	8	97	13	1	0
	06-17-94	7	0	7	1	1	0	47	0	41	8	1	0
	10-30-94	4	1	14	1	0	0	9	8	56	5	0	0
8-WB-B Webb Creek	Combined	10	5	17	2	1	0	58	15	169	12	3	0
	06-14-94	10	5	12	2	1	0	101	8	59	9	1	0
	10-29-94	3	2	15	2	1	0	48	7	110	3	2	0

Table 2. Continued

Site identifier	Dates	Total taxa						Total specimens					
		C	Tt	O	T	D	P	C	Tt	O	T	D	P
27-WBT1-B Webb Creek	Combined	0	1	3	2	0	0	0	3	21	13	0	0
Tributary	06-23-94	0	0	2	1	0	0	0	0	5	8	0	0
	10-02-94	0	1	2	2	0	0	0	3	16	5	0	0
9-WBT2-B Webb Creek	Combined	4	2	8	2	0	0	31	3	55	7	0	0
Tributary	06-28-94	4	2	5	2	0	0	25	2	15	7	0	0
	10-02-94	2	1	7	0	0	0	6	1	40	0	0	0
31-WBT3-B Webb Creek	06-28-94	1	0	2	1	0	0	1	0	6	1	0	0
Tributary													

Following the presentation of comments on the qualitative data, the quantitative (Hester-Dendy multiplate) sample data will be presented and briefly discussed. Table 3. contains a summary of both the EPT taxa and Chironomidae data for these samples.

DISCUSSION

Qualitative/Semi-Quantitative Samples

In the following discussion each qualitative sampling site will be dealt with alphabetically. These treatments will include comments on both the EPT taxa (Table 1) and the Chironomidae taxa (Table 2), as well as comments on taxa of particular interest.

12-BT-B, Butler Branch—The EPT taxa of this stream display a fairly decent diversity with a combination of spring and fall samples resulting in 17 mayfly taxa, 7 stonefly taxa and 16 caddisfly taxa. As one might expect, the greater diversity and abundance is found in the spring as opposed to the fall sampling period. A few of the taxa found at the site are indicative of cool, clean water habitats. These include the Peltoperlidae stoneflies and the stonefly *Malirekus hastatus*, the mayflies *Epeorus* sp. and *Heptagenia* spp., the dragonfly *Boyeria graffiana*, the caddisflies *Parapsyche cardis*, *Pycnopsyche gentilis*, and *Neophylax mitchelli*, and the riffle beetle *Promoresia*

Table 3. Hester-Dendy data for EPT taxa and numbers of individuals, and for chironomidae taxa and numbers of individuals from Section B of the Foothills Parkway study

Site identifier	Total EPT taxa			Total specimens		
	E	P	T	E	P	T
26-CB-B Cosby Creek;06-07-94;CC-DS	3	7	6	11	108	22
26-CN-B Cosby Creek;10-25-94;CC-DS	9	8	3	115	33	10
25-CB-A Cosby Creek;10-25-94;CC-US	7	5	4	98	18	15
17-DN-B Dunn Creek;06-07-94;DC-DS	5	8	6	12	106	47
17-DN-B Dunn Creek;10-25-94;DC-DS	2	5	4	10	14	9
16-DN-A Dunn Creek;06-07-94;DC-US	3	6	3	11	34	8
16-DN-A Dunn Creek;10-25-94;DC-US	4	6	3	11	30	8
2-LP-B Little Pigeon;06-07-94;LP-DS	6	4	8	49	102	30
2-LP-B Little Pigeon;10-25-94;LP-DS	6	6	2	36	53	8
1-LP-A Little Pigeon;06-07-94;LP-US	6	7	6	23	53	12
8-WB-B Webb Creek;10-25-94;WB-DS	5	7	5	122	54	33
7-WB-A Webb Creek;10-25-94;WB-US	7	7	4	61	53	7
7-WB-A Webb Creek;06-07-94;WB-US	12	9	9	65	114	84

Site identifier	Chironomini	Tanytarsini	Orthocladiinae	Tanypodinae
26-CB-B Cosby Creek;06-07-94;CC-DS	449	500	2381	124
26-CB-B Cosby Creek;10-25-94;CC-DS	142	563	71	11
25-CB-B Cosby Creek;10-25-94;CC-US	73	788	103	1
17-DN-B Dunn Creek;06-07-94;DC-DS	59	20	296	5
17-DN-B Dunn Creek;10-25-94;DC-DS	42	19	92	4
16-DN-A Dunn Creek;06-07-94;DC-US	100	21	360	17
16-DN-A Dunn Creek;10-25-94;DC-US	44	13	297	12
2-LP-B Little Pigeon;06-07-94;LP-DS	219	636	4300	7
2-LP-B Little Pigeon;10-25-94;LP-DS	591	249	225	16
1-LP-A Little Pigeon;06-07-94;LP-US	729	351	1028	68
8-WB-B Webb Creek;10-25-94;WB-DS	139	208	202	14
7-WB-A Webb Creek;10-25-94;WB-DS	176	229	149	13
7-WB-A Webb Creek;06-07-94;WB-US	134	369	1894	27

tardella. Louton (1982) indicates that *Boyeria graffiana* is infrequently collected in eastern Tennessee. *Neophylax mitchelli* was suspected to occur in, but had not been collected in Tennessee (Etnier and Schuster 1979). The Chironomidae (Table 2), also appear to be fairly well represented in the stream with the combined samples yielding 4 taxa of Chironomini, 1 taxon of Tanytarsini, 9 taxa of Orthocladiinae and 1 taxon of Tanypodinae. A review of the taxonomic list for the site shows a fairly diverse fauna (particularly in the spring sample) with no particular taxa that might be indicative of pollutional problems.

3-CP-A, 4-CP-B, Copeland Creek—Both sites on this stream possess excellent numbers of EPT taxa. Copeland Creek along Copeland Creek Road evidenced a combined total of 30 taxa of mayflies, 8 taxa of stoneflies, and 15 taxa of caddisflies (Table 1). The Copeland Creek site at McKinzie Way yielded a combined total of 28 mayfly taxa, 10 stonefly taxa, and 23 taxa of caddisflies. The site at McKinzie Way appears to be the healthier of the two sites based on the total number of EPT taxa, and the presence at that site of cool, clean water taxa including the dragonfly *Boyeria graffiana*, the Peltoperlidae stoneflies and the stoneflies *Malirekus hastatus* and *Isogenoides* sp., the mayflies *Epeorus* sp. and *Heptagenia* spp.the caddisflies *Micrasema* sp. *Ceratopsyche macleodi*, *Pycnopsyche gentilis*, and *Psilotreta* sp., and the riffle beetle *Promoresia tardella*. Both sites also had a fair representation of Chironomidae with the McKinzie Way site showing greater diversity of taxa and numbers of individuals (Table 2). The Copeland Creek Road site yielded an infrequently collected cool, clean water midge, *Odontomesa* sp. (subfamily: Prodiamesinae).

25-CB-A, 26-CB-B, Cosby Creek—Both sites on this stream yielded exceptional numbers of EPT taxa. Especially of note are the number of stonefly taxa collected. Cosby Creek at Indian Camp Creek is the slightly better of the two sites with a combined total of 32 taxa of mayflies, 19 taxa of stoneflies, and 23 taxa of caddisflies. The Cosby Creek site at Wallace C. Large Bridge yielded a combined total of 27 taxa of mayflies, 21 taxa of stoneflies, and 20 taxa of caddisflies. Of note were the cool, clean water taxa of the Peltoperlidae stoneflies, the stoneflies *Cultus decisus*, *Diploperla* sp., *Isogenoides hansoni*, *Malirekus hastatus*, *Remenus bilobatus*, and *Yugus* cf. *arinus*, the mayflies *Epeorus* sp., *Heptagenia* spp., *Rhithrogena* cf. *amica*, and *Neoephemera purpurea*, the caddisflies *Heteroplectron americanum*, *Micrasema* spp., *Ceratopsyche alhedra*, *Psychomyia* sp., and *Pycnopsyche gentilis*,and the riffle beetles *Promoresia elegans*, and *Promoresia tardella*. Both Cosby Creek sites also showed an exceptional diversity and abundance of Chironomidae with

the Indian Camp Creek site having a combined total of 8 taxa of Chironomini, 2 taxa of Tanytarsini, 21 taxa of Orthocladiinae, 1 taxon of Tanypodinae, 3 taxa of Diamesinae and 1 taxon of Prodiamesinae, and the Wallace C. Large Bridge site having a combined total of 10 taxa of Chironomini, 4 taxa of Tanytarsini, 21 taxa of Orthocladiinae, 1 taxon of Tanypodinae, 4 taxa of Diamesinae, and 2 taxa of Prodiamesinae (Table 2). Of particular note are the infrequently collected Diamesinae *Pagastia* sp., *Potthastia gaedii* group, and *Sympotthastia* sp., and the infrequently collected Prodiamesinae *Odontomesa* sp. and *Prodiamesa* sp.

14-DNW-A 16-DN-A, 17-DN-B, Dunn Creek—All three sites in the Dunn Creek Watershed possessed healthy numbers of EPT taxa. The Dunn Creek at Mathis Road site possessed a combined total of 31 mayfly taxa, 12 stonefly taxa, and 15 caddisfly taxa; the Dunn Creek-East Branch site evidenced a combined total of 26 mayfly taxa, 18 stonefly taxa, and 22 caddisfly taxa; the Dunn Creek-West Branch site yielded a combined total of 19 mayfly taxa, 12 taxa of stoneflies, and 19 taxa of caddisflies (Table 1). Of note at these sites were the cool, clean water taxa of the dragonfly *Boyeria graffiana*, the Peltoperlidae stoneflies (including *Peltoperla* sp.), the stoneflies *Cultus decisus*, *Diploperla duplicata*, *Malirekus hastatus*, and *Remenus bilobatus*, the mayflies *Epeorus* sp., *Heptagenia* spp., *Rhithrogena* cf. *amica*, and *Ameletus* spp., the caddisflies *Parapsyche cardis*, *Ceratopsyche macleodi*, *Pycnopsyche gentilis*, *Psilotreta labida*, *Rhyacophila torva*, *Neophylax* cf. *aniqua*, and *Neophylax mitchelli*, and the riffle beetles *Promoresia elegans* and *Promoresia tardella*. All three stations in Dunn Creek also displayed a fairly healthy Chironomidae fauna. Of the three sites, the west branch of Dunn Creek showed the lowest Chironomidae diversity for the combined samples with no taxa reported for either the Chironomini or Tanytarsini, 9 taxa of Orthocladiinae, and 1 taxon each of Tanypodinae and Diamesinae (Table 2). The taxa present, however, were not indicative of an impacted site. Of note were the presence of the Prodiamesinae *Odontomesa* sp. at the east branch site, and *Prodiamesa* sp. at the Dunn Creek site at Mathis Road.

23-IC-B, Indian Camp Creek—The site on this creek displayed a healthy diversity and abundance of EPT taxa with a combined total of 18 taxa of mayflies, 11 taxa of stoneflies, and 14 taxa of caddisflies (Table 1). Of note were the cool, clean water taxa of the Peltoperlidae stoneflies, the stonefly *Malirekus/Yugus* sp. the mayflies *Heptagenia* spp. and *Epeorus* spp., the caddisflies *Arctopsyche irrorata* and *Ceratopsyche macleodi*, and the riffle beetles *Promoresia elegans* and *Promoresia tardella*. The Indian Camp Creek site showed a fairly healthy diversity

and abundance of Chironomidae (Table 2). Of note was the presence of the Prodiamesinae *Prodiamesa* sp.

32-LB-B, Laurel Branch—This stream at Pittman Center yielded a healthy assemblage of EPT taxa with a combined total of 22 taxa of mayflies, 10 taxa of stoneflies, and 19 taxa of caddisflies (Table 1). Of note were the cool, clean water taxa of the dragonfly *Boyeria graffiana*, the stoneflies *Peltoperla* sp. and *Malirekus hastatus*, the mayflies *Epeorus* sp., *Heptagenia* sp., and *Rhithrogena* sp., the caddisflies *Micrasema rickeri*, *Parapsyche cardis*, *Psilotreta frontalis*, and *Neophylax mitchelli*, and the riffle beetle *Promoresia tardella*. The Chironomidae fauna showed fairly good diversity and abundance with no clear indication of pollutional problems (Table 2).

5-LN-A, 6-LN-B, Lindsey Creek—Both sites in Lindsey Creek showed a fairly healthy diversity and abundance of EPT taxa (Table 1). The Tunis Branch Road site was slightly richer faunistically. Of note were the cool, clean water taxa of the stonefly *Tallaperla* sp., and the mayflies *Epeorus* spp. and *Heptagenia* spp., and the riffle beetle *Promoresia tardella*. The small size of the stream, undoubtedly affected the diversity. The Chironomidae diversity was fair and no particularly problem taxa were noted (Table 2).

1-LP-A, 2-LP-B, Little Pigeon River—Both sites on the Middle Prong of the Little Pigeon displayed exceptionally healthy assemblages of EPT taxa. The Little Pigeon above Copeland Creek yielded a combined total of 34 taxa of mayflies, 19 taxa of stoneflies, and 34 taxa of caddisflies; the site on the Little Pigeon at Laurel Branch yielded a combined total of 37 taxa of mayflies, 13 taxa of stoneflies, and 34 taxa of caddisflies (Table 1). Both taxonomic richness and abundance at both sites were excellent. Of particular note were the cool, clean water taxa of the dragonfly *Boyeria graffiana*, the Peltoperlidae stoneflies, the stoneflies *Cultus decisus*, and *Isogenoides hansoni*, the mayflies *Epeorus* spp., *Heptagenia* spp., *Rhithrogena* spp., an unidentifiable Heptageniid mayfly, and *Neoephemera purpurea*, the caddisflies *Brachycentrus* sp., *Micrasema* spp., *Ceratopsyche alhedra*, *Pycnopsyche divergens* (possibly *P. lepida* grp.), *Lepidostoma frosti*, and *Rhyacophila vuphipes*, and the riffle beetles *Promoresia elegans* and *Promoresia tardella*. Also of note was the presence of 6–7 distinct taxa of the Perlid stoneflies. The Chironomidae fauna of both sites was also exceptionally diverse and abundant (Table 2). Of particular note was the presence of three taxa of Diamesinae and the Prodiamesinae *Odontomesa* sp. at the Little Pigeon River at Laurel Branch site.

13-MA-B, 13.5-MAT1-B, 14-MAT2-B, Matthew Creek—This stream and its two tributaries all showed excellent EPT taxa diversity and abundance. The lowest diversity of EPT taxa was found in the 1st tributary of Matthew Creek with a combined total of 15 taxa of mayflies, 8 taxa of stoneflies, and 14 taxa of caddisflies. Matthew creek proper with a combined total of 22 taxa of mayflies, 13 taxa of stoneflies, and 15 taxa of caddisflies and the 2nd Matthew Creek tributary with a combined total of 23 taxa of mayflies, 10 taxa of stoneflies, and 15 taxa of caddisflies both displayed somewhat greater diversity (Table 1). The differences may have been due to the relative sizes of the streams, with the 1st tributary being the smallest. Of note were the presence of the cool, clean water taxa of the Peltoperlidae stoneflies and the stoneflies *Malirekus hastatus* and *Remenus bilobatus*, the mayflies *Epeorus* sp. and *Heptagenia* sp., the caddisflies *Parapsyche cardis*, *Ceratopsyche macleodi*, *Pycnopsyche gentilis*, *Psilotreta* cf. *labida*, *Psilotreta frontalis*, and *Neophylax mitchelli*, and the riffle beetles *Promoresia elegans*, and *Promoresia tardella*. The diversity and abundance of the Chironomidae was greatest in Matthew Creek proper with a combined total of 3 taxa of Chironomini, 2 taxa of Tanytarsini, 18 taxa of Orthocladiinae, 2 taxa of Tanypodinae, and 1 taxon of Diamesinae (Table 2). The two tributaries possessed a Chironomidae fauna somewhat reduced in diversity, but apparently healthy, nonetheless.

10t-MD-B, Mill Dam Branch—The site in this stream displayed a healthy assemblage of EPT taxa with a combined total of 21 taxa of mayflies, 9 taxa of stoneflies, and 21 taxa of caddisflies (Table 1). Of note were the cool, clean water taxa of the dragonfly *Boyeria graffiana*, the Peltoperlidae stoneflies, the stonefly *Malirekus/Yugus* sp., the mayflies *Epeorus* spp., *Heptagenia thetis*, and *Rhithorogena* cf. *amica*, and the caddisflies *Micrasema* sp., *Aphropsyche doringa*, *Parapsyche cardis*, *Pycnopsyche gentilis*, and *Psilotreta* sp. The Chironomidae also showed a fairly good diversity and abundance with no indication of pollutional problems (Table 2).

18-OG-A, 19-OG-B, 20-CR-A, 21-CR-B, Ogle Spring Branch and Carson Branch—The two sites in this stream, and one site in each of its two tributaries all yielded a healthy assemblage of EPT taxa. Ogle Spring Branch above the Foothills Right of Way evidenced a combined total of 16 taxa of mayflies, 6 taxa of stoneflies, and 21 taxa of caddisflies; the site on Ogle Spring Branch at Rocky Flats Road yielded a combined total of 25 taxa of mayflies, 8 taxa of stoneflies, and 19 taxa of caddisflies; the tributary to Ogle Spring Branch 1/4 mile north of Apple Orchard Road (OGT-A) yielded a combined total of 19 taxa of mayflies, 12 taxa of stoneflies, and 19 taxa of caddisflies; the tributary to Ogle Spring Branch at Otto Williams Road evidenced a combined total

of 18 taxa of mayflies, 8 taxa of stoneflies, and 18 taxa of caddisflies (Table 1). In evidence at these sites were the cool, clean water taxa of the dragonfly *Boyeria graffiana*, the Peltoperlidae stoneflies (including *Tallaperla* sp.), the stoneflies *Malirekus hastatus* and *Remenus bilobatus*, the mayflies *Epeorus* spp. and *Heptagenia* spp., the caddisflies *Parapsyche cardis*, *Ceratopsyche macleodi*, *Pycnopsyche gentilis*, *Psilotreta* sp., and *Neophylax mitchelli*, and the riffle beetle *Promoresia tardella*. The Ogle Spring Branch site at Rocky Flats Road, and the site in the OGT-A Tributary of Ogle Spring Branch evidenced the greatest diversity and abundance of Chironomidae of the Ogle Branch sites. The site at Rocky Flats Road yielded a combined total of 4 taxa of Chironomini, 2 taxa of Tanytarsini, 11 taxa of Orthocladiinae and one taxon each of Tanypodinae, Diamesinae, and Prodiamesinae; the OGT-A tributary yielded a combined total of 1 taxon of Chironomini, 3 taxa of Tanytarsini, 15 taxa of Orthocladiinae, 2 taxa of Tanypodinae, and 1 taxon of Diamesinae (Table 2). The site in Ogle Spring Branch above the Foothills Right of Way, and the OGT-B tributary both displayed of somewhat reduced diversity of Chironomidae; however, no taxa indicative of pollutional problems were in evidence. Of particular note was the presence of the cool, clean water Prodiamesinae midge, *Prodiamesa* sp. at the Rocky Flat Road site.

24-SH-B, Sandy Hollow Creek—The site on this stream from its mouth at Indian Camp Creek upstream about 100 meters, displayed a healthy assemblage of EPT taxa with a combined total of 24 taxa of mayflies, 11 taxa of stoneflies, and 18 taxa of caddisflies (Table 1). Of note were the presence of cool, clean water taxa including the dragonfly *Boyeria graffiana*, the Peltoperlidae stoneflies, the stoneflies *Zealeuctra* sp., *Malirekus hastatus*, and *Remenus bilobatus*, the mayflies *Epeorus* spp. and *Heptagenia* sp., the caddisfly *Psilotreta frontalis*, and the riffle beetle *Promoresia tardella*. The stream also yielded a respectable diversity and abundance of Chironomidae including a combined total of 6 taxa of Chironomini, 1 taxon of Tanytarsini, 11 taxa of Orthocladiinae, 3 taxa of Tanypodinae, and 1 taxon of Diamesinae (Table 2). None of the Chironomid taxa present were indicative of pollutional problems. Of note was the presence of the midge *Pagastia* sp. (subfamily: Diamesinae).

28-SP-B, Sheep Pen Branch—The site in this stream yielded a respectable diversity of EPT taxa, with a combined total of 10 taxa of mayflies, 13 taxa of stoneflies, and 15 taxa of caddisflies for the two sample dates (Table 1). Of note were the presence of cool, clean water taxa including the Peltoperlidae stoneflies, the stoneflies *Malirekus hastatus* and *Remenus bilobatus*, the mayflies *Epeorus dispar*, and *Heptagenia thetis*, and the caddisflies *Parapsyche cardis*, *Pycnopsyche*

flavata, *Psilotreta* sp. and *Neophylax mitchelli*. The Chironomidae diversity was somewhat reduced with a combined total of 2 taxa of Chironomini, 0 taxa of Tanytarsini, 5 taxa of Orthocladiinae, and 1 taxon of Tanypodinae; however, none of the taxa present gave an indication of possible pollutional problems (Table 2).

11-WR-B, Warden Branch—The site in this stream yielded a healthy assemblage of EPT taxa with a combined total of 21 taxa of mayflies, 11 taxa of stoneflies, and 21 taxa of caddisflies for the two sample dates (Table 1). Of note were the cool, clean water taxa including the dragonfly *Boyeria graffiana*, the Peltoperlidae stoneflies, the stonefly *Malirekus hastatus*, the mayflies *Epeorus* spp., and *Heptagenia* spp., the caddisflies *Ceratopsyche macleodi*, *Parapsyche cardis*, *Pycnopsyche gentilis*, and *Neophylax mitchelli*, and the riffle beetle *Promoresia tardella*. A healthy assemblage of Chironomidae fauna was also found to be present with a combined total of 4 taxa of Chironomini, 1 taxon of Tanytarsini, 11 taxa of Orthocladiinae, and 1 taxon each of Tanypodinae and Prodiamesinae (Table 2). Of note was the presence of *Odontomesa* sp.(subfamily: Prodiamesinae).

7-WB-A, 8-WB-B, Webb Creek—The two sites in this stream both yielded impressive lists of EPT Taxa. The Webb Creek site on U.S. 321 at Volunteer Road yielded a combined total of 30 taxa of mayflies, 15 taxa of stoneflies, and 22 taxa of caddisflies; the site on Webb Creek at Webb Creek Road yielded a combined total of 34 taxa of mayflies, 17 taxa of stoneflies, and 21 taxa of caddisflies (Table 1). Of note were the cool, clean water taxa including the Peltoperlidae stoneflies the stoneflies *Zealeuctra* sp., *Cultus decisus*, *Isogenoides hansoni* and *Malirekus/Yugus* sp., the mayflies *Epeorus rubidus/subpallidus*, *Heptagenia* spp., *Rhithrogena* cf. *amica*, an unidentifiable Heptageniidae nymph and *Neoephemera purpurea*, the caddisflies *Micrasema* spp. and *Psychomyia* sp., and the riffle beetles *Promoresia elegans* and *Promoresia tardella*. Both sites showed fairly diverse assemblages of Chironomidae with the U.S. 321 at Volunteer Road site yielding a combined total of 7 taxa of Chironomini, 1 taxon of Tanytarsini, 16 taxa of Orthocladiinae, and 1 taxon each of Tanypodinae and Diamesinae, and the Webb Creek Road site yielding a combined total of 10 taxa of Chironomini, 5 taxa of Tanytarsini, 17 taxa of Orthocladiinae, 2 taxa of Tanypodinae, and 1 taxon of Diamesinae (Table 2). Of some note were the numbers of *Microtendipes* sp. and various taxa of *Cricotopus/Orthocladius* spp. particularly at the Webb Creek Road site. These taxa may be indicative of some degree of organic enrichment of the stream.

9-WBT2-B, 27-WBT1-B, 31-WBT3-B, The three tributary streams of Webb Creek— (WBT1-B site at most easterly bridge on U.S. 321; WBT2-B site west of mouth of Timothy Creek; WBT3-B site downstream of mouth of Timothy Creek) evidenced assemblages of EPT taxa which varied with the size of the stream. The largest of the tributaries (WBT2-B) yielded a combined total of 14 taxa of mayflies, 7 taxa of stoneflies, and 18 taxa of caddisflies; the mid-sized tributary (WBT1-B) yielded a combined total of 8 taxa of mayflies, 6 taxa of stoneflies, and 14 taxa of caddisflies; the smallest tributary (WBT3-B) was flowing for only the spring sample and yielded 5 taxa of mayflies, 2 taxa of stoneflies and 5 taxa of caddisflies (Table 1). All sites evidenced some cool, clean water taxa including the dragonfly *Boyeria grafiana* (WBT1-B), Peltoperlidae stoneflies (WBT1-B; WBT2-B; WBT3-B), the mayflies *Epeorus dispar* (WBT2-B; WBT3-B), *Heptagenia thetis* (WBT2-B), and the caddisflies *Heteroplectron americana* (WBT1-B), *Parapsyche cardis* (WBT2-B), *Pycnopsyche gentilis* (WBT1-B; WBT2-B), *Psilotreta frontalis* (WBT1-B), *Psilotreta labida* (WBT2-B) and *Neophylax mitchelli* (WBT1-B; WBT2-B; WBT3-B). The diversity of Chironomidae taxa also followed the same stream-size pattern with the WBT2-W tributary yielding a combined total of 4 taxa of Chironomini, 2 taxa of Tanytarsini, 8 taxa of Orthocladiinae, and two taxa of Tanypodinae, the WBT1-W tributary yielding a combined total of 0 taxa of Chironomini 1 taxon of Tanytarsini, 3 taxa of Orthocladiinae and 2 taxa of Tanypodinae, and the WBT3-W tributary yielding only 1 taxon of Chironomini, 0 taxa of Tanytarsini, 2 taxa of Orthocladiinae and 1 taxon of Tanypodinae (Table 2). In none of the tributaries did the assemblage present indicate any pollutional problems.

Quantitative (Hester-Dendy Multiplate) Samples

As indicated earlier, the Hester-Dendy Samplers tend to be fairly selective for the taxa they will attract (Simpson and Bode 1977). The available data bears this out (Table 3.) by the fact that the majority of the organisms listed are Chironomidae. Several interesting points may be gleaned from the quantitative portion of this study. The study sites (Cosby Creek, Dunn Creek, Little Pigeon River, and Webb Creek) were all in streams that displayed diverse assemblages of EPT taxa. As one might expect due to the selectivity of the samplers used, the data for EPT taxa in the quantitative portion of this study did not yield very impressive numbers of EPT taxa as compared to the qualitative/semi-quantitative samples. In Cosby Creek where the lowest number of EPT taxa found on any sampling date for the qualitative samples was 21 taxa of mayflies, 11 taxa of stoneflies, and 12 taxa of caddisflies, a highest number of only 9 taxa of mayflies, 8 taxa of

stoneflies, and 3 taxa of caddisflies was noted for the Hester-Dendy samples. In Dunn Creek where the lowest number of EPT taxa found on any sampling date for the qualitative samples was 13 taxa of mayflies, 7 taxa of stoneflies and 14 taxa of caddisflies, a highest number of 5 taxa of mayflies, 8 taxa of stoneflies, and 6 taxa of caddisflies was noted for the Hester-Dendy samples. In the Little Pigeon River where the lowest number of EPT taxa found on any sampling date for the qualitative samples was 24 taxa of mayflies, 11 taxa of stoneflies, and 25 taxa of caddisflies, the highest number of 6 taxa of mayflies, 7 taxa of stoneflies, and 6 taxa of caddisflies was noted for the Hester-Dendy samples. In Webb Creek where the lowest number of EPT taxa found on any sampling date for the qualitative samples was 21 taxa of mayflies, 12 taxa of stoneflies, and 14 taxa of caddisflies, the highest number of 12 taxa of mayflies, 9 taxa of stoneflies, and 9 taxa of caddisflies was noted for the Hester-Dendy samples. Of interest in this data is that the Plecoptera were typically well represented on the Hester-Dendy samplers. A number of taxa in this order are predatory on Chironomidae and may have been taking advantage of the concentration of midges on these samplers.

Considering the Chironomidae data from the Hester-Dendy samples, a few interesting points can be made. For all streams, the spring Hester-Dendy samples were dominated by the subfamily Orthocladiinae. Clean waters are often dominated by larvae of the subfamily Orthocladiinae (Heliovaara and Vaisanen 1993). Some care must be taken, however, in interpreting the data in this fashion. Initially, analysis of the Hester-Dendy samples was to include identification of all Chironomidae taxa to the lowest possible taxonomic level. Initial rough sorting of the largest samples from the late spring sampling period showed that identification of these samples to that level would be too time and cost intensive. Therefore, later samples were sorted only to subfamily to reduce the time and cost of analysis. In the initial rough sorting, however, some valuable information was obtained concerning the downstream Little Pigeon Station. Although the Orthocladiinae were dominant in these samples, it was noted that a disproportionate number of the specimens were early instars of the genera *Cricotopus* and *Orthocladius*. This would lead one to suspect the presence of some input of organic pollution in the vicinity of this station. Further study may be necessary to pinpoint the source. Along with this fact, another of anecdotal interest should be noted. A Orthocladiinae midge (*Symposiocladius lignicola*) seldom seen in the qualitative samples collected occurred quite commonly in the Hester-Dendy samples. This midge displays the unique habit of burrowing into submerged wood in streams. It would be of interest to more

thoroughly analyze the Hester-Dendy samples such that a comparison of the taxa found on them versus the taxa encountered in qualitative sampling could be compared.

SUMMARY

The qualitative/semiquantitive samples evidenced that the majority of the sites in the majority of the streams sampled on the Foothills project were relatively unimpacted and possessed healthy assemblages of EPT taxa and Chironomidae. The one stream that showed a slight indication of potential organic enrichment was Webb Creek. Although the fauna in that stream appeared healthy in most respects, the presence of certain taxa of Chironomidae and their numbers showed the possibility of an early stage of pollutional problems.

The quantitative samples taken from selected streams on the Foothills project area for the most part were indicative of very healthy streams. One potential problem area was the station in the Little Pigeon River downstream of Copeland Creek. At that station the preponderance of early instar *Cricotopus* and *Orthocladius* midges indicate pollutional inputs that further study will be required to pinpoint.

REFERENCES CITED

Etnier, D. A. and G. A. Schuster. 1979. An annotated list of Trichoptera (caddisflies) of Tennessee. J. Tenn. Acad Sci. 54:15–22.

Louton, J. A. 1982. Lotic Dragonfly (Anisoptera: Odonata) Nymphs of the Southeastern United States: Identification, Distribution, and Historical Biogeography. Unpubl. Ph.D. Dissertation, Univ. of Tennessee, Knoxville.

Heliovaara, K. and R. Vaisanen. 1993. Insects and Pollution. CRC Press, Inc., Ann Arbor, 393 pp.

Rosenberg, D. M. and V. H. Resh, eds. 1993. Freshwater Biomonitoring and Benthic Macroinvertebrates. Chapman and Hall, New York, 488 pp.

Simpson, K. W. and R. W. Bode. 1980. Common Larvae of the Chironomidae (Diptera) from New York State Streams and Rivers with particular reference to the fauna of artificial substrates. Bulletin #439, New York State Museum.

PART 4

The data is presented in order of the ascending numbers of the site identifiers. Within each site the survey data is presented in the following order:

- **benthic macroinvertebrate survey data:**
  - all 31 stream sites,
  - opportunistic taxa sampling within the diversity of habitats along the site, leading to a taxa listing that probably reflects 50 to 70% of the resident benthic macroinvertebrate taxa,
  - qualitative
- **Hester Dendy-mulitplate sampling:**
  - at 8 largest stream sampling sites only,
  - quantitative on artificial substrate with standardized area (1 square foot),
  - artificial substrate is selective for certain taxa [Diptera (true flies)]
- **fish survey data:**
  - all 31 sites
    - at 8 largest stream sampling sites only—quantitative triple-pass depletion method leads to calculation of fish population and biomass
    - remaining sites—single pass electroshock sampling leads to a qualitative sampling that includes a full species listing and an indication of relative dominance for the dominant species.

1-LP-A LITTLE PIGEON RIVER—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-54 and DAE 94-106, site 1, LP-A, Little Pigeon River above ford ca. 0.3 road miles above Copeland Branch, Pittman Center, Sevier Co., Tenn., 14 June and 29 October 1994. Substrate 70% boulder and cobbles, 20% gravel, 5% bedrock, 5% silt; maximum depth 3 ft; mean width ca. 60 ft; 20% canopy. Collectors on 14 June DA Etnier, CH Heacock, CJ Paxton, CE Skelton, JT Baxter, FJ Kriegler, MH Hughes, SJ Fraley, 15 hrs effort; collectors on 29 October DA and EL Etnier, JT Baxter, LD Bonds, KL Harpster, 15.75 hrs effort. Abundant taxa on 29 October included *Atherix*, *Callopteryx*, philopotamids, baetids, heptageniids. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera species preceded with an asterisk have been catalogued at UT. Det. DA Etnier, KL Harpster, EL Etnier

Taxon	94-54 14 Jun	94-54 (100)	94-106 29 Oct	94-106 (100)
Platyhelminthes				
Planarians			0	1
Annelida				
Oligochaeta	2		4	
Mollusca				
Ancylidae				
Ferrissia sp.			2	1
Pleuroceridae				
Elimia clavaeformis	2			
Arachnida				
Hydracarina	1			1
Crustacea				
Decapoda				
Cambarus bartoni	1			
Cambarus longirostris	0	1	2	
Insecta				
Plecoptera				
Chloroperlidae				
Haploperla brevis			4	
Sweltsa sp.			53	16
Chloroperlidae sp. (early instars)	2	1	2	
Leuctridae				
Leuctra sp.			3	
Leuctridae sp. (early instars)	15	3	3	
Peltoperlidae				
Peltoperlidae sp. (early instars)	3	1	22	1
Perlidae				
Agnetina capitata	4		6	4
Acroneuria carolinensis	1	5		
Acroneuria abnormis	1	2	8	
Acroneuria sp. (early instars)	1			

Eccoptura xanthenes	2		2	
Neoperla sp.	1		1	
Paragnetina immarginata			8	
Perlesta sp. (early instars)	15	2		
Perlodidae				
Clioperla clio? (early instars)			2	
Cultus decisus			8	
Isogenoides hansoni			23	1
Isoperla holochlora	6			
Isoperla sp. (early instars)			80	2
Malirekus/Yugus sp.			1	
Pteronarcyidae				
Allonarcys sp.	2		1	
Taeniopterygidae				
Taeniopteryx sp.			11	
Plecoptera sp.				
Allocapnia/Zealeuctra (early)			2	1
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	21	10	69	1
Acentrella sp. (slender, cerci naked with black band)	2	3		
Acentrella sp. (slender, no bands or distinct fringe on cerci)	15			
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	11	19	2	
Acentrella sp. (medium, cerci fringed, black band, 8-9 pale)			1	
Acentrella sp. (early instars)	7	3	2	
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	10		4	2
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)			46	10
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)			20	
Baetis intercalaris/pluto	3	10		
Centroptlum sp.	4		10	
Baetidae sp. (early or damaged)			3	
Baetiscidae				
Baetisca carolina	1			
Caenidae				
Caenis sp.	1		3	

Ephemeridae				
Ephemera sp.	1			
Ephemerellidae				
Dannella simplex	3			
Drunella cornuta/cornutella	4			
Ephemerella invaria? (early)			1	
Ephemerella rossi			1	
Ephemerella sp. (early)			1	
Eurylophella doris sp. group	39			
Eurylophella funeralis	7		4	
Eurylophella sp. (early instars)	4		23	1
Serratella deficiens	1			
Serratella serratoides			1	
Serratella sp. (early instars			3	2
Heptageniidae				
Cinygmula subaequalis	7	3		
Epeorus dispar (small first gill)	3			
Epeorus rubidus/subpallidus	10			
Epeorus sp. (early instars)	1		31	
Heptagenia thetis			1	
Heptagenia sp. (early instars)	4	4	16	5
Rhithrogena sp. cf. amica	2	1		
Rhithrogena sp. (early instars)			1	1
Stenacron pallidum	10		10	
Stenonema ithaca/modestum	21	2	120	7
Stenonema pudicum	7		112	15
Stenonema sp. (early instars)			44	
Heptageniidae sp. (early instars)	1	1	16	10
Leptophlebiidae				
Habrophlebia vibrans	0	1		
Habrophlebiodes sp.	13	1	15	
Leptophlebia sp.			15	
Paraleptophlebia adoptiva/mollis			7	
Paraleptophlebia sp. cf. guttata	0	1		
Paraleptophlebia sp. cf. guttata (maxillary palp short & thick)			4	
Leptophlebiidae sp. (early)			3	1
Odonata				
Aeshnidae				
Boyeria graffiana	2			
Boyeria vinosa	12		31	
Boyeria sp. (early instars)	1			
Calopterygidae				
Calopteryx angustipennis	3		6	
Calopteryx maculata/dimidiata	7		35	
Hetaerina sp.			1	
Cordulegastridae				
Cordulegaster maculata	1		5	
Corduliidae				
Helocordulia uhleri	4		6	

Gomphidae				
Gomphurus rogersi	2			
Gomphus lividus	2		5	
Lanthus vernalis	23		9	
Stylogomphus albistylus	9	5		
Macromiidae				
Macromia sp.	1			
Heteroptera				
Belostomatidae				
Belostoma fluminea			1	
Corixidae				
Sigara sp.			2	
Gerridae				
Gerris marginatus	1			
Nepidae				
Ranatra sp.			1	
Notonectidae				
Buenoa sp.			1	
Veliidae				
Microvelia sp.			1	
Rhagovelia obesa	3		6	
Megaloptera				
Corydalidae				
Corydalus cornutus	1		2	
Nigronia serricornis	14		2	
Trichoptera				
Brachycentridae				
Brachycentrus sp. (early instars)	2			
Micrasema bennetti			2	
Micrasema rickeri	1			
Micrasema sp. (empty veg. cases)	13		1	
Calamoceratidae				
Heteroplectron americanum			1	
Glossosomatidae				
Glossosoma nigrior (1 male pupa)	8		16	
Hydropsychidae				
*Ceratopsyche alhedra			3	
Ceratopsyche bronta	4		20	1
Ceratopsyche morosa			2	
Ceratopsyche slossonae (1 pupa)	25		1	
Ceratopsyche sparna	7		32	
Cheumatopsyche sp.	9		51	2
Diplectrona modesta (1 pupa)	2		3	
*Hydropsyche sp. cf. scalaris			2	
Hydropsychidae sp., early instars	1		5	2
Hydroptilidae sp. (cases)			1	
Lepidostomatidae				
*Lepidostoma frosti (mature male pupa, parasitized)	1			
Lepidostoma sp. (not frosti)	12		5	

Leptoceridae				
*Mystacides sp. nov.? (not sepulchralis, pale head)	2		16	
Oecetis sp. (log cabin case)			1	
Triaenodes sp. cf. tardus	1	5		
*Triaenodes sp. (darkly pigmented head, not T. tardus)	3			
Limnephilidae				
Apatania sp.	1		2	
*Goera calcarata	6		2	
Platycentropus radiatus (cases)	1			
*Pycnopsyche divergens	2			
Pycnopsyche guttifer species group	5		23	
Pycnopsyche luculenta sp. group	11		10	
Philopotamidae				
Dolophilodes distinctus	3		34	
Phryganeidae				
Ptilostomis sp.			1	
Polycentropodidae				
Nyctiophylax sp.	4		4	
Polycentropus sp.	24		5	
Rhyacophilidae				
Rhyacophila carolina group (pupae)	1			
Rhyacophila fuscula			2	
Sericostomatidae				
Fattigia pele? (empty cases)	1			
Uenoidae				
Neophylax consimilis	2			
Neophylax sp. (cases)			1	
Coleoptera				
Dryopidae				
Helichus basalis adults	21		3	
Dytiscidae				
Hydroporinae adults	1			
Elmidae				
Macronychus glabratus adults	1		1	
Microcylloepus pusillus adults	1			
Optioservus ovalis adults	2	2	6	
Optioservus sp. larvae			20	1
Oulimnius latiusculus adults			0	1
Promoresia elegans larvae	1		16	
Promoresia tardella adults			4	
Stenelmis sp.	3			
Stenelmis sp. adults	4	3	6	
Gyrinidae				
Gyrinus sp.	6		2	
Hydrophilidae				
Hydrobius sp.	1			
Hydrobius sp. adults	1			

Psephenidae				
Psephenus herricki	6	1	13	
Diptera				
Athericicae (Atherix sp.)	1		13	
Blephariceridae pupae	1			
Ceratopogonidae				
"Palpomyia" sp.	1	1	6	
Chironomidae				
Chironominae				
Chironomini				
Demicryptochironomus sp.	1		4	
Microtendipes sp.	26		25	
Phaenopsectra sp.	11			
Polypedilum convictum	5		9	
Polypediluym fallax?	1		1	
Polypedilum illinoense	9			
Polypedilum sp. cf. scalaenum	1		4	
Stichtochironomus sp.	1			
Chironomini sp.	1	5	1	
Tanytarsini				
Rheotanytarsus sp.	5		8	
Tanytarsus sp.	3			
Orthocladiinae				
Brillia sp.	1		1	
Corynoneura sp.	1		12	
Cricotopus bicinctus	3		3	
Cricotopus tremulus group	4		3	
Cricotopus/Orthocladius sp.	2		5	
Eukiefferiella brehmi group			3	
E. claripennis group			1	
E. devonica group			1	
E. gracei group			1	
Limnophyes sp.	1			
Nanocladius sp.			2	
Orthocladius (Euorthocladius) sp.			8	
Parakiefferiella sp.			3	
Parametriocnemus sp.	2		9	
Psectrocladius sp.	1			
Psectrocladius sp. (hook head)	1			
Symposiocladius lignicola	1			
Synorthocladius semivirens	3		24	
Thienemanniella sp.	3		7	
Tvetenia bavarica group	9		8	
Tvetenia discoloripes group			1	
Orthocladiinae sp.	7	4	3	8
Tanypodinae				
Ablabesmyia sp.	1			
Thienemannimyia group	4		7	
Tanypodinae sp.		1	1	
Chironomidae sp.	6	2	7	1

Culicidae sp.	1			
Empididae sp.			1	
Simuliidae sp.	22	5	18	2
Tabanidae sp.			4	
Tipulidae				
Antocha sp.	3	2	2	
Dicranota sp.	6	1	1	
Hexatoma sp. (1 pupa)	4	1	7	
Limnophila sp.	1			
Tipula "abdominalis"			5	
Tipula sp. (early instars, prob. "abdominalis")	2			

DAE 94-54: 61 of 124 taxa (49%) and 417 of 714 specimens (58%) were EPTs. DAE 94-54(100): 18 of 31 taxa (58%) and 73 of 102 specimens (72%) were EPTs. Effort = 15 hours; 8.5 taxa per hour; 52 specimens per hour (per hour data includes sample of 100, with 3 taxa added from that sample); 5.8 specimens per taxon.

DAE 94-106: 65 of 126 taxa (52%) and 1076 of 1582 specimens (68%) were EPTs. DAE 94-106(100): 18 of 25 taxa (72%) and 85 of 101 specimens (84%) were EPTs. Effort = 15.75 hours; 8.1 taxa per hour; 107 specimens per hour (per hour data includes sample of 100; with one taxon added from that sample); 12.5 specimens per taxon.

DAE 94-54 and DAE 94-106 combined: 88 of 174 total taxa (62%) and 1493 of 2296 specimens (65%) were EPTs (total taxa includes two non-EPTs present in samples of 100 that were not taken in qualitative samples). DAE 94-54(100) and DAE 94-106(100) combined: 28 of 45 taxa (62%) and 158 of 203 specimens (78%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Little Pigeon River, Middle Prong, Hester-Dendy artificial substrate samples, upstream station, LP-US, retrieved 7 June 1994.

Taxon	**1**	**2**	**3**	**4**	**5**
Annelida					
Oligochaeta		3			
Arachnida					
Hydracarina		1			
Insecta					
Plecoptera					
Leuctridae					
Leuctra sp.				1	
Leuctridae sp. (early instars)	1	6	3	6	4
Nemouridae					
Amphinemura wui	1	1			1
Peltoperlidae					
Peltoperlidae sp. (early inst.)	2	7	4	1	6

Perlidae					
Acroneuria carolinensis			1		
Perlesta sp. (early instars)	1			1	
Perlodidae					
Isoperla holochlora	1	2		1	1
Pteronarcyidae					
Allonarcys sp.			1		
Ephemeroptera					
Ephemerellidae					
Eurylophella doris species grp	1	2		3	2
Eurylophella sp. (early inst.)		2		1	
Serratella deficiens			1	1	
Heptageniidae					
Heptageniidae sp. (early inst.)		2		2	
Leptophlebiidae					
Habrophlebia vibrans				1	
Habrophlebiodes sp.					3
Paraleptophlebia sp. (damaged)			1	1	
Megaloptera					
Corydalidae					
Nigronia serricornis			1		
Trichoptera					
Hydropsychidae					
Ceratopsyche macleodi				1	
Ceratopsyche slossonae				1	
Diplectrona modesta		1		1	
Lepidostomatidae					
Lepidostoma sp.			1		
Philopotamidae					
Dolophilodes distinctus			2		2
Polycentropodidae					
Polycentropus sp.		1			2

Taxon	**1**	**2**	**3**	**4**	**5**
Coleoptera					
Psephenidae					
Psephenus herricki	1				
Ptilodactylidae					
Anchytarsus bicolor				2	
Diptera					
Chironomidae					
Chironominae					
Chironomini	109	228	135	164	93
Tanytarsini	31	160	79	38	43
Orthocladiinae	93	495	189	145	106
Tanypodinae	6	13	4	32	13
Chironomidae sp.	6	116	35	28	9

Empididae sp.		1		1	
Simuliidae				1	
Tipulidae					
Dicranota sp.	1	1		2	1
Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa	11	6	8	4	85
Non-EPT specimens	2385	247	1018	442	413265
EPT taxa		19	8	8	6119
EPT specimens	88	9	25	11	2221
Percent EPT taxa	63	60	50	60	5864
Percent EPT specimens	4	4	2	2	57

Note: Chironomids identified to genus/species are listed below. Total taxa data are obtained by teating all five replicates as a single sample. Column entries that are taxonomically conservative, such as "*Eurylophella* sp. (early instars)" are not considered as separate taxa if other *Eurylophella* have been identified to species in that sample.

Chironomidae				
Chironominae				
Chironomini				
Microtendipes sp.				1
Tanytarsini				
Rheotanytarsus sp.		1		
Zavrelia sp.?		1		
Orthocladiinae				
Corynoneura sp.		1		
Eukiefferiella pseudomontana group		1		
Parametriocnemus sp.		1		
Symposiocladius lignicola		2	7	
Thienemanniella sp.		1		
Tanypodinae				
Thienemannimyia group		1		

FISH SURVEY DATA —
• QUANTITATIVE TRIPLE-PASS DEPLETION METHOD

STATION 1, LP-A. Population Estimates, 9 October 1994. The 179.6-meter reach sampled was approximately centered on a bridge off Emert's Cover Road and 0.1 mile from Tenn. Hwy. 416. Six shocker units were used. Collectors were Rebecca Young, Chris Paxton, Dave and Liz Etnier, Cindy Eperlee, J.T. Baxter, Steve Fraley, Amy Sensibaugh, Steve and Jason Moore, Kelly Harpster, Michael Trout, Matt Kulp, Alan Loy, Aaron Whaley, John Hammonds, Sean McAfee, David Alaban, and Chip Buchanan. This station was not completed due to inclement weather. The data gathering was terminated after the first depletion pass. (Number of specimens captured on first depletion pass was used to calculate a population estimate based on the data from LP-B, the lower Little Pigeon River site. Data was calculated as a ratio between the first pass and total population for LP-A and first pass and total population for LP-B. (Pop. Est. for LP-A = (Pass 1 at

LP-A X Pop. LP-B)/ Pass 1 at LP-B). 95% Confidence Intervals should be of the same range as those found at LP-B, but were not calculated.)

	I	Pop. Estimate
stoneroller (Campostoma anomalum)	1749	2587
whitetail shiner (Cyprinella galactura)	9	26
striped shiner/telescope shiner hybrid (Luxilus chrysocephalus X Notropis telescopus)	1	1
warpaint shiner (Luxilus coccogenis)	524	802
river chub (Nocomis micropogon)	160	218
Tennessee shiner (Notropis leuciodus)	375	640
Tennessee shiner/saffron shiner hybrid (Notropis leuciodus X Notropis rubricroceus)	12	12
saffron shiner (Notropis rubricroceus)	57	71
telescope shiner (Notropis telescopus)	77	171
blacknose dace (Rhinichthys atratulus)	13	26
longnose dace (Rhinichthys cataractae)	31	40
northern hogsucker (Hypentelium nigricans)	34	40
black redhorse (Moxostoma duquesnei)	4	5
channel catfish (Ictalurus punctatus)	1	1
rainbow trout > 90 mm TL (Oncorhynchus mykiss)	5	6
brook trout (Salvelinus fontinalis)	1	1
banded sculpin (Cottus carolinae)	184	312
rockbass (Ambloplites rupestris)	6	14
smallmouth bass <100 mm TL (Micropterus dolomieu)	1	1
greenside darter (Etheostoma blennioides)	1	2
greenfin darter (Etheostoma chlorobranchium)	24	43
fantail darter (Etheostoma flabellare)	4	4
redline darter		

(Etheostoma rufilineatum)	3	4
snubnose darter		
(Etheostoma simoterum)	18	32
Swannanoa darter		
(Etheostoma swannanoa)	40	62
tangerine darter		
(Percina aurantiaca)	1	4
Totals for Station	3335	5230

STATION LP-A. Population Biomass Estimates. (Data calculated from average weights of each species multiplied by the estimated population of each species. Capture Probabilities could not be calculated for this site.)

	Biomass Estimate
stoneroller	
(Campostoma anomalum)	41337
whitetail shiner	
(Cyprinella galactura)	558
striped shiner/telescope shiner hybrid	
(Luxilus chrysocephalus X Notropis telescopus)	8
warpaint shiner	
(Luxilus coccogenis)	2624
river chub	
(Nocomis micropogon)	2031
Tennessee shiner	
(Notropis leuciodus)	1112
Tennessee shiner/saffron shiner hybrid	
(Notropis leuciodus X N. rubricroceus)	34
saffron shiner	
(Notropis rubricroceus)	95
telescope shiner	
(Notropis telescopus)	277
blacknose dace	
(Rhinichthys atratulus)	12
longnose dace	
(Rhinichthys cataractae)	116
northern hogsucker	
(Hypentelium nigricans)	2870
black redhorse	
(Moxostoma duquesnei)	2517
channel catfish	
(Ictalurus punctatus)	5
rainbow trout > 90 mm TL	
(Oncorhynchus mykiss)	861
brook trout	
(Salvelinus fontinalis)	25

banded sculpin (Cottus carolinae)	3864
rockbass (Ambloplites rupestris)	761
smallmouth bass <100 mm TL (Micropterus dolomieu)	1
greenside darter (Etheostoma blennioides)	38
greenfin darter (Etheostoma chlorobranchium)	232
fantail darter (Etheostoma flabellare)	9
redline darter (Etheostoma rufilineatum)	18
snubnose darter (Etheostoma simoterum)	71
Swannanoa darter (Etheostoma swannanoa)	204
tangerine darter (Percina aurantiaca)	100
Total Estimated Biomass for Station	59780

STATION LP-A. Range in Length of Non-gamefish. (Data in column are maximum and minimum total length in millimeters for each species.)

	I
stoneroller	26-213
whitetail shiner	61-140
warpaint shiner	21-136
striped shiner/telescope shiner hybrid	96
river chub	28-218
Tennessee shiner	22-104
Tennessee shiner/saffron shiner hybrid	65-91
saffron shiner	28-80
telescope shiner	28-84
blacknose dace	25-44
longnose dace	32-110
northern hogsucker	35-315
black redhorse	361-390
channel catfish	80
banded sculpin	39-134
greenside darter	120
greenfin darter	25-113
fantail darter	60-66
redline darter	47-76

snubnose darter	28-70
Swannanoa darter	37-99
tangerine darter	135

Length/Weight Data for Gamefish From Station LP-A. (total length in millimeters followed by weight in grams for each individual)

rainbow trout—226(99),247(142),265(175),270(145),274(192)
brook trout—145(25)
rockbass—55(5), 61(5),69(5),156(66),180(100),195(145)
smallmouth bass—46(1)

2-LP-B LITTLE PIGEON RIVER—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-53 and DAE 94-98, site 2, LP-B, Little Pigeon River at and above mouth of Laurel Creek, Pittman Center, Sevier Co., Tenn., 14 June 1994 and 8 and 9 October 1994. Substrate 75% boulder and cobbles, 20% bedrock, 3% silt and sand, 2% gravel; maximum depth to 5 ft during spring sample, when water levels were high enough to make sampling a bit difficult (I subtracted 1/4 hour from each collector's time to reflect time spent "tiptoing" between collecting areas). Mean width from electrofishing measurements = 17.4 meters. Canopy 10%. Collectors on 14 June DA Etnier, CH Heacock, MH Hughes, CJ Paxton, CE Skelton, JT Baxter, FJ Kriegler, SJ Fraley, 16 hours of effort; 8 and 9 October collectors DA & EL Etnier, MH Hughes, JT Baxter, SJ Fraley, RB Evans, KL Harpster, RA Young, CJ Paxton, 10 hours effort on 8 Oct. and 3 additional hours on 9 Oct = 13 hours effort. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera species preceded with an asterisk have been catalogued at UT. Det. DAE, ELE.

Taxon	94-53 14 Jun	94-53 (100)	94-98 8 Oct	94-98 (100)
Annelida				
Oligochaeta	10	27	1	
Mollusca				
Ancylidae				
Ferrissia sp.			7	
Pleuroceridae				
Elimia clavaeformis	10		1	
Arachnida				
Hydracarina	5	1	6	
Crustacea				
Decapoda				
Cambarus longirostris	2			
Orconectes sp. (juveniles)	2		3	
Insecta				
Plecoptera				
Chloroperlidae				
Alloperla sp.	1			
Chloroperlidae sp. (early instars, not Alloperla)	1		33	1
Leuctridae				
Leuctra sp.	17	2	1	
Leuctridae sp. (early instars)	9		1	
Peltoperlidae				
Peltoperlidae sp. (early instars)	9		17	
Perlidae				
Agnetina capitata	3		6	
Acroneuria abnormis	7		8	
Acroneuria carolinensis			1	
Paragnetina immarginata	10		8	

Paragnetina media	1			
Paragnetina sp. (early instars)	2			
Perlesta sp. (early instars)	21	1	1	
Perlodidae				
Isoperla holochlora	17		4	
Isoperla sp. (early instars)			5	
Malirekus/Yugus sp. (early)			20	5
Yugus arinus? (early instars)			2	
Perlodidae sp. (early instars)			5	
Perlodidae/Perlidae sp. (early)			11	
Pteronarcyidae				
Allonarcys sp.	2		4	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	38	1	47	6
Acentrella sp. (broad, fringe and dark band on cerci)			6	
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	47	22	15	4
Acentrella sp. (slender, no bands or distinct fringe on cerci)	36	7	4	
Acentrella sp. (early instars)	10	1	4	
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	1		66	16
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	5	3	24	5
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	9		81	
Baetis sp. (early instars)			15	2
Baetidae sp. (early instars)	4			
Centroptilum sp.	25		14	
Baetiscidae				
Baetisca carolina	3		2	
Caenidae				
Caenis sp.	1	1		
Ephemeridae				
Ephemera sp.	1			
Ephemerellidae				
Dannella simplex	4			
Drunella cornuta/cornutella	21			
Ephemerella catawba	1			
Eurylophella doris sp. group	56			

Eurylophella funeralis	1	1		
Eurylophella minimella	25	2		
Eurylophella versimilis	1			
Eurylophella sp. (early instars)	11	2	6	
Serratella deficiens	1		1	
Serratella serrata	9			
Serratella serratoides			6	
Serratella sp. (early instars)			42	
Heptageniidae				
Epeorus rubidus/subpallidus	32		11	1
Epeorus sp. (early instars)	12		5	
Heptagenia aphrodite	7		8	
Heptagenia juno	7		14	2
Heptagenia thetis	4			
Heptagenia sp. (early instars)	6		4	
Heptageniidae (new genus? All gills slender obovate with large fibrillar tuft at base)	3	1	18	
Rhithrogena fusciformis	11			
Rhithrogena sp.	4			
Stenacron pallidum	5		21	
Stenonema ithaca/modestum	38		101	10
Stenonema pudicum (both ventrally pigmented and non-pigmented forms)	4		71	1
Stenonema sp. (early instars)			10	5
Heptageniidae sp. (early instars)			18	2
Leptophlebiidae				
Habrophlebia vibrans	7			
Habrophlebiodes sp.	21	1		
Paraleptophlebia adoptiva/mollis			4	1
Paraleptophlebia guttata	2			
Paraleptophlebia sp. cf. guttata (max. palp short and stocky)	2			
Neoephemeridae				
Neoephemera purpurea			7	
Oligoneuridae				
Isonychia sp.	4		4	
Odonata				
Aeshnidae				
Boyeria graffiana	1			
Boyeria vinosa	4		15	
Boyeria sp. (early instars)	2			
Calopterygidae				
Calopteryx angustipennis			2	
Calopteryx maculata/dimidiata	3		15	
Calopteryx sp. (early instars)			1	
Coenagrionidae				
Coenagrionidae sp. (early instars)			1	

Cordulegastridae			
Cordulegaster erronea	1		
Cordulegaster maculata	3	1	
Corduliidae			
Helocordulia uhleri		1	
Gomphidae			
Gomphurus rogersi	2	1	
Gomphus lividus	11	3	
Lanthus vernalis	19	5	
Stylogomphus albistylus	12		
Macromiidae			
Macromia sp.	1	12	
Heteroptera			
Gerridae			
Gerris sp. nymphs	2		
Veliidae			
Rhagovelia obesa	10	10	
Megaloptera			
Corydalidae			
Corydalus cornutus	2	12	
Nigronia serricornis	8	14	
Trichoptera			
Brachycentridae			
Brachycentrus sp.	1		
*Micrasema bennetti		46	
*Micrasema rickeri (cases only in spring sample	1	32	
*Micrasema wataga	1	1	
Micrasema sp. (early instars)		1	
Glossosomatidae			
Agapetus sp.		1	
Glossosoma sp.	7	8	
Hydropsychidae			
*Ceratopsyche alhedra	5	3	
Ceratopsyche bronta	5	20	
Ceratopsyche morosa	1	21	
Ceratopsyche slossonae	15		
Ceratopsyche sparna	15	165	3
Ceratopsyche sp. (early instars)	6		
Cheumatopsyche harwoodi male pup.	1		
Cheumatopsyche sp.	11	54	3
Hydropsyche venularis		1	
*Hydrospyche sp. cf. scalaris		11	
Hydropsychidae sp., early instars	1	32	2
Lepidostomatidae			
Lepidostoma sp.	7	1	
Leptoceridae			
Ceraclea sp.	1	1	
*Mystacides sp. nov.	1		
Oecetis sp. (cases only in spring)	1	3	

Triaenodes sp. cf. tarda			2	
*Triaenodes sp. (darkly pigmented head, not T. tardus, = ignitus?)			6	
Limnephilidae				
Goera calcarata (1 male pupa)	4			
Goera sp. (empty cases)			1	
*Pycnopsyche divergens	3			
Pycnopsyche guttifer group			8	
Pycnopsyche luculenta group	11		1	
Philopotamidae				
Chimarra sp.			2	
Dolophilodes distinctus	19	1	95	4
Polycentropodidae				
Nyctiophylax sp.	7		8	
Neureclipsis crepuscularis			3	
Phylocentropus sp.	2		2	
Polycentropus sp.	29		2	
Polycentropodidae sp. (early)			5	
Rhyacophilidae				
Rhyacophila carolina group	1		2	
Rhyacophila fuscula	5		13	
Rhyacophila sp. cf. nigrita (early instar, head & pronotum black)	1			
*Rhyacophila vuphipes	1			
Lepidoptera				
Pyralidae				
Petrophila sp.			2	
Coleoptera				
Carabidae sp. (Chlaenius-like, but tarsal claws single)	0	2		
Dryopidae				
Helichus basalis adults	21		7	
Helichus fastigiatus adults			1	
Helichus lithophilus adults	2		2	
Elmidae				
Macronychus glabratus larvae			3	
Macronychus glabratus adults	1			
Optioservus ovalis adults				1
Optioservus sp. larvae	1		6	2
Promoresia elegans (2 adults)			10	
Promoresia tardella (4 adults)			8	
Oulimnius latiusculus larvae			2	
Stenelmis sp. larvae	3			
Stenelmis sp. adults	4		9	6
Hydrophilidae				
Laccobius sp. adults			1	
Psephenidae				
Psephenus herricki	15		13	1
Diptera				
Athericicae (Atherix sp.)			26	7

Blephariceridae (Blepharicera sp.)	8		3	
Ceratopogonidae				
"Palpomyia" sp.	0	1	3	
Chironomidae				
Chironominae				
Chironomini				
Chironomus/Einfeldia sp.	1			
Cryptochironomus sp.	2			
Dicrotendipes neomodestus?			2	
Microtendipes sp.	48		3	
Paratendipes sp.	1			
Phaenopsectra sp.	25		2	
Polypedilum convictum	20		36	
Polypedilum fallax group	2			
Polypedilum illinoense	3		1	
Polypedilum scalaenum	2		1	
Chironomini sp.	1	11	7	4
Tanytarsini				
Cladotanytarsus sp.	1			
Rheotanytarsus sp.	11		34	
Tanytarsus sp.	5		3	
Tanytarsini sp			2	
Diamesinae				
Pegastia sp.	1			
Potthastia gaedii group			2	
Potthastia longimanus			1	
Orthocladiinae				
Cardiocladius sp.	7		2	
Corynoneura sp.	6		15	
Cricotopus bicinctus	5		2	
Cricotopus/Orthocladius sp.	4			
Eukiefferiella brehmi group	6		6	
E. claripennis group			1	
E. devonica group	3			
E. pseudomontana group	1		1	
Nanocladius sp.	3		9	
Orthocladius (Euorthocladius)	3		19	
Parakiefferiella sp.			6	
Parametriocnemus sp.	11		5	
Rheocricotopus sp.	1			
Smittia sp.	1			
Symposiocladius lignicola	1			
Synorthocladius semivirens	2		9	
Thienemanniella sp.	4		5	
Tvetenia bavarica group	14		11	
T. discoloripes group	1		5	
Orthocladiinae sp.	6	22	3	9
Prodiamesinae				
Odontomesa sp.	1			

Tanypodinae				
Ablabesmyia mallochi			1	
Labrundinia sp.			1	
Thienemannimyia group	6		1	
Tanypodinae sp.		1		
Chironomidae sp.	10	3	5	2
Dixidae				
Dixa sp.			1	
Empididae sp.	1	1		
Simuliidae				
Simuliidae sp.	35		31	2
Tipulidae				
Antocha sp.	6		2	1
Hexatoma sp.	8	1	10	
Tipula "abdominalis")	4		1	
Tipula sp. (Fig. 11.3)	9		1	
Tipulidae sp. pupae	2			
Tipulidae sp. (tiny, empid-like, but with ventral oval creeping welts and non-bifid terminalia)	1			

DAE 94-53: 70 of 136 taxa (51%) and 742 of 1194 specimens (62%) were EPTs. DAE 94-53(100): 12 of 20 taxa (60%) and 46 of 116 specimens (40%) were EPTs. (The high 100 count may be influenced by fragmented oligochaetes, of which 27 "individuals" were counted. Reducing this number by 16 to reduce specimens in the sample of 100 to exactly 100 results in 46% of specimens as EPTs). Effort = 16 hours; 8.6 taxa per hour; 8 specimens per hour (per hour data includes sample of 100, with two taxa added from that sample); 8.8 specimens per taxon.

DAE 94-98: 63 of 130 taxa (48%) and 1312 of 1772 specimens (74%) were EPTs. DAE 94-98(100): 14 of 21 taxa (67%) and 73 of 109 specimens (67%) were EPTs. Effort = 13 hours; 10.0 taxa per hour; 144 specimens per hour (per hour data includes sample of 100); 13.6 specimens per taxon. High specimen per hour and specimens per taxon figures are a reflection of the large number of workers (9), each of which presumably preserved many specimens of multiple-taxon groups such as Baetidae, Heptageniidae, Hydropsychidae, etc., and at least one or two specimens of each single-taxon group they encountered.

DAE 94-53 and DAE 94-98 combined: 87 of 174 total taxa (50%) and 2054 of 2966 total specimens (69%) were EPTs. DAE 94-53(100) and DAE 94-98(100) combined: 22 of 36 taxa (61%) and 119 of 226 total specimens (53%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Little Pigeon River, Middle Prong, Hester-Dendy artificial substrate samples, downstream station, LP-DS, retrieved 7 June 1994.

Taxon	1	2	4	5	
Annelida					
Oligochaeta	2	3	1	2	
Arachnida					
Hydracarina	1	3	1		
Insecta					
Plecoptera					
Peltoperlidae					
Peltoperlidae sp. (early instars)	6	18	17	12	5
Perlidae					
Agnetina capitata	5	2	3	4	2
Perlesta sp. (early instars)	2		2		1
Perlidae sp. (early instars)	1	1		4	
Perlodidae					
Isoperla holochlora	2	1	4	7	3
Ephemeroptera					
Baetidae					
Acentrella sp. (broad, no fringe)	4			2	
Acentrella sp. (early instars)	3	7	6	8	3
Baetis sp. cf. brunneicolor				1	
Baetis sp. cf. pluto				1	
Baetis sp. (early instars)					2
Baetidae sp. (early instars)		1	2	1	5
Ephemerellidae					
Drunella cornuta/cornutella			1		
Ephemerella/Serratella sp. (early)			1		
Heptageniidae					
Epeorus dispar				1	
Trichoptera					
Hydropsychidae					
Ceratopsyche bronta		1			1
Ceratopsyche macleodi	1	1		1	1
Ceratopsyche slossonae				1	
Ceratopsyche sparna		1	2		1
Cheumatopsyche sp.	1	1	1	1	3
Hydropsychidae sp. (early instars)		1	1	1	1
Philopotamidae					
Dolophilodes distinctus		3			
Rhyacophilidae					
Rhyacophila fuscula	2	1			
Rhyacophila sp. cf. nigrita	1			1	
Coleoptera					
Elmidae					
Promoresia elegans		1		2	
Diptera					
Athericidae					
Atherix sp.	1			2	1

Taxon	1	2	3	4	5
Chironomidae					
Chironominae					
Chironomini	58	48	47	41	25
Tanytarsini sp.	37	83	212	166	138
Orthocladiinae sp.	400	1178	1139	857	726
Tanypodinae sp.	1	1	3	2	
Chironomidae sp.	2	7	10	8	14
Empididae sp.				1	
Simuliidae	2	14	14	17	19
Tipulidae					
Antocha sp.				3	
Dicranota sp.					1

Summary Total	1	2	3	4	5
Non-EPT taxa	12	6	8	7	117
Non-EPT specimens	5294	501	1335	1431	1101926
EPT taxa	18	9	10	9	1110
EPT specimens	166	25	42	40	4728
Percent EPT taxa	60	60	56	56	5059
Percent EPT specimens	3	5	3	3	43

Note: Chironomid taxa identified to genus/species appear below; in above data these are treated at the subfamily/tribe level. Totals are obtained by treating all five replicates as a single sample. Column entries that are taxonomically conservative, such as "Hydropsychidae (early instars)" are not considered as separate taxa if other hydropsychids identified to genus or genus and species were present in the sample.

Chironomidae					
Chironominae					
Tanytarsini					
Rheotanytarsus sp.		1		4	42
Orthocladiinae					
Corynoneura sp.				1	
Cricotopus tremulus group				1	1
Cricotopus/Orthocladius sp.		5	2	3	3
Eukieferiella brevicalcar group?	1				
Eukieferiella claripennis group	2			1	
Orthocladius (Euorthocladius) sp.				1	
Parametriocnemus sp.				1	
Symposiocladius lignicola				7	24
Thienemanniella sp.		1	1	2	3
Tvetenia bavarica group		1		6	11
Orthocladiinae sp.		47	15	26	3410
Chironomidae sp.		1	6	9	9

FISH SURVEY DATA —
• QUANTITATIVE TRIPLE-PASS DEPLETION METHOD

Little Pigeon River, Middle Prong, Hester-Dendy artificial substrate samples, downstream station, LP-DS, retrieved 25 October 1994.

Taxon	1	2	3	4	5
Annelida					
Oligochaeta	0	0	0	2	0
Insecta					
Plecoptera					
Capniidae					
Allocapnia sp.	0	0	0	1	0
Chloroperlidae					
Sweltsa sp.	0	0	0	0	1
Peltoperlidae sp. (early instars)	2	6	1	4	3
Perlidae					
Paragnetina immarginata	0	1	1	1	0
Perlodidae					
Isoperla sp. (early instars)	6	14	2	5	3
Taeniopterygidae					
Taeniopteryx sp.	0	0	0	2	0
Ephemeroptera					
Baetidae					
Acentrella sp. (broad, no fringe)	1	0	0	0	0
Baetis sp. cf. pluto	1	0	0	0	0
Ephemerellidae					
Eurylophella funeralis	0	1	0	0	0
Eurylophella sp. (early instars)	1	1	0	2	0
Serratella sp. (early instars)	1	0	0	1	0
Heptageniidae					
Stenonema ithaca/modestum	1	1	0	0	0
Stenonema sp. (early instars)	6	1	8	6	3
Leptophlebiidae					
Leptophlebia sp.	1	0	0	0	0
Trichoptera					
Hydropsychidae					
Ceratopsyche sparna	2	1	1	0	2
Cheumatopsyche sp.	1	0	1	0	0
Diptera					
Chironomidae					
Chironominae					
Chironomini sp.	150	160	114	115	52
Tanytarsini sp.	52	69	72	38	18
Orthocladinae sp.	37	80	32	53	23
Tanypodinae sp.	0	0	6	6	4
Chironomidae sp.	5	3	1	0	0

Empididae sp.	0	0	1	1	0
Tipulidae					
Antocha sp.	0	1	0	0	0
Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa	7	3	4	5	64
Non-EPT specimens	1198	244	413	226	21397
EPT taxa	14	10	6	6	85
EPT specimens	97	23	26	14	2212
Percent EPT taxa	67	77	60	55	5756
Percent EPT specimens	8	9	6	6	911

Note: Total taxa data are obtained by treating all five replicates as a single sample. Column entries that are taxonomically conservative, such as "Stenonema sp. (early instars)" are not considered as separate taxa if other Stenonema identified to species were present in the sample.

3-CP-A COPELAND CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-58 and DAE 94-78, site number 3, CP-A, Copeland Creek along Copeland Creek Road at McKinzie Way, Sevier Co., Tenn., 19 June and 11 September 1994. Collectors on 19 June DA and EL Etnier, CH Heacock, CE Skelton, JT Baxter, SJ Fraley, 9.5 hours effort. *Eurycea* and *Desmognathus* salamanders, blacknose dace, creek chubs, sculpins, and fantail darters present; *Peltoperla* and *Acentrella* very abundant. Collectors on 11 September JT Baxter, CE Skelton, SJ Fraley, CJ Paxton, RS Brown, JM Young, 5.67 hours effort. Abundant taxa included baetids, *Isonychia, Cheumatopsyche*, Psephenidae, and *Calopteryx*. The creek averages 10 feet wide and has a maximum depth of about 2 feet. Substrate is 40% cobbles, 45% gravel, 10% sand and silt, and 5% boulder. Aquatic vegetation was absent. The site is in a pasture, with 5% canopy. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichopteran taxa preceded with an asterisk have been catalogued at UT. Det. DAE, ELE, RBE.

Taxon	94-58 19 Jun	94-58 (100)	94-78 11 Sep	94-78 (100)
Platyhelminthes (planarians)			1	
Annelida				
Oligochaeta	12	8	2	1
Hirudinea				
Placobdella sp.	2		2	
Mollusca				
Ancylidae				
Ferrissia sp.	1		2	
Arachnida (Hydracarina)			0	1
Crustacea				
Decapoda				
Cambarus bartoni	1			
Cambarus longirostris	5			
Cambarus sp. (early instars)		1		
Orconectes forceps	3		6	
Insecta				
Plecoptera				
Leuctridae				
Leuctra sp.	8		28	4
Leuctridae sp., early instars	30	6		
Peltoperlidae				
Peltoperlidae sp. (early instars)	26		8	1
Perlidae				
Acroneuria abnormis	12		13	
Agnetina capitata			3	
Eccoptura xanthenes	2		1	
Neoperla sp.	2	2	1	
Perlesta sp.	5			
Perlidae sp. (early instars)	6		1	

Perlodidae				
Isogenoides sp. (early instars)			1	
Isoperla holochlora	6			
Pteronarcyidae				
Allonarcys sp.	3			
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	149	11	60	22
Acentrella sp. (slender, no bands or distinct fringe on cerci)	10		2	
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	4			
Acentrella sp. (early instars)	8			
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	5		13	4
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	33	6	15	5
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	2			
Baetis sp. (harlequin, posterior spine fringe on abd. segs.)			4	
Baetis sp. (early instars)			7	7
Centroptilum sp.	22			
Baetidae (early instars)	7			
Baetiscidae				
Baetisca carolina	2		7	
Ephemeridae				
Ephemera sp.	7		13	
Ephemerelllidae				
Drunella cornuta/cornutella	4			
Ephemerella catawba	1			
Eurylophella funeralis	1		10	
Eurylophella sp. (early instars)	1		2	
Serratella deficiens	19	1		
Ephemerellidae sp. (early, prob. Ephemera or Serratella)			0	1
Heptageniidae				
Cinygmula subaequalis	1			
Epeorus dispar (small 1st gill)			2	
Epeorus rubidus/subpallidus	26		41	2
Epeorus sp. (early instars)	14	1		
Heptagenia aphrodite	7	1	17	2

Heptagenia juno	6		9	
Heptagenia maculipennis			1	
Heptagenia thetis	3	1	3	
Heptagenia sp. (early instars)	7		3	
Stenacron pallidum	4	1	1	
Stenonema ithaca/modestum	10		29	
Stenonema pudicum	29	3	21	3
Stenonema sp. (early instars)			9	3
Heptageniidae sp. (early instars)	9		1	
Leptophlebiidae				
Habrophlebiodes sp.	20	1	3	
Paraleptophlebia adoptiva/mollis	1			
Paraleptophlebia sp. cf. guttata (max. palp long & slender)	13	8	1	
Leptophlebiidae sp. (early)	1	1		2
Oligoneuridae				
Isonychia sp.	2	1	30	3
Odonata				
Aeshnidae				
Boyeria graffiana	1		4	
Boyeria vinosa	3			
Calopterygidae				
Calopteryx maculata/dimidiata	17		9	
Coenagrionidae				
Argia bipunctulata	1			
Cordulegastridae				
Cordulegaster maculata	19		15	
Cordulegaster sp. (early instars)	3			
Gomphidae				
Gomphurus rogersi	33		23	
Gomphus lividus	2		7	
Lanthus vernalis	47	2	10	
Ophiogomphus incurvatus	3		7	1
Stylogomphus albistylus	16		2	
Lanthus/Stylogomphus (early)			2	
Libellulidae				
Perithemis tenera			1	
Macromiidae				
Macromia sp.	2			
Heteroptera				
Belostomatidae				
Belostoma flumineum			1	
Gerridae				
Gerris marginatus	1			
Gerris remigis	1			
Veliidae				
Rhagovelia obesa	6		11	
Megaloptera				
Corydalidae				

Nigronia serricornis	7		17	
Nigronia sp. (early instars)	3	1		
Sialidae (Sialis sp.)	1			
Trichoptera				
Brachycentridae				
Micrasema sp. (veg. cases)	1			
Micrasema burksi? (sand case)			2	
Glossosomatidae				
Glossosoma nigrior (5 male pupae)	14		33	1
Hydropsychidae				
Ceratopsyche bronta	1		1	
Ceratopsyche macleodi	3			
Ceratopsyche sparna	6	4	3	1
Cheumatopsyche sp.	47	3	47	7
Diplectrona modesta	35	1	4	
Hydropsyche betteni/depravata	3		3	
Hydropsychidae sp. (early instars)				2
Hydroptilidae sp. (empty cases)	1			
Lepidostomatidae				
*Lepidostoma latipenne male pupae	1			
Lepidostoma sp.	1			
Limnephilidae				
Goera sp. female pupae	1			
Pycnopsyche gentilis	1			
Pycnopsyche guttifer group	3		1	
*Pycnopsyche luculenta (2 male pupae)			8	
Pycnopsyche luculenta group	4			
Odontoceridae				
Psilotreta sp. (early instars)	2			
Philopotamidae				
Chimarra sp.	9	1	3	
Dolophilodes distinctus	12		3	
Phryganeidae				
Ptilostomis sp.			1	
Polycentropodidae				
*Polycentropus maculatus male pupa	1			
Polycentropus sp.	5			
Psychomyidae				
Psychomyia sp.			1	
Rhyacophilidae				
*Rhyacophila carolina, male pupa	1			
Rhyacophila fuscula	4			
Uenoidae				
Neophylax consimilis (1 male pupa)	5		1	
Coleoptera				
Dryopidae				
Helichus basalis adults	19		4	
Dytiscidae				
Hydroporus sp. adults	1			

Elmidae				
Optioservus ovalis adults	3	2	0	1
Optioservus sp. larvae	1			
Promoresia tardella adults	3		11	1
Stenelmis sp. adults	5		0	1
Psephenidae				
Psephenus herricki	17	9	12	2
Ptilodactylidae				
Anchytarsus bicolor	1			
Diptera				
Athericicae (Atherix sp.)	6		6	
Blephariceridae (Blepharicera sp.)			1	
Ceratopogonidae ("Palpomyia" sp.)	1		3	
Chironomidae				
Chironominae				
Chironomini				
Chironomus/Einfeldia sp.	1		2	
Dicrotendipes neomodestus?			1	
Microtendipes sp.	1		1	
Paratendipes sp.			1	
Phaenopsectra sp.	1		1	
Polypedilum convictum	8		8	
Polypedilum fallax group	1			
Stichtochironomus sp.	3			
Chironomini sp.				1
Tanytarsini				
Cladotanytarsus sp.			1	
Rheotanytarsus sp.	2		1	
Tanytarsus sp.			8	
Orthocladiinae				
Cardocladius sp.			1	
Cricotopus bicinctus	16			
Cricotopus tremulus group	1			
Cricotopus/Orthocladius sp.	2			
Epoicocladius sp.	2		4	
Eukiefferiella brehmi group	1			
E. claripennis group	22			
E. devonica group	1			
E. pseudomontana group	1			
Orthocladius (Euorthocladius)	1			
Parakiefferiella sp.?	1			
Parametriocnemus sp.	11		7	
Thienemanniella sp.	5		2	
Tvetenia bavarica group	24		4	
Orthocladinae sp.			1	13
Tanypodinae				
Larsia sp.	1			
Procladius sp.	1		1	
Thienemannimyia group	13		2	

Tanypodinae sp.				1
Chironomidae sp.	2	21		
Dixidae (Dixa sp.)			1	
Simuliidae	30		3	14
Tabanidae sp.	1			
Tipulidae				
Antocha sp.	4		6	
Dicranota sp.	5		2	
Hexatoma sp.	13	3	1	
Tipula "abdominalis"	2			
Tipula sp. (big slender gray one with spir. disc. as Fig. 11.3)	12		3	
Tipula sp. (moss animal)			1	
Tipulidae sp. (pupae)			4	

DAE 94-58: 54 of 115 taxa (45%) and 689 of 1121 specimens (61%) were EPTs. DAE 94-58(100): 17 of 25 taxa (68%) and 53 of 100 specimens (53%) were EPTs. Effort = 9.5 hours; 9.8 taxa per hour; 127 specimens per hour (per hour data includes sample of 100; no new taxa were added from the sample of 100); 9.7 specimens per taxon.

DAE 94-78: 42 of 89 taxa (47%) and 471 of 697 specimens (68%) were EPTs (chironomid taxa to be added). DAE 94-78(100): 14 of 27 taxa (52%) and 70 of 107 specimens (65%) were EPTs. Effort = 5.67 hours; 16.4 taxa per hour (includes 3 non-EPT taxa and 1 EPT taxon from the sample of (100) that were absent from the qualitative sample); 142 specimens per hour.

DAE 94-58 and DAE 94-78 combined: 62 of 130 total taxa (48%) (includes one non-EPT taxon from the samples of (100) that was absent in both qualitative samples) and 1160 of 1818 specimens (64%) were EPTS; DAE 94-58(100) and DAE 94-78(100): 20 of 35 taxa (57%) and 123 of 207 specimens (59%) were EPTs.

FISH SURVEY DATA — • SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-78, Station 3, CP-A, fishes. Copeland Creek along Copeland Road at McKinzie Way, 3/4 road mile above its confluence with Little Pigeon River, Pittman Center, Sevier County, Tennessee, 11 September 1994. The area sampled is a 100-meter reach extending 50 meters above and 50 meters below McKinzie Way. Effort 15 minutes, shocking upstream. Collectors SJ Fraley, JM Young, effort of single-pass electrofishing depletion estimate. Released fishes identified by SJ Fraley. Mean width 10 ft, maximum depth 2 ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6191	Campostoma anomalum (36)	6 (45-80)
44.6192	Rhinichthys atratulus (26)	5 (23-65)
44.6193	Semotilus atromaculatus (39)	5 (52-140)
45.1166	Hypentelium nigricans (3)	5 (55-110)
129.473	Cottus carolinae (7)	3 (33-105)
91.4517	Etheostoma flabellare (22)	21 (22-67)

4-CP-B COPELAND CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-51 and DAE 94-79, site CP-B, Copeland Creek along Copeland Creek Road ca. 0.1 rd mi above Little Pigeon River, Sevier Co., Tenn., 12 June and 11 September 1994. The creek averages 8 feet wide and has a maximum depth of about 1.5 ft. Substrate is 50% cobbles, 30% gravel, 10% boulder, and 10% sand and silt. Aquatic vegetation was absent. The site is in a pasture, with 0% canopy and cows in the creek just above the 100-yard reach sampled. Collectors on 12 June SJ Fraley, EA Etnier, CH Heacock, MH Hughes, CJ Paxton, 8.75 hours effort. Collectors on 11 September JT Baxter, CE Skelton, SJ Fraley, CJ Paxton, RS Brown, 8.5 hrs effort. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera preceded with an asterisk have been catalogued at UT. Det. DAE, KLH.

Taxon	94-51 12 Jun	94-51 (100)	94-79 11 Oct	94-79 (100)
Annelida				
Hirudinea				
Placobdella sp.	2		1	
Oligochaeta	7	10	7	5
Mollusca				
Gastropoda				
Ancylidae				
Ferrissia sp.			6	1
Arachnida (Hydracarina)			0	1
Crustacea				
Decapoda				
Orconectes forceps	4		5	
Insecta				
Plecoptera				
Leuctridae				
Leuctra sp.	6	5	18	
Peltoperlidae				
Peltoperlidae sp. (early instars)	6		10	1
Perlidae				
Acroneuria abnormis	2		4	
Neoperla sp.			1	
Perlesta sp.	10			
Perlodidae				
Isoperla holochlora	1			
Malirekus hastatus			1	
Pteronarcyidae				
Allonarcys sp.	3		3	
Ephemeroptera				
Baetidae				

Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	58	9	29	7
Acentrella sp. (slender, no bands or distinct fringe on cerci)	2	1	4	1
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)			4	
Acentrella sp. (early instars)	1		2	4
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	21	4	27	22
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	8		19	10
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	3		9	4
Baetis sp. (large, abd. plain, labial palp with large "thumb")	1		3	
Baetis/Centroptilum sp. (5,8,9 very pale, other segs. very dark, post. spine fringe conspicuous, a small species)	1		1	
Baetis sp. (early instars)	2		12	11
Centroptilum sp.	8		5	
Baetiscidae				
Baetisca carolina	1			
Caenidae				
Caenis sp.	3		6	
Ephemerellidae				
Drunella cornutella (7-9 mm)	12			
Eurylophella doris sp. group	1			
Eurylophella minimella	2			
Eurlyophella sp. (early instars)	1		2	1
Serratella deficiens	12	1	3	
Ephemeridae				
Ephemera sp.			1	
Heptageniidae				
Epeorus dispar (small first gill)	2		6	
Epeorus rubidus/subpallidus	7		16	1
Epeorus sp. (early instars)			1	
Heptagenia aphrodite	3		3	
Heptagenia juno	6		12	2
Heptagenia thetis	7			
Heptagenia sp. (early instars)				1
Stenacron carolina			1	
Stenacron pallidum			3	

Stenonema ithaca/modestum	42	5	14	1
Stenonema pudicum	9	4	41	1
Stenonema sp. (early instars)	4		12	5
Leptophlebiidae				
Habrophlebiodes sp.	1		1	
Paraleptophlebia adoptiva/mollis			1	
Paraleptophlebia sp. cf. guttata (max. palp long & slender)	9			
Paraleptophlebia sp. cf. guttata (max. palp short, thick, hairy)	1			
Leptophlebiidae sp. (early)		10	6	
Oligoneuridae				
Isonychia sp.	15		3	1
Odonata				
Aeshnidae				
Boyeria vinosa	8		9	
Calopterygidae				
Calopteryx maculata/dimidiata	4		12	1
Cordulegastridae				
Cordulegaster maculata	20		5	
Gomphidae				
Gomphurus rogersi	9		8	
Gomphus lividus	6		14	
Lanthus vernalis	30	1	3	
Ophiogomphus incurvatus	1		2	
Stylogomphus albistylus	20		7	
Lanthus/Stylogomphus (early)				1
Heteroptera				
Belostomatidae				
Belostoma testaceum			1	
Veliidae				
Rhagovelia obesa	2		1	
Megaloptera				
Corydalidae				
Corydalus cornutus	2		3	
Nigronia serricornis	5		14	1
Sialidae				
Sialis sp.			1	
Trichoptera				
Brachycentridae				
Micrasema sp. (veg. cases)	1			
Glossosomatidae				
*Agapetus tomus	1			
Glossosoma nigrior (2 male pupae)	29	1	6	
Hydropsychidae				
Ceratopsyche bronta	1			
Ceratopsyche sparna			3	
Ceratopsyche sp. (female pupae)			1	
Cheumatopsyche harwoodi male pupae			1	
Cheumatopsyche sp.	27	9	20	3

Diplectrona modesta	17		3	
Hydropsyche betteni/depravata	20	1	18	2
Hydropsychidae sp. (early instars)			1	1
Lepidostomatidae				
Lepidostoma sp.	1			
Limnephilidae				
Goera calcarata	2			
Goera sp. (empty cases)			1	
Pycnopsyche guttifer group	5		1	
Pycnopsyche luculenta group	15	1	6	
Philopotamidae				
Chimarra aterrima (male pupae)			1	
Chimarra sp.	14		22	1
Dolophilodes distinctus	1		1	
Phryganeidae				
Ptilostomis sp.			1	
Uenoidae				
Neophylax consimilis (5 male pupae in fall sample)	24		6	
Neophylax sp. (early pupae, female pupae)			12	
Coleoptera				
Dryopidae				
Helichus basalis adults	3		3	
Elmidae				
Macronychus glabratus adults	1			
Optioservus sp. larvae	1			
Optioservus ovalis adults			1	
Stenelmis sp. larvae	1		1	
Stenelmis sp. adults	2	1	4	1
Hydrophilidae				
Tropisternus lateralis adults	1			
Psephenidae				
Psephenus herricki	9	4	5	2
Diptera				
Athericidae (Atherix sp.)			2	
Blephariceridae (Blepharicera)			1	
Ceratopogonidae ("Palpomyia" sp.)	0	3	3	
Chironomidae				
Chironominae				
Chironomini				
Chironomus/Einfeldia sp.	19			
Cryptochironomus sp.	1			
Microtendipes sp.	14		1	
Paratendipes sp.	1		18	
Phaenopsectra sp.	4			
Polypedilum convictum	6		2	
Polypedilum illinoense			2	
Polypedilum scalaenum			1	
Stichtochironomus sp.	2			

Chironomini sp.		9		
Tanytarsini				
Paratanytarsus sp.	1			
Rheotanytarsus sp.	5		1	
Tanytarsus sp.			1	
Orthocladiinae				
Corynoneura sp.	1			
Cricotopus bicinctus			1	
Cricotopus tremulus group	2		1	
Cricotopus/Orthocladius sp.	5		2	
Eukiefferiella claripennis grp			2	
Parametriocnemus sp.	5		9	
Thienemanniella sp.	3		3	
Tvetenia bavarica group	21		5	
Orthocladiinae sp.	2	8		10
Prodiamesinae				
Odontomesa sp.	1			
Tanypodinae				
Ablabesmyia mallochi			1	
Thienemannimyia group	6		2	
Tanypodinae sp.		1		
Dixidae (Dixa sp.)	1		1	
Simuliidae	7	3	13	2
Tipulidae				
Antocha sp.	12			
Dicranota sp.	0	1		
Hexatoma sp.	4	1	6	
Limnophila macrocera	4			
Tipula "abdominalis"	8	1		
Tipula sp. (Fig. 11.3, long gills)	5		1	

DAE 94-51: 45 of 89 taxa (51%) and 426 of 696 specimens (61%) were EPTs. DAE 94-51(100): 12 of 24 taxa (50%) and 51 of 94 specimens (54%) were EPTs. Effort = 8.75 hours; 10.4 taxa per hours; 89 specimens per hour (per hour data includes specimens from sample of 100, including two non-EPT taxa taken in the sample of 100 that were not present in the qualitative sample); 8.0 specimens per taxon.

DAE 94-79: 42 of 86 taxa (49%) and 388 of 570 specimens (68%) were EPTs. DAE 94-79(100): 16 of 26 taxa (62%) and 80 of 105 specimens (76%) were EPTs. Effort = 8.5 hours; 10.2 taxa per hour (includes one non-EPT from (100) not present in qualitative sample); 79 specimens per hour; 6.6 specimens per taxon.

DAE 94-51 and DAE 94-79 combined: 54 of 115 total taxa (47%) and 814 of 1266 specimens (64%) were EPTs (includes 2 non-EPT taxa from samples of (100) that were not in either qualitative sample). DAE 94-51(100) and DAE 94-79(100) combined: 21 of 37 taxa (57%) and 131 of 199 specimens (66%) were EPTS.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-79, Station 4, CP-B, fishes. Copeland Creek along Copeland Road 0.1 road mile above its confluence with Little Pigeon River, Pittman Center, Sevier County, Tennessee, 11 September 1994. The area sampled is a 100-meter reach extending upstream from the fence just above the Tennessee Highway 416 bridge over Copeland Creek. Effort 40 minutes, shocking upstream. Collectors SJ Fraley, JM Young, effort of single-pass electrofishing depletion estimate. Released fishes identified by SJ Fraley. Mean width ft, maximum depth ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6196	Campostoma anomalum (62)	50 (28-70)
44.6197	Luxilus coccogenis	4 (65-95)
44.6198	Notropis rubricroceus	1 (37)
44.6199	Rhinichthys atratulus (23)	12 (30-70)
44.6200	Semotilus atromaculatus (62)	12 (30-135)
45.1167	Hypentelium nigricans (13)	7 (45-130)
45.1168	Moxostoma duquesnei	1 (88)
129.474	Cottus carolinae	7 (43-100)
91.4518	Etheostoma flabellare	22 (30-72)
91.4519	Etheostoma simoterum	1 (53)

5-LN-A LINDSEY CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-49 and DAE 94-77, Station 5, LN-A, Lindsey Creek 0.5 air miles ESE of Pittman Center, Sevier County, Tennessee, 12 June and 11 Sept. 1994. Area sampled extends 50 m above small dam above culvert on Kettle Creek Way. Collectors on 12 June SJ Fraley, EL Etnier, CH Heacock, MH Hughes, CJ Paxton, 8 3/4 hours effort; collectors on 11 September JT Baxter, CE Skelton, CJ Paxton, RS Brown, SJ Fraley, 3 2/3 hours of effort. Mean width 3 ft, maximum depth 1.5 ft, substrate 60% gravel, 20% cobble, 10% bedrock, 10% sand and silt. Canopy 30%. Trichoptera entries preceded with an asterisk have been catalogued at UT. Det ELE, DAE, CES

Taxon	12 June 94-49	94-49 (100)	11 Sep 94-77	94-77 (100)
Annelida				
Oligochaeta	6		3	
Arachnida				
Hydracarina	1			
Crustacea				
Decapoda				
Cambarus bartoni				1
Cambarus sp. cf. diogenes			1	
Cambarus longirostris	1		1	1
Cambarus sp. (early instars)	1			
Insecta				
Plecoptera				
Leuctridae				
Leuctridae sp. (early instars)			1	
Peltoperlidae				
Tallaperla sp.	8	1		
Peltoperlidae (early instars)			2	2
Perlidae				
Acroneuria abnormis			3	
Beloneuria sp.				1
Eccoptura xanthenes			2	
Perlesta sp.	61	4		
Ephemeroptera				
Baetidae				
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	12	1	4	1
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)			1	1
Baetis sp. (early or damaged)	10		1	4

Ephemerellidae				
Eurylophella sp. (early instars)			1	
Serratella deficiens	1			
Ephemeridae				
Ephemera sp.			2	
Heptageniidae				
Epeorus dispar (small 1st gill)			2	
Epeorus rubidus/subpallidus			1	
Heptagenia thetis	9			
Stenacron carolina			1	
Stenacron interpunctatum	7		1	
Stenacron sp. (early instars)		1		
Stenonema pudicum	87	2	114	30
Stenonema sp. (early instars)		3		
Leptophlebiidae				
Habrophlebiodes sp.	42	17	15	4
Leptophlebiidae sp. (early)			20	
Odonata				
Aeshnidae				
Boyeria vinosa	8		11	
Calopterygidae				
Calopteryx maculata/dimidiata	23		22	3
Cordulegastridae				
Cordulegaster diastatops	1			
Cordulegaster maculata	9		2	
Cordulegaster sp. (early instars)			1	
Gomphidae				
Gomphurus rogersi	22	1	6	
Gomphus lividus	3		3	
Lanthus vernalis	2		1	
Gomphidae sp. (early instars)			1	
Heteroptera				
Corixidae				
Trichocorixa sp.	1			
Corixidae sp. (damaged)	1			
Veliidae				
Rhagovelia obesa	33		6	1
Megaloptera				
Corydalidae				
Nigronia serricornis	9	1	6	2
Trichoptera				
Glossosomatidae				
Agapetus sp.	2			
Glossosoma nigrior (1 male pupa)	7			
Hydropsychidae				
Ceratopsyche sparna	2		9	1
Ceratopsyche sp. (early instars)			21	
Cheumatopsyche sp.	56	11	3	1
Diplectrona modesta			3	

Hydropsyche betteni/depravata	36	8	8	3
Hydropsychidae sp. (early)	24	6	3	1
Leptoceridae				
Oecetis sp.	1			
Limnephilidae				
Goera sp.	2			
Pycnopsyche guttifer group	13		1	
Pycnopsyche luculenta group	8		1	
Philopotamidae				
Chimarra sp.	50	24	30	45
Philopotamidae sp. (early)			5	
Rhyacophilidae				
Rhyacophila carolina group			1	
Uenoidae				
*Neophylax concinnus	7			
*Neophylax consimilis				
(2 male, one female pupae)	3	1	3	
Neophylax sp.	1	1		
Coleoptera				
Elmidae				
Macronychus glabratus adults			1	
Microcylloepus pusillus adults			1	
Stenelmis sp. larvae	24	1	9	
Stenelmis sp. adults	29	5	14	2
Elmidae sp. (early instars)	5			
Psephenidae				
Psephenus herricki	14		4	
Ptilodactylidae				
Anchytarsus bicolor	5			1
Diptera				
Ceratopogonidae				
"Palpomyia" sp.	1		1	
Chironomidae				
Chironominae				
Chironomini				
Cryptochironomus sp.	3			
Microtendipes sp.	2			
Paralauterborniella sp.	2			
Paratendipes sp.			2	
Polypedilum convictum	16		7	
Polypedilum illinoense	2			
Polypedilum scalaenum	2		1	
Chironomini sp.				1
Tanytarsini				
Micropsectra sp.?	1			
Paratanytarsus sp.	1			
Rheotanytarsus sp.	6		2	
Tanytarsini sp.	1			

Orthocladiinae				
Brillia sp.	1			
Epoicocladius sp.			1	
Eukiefferiella claripennis group	1			
Parakiefferiella sp.			2	
Parametriocnemus sp.	6		2	
Thienemanniella sp.			1	
Tvetenia bavarica group	7			
Orthocladiinae sp.			1	2
Tanypodinae				
Nilotanypus sp.			1	
Thienemannimyia group	3		3	
Zavrelimyia sp.			3	
Chironomidae sp.	8	9	2	2
Dixidae (Dixa sp.)			2	
Simuliidae sp.	4		2	1
Tabanidae sp.	1		2	
Tipulidae				
Hexatoma sp.	2			
Limnophila sp.			1	
Tipula "abdominalis"	9		1	1
Tipula sp. (Fig. 11.3)	6	3		

DAE 94-49: 20 of 50 taxa (40%) and 449 of 728 specimens (62%) were EPTs. DAE 94-49(100): 10 of 15 taxa (67%) and 81 of 101 specimens (80%) were EPTs. Effort = 8.75 hours; 5.7 taxa per hour; 95 specimens per hour (per hour data includes sample of 100; no new taxa added from sample of 100); 14.6 specimens per taxon.

DAE 94-77: 25 of 56 taxa (45%) and 259 of 389 specimens (67%) were EPTs. DAE 94-77(100): 10 of 21 taxa (48%) and 94 of 112 specimens (84%) were EPTs. Effort = 3 2/3 hours; 15.3 taxa per hour; 137 specimens per hour (per hour data includes sample of 100; no new taxa added from sample of 100); 7.1 specimens per taxon.

DAE 94-49 and DAE 94-77 combined: 32 of 79 taxa (41%) and 708 of 1117 specimens (63%) were EPTs. DAE 94-49(100) and DAE 94-77(100) combined: 13 of 26 taxa (50%) and 175 of 213 specimens (82%) were EPTs. The high numbers of EPT specimens in the samples of 100 are difficult to explain.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-77, Station 5, LN-A, fishes. Lindsey Creek 0.3 air miles southwest of Webb Creek Road on unnamed road, Pittman Center, Sevier County, Tennessee, 11 September 1994. The area sampled extends from 10 meters below to 40 meters above the culvert going under the road at the site. Effort 15 minutes, shocking upstream. Collectors SJ Fraley, JM Young, effort of single-pass electrofishing depletion estimate. Released fishes identified by SJ Fraley. There is a pond upstream of the site on Lindsey Creek, and another on a tributary just downstream that drains into Lindsey Creek just below the site, explaining the presence of the centrarchids. Width to ft, mean about ft, and maximum depth ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6194	Rhinichthys atratulus (10)	9 (11-63)
44.6190	Semotilus atromaculatus (6)	4 (22-135)
90.1635	Lepomis cyanellus	3 (23-47)
90.1634	Lepomis macrochirus (6)	3 (55-115)

6-LN-B LINDSEY CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-50 and DAE 94-96, Lindsey Creek, site number 6, LN-B, 12 June 1994 and 20 October 1994. Surveyed 60 m below culvert on Tunis Branch Road. Average width 4-6 ft, maximum depth to 2 ft, with 10% high canopy, 40% open, and 50% shaded by multiflora rose. Substrate 70% gravel, 15% cobble and boulder, 15% sand and silt. Collectors 12 June SJ Fraley, EL Etnier, CH Heacock, MH Hughes, CJ Paxton, 8.75 hrs effort. Collectors 20 October DA Etnier, SE McLane, CJ Paxton, 5 hrs effort. Abundant taxa 20 October included *Psephenus*, philopotamids, heptageniids, *Tipula, Hydropsyche, Elimia, Nigronia*, and *Peltoperla*. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera preceded with an asterisk have been catalogued at UT Det. SJF, DAE, KLH.

Taxon	94-50 12 Jun	94-50 (100)	94-96 20 Oct	94-96 (100)
Annelida				
Oligochaeta	11	1	3	2
Mollusca				
Ancylidae				
Ferrissia sp.			1	
Pleuroceridae				
Elimia clavaeformis	17	1	5	
Sphaeriidae				
Sphaerium sp.	1			
Crustacea				
Decapoda				
Cambarus bartoni	3			
Cambarus longirostris			4	
Orconectes sp.	1			
Insecta				
Plecoptera				
Leuctridae				
Leuctra sp.	10	1		
Nemouridae				
Amphinemura delosa/nigritta	28	2		
Peltoperlidae				
Tallaperla sp.	18			
Peltoperlidae sp. (early instars)		1	6	
Perlidae				
Acroneuria abnormis			2	
Eccoptura xanthenes			6	
Paragnetina immarginata			1	
Perlesta frisoni?	50	3		
Pteronarcyidae				
Allonarcys sp.			1	
Ephemeroptera				
Baetidae				

Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	1		0	1
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)			3	1
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	14		8	1
Centroptilum sp.	1			
Baetiscidae				
Baetisca carolina			1	
Ephemerellidae				
Ephemerella dorothea	12			
Heptageniidae				
Epeorus rubidus/subpallidus	2	2	2	
Epeorus sp. (early instars)			3	3
Heptagenia juno	0	1	4	
Heptagenia maculipennis		3		
Heptagenia thetis			2	
Heptagenia sp. (early instars)	12			1
Stenacron pallidum	9			
Stenacron sp. (early instars)	1		1	
Stenonema pudicum	60	22	81	9
Stenonema ithaca/modestum	13		0	1
Stenonema sp. (early instars)	103		27	22
Heptageniidae sp. (early instars)				2
Leptophlebiidae				
Habrophlebiodes sp.	4		1	
Paraleptophlebia guttata	3	1		
Leptophlebiidae sp.	3			
Oligoneuridae				
Isonychia sp.	14	4	8	
Odonata				
Aeshnidae				
Boyeria vinosa	17		10	
Calopterygidae				
Calopteryx maculata/dimidiata	16		4	
Cordulegastridae				
Cordulegaster erronea	1			
Cordulegaster maculata	2		4	
Gomphidae				
Gomphurus rogersi	1		5	
Gomphus lividus			7	
Lanthus vernalis	9		2	
Ophiogomphus incurvatus	4		5	2
Gomphidae sp. (early instars)			2	

Heteroptera				
Veliidae				
Rhagovelia obesa	4		3	
Megaloptera				
Corydalidae				
Nigronia fasciata	1			
Nigronia serricornis	15		16	3
Sialidae				
Sialis sp.	1			
Trichoptera				
Glossosomatidae				
Agapetus sp.	3			
Glossosoma sp.	2			
Hydropsychidae				
Cheumatopsyche sp.	77	7	23	22
Diplectrona modesta			1	
Hydropsyche betteni/depravata	10	2	14	
Ceratopsyche/Hydropsyche sp.				2
Hydropsychidae sp. (early instars)		2	4	2
Leptoceridae				
Triaenodes sp. cf. tardus	1			
Triaenodes sp. (cases)			1	
Limnephilidae				
Pycnopsyche luculenta group	1		1	
Philopotamidae				
Chimarra sp.	81	38	38	20
Rhyacophilidae				
Rhyacophila fuscula	0	1		
Rhyacophila sp. (early instars)				1
Uenoidae				
*Neophylax concinnus	2			
Neophylax consimilis	29			
Neophylax sp. (cases)			1	
Coleoptera				
Dryopidae				
Helichus basalis adults	3		3	
Helichus fastigiatus adults			1	
Elmidae				
Macronychus glabratus adults	19		15	
Macronychus glabratus larvae			2	
Optioservus sp. larvae	1			
Promoresia tardella adults			1	
Stenelmis sp. larvae	1			1
Stenelmis sp. adults	22	3	30	3
Elmidae sp. (early instars)			1	
Hydrophilidae				
Hydrobius sp.	1			
Psephenidae				
Psephenus herricki	26	2	19	7

Ptilodactylidae				
Anchytarsus bicolor	3		3	
Diptera				
Ceratopogonidae				
"Palpomyia" sp.	1		1	
Chironomidae				
Chironominae				
Chironomini				
Polypedilum convictum			1	
Polypedilum fallax group			1	
Tanytarsini				
Tanytarsus sp.			1	
Orthocladiinae				
Brillia sp.			1	
Corynoneura sp.			1	
Eukiefferiella brevicalcar group			1	
Orthocladiinae sp.		4		
Chironomidae sp.	57			1
Dixidae (Dixa sp.)	1		4	2
Simuliidae	5	3	6	
Tipulidae				
Antocha sp.	9			
Dicranota sp.	1			
Hexatoma sp.			1	1
Tipula "abdominalis"	3		6	
Tipula sp. (Fig. 11.3)			2	
Tipula sp. (moss inhabitant)	1		2	

DAE 94-50: 26 of 57 taxa (46%) and 564 of 821 specimens (69%) were EPTs (chironomid taxa to be added). DAE 94-50(100): 14 of 20 taxa (70%) and 90 of 104 specimens (87%) were EPTs. Effort = 8.75 hours; 6.7 taxa per hour; 106 specimens per hour (per hour data includes sample of 100, with 2 EPT taxa added from that sample); 14.4 specimens per taxon.

DAE 94-96: 22 of 55 taxa (40%) and 240 of 311 specimens (77%) were EPTs. DAE 94-96(100): 11 of 19 taxa (58%) and 88 of 110 specimens (80%) were EPTs. Effort = 5 hours; 11.4 taxa per hour; 84 specimens per hour (per hour data includes sample of 100, with 2 EPT taxa added from that sample); 5.7 specimens per taxon.

DAE 94-50 and DAE 94-96 combined: 36 of 78 total taxa (46%) and 804 of 1132 specimens (71%) were EPTs (total taxa includes one EPT taxon present in samples of 100 but absent from both qualitative samples). DAE 94-50(100) and DAE 94-96(100) combined: 19 of 29 taxa (66%) and 178 of 214 specimens (83%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-96, Station 6, LN-B, fishes. Lindsey Creek below right-of-way, ca. 0.1 mi upstream from Pittman Center, Sevier County, Tennessee, 20 October 1994. The area sampled extends 80 meters downstream from the culvert on Webb Creek road. Effort = 25 minutes, shocking upstream.

Collectors CJ Paxton, RB Evans, effort of single-pass electrofishing depletion estimate. Released fishes identified by DA Etnier. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6221	Notropis rubricroceus	1 (64)
44.6224	Rhinichthys atratulus (25)	24 (17-58)
44.6225	Semotilus atromaculatus (6)	15 (40-115)
31.178	Salmo trutta	1 (120)

7-WB-A WEBB CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-59 and DAE 94-108, site 7, WB-A, Webb Creek above and below most easterly bridge on US 321, at Volunteer Road, 17 June and 30 October 1994. Substrate 30% boulder, 30% cobble, 30% coarse gravel, 5% bedrock, 5% sand and silt; maximum depth 3 ft, mean width 35 ft., canopy about 50%. Collectors on 17 June DA and EL Etnier, CH Heacock, CE Skelton, JT Baxter, SJ Fraley, 9.5 hours effort; collectors on 30 October JT Baxter, SE McLain, KL Harpster, LD Bonds, RM Brown, 11.25 hours effort. Very abundant taxa on 17 June were *Isoperla, Acentrella, Diplectrona*, Peltoperlidae; very abundant taxa on 30 October included Heptageniidae, *Cheumatopsyche*, Tipulidae, Calopteryx, Baetidae, *Boyeria*. Trichopteran taxa preceded with an asterisk have been catalogued at UT. Fish species present included *Nocomis micropogon, Etheostoma flabellare*, and *Cottus carolinae*. Det. DA Etnier, KL Harpster, RB Evans

Taxon	94-59 17 Jun	94-59 (100)	94-108 30 Oct	94-108 (100)
Annelida				
Oligochaeta	5	1	8	2
Mollusca				
Ancylidae				
Ferrissia sp.			1	
Pleuroceridae				
Elimia clavaeformis	12	1	15	
Corbiculidae				
Corbicula fluminea	6		1	
Arachnida				
Hydracarina			1	
Crustacea				
Decapoda				
Cambarus longirostris	1		3	
Orconectes sp. (early)	4		1	
Insecta				
Plecoptera				
Capniidae				
Allocapnia sp.			1	
Chloroperlidae				
Haploperla sp.?	1		1	
Chloroperlidae sp. (early	1			1
Leuctridae				
Leuctra sp.	11	6	4	
Zealeuctra sp.			6	
Leuctridae sp. (early instars)			8	
Nemouridae				
Amphinemura delosa/nigritta	2			
Peltoperlidae				
Peltoperlidae sp. (early instars)	10	1		

Perlidae				
Acroneuria abnormis	7		12	2
Eccoptura xanthenes	1		1	
Paragnetina immarginata	5		2	
Perlesta sp.	20	1		
Perlidae sp. (early instars)	2		4	
Perlodidae				
Isoperla holochlora	24			
Isoperla sp. (early instars)			40	2
Helopicus subvarians			6	
Malirekus/Yugus sp. (early)			4	
Perlodidae sp. (early instars)			33	
Pteronarcyidae				
Allonarcys sp.	6		6	
Taeniopterygidae				
Taeniopteryx sp.			2	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	83	28	37	3
Acentrella sp. (slender, no bands or distinct fringe on cerci)	16			
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	39	25	2	1
Acentrella sp. (early instars)	6		1	
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	15	3	12	1
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	5	3	1	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	2		20	
Baetidae sp. (early or damaged)	6			
Centroptilum sp.	1		5	
Baetiscidae				
Baetisca carolina			1	
Caenidae				
Caenis sp.	2		7	1
Ephemerelllidae				
Dannella simplex	1			
Drunella cornutella	20	1		
Drunella sp. early instar, but not cornutella)	1			
Ephemerella catawba	3			

Ephemerella invaria			11	
Ephemerella sp. (early instars)			109	7
Eurylophella funeralis			14	
Eurylophella sp. (early instars)			2	
Serratella deficiens	8			
Serratella serrata	45	7		
Serratella sp. (early instars)	14		7	3
Ephemerellidae sp. (early instars)			4	7
Ephemeridae				
Ephemera sp.	3		6	
Heptageniidae				
Epeorus rubidus/subpallidus	24			
Epeorus sp. (early instars)	10		43	4
Heptagenia aphrodite	9	2		
Heptagenia juno	7			
Heptagenia thetis	4			
Heptagenia sp. (early instars)	11		11	
Stenacron pallidum			3	
Stenonema ithaca/modestum	41	1	113	7
Stenonema pudicum	1		30	2
Stenonema sp. (early instars)	4		38	3
Leptophlebiidae				
Leptophlebia sp.			4	
Paraleptophlebia adoptiva/mollis			19	1
Paraleptophlebia sp cf. guttata	21	3		
Leptophlebiidae sp. (early)	2		1	1
Neoephemeridae				
Neoephemera purpurea			2	
Oligoneuridae				
Isonychia sp.	26	1	46	1
Odonata				
Aeshnidae				
Boyeria vinosa	1		17	
Boyeria sp. (early instars)	1			
Calopterygidae				
Calopteryx maculata/dimidiata	7		28	
Cordulegastridae				
Cordulegaster maculata	2		6	
Gomphidae				
Gomphurus rogersi	9		1	
Gomphus lividus	11		5	
Hagenius brevistylus	1			
Lanthus vernalis	6		2	
Stylogomphus albistylus	8		3	
Lanthus/Stylogomphus sp. (early)	11			
Macromiidae				
Macromia sp.	9		6	
Heteroptera				
Gerridae				

Gerris remigis	1			
Gerris sp. (nymphs)	2		2	
Veliidae				
Rhagovelia obesa	2		2	
Megaloptera				
Corydalidae				
Corydalus cornutus	8	1	7	
Nigronia serricornis	6		15	
Sialidae (Sialis sp.)	1			
Trichoptera				
Brachycentridae				
*Micrasema charonis	1			
*Micrasema wataga	3			
Glossosomatidae				
Glossosoma sp.	7		18	
Hydropsychidae				
Ceratopsyche bronta	6		5	
Ceratopsyche morosa			1	
Ceratopsyche slossonae	3			
Ceratopsyche sparna (1 male pupa)	11		32	2
Cheumatopsyche harwoodi male pup.	2			
Cheumatopsyche sp.	101	5	204	37
Diplectrona modesta	9		1	1
Hydropsychidae sp. (early)	1		2	
Lepidostomatidae				
Lepidostoma sp.	9			
Leptoceridae				
Triaenodes sp. cf. ignita	1			
Triaenodes sp. cf. tardus	1			
Limnephilidae				
Pycnopsyche guttifer group	3		7	
Pycnopsyche luculenta group	4		10	
Pycnopsyche sp. (early instars)			1	
Philopotamidae				
Chimarra sp.			5	2
Dolophilodes distinctus	2		18	3
Wormaldia sp.	2			
Polycentropodidae				
Polycentropus sp.	6		3	2
Psychomyiidae				
Lype diversa			1	
Rhyacophilidae				
Rhyacophila carolina group	3		2	
Rhyacophila fuscula	15		13	
Uenoidae				
*Neophylax oligius	4			
Neophylax sp. (female pupa)	1			
Coleoptera				
Dryopidae				

Helichus basalis adults	10		12	
Helichus fastigiatus adults	4			
Helichus lithophilus adults	1			
Elmidae				
Macronychus glabratus adults	4			
Optioservus ovalis adults	3			
Optioservus sp.	1		8	1
Oulimnius latiusculus adults	1			
Promoresia elegans larvae	1			
Promoresia tardella larvae			1	
Promoresia tardella adults	1			
Stenelmis sp. adults	13		2	
Hydrophilidae				
Tropisternus lateralis nimbatus adults	1			
Psephenidae				
Psephenus herricki	19	1	13	8
Diptera				
Athericicae (Atherix sp.)	11		36	4
Blephariceridae sp.	3			
Ceratopogonidae				
"Palpomyia" sp. (large brown head as long as 1st thoracic segment)	1		5	
"Palpomyia" sp. (small pointed yellow head half as long as 1st thoracic segment)	1			
Ceratopgonidae sp. (pupae)	1			
Chironomidae				
Chironominae				
Chironomini				
Chironomus/Einfeldia sp.	7		1	
Cryptochironomus sp.	2			
Demicryptochironomus sp.	10		3	
Microtendipes sp.	16		2	
Phaenopsectra sp.	3			
Polypedilum convictum	8		3	
Polypedilum fallax group	1			
Chironomini sp.		7		
Tanytarsini				
Rheotanytarsus sp.			8	
Tanytarsini sp.		1		
Diamesinae				
Diamesa sp.	1			
Orthocladiinae				
Brillia sp.	5		1	
Cardiocladius sp.	9			
Corynoneura sp.			2	
Cricotopus/Orthocladius sp.			1	
Epoicocladius sp.			2	
Eukiefferiella brehmi group	1			

E. claripennis group	6		1		
Nanocladius sp.	2		6		
Orthocladius obumbratus			12		
Orthocladius (Euorthocladius)			3		
Parachaetocladius sp.			2		
Parametriocnemus sp.	8		4		
Rheocricotopus sp.			2		
Synorthocladius semivirens			10		
Thienemanniella sp.			3		
Tvetenia bavarica group	10		7		
Orthocladiinae sp.		2		6	
Tanypodinae					
Thienemannimyia group	8		4		
Tanypodinae sp.		1	1		
Chironomidae sp.	7	1	2		
Dixidae (Dixa sp.)	1				
Simuliidae sp.	29	2	40		
Tipulidae					
Antocha sp.	6		4	1	
Dicranota sp.	2				
Hexatoma sp.	8		1		
Tipula "abdominalis"	4		14		
Tipula sp. (Fig. 11.3)	4				

DAE 94-59: 53 of 111 taxa (48%) and 621 of 972 specimens (64%) were EPTs. DAE 94-59(100): 14 of 23 taxa (61%) and 87 of 105 specimens (83%) were EPTs. Effort = 9.5 hours; 11.7 taxa per hour; 113 specimens per hour (per hour data includes sample of 100); 8.8 speciemns per taxon.

DAE 94-108: 48 of 98 taxa (49%) and 903 of 1243 specimens (73%) were EPTs. DAE 94-108(100): 20 of 26 taxa (77%) and 93 of 115 specimens (81%) were EPTs. Effort = 11.25 hours; 8.7 taxa per hour; 121 specimens per hour; 12.7 specimens per taxon.

DAE 94-59 and DAE 94-108 combined: 68 of 137 total taxa (50%) and 1524 of 2215 specimens (69%) were EPTs. DAE 94-59(100) and DAE 94-108(100) combined: 27 of 39 taxa (69%) and 180 of 220 specimens (82%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA • HESTER DENDY-MULTIPLATE SAMPLING

Webb Creek, Hester-Dendy artificial substrate samples, upstream station, WC-US, retrieved 7 June 1994.

Taxon	**1**	**2**	**3**	**4**	**5**
Annelida					
Oligochaeta	4	2	5	6	1
Insecta					
Plecoptera					
Leuctridae					
Leuctridae sp. (early instars)	1		1	1	

Nemouridae					
Amphinemura delosa/nigritta				1	
Nemouridae sp. (early instars)				2	
Peltoperlidae					
Peltoperlidae sp. (early instars)	19	19	6	15	9
Perlidae					
Acroneuria abnormis	1				
Acroneuria sp. (early instars)			1		
Perlesta sp. (early instars)	2	5	3	3	1
Perlidae sp. (early instars)	2				
Perlodidae					
Isoperla holochlora	1	5	1	5	3
Malirekus/Yugus sp. (early instars)				1	1
Remenus bilobatus		1	1		
Pteronarcyidae					
Allonarcys sp.			1	1	1
Ephemeroptera					
Baetidae					
Acentrella sp. (broad, no fringe)				1	1
Acentrella sp. (narrow, banded cerci)	1				
Acentrella sp. (narrow, no bands)		2			
Acentrella sp. (early instars)		6	4	1	1
Baetis sp. cf. intercalaris/pluto		1			1
Baetis sp. (early instars)	2				1
Caenidae					
Caenis sp.	2				1
Ephemerellidae					
Dannella simplex				1	
Ephemerella sp. cf. invaria		1			
Eurylophella funeralis				1	
Eurylophella sp. (early instars)				1	
Serratella deficiens	1	2	5	1	
Serratella serrata		3	2	1	
Serratella sp. (early instars)	5				1
Ephemerellidae sp. (early instars)			1	1	
Heptageniidae					
Stenonema ithaca/mediopunctatum	1	1	2		
Heptageniidae sp. (early instars)	2	1		4	1
Oligoneuridae					
Isonychia sp.	1				

Taxon 1	**2**	**3**	**4**	**5**	
Megaloptera					
Corydalidae					
Corydalus cornutus	1			1	1
Nigronia serricornis	3	1	2	3	1
Trichoptera					
Hydropsychidae					

Ceratopsyche bronta				3	
Ceratopsyche macleodi				1	
Ceratopsyche morosa		2			
Ceratopsyche slossonae			1		
Ceratopsyche sparna		1			2
Cheumatopsyche harwoodi male pupae				1	
Cheumatopsyche sp.	7	4	7	7	10
Diplectrona modesta	1			2	
Hydropsychidae sp. (early instars)	11	3	1	9	8
Lepidostomatidae					
Lepidostoma sp. (empty cases)					1
Psychomyidae					
Lype diversa	2				
Coleoptera					
Elmidae					
Macronychus glabratus adults	3		2		
Promoresia elegans	1	2	3		3
Stenelmis sp. adults			1		
Diptera					
Athericidae					
Atherix sp.	6	1	6	5	10
Chironomidae					
Chironominae					
Chironomini	33	30	12	30	29
Tanytarsini	90	54	67	96	62
Orthocladiinae	386	478	378	443	209
Tanypodinae	7	7	1	6	6
Chironomidae sp.	26	6	17	28	15
Empididae	1		1	2	1
Simuliidae	1		2	2	1
Tipulidae					
Antocha sp.	1	2		3	
Dicranota sp.			1		
Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa	15	13	9	13	1111
Non-EPT specimens	2618	563	583	498	635339
EPT taxa		30	15	15	141713
EPT specimens	253	65	59	37	6435
Percent EPT taxa	67	54	62	52	6154
Percent EPT specimens	9	10	9	8	99

Note: Chironomid taxa are more thoroughly identified below. Total taxa data are obtained by treating all five replicates as a single sample. Column entries that are taxonomically conservative, such as "Perlidae sp. (early instars)" are not considered as separate taxa if other perlids were identified to genus or to genus and species in the sample.

Chironomidae					
Chironominae					
Chironomini					
Tanytarsini					
Rheotanytarsus sp.		1			2
Orthocladiinae					
Corynoneura sp.		1			4
Cricotopus bicinctus		1	2		
C. tremulus group				1	1
Eukiefferiella devonica group	1				
Orthocladius (Euorthocladius) sp.			1		
Parametriocnemus sp.			1	1	
Symposiocladius lignicola		6			11
Thienemanniella sp.		2		2	2
Tvetenia bavarica group		1	3	3	11
Orthocladiinae sp.		1	2	1	4
Tanypodinae					
Thienemannimyia group					1
Chironomidae sp. (pupae)		25	5	16	2815

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Webb Creek, Hester-Dendy artificial substrate samples, upstream station, WB-DS, retrieved 25 October 1994.

Taxon	**1**	**2**	**3**	**4**	**5**
Annelida					
Oligochaeta	10	3	1	0	1
Insecta					
Plecoptera					
Capniidae					
Allocapnia sp.	4	3	7	3	10
Chloroperlidae					
Sweltsa sp.	0	1	0	0	0
Peltoperlidae sp. (early instars)	0	0	0	0	4
Perlodidae					
Clioperla clio	1	0	2	2	3
Cultus decisus	0	1	1	0	0
Isoperla sp. (early instars)	2	2	3	1	2
Malirekus hastatus	0	1	0	0	0
Ephemeroptera					
Caenidae					
Caenis sp.	0	0	0	0	1
Ephemerellidae					
Ephemerella sp. (early instars)	3	0	7	2	7
Eurylophella funeralis	0	0	1	0	0
Eurylophella sp. (early instars)	0	0	0	2	1

Serratella sp. (early instars)	0	0	1	0	1
Heptageniidae					
Heptagenia sp. (early instars)	1	0	0	0	1
Stenonema ithaca/modesta	1	1	1	2	1
Stenonema sp. (early instars)	4	3	3	8	8
Leptophlebiidae					
Leptophlebia sp.	1	0	0	0	0
Megaloptera					
Corydalidae					
Nigronia serricornis	1	0	0	0	0
Trichoptera					
Hydropsychidae					
Ceratopsyche sparna	0	0	0	1	0
Cheumatopsyche sp.	0	0	0	1	2
Polycentropodidae					
Polycentropus sp.	1	0	0	0	0
Psychomyidae					
Lype diversa	0	1	0	0	1
Diptera					
Athericidae (Atherix sp.)	0	0	1	0	0
Chironomidae					
Chironominae					
Chironomini sp.	16	13	46	23	78
Tanytarsini sp.	14	40	46	91	38
Orthocladiinae sp.	37	16	28	36	32
Tanypodinae sp.	3	2	4	0	4
Tipulidae					
Antocha sp.	1	1	0	0	0
Tipula "abdominalis"	0	0	0	1	1
Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa	9	7	6	6	46
Non-EPT specimens	588	82	75	126	151154
EPT taxa		18	8	7	8812
EPT specimens	121	18	13	26	2242
Percent EPT taxa	67	53	54	57	6767
Percent EPT specimens	17	18	15	17	1321

Note: Total taxa data are obtained by treating the five replicates as a single sample. Column entries that are taxonomically conservative, such as "*Stenonema* sp. (early instars)" are not considered as separate taxa if other *Stenonema* are identified to species in that sample.

FISH SURVEY DATA —
• QUANTITATIVE TRIPLE-PASS DEPLETION METHOD

STATION 7, WB-A. Population Estimates, 30 October 1994. The 107.2-meter reach sampled has its upper end 150 m below the most westerly U.S. 321 bridge over Dunn Creek (not the same

as the site where the invertebrate samples were taken). Widths, measured at 10-m intervals starting at the lower end of the reach, were 0(7.4 m), 10 (7.25), 20(7.85), 30(6.4), 40(6.7), 50(6.4), 60(4.5), 70(5.0), 80(5.9), 90(5.1), 100(7.7), 107.2(8.7), mean width 6.58 m. Three shockers were used. Collectors were Brian Evans, Chris Paxton, Dave Etnier, Sylvia McLain, Charles Heacock, J.T. Baxter, Steve Fraley, Steve Moore, Rebecca Brown, Lucy Bonds, John Hammonds, Sean McAfee, David Alaban, Kelly Harpster, Mike Murphy, Matt Kulp, Alan Loy, and Aaron Whaley. (Number of specimens captured per sample plus maximum likelihood estimate of population size followed by 95% Confidence Interval.)

	I	II	IIIPop (95% CI)
stoneroller (Campostoma anomalum)	425	83	32547 (541-553)
warpaint shiner (Luxilus coccogenis)	177	77	22291 (279-303)
river chub (Nocomis micropogon)	94	28	8133 (130-138)
Tennessee shiner (Notropis leuciodus)	52	17	779 (76-84)
Tennessee shiner/saffron shiner hybrid (N. leuciodus X N. rubricroceus)	5	0	05 (*)
saffron shiner (Notropis rubricroceus)	253	105	32411 (397-425)
telescope shiner (Notropis telescopus)	36	17	358 (56-62)
longnose dace (Rhinichthys cataractae)	19	16	547 (40-60)
northern hogsucker (Hypentelium nigricans)	12	5	118 (18-20)
banded sculpin** (Cottus carolinae)	157	47	17227 (221-234)
rockbass (Ambloplites rupestris)	1	2	03 (3-6)
smallmouth bass (Micropterus dolomieu)	1	0	01 (*)
fantail darter (Etheostoma flabellare)	15	12	539 (32-53)
snubnose darter (Etheostoma simoterum)	5	0	05 (*)
Swannanoa darter (Etheostoma swannanoa)	14	5	527 (24-35)
Totals for Station	1266	414	1371883 (1861-1905)

*—all fish caught on first pass

**—based on results from lower Webb Creek, this entry probably consists of a mixed lot of *Cottus carolinae* and *C. bairdi.* The only three specimens retained were *C. carolinae.*

STATION WB-A. Capture Probabilities, Standing Crop Biomass, and Biomass 95% Confidence Intervals for 30 October 1994. (Weight is in grams, and 95% confidence intervals for biomass are estimated by multiplying average weight for each species by the upper and lower limits of the 95% CI for population size. NA= not applicable)

	Capture Prob.	Wt. (95% CI)
stoneroller (Campostoma anomalum)	.7627	8683 (8602-8792)
warpaint shiner (Luxilus coccogenis)	.6244	260 (251-272)
river chub (Nocomis micropogon)	.7104	1180 (1157-1228)
Tennessee shiner (Notropis leuciodus)	.6522	99 (99-109)
Tennessee shiner/saffron shiner hybrid (Notropis leuciodus X N. rubricroceus)	NA	5 (NA)
saffron shiner (Notropis rubricroceus)	.6270	410 (397-425)
telescope shiner (Notropis telescopus)	.6588	39 (39-43)
longnose dace (Rhinichthys cataractae)	.4598	403 (397-425)
northern hogsucker (Hypentelium nigricans)	.7200	1631 (1631-1812)
sculpin** (Cottus carolinae and C. bairdi)	.6906	2678 (2608-2761)
rockbass (Ambloplites rupestris)	.6000	41 (41-82)
smallmouth bass (Micropterus dolomieu)	NA	70 (NA)
fantail darter (Etheostoma flabellare)	.4267	61 (51-85)
snubnose darter (Etheostoma simoterum)	NA	6 (NA)
Swannanoa darter (Etheostoma swannanoa)	NA	169 (151-221)
Average/Totals for Station	.6722	15735 (NA)

STATION WB-A. Range in Length of Non-gamefish. (Data in columns are maximum and minimum total length in millimeters for each species.)

	I	II	III
stoneroller	44-190	43-180	38-108
warpaint shiner	22-92	30-85	27-56
river chub	29-211	33-203	40-118
Tennessee shiner	26-70	29-77	28-63

Tennessee shiner/saffron shiner hybrid	30-75	NA	NA
saffron shiner	21-82	24-75	25-72
telescope shiner	36-74	33-63	42-43
longnose dace	46-122	48-128	48-120
northern hogsucker	90-300	51-249	10
sculpin**	35-130	43-132	41-105
fantail darter	42-76	38-81	37-76
snubnose darter	37-58	NA	NA
Swannanoa darter	44-94	53-86	46-90

**—mixed lot of *Cottus carolinae* and *C. bairdi*

Length/Weight Data for Gamefish From Station WB-A. (total length in millimeters followed by weight in grams for each individual)

smallmouth bass—1 seen and inadvertently released, approx. 70 mm TL
rockbass—54(1),106(20),111(20)

8-WB-B WEBB CREEK—Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-52 and DAE 94-107, site 8, WB-B, Webb Creek below bridge on Webb Creek Road, just above and including straight, smooth reach ca. 100 m above Pittman Center school, 14 June and 29 October 1994. Substrate 50% boulder and cobbles, 44% gravel, 5% bedrock, 1% silt; maximum depth 3 ft; mean width ca. 40 ft; 35% canopy. Collectors on 14 June DA Etnier, CH Heacock, CJ Paxton, CE Skelton, JT Baxter, FJ Kriegler, MH Hughes, SF Fraley, 17 1/3 hours effort. Collectors on 29 October DA & EL Etnier, JT Baxter, LD Bonds, KL Harpster, 15.75 hours. Abundant taxa on 29 October were *Atherix, Calopteryx*, philopotamids, *Stenonema, Heptagenia*, baetids. Det. DAE, RBE.

Taxon	94-52 14 Jun	94-52 (100)	94-107 29 Oct	94-107 (100)
Annelida				
Oligochaeta	6	8	3	2
Mollusca				
Ancylidae				
Ferrissia sp.			6	
Lymnaeidae (Lymnaea sp.?)				
(like dextral Physella)			1	
Pleuroceridae				
Elimia clavaeformis	12		6	
Sphaeriidae				
Spaherium sp.			2	
Corbiculidae				
Corbicula fluminea	3		1	
Arachnida				
Hydracarina	2	1	5	3
Crustacea				
Decapoda				
Cambarus sp. cf. bartoni	1		1	
Cambarus longirostris	3		3	
Orconectes forceps	8	2	1	
Insecta				
Plecoptera				
Capniidae				
Allocapnia sp.			18	
Chloroperlidae				
Haploperla brevis			15	
Leuctridae				
Leuctra sp.	1		6	2
Leuctridae sp. (early instars)	21	1		
Nemouridae				
Amphinemura delosa/nigritta	2			
Peltoperlidae				
Peltoperlidae sp. (early instars)	6	1	3	

Perlidae				
Acroneuria carolinensis	1			
Acroneuria abnormis	1		4	
Neoperla sp.	1			
Paragnetina immarginata			1	
Perlesta placida	17			
Perlidae sp. (early instars)	7			
Perlodidae				
Clioperla clio			4	
Cultus decisus			5	1
Helopicus subvarians			8	
Isogenoides hansoni			5	1
Isoperla holochlora	4			
Isoperla sp. (dark head with pale spot anterior to ant. ocellus, prob. early I. holochlora)			24	3
Pteronarcyidae				
Allonarcys sp.	5		9	
Taeniopterygidae				
Taeniopteryx sp.			1	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	46	4	10	
Acentrella sp. (slender, cerci with band & fringe, 8 & 9 pale, paired dorsal dark smudges, "Y-shaped dark tracheal mark on ventrolat-erally on abdominal segments)	65	7	6	
Acentrella sp. (early instars)	16			
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	6	2	3	
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)			7	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	2		13	
Baetis sp. (early instars)	2			
Centroptlum sp.	16	3	2	
Baetiscidae				
Baetisca carolina	1		3	
Caenidae				
Caenis sp.	7	6	7	1
Ephemeridae				
Ephemera sp.	4		9	

Ephemerelllidae				
Dannella simplex	5			
Drunella cornuta/cornutella	43	1		
Ephemerella catawba	1		6	
Ephemerella dorothea	1			
Ephemerella invaria			35	3
Ephemerella sp. (early instars)			3	
Eurylophella doris sp. group	1			
Eurylophella funeralis	5		14	
Eurylophella verisimilis	2			
Eurylophella sp. (early instars)	3		5	
Serratella deficiens	10			
Serratella serrata	81	1		
Serratella serratoides	1			
Heptageniidae				
Epeorus rubidus/subpallidus	15		10	
Epeorus sp. (early instars)				1
Heptagenia juno	35	2		
Heptagenia thetis			4	
Heptagenia sp. (long slender gills with large basal tufts, same as in Little Pigeon)			1	
Heptagenia sp. (early instars)	23		6	
Rhithrogena sp. cf. amica	1			
Rhithrogena sp. (early instars)			1	
Stenacron pallidum	3		4	
Stenonema ithaca/modestum	75	3	171	7
Stenonema pudicum	1		26	
Stenonema sp. (early instars)	4		19	5
Heptageniidae sp. (early instars)	10	3	4	
Leptophlebiidae				
Habrophlebiodes sp.	1			
Leptophlebia sp.			4	
Paraleptophlebia adoptiva/mollis			12	3
Paraleptophlebia sp. cf. guttata	18	6		
Neoephemeridae				
Neoephemera purpurea	3	1	10	
Oligoneuridae				
Isonychia sp.	22	6	14	4
Odonata				
Aeshnidae				
Boyeria vinosa	10		14	
Boyeria sp. (early instars)	2			
Calopterygidae				
Calopteryx angustipennis			3	
Calopteryx maculata/dimidiata	16		25	
Cordulegastridae				
Cordulegaster maculata	5		3	
Corduliidae				
Helocordulia uhleri			2	

Gomphidae				
Gomphurus rogersi	12		10	
Gomphus lividus	19		14	
Lanthus vernalis	12		4	
Ophiogomphus incurvatus	1			
Stylogomphus albistylus	17		5	
Stylurus scudderi	2			
Macromiidae				
Macromia sp.	9		5	
Heteroptera				
Veliidae				
Microvelia sp.			3	
Rhagovelia obesa	14		6	
Megaloptera				
Corydalidae				
Corydalus cornutus	7		6	
Nigronia serricornis	12	1	14	
Trichoptera				
Brachycentridae				
Micrasema bennetti			1	
Micrasema sp. cf. wataga (early)			5	
Micrasema sp. (empty cases)	1			
Glossosomatidae				
Glossosoma nigrior (1 male pupa)	4		17	
Hydropsychidae				
Ceratopsyche bronta	12		18	1
Ceratopsyche morosa			2	
Ceratopsyche sparna	6		145	9
Ceratopsyche sp. (female pupae)	1			
Cheumatopsyche sp.	108	6	99	12
Diplectrona modesta	2		2	1
Hydropsychidae sp. (early instars)	2		2	
Hydroptilidae				
Hydroptila sp.			2	
Lepidostomatidae				
Lepidostoma sp.	4		1	
Leptoceridae				
Triaenodes sp. cf. tardus	1		8	
Limnephilidae				
*Goera calcarata (1 male pupa)	2			
Goera sp.	5		15	
Pycnopsyche guttifer group	3		1	
Pycnopsyche luculenta group	16		2	
Philopotamidae				
Chimarra sp.			4	
Dolophilodes distinctus	4		38	2
Polycentropodidae				
Polycentropus cinereus male pupae	2			
Polycentropus sp.	18		4	1

Psychomyiidae				
Psychomyia sp.	1		12	1
Rhyacophilidae				
Rhyacophila carolina group			2	
Rhyacophila fuscula			22	1
Rhyacophila sp. (early instars)	1			
Uenoidae				
*Neophylax consimilis (1 parasitized male pupa, 1 larva)	2			
Coleoptera				
Dryopidae				
Helichus basalis adults	25	1	11	
Helichus fastigiatus adults			1	
Elmidae				
Macronychus glabratus adults	11		1	
Optioservus ovalis adults			4	
Optioservus sp. larvae	1		18	
Promoresia elegans adults	1			
Promoresia tardella larvae	1			
Promoresia tardella adults	2			
Stenelmis sp. adults	2		1	
Eubriidae				
Ectopria sp.	0	1		
Gyrinidae				
Dineutus discolor adults	1			
Hydrophilidae				
Hydrobius sp.	1			
Sperchopsis sp.	2			
Psephenidae				
Psephenus herricki	19	7	11	1
Diptera				
Athericidae (Atherix sp.)	8		32	6
Blephariceridae pupae	1			
Ceratopogonidae				
"Palpomyia" sp.	5	2	2	
Chironomidae				
Chironominae				
Chironomini				
Chironomus/Einfeldia sp	1			
Cryptochironomus sp.	1			
Demicryptochironomus sp.	1		8	
Dicrotendipes cf. neomodestus	1			
Microtendipes sp.	77		33	
Paratendipes sp.	1			
Phaenopsectra sp.	8			
Polypedilum convictum	7		4	
Polypedilum illinoense	2		1	
Polypedilum scalaenum	1			
Polypedilum sp.	1		2	
Chironomini sp.		3		

Tanytarsini				
Cladotanytarsus sp.	2			
Micropsectra sp.?	1			
Paratanytarsus sp.	1			
Rheotanytarsus sp.	1		6	
Tanytarsus sp.	3		1	
Tanytarsini sp.		1		
Diamesinae				
Diamesa sp.	1		2	
Orthocladiinae				
Brillia sp.			2	
Corynoneura sp.	1		1	
Cricotopus bicinctus group	6		8	
Cricotopus tremulus group	2		5	
Cricotopus/Orthocladius sp.	1		24	
Epoicocladius sp.	2			
Eukiefferiella claripennis grp.			1	
E. pseudomontana group	3			
Nanocladius sp.	2		3	
Orthocladius obumbratus			1	
Orthocladius (Euorthocladius)	1		7	
Parakiefferiella sp.			2	
Parametriocnemus sp.	10		6	
Rheocricotopus sp.			2	
Synorthocladius semivirens	3		34	
Thienemanniella sp.	2		2	
Tvetenia bavarica group	20		10	
Orthocladiinae sp.	6	10	2	26
Tanypodinae				
Ablabesmyia mallochi	2		1	
Thienemannimyia group	7		2	
Chironomidae sp.	11	1	5	1
Culicidae sp.			1	
Dolichopodidae				
Rhaphium sp.	1			
Empididae	1		1	
Muscidae				
Limnophora sp.	2	1		
Simuliidae sp.	29	2	13	2
Tabanidae sp.			1	
Tipulidae				
Antocha sp.	21	1	22	2
Hexatoma sp.	12	1	13	
Tipula "abdominalis"	5		5	
Tipula sp. (Fig. 11.3)			2	

DAE 94-52: 54 of 125 taxa (43%) and 790/1304 specimens (61%) were EPTs. DAE 94-52(100): 15 of 30 taxa (50%) and 53 of 96 specimens (55%) were EPTs. Effort = 17 1/3 hours; 7.3 taxa per hour; 78 specimens per hour (per hour data includes sample of 100, with one new taxon added from that sample); 10.4 specimens per taxon.

DAE 94-107: 55 of 120 taxa (46%) and 914 of 1372 specimens (67%) were EPTs. DAE 94-107(100): 18 of 25 taxa (72%) and 59 of 102 specimens (58%) were EPTs. Effort = 15.75 hours; 7.6 taxa per hour; 94 specimens per hour (per hour data includes sample of 100); 11.5 specimens per taxon.

DAE 94-52 and DAE 94-107 combined: 73 of 160 total taxa (46%) and 1704 of 2676 specimens (64%) were EPTs (total taxa includes one non-EPT taxon taken in samples of 100 but absent from both qualitative samples). DAE 94-52(100) and DAE 94-107(100) combined: 28 of 44 taxa (64%) and 112 of 198 specimens (57%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Webb Creek, Hester-Dendy artificial substrate samples, downstream station, WB-DS, retrieved 25 October 1994.

Taxon	**1**	**2**	**3**	**4**	**5**
Annelida					
Oligochaeta	1	7	3	4	6
Mollusca					
Gastropoda					
Ancylidae					
Ferrissia sp.	0	0	2	0	0
Pleuroceridae					
Goniobasis sp.	0	0	0	1	0
Insecta					
Plecoptera					
Capniidae					
Allocapnia sp.	0	0	0	0	1
Capniidae/Leuctridae sp. (early instars)	0	1	2	7	3
Peltoperlidae sp. (early instars)	0	2	2	2	1
Perlidae					
Paragnetina immarginata	0	0	0	1	0
Perlodidae					
Clioperla clio	1	1	1	1	0
Cultus decisus	0	0	0	1	0
Isoperla sp. (early instars)	3	2	6	5	10
Malirekus hastatus	0	1	0	0	0
Ephemeroptera					
Caenidae					
Caenis sp.	0	0	2	0	0
Ephemerellidae					
Ephemerella sp. (early instars)	1	0	3	6	9
Heptageniidae					
Stenonema ithaca/modesta	12	1	0	1	9
Stenonema pudicum	0	0	0	0	2
Stenonema sp. (early instars)	11	8	7	20	28

Oligoneuridae					
Isonychia sp.	0	0	0	0	2
Trichoptera					
Hydropsychidae					
Ceratopsyche bronta	0	1	0	0	0
Ceratopsyche sparna	0	2	1	3	3
Cheumatopsyche sp.	7	1	2	3	0
Hydropsychidae sp. (early instars)	0	1	0	0	2
Philopotamidae					
Dolophilodes distinctus	0	1	0	0	0
Psychomyidae					
Lype diversa	1	0	0	1	4
Coleoptera					
Elmidae					
Macronychus glabratus adults	0	0	1	0	0

Taxa 1	**2**	**3**	**4**	**5**	
Diptera					
Chironomidae					
Chironominae					
Chironomini sp.		2	39	24	5123
Tanytarsini sp.		40	53	24	5239
Orthocladiinae sp.		17	32	24	5871
Tanypodinae sp.		3	4	4	12
Chironomidae sp.		0	0	0	12
Empididae sp.		0	1	1	01
Tipulidae					
Antocha sp.		0	0	0	10
Tipula "abdominalis"		1	1	2	21

Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa	11	6	6	9	87
Non-EPT specimens	602	64	137	85	171145
EPT taxa	17	6	10	9	1110
EPT specimens	209	36	22	26	5174
Percent EPT taxa	61	50	62	50	5859
Percent EPT specimens	26	36	14	23	2334

Note: Total taxa data are obtained by treating the five replicates as a single sample. Column entries that are taxonomically conservative, such as "*Stenonema* sp. (early instars)" are not considered as separate taxa if other *Stenonema* are identified to species in that sample.

FISH SURVEY DATA —
• QUANTITATIVE TRIPLE-PASS DEPLETION METHOD

STATION 8, WB-B. Population Estimates, 30 October 1994. The 100-meter reach sampled has its upper end at a shallow riffle at a broad gravel shoal above the first pool above the Pittman Center school, with the lower end at a large Sycamore tree along the road where flagging exists. Widths, measured at 10-m intervals starting at the lower end of the station, were 0(6.3 m), 10(4.7), 20(5.8), 30(5.8), 40(6.7), 50(8.5), 60(8.7), 70(8.6), 80(9.1), 90(7.7), 100(7.7), mean width 7.24 m. Collectors were Brian Evans, Dave Etnier, Steve Fraley, Steve Moore, Matt Kulp, Alan Loy, Aaron Whaley, Lucy Bonds, and John Hammonds. (Number of specimens captured per sample plus maximum likelihood estimate of population size followed by 95% Confidence Interval.)

	I	II	IIIPop (95% CI)
stoneroller (Campostoma anomalum)	103	29	36195 (172-218)
warpaint shiner (Luxilus coccogenis)	50	11	47162 (**)
river chub (Nocomis micropogon)	72	33	30173 (138-208)
Tennessee shiner (Notropis leuciodus)	6	2	111 (11-12)
saffron shiner (Notropis rubricroceus)	184	69	24290 (279-301)
telescope shiner (Notropis telescopus)	1	1	02 (2-7)
longnose dace (Rhinichthys cataractae)	24	9	3298 (**)
northern hogsucker (Hypentelium nigricans)	10	1	833 (19-79)
rainbow trout >90 mm TL (Oncorhynchus mykiss)	0	0	46 (**)
brown trout (Salmo trutta)	1	1	28 (4-50**)
sculpin*** (Cottus carolinae & C. bairdi)	342	100	89585 (558-612)
smallmouth bass < 100 mm TL (Micropterus dolomieu)	0	1	01 (*)
fantail darter (Etheostoma flabellare)	45	20	1082 (75-92)
Swannanoa darter (Etheostoma swannanoa)	35	11	654 (52-59)
Totals for Station	851	279	2541576 (1520-1632)

*—all fish caught on one pass
**—capture data not in descending order, data unreliable
***—this entry consists of a mixed lot of *Cottus carolinae* and *C. bairdi*

STATION WB-B. Capture Probabilities, Standing Crop Biomass, and Biomass 95% Confidence Intervals for 30 October 1994. (Weight is in grams, and 95% confidence intervals

for biomass are estimated by multiplying average weight for each species by the upper and lower limits of the 95% CI for population size. NA= not applicable)

	Capture Prob.	Wt. (95% CI)
stoneroller (Campostoma anomalum)	.4800	1920 (1686-2136)
warpaint shiner (Luxilus coccogenis)	NA	392 (NA)
river chub (Nocomis micropogon)	.3947	820 (649-978)
Tennessee shiner (Notropis leuciodus)	.7333	7 (7)
saffron shiner (Notropis rubricroceus)	.6397	321 (307-331)
telescope shiner (Notropis telescopus)	.6667	2 (2-6)
longnose dace (Rhinichthys cataractae)	NA	555 (NA)
northern hogsucker (Hypentelium nigricans)	.2436	1172 (675-2805)
rainbow trout >90 mm TL (Oncorhynchus mykiss)	NA	354 (NA)
brown trout (Salmo trutta)	.1905	340 (170-2125)
Cottus sp. (Cottus carolinae & C. bairdi)	.5469	5453 (5189-5692)
smallmouth bass < 100 mm TL (Micropterus dolomieu)	NA	4 (4)
fantail darter (Etheostoma flabellare)	.5515	245 (225-276)
Swannanoa darter (Etheostoma swannanoa)	.6420	427 (411-466)
Average/Totals for Station	.5038	11457 (NA)

STATION WB-B. Range in Length of Non-gamefish. (Data in columns are maximum and minimum total length in millimeters for each species.)

	I	II	III
stoneroller	40-190	47-176	52-186
warpaint shiner	32-50	32-47	28-109
river chub	26-134	28-210	28-153
Tennessee shiner	37-47	33-34	34-37
saffron shiner	20-77	20-69	21-70
telescope shiner	43	37	NA
longnose dace	50-121	55-101	28-115
northern hogsucker	122-340	117	91-121

sculpin**	48-118	47-142	39-122
fantail darter	42-88	40-85	45-85
Swannanoa darter	47-97	68-95	75-99

**—mixed lot of *Cottus carolinae* and *C. bairdi*

Length/Weight Data for Gamefish From Station WB-B. (total length in millimeters followed by weight in grams for each individual)

rainbow trout—168(48)170(48),183(63),206(77)
brown trout—150(33),156(42),162(43),175(52)
smallmouth bass—67(4)

9-WBT2-B WEBB CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-95, Station 30, WBT2-B, fishes. Northern tributary to Webb Creek 0.15 air miles west of mouth of Timothy Creek, Sevier County, Tennessee, 20 October 1994. The area sampled includes the two deepest pools in the lower 150 meters of the stream, located 100 m above and 150 m above the mouth of the tributary. Fishes were collected with a minnow seine. The upper pool was 0.4 m deep, and the lower pool 0.3 m deep. We did not expect to find any fishes besides *Rhinichthys atratulus*, and the stream is so small that the complete absence of fishes would not have been surprising. Our efforts did produce 4 *Rhinichthys atratulus*, with these dace prsent in both pools sampled. All four were released. Collectors DA Etnier and CJ Paxton.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

CES 94-19 and DAE 94-94, Station 30, WBT2-B, unnamed northern tributary to Webb Creek 0.15 air miles west of mouth of Timothy Creek, 1.7 air miles east of Pittman Center, Sevier County, Tennessee, 28 June and 2 October 1994. Surveyed a 100-meter reach from the mouth of the creek upstream. Mean width 6 ft, maximum depth in pools in upper portion of reach 15 in. Substrate 40% gravel, 35% boulder and cobble, 23% bedrock, and 2% silty sand. Canopy 90% complete. Collectors on 28 June CE Skelton, JT Baxter, MH Hughes, CJ Paxton, FJ Kriegler, 9 hours effort. Collectors on 2 October DA Etnier, LD Bonds, KL Harpster, SE McLane, CJ Paxton, 8 hours effort. Abundant taxa on 2 October were peltoperlids, *Elimia, Tipula, Dixa,* simuliids, and *Diplectrona*. Det. ELE, DAE, KLH

Taxon	94-19 28 Jun	94-19 (100)	94-94 2 Oct	94-94 (100)
Annelida				
Oligochaeta	11	3	8	2
Mollusca				
Pleuroceridae				
Elimia clavaeformis	2		11	3
Crustacea				
Decapoda				
Cambarus bartoni			1	
Cambarus longirostris			3	
Insecta				
Plecoptera				
Chloroperlidae sp. (early instars)	1		3	
Leuctridae				
Leuctra sp.			25	
Leuctridae sp. (early instars)	39	17	6	
Nemouridae				
Amphinemura sp. (early instars)	1		14	2
Nemouridae sp. (not Amphinemura)			1	
Peltoperlidae sp. (early instars)	10	7	20	
Perlidae				

Acroneuria abnormis	29	10	53	7
Perlidae sp. (early instars)	8			
Perlodidae				
Isoperla sp. (early instars)			3	
Ephemeroptera				
Baetidae				
Acentrella sp. (early instars)	2			
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	17	3	2	
Centroptilum sp.	1			
Baetidae sp. (early instars)			3	
Ephemerellidae				
Ephemerella dorothea	2			
Eurylophella funeralis			1	
Ephemeridae				
Ephemera sp.	19		16	8
Heptageniidae				
Epeorus dispar	6		8	
Epeorus sp. (early instars)	2		37	6
Heptagenia thetis	19	3	11	2
Heptageniidae sp. (early instars		2	10	1
Stenacron pallidum	4			
Stenonema carlsoni	6		62	7
Leptophlebiidae				
Habrophlebiodes sp.	16			
Paraleptophlebia adoptiva/mollis	1			
Paraleptophlebia guttata	2			
Leptophlebiidae sp. (early)	1		19	4
Oligoneuridae				
Isonychia sp.	1			
Odonata				
Cordulegastridae				
Cordulegaster erronea	3		1	
Gomphidae				
Lanthus vernalis	10		10	
Stylogomphus albistylus	4		2	
Heteroptera				
Gerridae				
Gerris sp. (nymphs)			6	
Veliidae				
Microvelia sp.			3	
Rhagovelia obesa			7	
Megaloptera				
Corydalidae				
Nigronia fasciata	2			
Trichoptera				
Glossosomatidae				
Agapetus sp.	6			
Glossosoma nigrior (1 male pupa)	2		17	

Hydropsychidae				
Diplectrona modesta	23	9	141	40
Parapsyche cardis	12	1	40	
Hydropsychidae sp. (early instars)	1	2	4	10
Lepidostomatidae				
Lepidostoma sp.	9		1	
Limnephilidae				
Goera sp. cases	1			
Pycnopsyche gentilis	1			
Pycnopsyche luculenta group	1			
Molannidae				
Molanna sp. (early pupa)	1			
Odontoceridae				
Psilotreta labida			2	
Psilotreta sp. (early instars)	2			
Philopotamidae				
Dolophilodes distinctus	9	1	47	
Wormaldia sp.	4	4	11	1
Philopotamidae sp. (early instars)	3			
Polycentropodidae				
Nyctiophylax sp.	1			
Polycentropus sp.	1			
Polycentropodidae sp. (early pupae)	2			
Rhyacophilidae				
*Rhyacophila carolina (male pupa)	1			
Rhyacophila carolina sp. group	7	1	1	
Rhyacophila fuscula			1	
*Rhyacophila sp. cf. nigrita	1		7	1
Uenoidae				
Neophylax mitchelli	4			
Neophylax sp. (cases)			1	
Coleoptera				
Elmidae				
Stenelmis sp. adults	3		2	
Eubriidae				
Ectopria sp.			6	
Hydrophilidae				
Helophorus sp.	1			
Psephenidae				
Psephenus herricki	3		8	
Ptilodactylidae				
Anchytarsus bicolor	1		1	
Diptera				
Ceratopogonidae				
"Palpomyia" sp.	2		5	1
Chironomidae				
Chirononinae				
Chironomini				
Demicryptochironomus sp.	1			
Microtendipes sp.	2		3	

Polypedilum convictum	21		3	
Polypedilum illinoense?	1			
Chironomini sp.		16		2
Tanytarsini				
Rheotanytarsus sp.	1			
Tanytarsus sp.	1		1	
Tanytarsini sp.		2		
Orthocladiinae				
Brillia sp			2	
Corynoneura sp.	3		3	
Epoicocladius sp.	4		1	
Eukiefferiella brevicalcar grp.			6	
Limnophyes sp.			1	
Parametriocnemus sp.	5		22	
Thienemanniella sp.	1			
Tvetenia bavarica group	2		5	
Orthocladiinae sp.		6		5
Tanypodinae				
Nilotanypus sp.	1			
Thienemannimyia group	6			
Tanypodinae sp.		2		
Chironomidae sp.	1			
Dixidae (Dixa sp)	1	1	6	
Empididae sp.	1			
Ptychopteridae				
Ptychoptera sp.	2			
Simuliidae	19	1	15	1
Tipulidae				
Antocha sp.			1	
Dicranota sp.	7	4		
Hexatoma sp.	4		2	1
Limnophila sp.	2			
Tipula "abdominalis"	4		19	
Tipula sp. (moss inhabitant)	1		6	

CES 94-19: 37 of 71 taxa (52%) and 306 of 473 specimens (65%) were EPTs. CES 94-19(100): 10 of 18 taxa (56%) and 60 of 93 specimens (65%) were EPTs. Effort = 9 hours; 7.9 taxa per hour; 52 specimens per hour (per hour data includes sample of 100); 6.6 specimens per taxon.

DAE 94-94: 26 of 57 taxa (46%) and 567 of 738 specimens (77%) were EPTs. DAE 94-94(100): 10 of 16 taxa (62%) and 89 of 104 specimens (86%) were EPTs. Effort = 8 hours; 7.1 taxa per hour; 105 specimens per hour (per hour data includes sample of 100); 12.9 specimens per taxon.

CES 94-19 and DAE 94-94 combined: 39 of 82 total taxa (48%) and 873 of 1211 specimens (72%) were EPTs. CES 94-19(100) and DAE
94-94(100) combined: 16 of 26 taxa (62%) and 149 of 197 specimens (76%) were EPTs.

10-MD-B Mill Dam Branch—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-57 and 94-92, Station 9, MD-B, Mill Dam Branch above and below swimming pool on Golf Creek Road, Kobbly Knob, Sevier County, Tennessee, 15 June and 1 October 1994. Collectors on 15 June DA Etnier, CJ Paxton, CH Heacock, CE Skelton, JT Baxter, FJ Kriegler, 8.5 hours effort. Collectors on 1 October EL Etnier, LD Bonds, KL Harpster, SE McLane, RS Brown, 9 hours 10 minutes effort. Substrate 40% bedrock, 33% boulder and cobble, 25% gravel, 2% sand and silty sand, some moss on boulders. Mean width 8 ft, maximum depth 2.5 ft, canopy 50% below pool, 25% above pool. Zeros in the qualitative data columns indicate taxa that were taken in the sample of 100, but not in the qualitative sample. Det. SJF, ELE, DAE, KLH

Taxon	94-57 15 June	94-57 (100)	94-92 1 Oct	94-92 (100)
Annelida				
Oligochaeta	3	2	10	1
Mollusca				
Pleuroceridae				
Elimia clavaeformis	15	22	10	1
Crustacea				
Decapoda				
Cambarus bartoni	5	1	1	
Cambarus sp. (early instars)			5	
Insecta				
Plecoptera				
Chloroperlidae				
Chloroperlidae sp. (early)			2	
Leuctridae				
Leuctra sp.	21		11	3
Leuctridae sp. (early instars)		6		
Nemouridae				
Amphinemura delosa/nigritta	1			
Amphinemura sp. (early instars)			2	
Peltoperlidae				
Peltoperlidae sp. (early instars)	6		30	1
Perlidae				
Acroneuria abnormis	11		42	6
Eccoptura xanthenes	1	2	1	
Perlesta sp. (early instars)	1			
Perlodidae				
Isoperla holochlora	5			
Malirekus/Yugus (early instars)	1		33	1
Ephemeroptera				
Baetidae				

Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	1			
Acentrella sp. (slender, no bands or distinct fringe on cerci)			7	2
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	5			
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	27		21	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	1			
Baetis sp. (early instars)			5	
Centroptilum sp.	4			
Ephemerellidae				
Ephemerella catawba	3			
Ephemerella sp. (early instars)			1	
Eurylophella minimella			7	
Eurylophella sp. (early instars)	1		1	
Serratella sp. (early instars)			0	1
Ephemeridae				
Ephemera sp.	4		13	
Heptageniidae				
Epeorus dispar (small first gill)	8		6	1
Epeorus rubidus/subpallidus	7		3	
Epeorus sp. (early instars)	1		18	
Heptagenia thetis	3			
Heptagenia sp. (early instars)		1	16	6
Rhithrogena sp. cf. amica	1			
Stenacron carolina	10			
Stenacron sp. (early instars)			6	1
Stenonema pudicum	4			
Stenonema sp. (early instars)			0	12
Leptophlebiidae				
Habrophlebia vibrans	1			
Habrophlebiodes sp.	5			
Paraleptophlebia sp. cf. guttata	6	1		
Paraleptophlebia sp. cf. adoptiva/ mollis	2			
Leptophlebiidae sp. (early instars)			37	11
Oligoneuridae				
Isonychia sp.	8		1	
Odonata				
Aeshnidae				
Boyeria graffiana			1	

Calopterygidae				
Calopteryx maculata/dimidiata			1	
Cordulegastridae				
Cordulegaster maculata	1			
Cordulegaster sp. (early instars)	1			
Gomphidae				
Gomphurus rogersi	1			
Lanthus vernalis	26		7	
Stylogomphus albistylus	11		2	
Heteroptera				
Gerridae				
Gerris remigis	5		2	
Gerris sp. (nymphs)	15		4	
Veliidae				
Rhagovelia obesa			7	
Megaloptera				
Corydalidae				
Nigronia fasciata	1			
Nigronia serricornis	2		2	
Trichoptera				
Brachycentridae				
Micrasema sp. (cases)	1			
Glossosomatidae				
Agapetus minutus (l male pupa)	16			
Glossosoma nigrior (l male pupa)	14	2	30	
Hydropsychidae				
Aphropsyche doringa	1			
Ceratopsyche sparna			2	
Cheumatopsyche sp.	1	1	3	
Diplectrona modesta	29	12	93	22
Parapsyche cardis	1	8		
Hydropsychidae sp. (early instars)			9	
Lepidostomatidae				
Lepidostoma sp.	25	1	1	
Limnephilidae				
Pycnopsyche gentilis	1			
Pycnopsyche guttifer species group	1			
Pycnopsyche luculenta sp. group	3		1	
Odontoceridae				
Psilotreta sp. (early instars)	1			
Philopotamidae				
Dolophilodes distinctus	7	4	67	16
Wormaldia sp.	1			
Polycentropodidae				
Polycentropus sp.	2			
Rhyacophilidae				
Rhyacophila carolina group	1		3	1
Rhyacophila fuscula	3			

Rhyacophila sp. cf. nigrita (black head and pronotum, early)	1		4	
Rhyacophila sp. cf. parantra	1			
Uenoidae				
Neophylax oligius?	1			
Coleoptera				
Carabidae				
Chlaenius sp.?	1			
Dryopidae				
Helichus basalis adults			1	
Elmidae				
Stenelmis sp. adults	1			
Eubriidae				
Ectopria sp.	1	1	3	
Psephenidae				
Psephenus herricki	7	11	16	
Ptilodactylidae				
Anchytarsus bicolor			1	
Diptera				
Blephariceridae sp.	2		1	
Ceratopogonidae				
"Palpomyia" sp.			7	
Chironomidae				
Chironominae				
Chironomini				
Microtendipes sp.	1		2	
Polypedilum convictum			6	
Chironomini sp.		4		
Tanytarsini				
Rheotanytarsus sp.			2	
Tanytarsini sp.	2		1	
Orthocladiinae				
Corynoneura sp.			2	
Epoicocladius sp.	1		5	
Eukiefferiella brevicalcar group			1	
E. claripennis group	1		1	
Parachaetocladius sp.			1	
Parametriocnemus sp.	7		1	
Thienemanniella sp.			6	
Tvetenia bavarica group	1		8	
Orthocladiinae sp.		2		7
Tanypodinae				
Labrundinia sp.			1	
Thienemannimyia group	3			
Tanypodinae sp.		3	1	
Chironomidae sp.		1	3	3
Dixidae (Dixa sp.)	1		8	
Dolichopodidae	1			
Empididae			1	

Simuliidae	18	5	27	5
Ptychopteridae				
Bittacomorpha sp.	1			
Tipulidae				
Antocha sp.	0	3		
Dicranota sp.	18			
Hexatoma sp.	11	4	20	3
Limnophila sp.	2			
Pseudolimnophila sp.	6			
Tipula "abdominalis"	3	1	57	
Tipula sp. (Fig. 11.3)	1		1	
Tipulidae sp. (pupae)	1			

DAE 94-57: 47 of 79 taxa (59%) and 260 of 437 specimens (59%) were EPTs. DAE 94-57(100): 10 of 22 taxa (45%) and 38 of 98 specimens (39%) were EPTs. Effort = 9.4 hours; 8.5 taxa per hour; 64 specimens per hour (per hour data includes sample of 100, with one taxon added from that sample); 5.5 specimens per taxon.

DAE 94-92: 28 of 63 taxa (44%) and 476 of 726 specimens (66%) were EPTs. DAE 94-92(100): 14 of 19 taxa (74%) and 84 of 104 specimens (81%) were EPTs. Effort = 9 1/6 hours; 7.1 taxa per hour; 91 specimens per hour (per hour data includes sample of 100; with 2 taxa added from that sample); 11.5 specimens per taxon.

DAE 94-57 and DAE 94-92 combined: 51 of 100 taxa (60%) and 736 of 1163 specimens (63%) were EPTs. DAE 94-57(100) and DAE 94-92(100) combined: 19 of 31 taxa (61%) and 122 of 202 specimens (60%) were EPTs. Effort = 17 2/3 hours; 4.8 taxa per hour; 77 specimens per hour (per hour data includes samples of 100).

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-92, Station 9, MD-B, Mill Dam Branch, fishes, 1 October 1994. We electrofished upstream for 35 minutes, completing a reach of 125 m, with an effort equivalent to that of the first pass of a three-pass depletion study. The reach extended 68 m above and 57 m below the swimming pool. Collectors RB Evans and CJ Paxton. Released fishes (in parentheses in the table) were identified by the collectors.

Cat. #	Taxon	No. (mm SL)
44.6223	Rhinichthys atratulus (33)	22 (17-60)

MD-B Mill Dam Branch—Stream Biologcial Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-57 and 94-92, Station 9, MD-B, Mill Dam Branch above and below swimming pool on Golf Creek Road, Kobbly Knob, Sevier County, Tennessee, 15 June and 1 October 1994. Collectors on 15 June DA Etnier, CJ Paxton, CH Heacock, CE Skelton, JT Baxter, FJ Kriegler, 8.5 hours effort. Collectors on 1 October EL Etnier, LD Bonds, KL Harpster, SE McLane, RS Brown, 9 hours 10 minutes effort. Substrate 40% bedrock, 33% boulder and cobble, 25% gravel, 2% sand and silty sand, some moss on boulders. Mean width 8 ft, maximum depth 2.5 ft, canopy 50% below pool, 25% above pool. Zeros in the qualitative data columns indicate taxa that were taken in the sample of 100, but not in the qualitative sample. Det. SJF, ELE, DAE, KLH

Taxon	94-57 15 June	94-57 (100)	94-92 1 Oct	94-92 (100)
Annelida				
Oligochaeta	3	2	10	1
Mollusca				
Pleuroceridae				
Elimia clavaeformis	15	22	10	1
Crustacea				
Decapoda				
Cambarus bartoni	5	1	1	
Cambarus sp. (early instars)			5	
Insecta				
Plecoptera				
Chloroperlidae				
Chloroperlidae sp. (early)			2	
Leuctridae				
Leuctra sp.	21		11	3
Leuctridae sp. (early instars)		6		
Nemouridae				
Amphinemura delosa/nigritta	1			
Amphinemura sp. (early instars)			2	
Peltoperlidae				
Peltoperlidae sp. (early instars)	6		30	1
Perlidae				
Acroneuria abnormis	11		42	6
Eccoptura xanthenes	1	2	1	
Perlesta sp. (early instars)	1			
Perlodidae				
Isoperla holochlora	5			
Malirekus/Yugus (early instars)	1		33	1
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or				

conspicuous fringe on cerci)	1			
Acentrella sp. (slender, no bands or distinct fringe on cerci)			7	2
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	5			
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	27		21	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	1			
Baetis sp. (early instars)			5	
Centroptilum sp.	4			
Ephemerellidae				
Ephemerella catawba	3			
Ephemerella sp. (early instars)			1	
Eurylophella minimella			7	
Eurylophella sp. (early instars)	1		1	
Serratella sp. (early instars)			0	1
Ephemeridae				
Ephemera sp.	4		13	
Heptageniidae				
Epeorus dispar (small first gill)	8		6	1
Epeorus rubidus/subpallidus	7		3	
Epeorus sp. (early instars)	1		18	
Heptagenia thetis	3			
Heptagenia sp. (early instars)		1	16	6
Rhithrogena sp. cf. amica	1			
Stenacron carolina	10			
Stenacron sp. (early instars)			6	1
Stenonema pudicum	4			
Stenonema sp. (early instars)			0	12
Leptophlebiidae				
Habrophlebia vibrans	1			
Habrophlebiodes sp.	5			
Paraleptophlebia sp. cf. guttata	6	1		
Paraleptophlebia sp. cf. adoptiva/ mollis	2			
Leptophlebiidae sp. (early instars)			37	11
Oligoneuridae				
Isonychia sp.	8		1	
Odonata				
Aeshnidae				
Boyeria graffiana			1	
Calopterygidae				
Calopteryx maculata/dimidiata			1	
Cordulegastridae				
Cordulegaster maculata	1			

Cordulegaster sp. (early instars)	1			
Gomphidae				
Gomphurus rogersi	1			
Lanthus vernalis	26		7	
Stylogomphus albistylus	11		2	
Heteroptera				
Gerridae				
Gerris remigis	5		2	
Gerris sp. (nymphs)	15		4	
Veliidae				
Rhagovelia obesa			7	
Megaloptera				
Corydalidae				
Nigronia fasciata	1			
Nigronia serricornis	2		2	
Trichoptera				
Brachycentridae				
Micrasema sp. (cases)	1			
Glossosomatidae				
Agapetus minutus (1 male pupa)	16			
Glossosoma nigrior (1 male pupa)	14	2	30	
Hydropsychidae				
Aphropsyche doringa	1			
Ceratopsyche sparna			2	
Cheumatopsyche sp.	1	1	3	
Diplectrona modesta	29	12	93	22
Parapsyche cardis	1	8		
Hydropsychidae sp. (early instars)			9	
Lepidostomatidae				
Lepidostoma sp.	25	1	1	
Limnephilidae				
Pycnopsyche gentilis	1			
Pycnopsyche guttifer species group	1			
Pycnopsyche luculenta sp. group	3		1	
Odontoceridae				
Psilotreta sp. (early instars)	1			
Philopotamidae				
Dolophilodes distinctus	7	4	67	16
Wormaldia sp.	1			
Polycentropodidae				
Polycentropus sp.	2			
Rhyacophilidae				
Rhyacophila carolina group	1		3	1
Rhyacophila fuscula	3			
Rhyacophila sp. cf. nigrita (black head and pronotum, early)	1		4	
Rhyacophila sp. cf. parantra	1			
Uenoidae				
Neophylax oligius?	1			

Coleoptera				
Carabidae				
Chlaenius sp.?	1			
Dryopidae				
Helichus basalis adults			1	
Elmidae				
Stenelmis sp. adults	1			
Eubriidae				
Ectopria sp.	1	1	3	
Psephenidae				
Psephenus herricki	7	11	16	
Ptilodactylidae				
Anchytarsus bicolor			1	
Diptera				
Blephariceridae sp.	2		1	
Ceratopogonidae				
"Palpomyia" sp.			7	
Chironomidae				
Chironominae				
Chironomini				
Microtendipes sp.	1		2	
Polypedilum convictum			6	
Chironomini sp.		4		
Tanytarsini				
Rheotanytarsus sp.			2	
Tanytarsini sp.	2		1	
Orthocladiinae				
Corynoneura sp.			2	
Epoicocladius sp.	1		5	
Eukiefferiella brevicalcar group			1	
E. claripennis group	1		1	
Parachaetocladius sp.			1	
Parametriocnemus sp.	7		1	
Thienemanniella sp.			6	
Tvetenia bavarica group	1		8	
Orthocladiinae sp.		2		7
Tanypodinae				
Labrundinia sp.			1	
Thienemannimyia group	3			
Tanypodinae sp.		3	1	
Chironomidae sp.		1	3	3
Dixidae (Dixa sp.)	1		8	
Dolichopodidae	1			
Empididae			1	
Simuliidae	18	5	27	5
Ptychopteridae				
Bittacomorpha sp.	1			

Tipulidae				
Antocha sp.	0	3		
Dicranota sp.	18			
Hexatoma sp.	11	4	20	3
Limnophila sp.	2			
Pseudolimnophila sp.	6			
Tipula "abdominalis"	3	1	57	
Tipula sp. (Fig. 11.3)	1		1	
Tipulidae sp. (pupae)	1			

DAE 94-57: 47 of 79 taxa (59%) and 260 of 437 specimens (59%) were EPTs. DAE 94-57(100): 10 of 22 taxa (45%) and 38 of 98 specimens (39%) were EPTs. Effort = 9.4 hours; 8.5 taxa per hour; 64 specimens per hour (per hour data includes sample of 100, with one taxon added from that sample); 5.5 specimens per taxon.

DAE 94-92: 28 of 63 taxa (44%) and 476 of 726 specimens (66%) were EPTs. DAE 94-92(100): 14 of 19 taxa (74%) and 84 of 104 specimens (81%) were EPTs. Effort = 9 1/6 hours; 7.1 taxa per hour; 91 specimens per hour (per hour data includes sample of 100; with 2 taxa added from that sample); 11.5 specimens per taxon.

DAE 94-57 and DAE 94-92 combined: 51 of 100 taxa (60%) and 736 of 1163 specimens (63%) were EPTs. DAE 94-57(100) and DAE 94-92(100) combined: 19 of 31 taxa (61%) and 122 of 202 specimens (60%) were EPTs. Effort = 17 2/3 hours; 4.8 taxa per hour; 77 specimens per hour (per hour data includes samples of 100).

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-92, Station 9, MD-B, Mill Dam Branch, fishes, 1 October 1994. We electrofished upstream for 35 minutes, completing a reach of 125 m, with an effort equivalent to that of the first pass of a three-pass depletion study. The reach extended 68 m above and 57 m below the swimming pool. Collectors RB Evans and CJ Paxton. Released fishes (in parentheses in the table) were identified by the collectors.

Cat. #	Taxon	No. (mm SL)
44.6223	Rhinichthys atratulus (33)	22 (17-60)

11-WR-B WARDEN BRANCH—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-56 and DAE 94-91, Station 10, WR-B, Warden Branch, from near mouth in Webb Creek upstream about 150 m to open pool area, Sevier County, Tennessee, 15 June and 1 October 1994. Collectors 15 June DA Etnier, CJ Paxton, CH Heacock, CE Skelton, JT Baxter, FJ Kriegler, 8.5 hrs effort. Collectors on 1 October EL Etnier, SJ Fraley, JT Baxter, CE Skelton, SE McLain, 8.5 hours effort. Substrate 50% bedrock, 30% boulder and cobble, 15% gravel, 5% sand and silty sand, with fine substrates restricted to upper pool area. Width 4-20 ft, mean width 7 ft, maximum depth to 1.5 ft, canopy 90%. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichopteran taxa preceded with an asterisk have been catalogued at UT. Det. DAE, SJF.

Taxon	94-56 15 Jun	94-56 (100)	94-91 1 Oct	94-91 (100)
Annelida				
Oligochaeta	9	3	7	4
Mollusca				
Pleuroceridae				
Elimia clavaeformis	10	9	12	3
Arachnida				
Hydracarina sp.			1	1
Crustacea				
Decapoda				
Cambarus bartoni			3	
Cambarus longirostris		1	1	2
Cambarus sp. (early instars)	2			
Insecta				
Plecoptera				
Chloroperlidae				
Sweltsa sp.			4	
Chloroperlidae sp. (not Sweltsa)			1	
Leuctridae				
Leuctra sp.	20		3	2
Nemouridae				
Amphinemura delosa/nigritta	2			
Amphinemura sp. (early instars)			5	
Peltoperlidae				
Peltoperlidae sp. (early instars)	18	1	26	
Perlidae				
Acroneuria abnormis	31	10	64	12
Eccoptura xanthenes	3		3	
Perlesta sp.	4	2		
Perlidae sp. (early instars)	3	3		

Perlodidae				
Isoperla holochlora	7			
Malirekus hastatus			14	
Malirekus/Yugus (early instars)	3			
Pteronarcyidae				
Allonarcys sp.	2		2	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	1	3		
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	2	2	2	
Acentrella sp. (early instars)	1	1		
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	1		0	1
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	18	3	23	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)			1	
Centroptilum sp.	2			
Baetidae sp. (early instars)	10		12	
Ephemerellidae				
Ephemerella catawba	1			
Eurylophella sp. (early instars)	1		0	1
Ephemerellidae sp. (not Eury.)			2	
Ephemeridae				
Ephemera sp.	13		23	7
Heptageniidae				
Epeorus dispar	6		7	
Epeorus rubidus/subpallidus	6	1	4	
Epeorus sp. (early instars)			20	2
Heptagenia aphrodite	1			
Heptagenia juno	1			
Heptagenia thetis	36	10		
Heptagenia sp. (early instars)			14	3
Stenacron pallidum	1			
Stenacron sp. (early instars)			4	
Stenonema carlsoni			3	
Stenonema pudicum	30	5	42	11
Stenonema sp. (early instars)			62	6
Leptophlebiidae				
Habrophlebia vibrans	1			
Habrophlebiodes sp.	3			

Paraleptophlebia sp. cf. guttata	8			
Paraleptophlebia adoptiva/mollis	1			
Leptophlebiidae sp. (early)	1		37	
Oligoneuridae				
Isonychia sp.	6	3	1	
Odonata				
Aeshnidae				
Boyeria graffiana			1	
Calopterygidae				
Calopteryx sp. (early instars)			1	
Cordulegastridae				
Cordulegaster erronea	5			
Cordulegaster sp. (early instars)	5	1	0	1
Gomphidae				
Gomphurus rogersi	1			
Lanthus vernalis	9	5	3	
Stylogomphus albistylus	13	4	5	1
Heteroptera				
Gerridae				
Gerris remigis			3	
Gerris sp. (nymphs)	21		1	
Veliidae				
Mesovelia sp.			1	
Rhagovelia obesa	2		5	
Megaloptera				
Corydalidae				
Nigronia serricornis	1	1	1	
Trichoptera				
Glossosomatidae				
Agapetus minutus (2 male pupae)	4	1		
Glossosoma nigrior (1 male pupa)	11		25	
Hydropsychidae				
Ceratopsyche macleodi			4	
Ceratopsyche sparna			2	
Cheumatopsyche sp.	3			
Diplectrona modesta	39	14	139	15
Hydropsyche betteni/depravata			1	
Parapsyche cardis	7		6	
Lepidostomatidae				
Lepidostoma sp.	12	1		
Limnephilidae				
Goera sp.			1	
Pycnopsyche gentilis	1			
Pycnopsyche guttifer group	4			
Pycnopsyche luculenta group	4			
Philopotamidae				
Dolophilodes distinctus	21		40	
Wormaldia sp.	2		1	2
Polycentropodidae				
Polycentropus sp.	1		0	1

Rhyacophilidae				
Rhyacophila carolina group	4		3	
Rhyacophila fuscula			3	
Rhyacophila sp. cf. nigrita			8	
Rhyacophila sp. (early instars)			2	
Uenoidae				
Neophylax consimilis	2			
*Neophylax mitchelli	1		2	
Coleoptera				
Carabidae sp.			1	
Elmidae				
Optioservus sp. larvae	1		1	
Oulimnius latiusculus adults	0	1	1	1
Promoresia tardella adults			3	
Stenelmis sp. adults	2		1	
Eubriidae				
Ectopria sp.	3		8	
Hydrophilidae				
Cymbiodyta sp.?	1			
Psephenidae				
Psephenus herricki	4		12	
Diptera				
Athericidae (Atherix sp.)			1	
Ceratopogonidae				
"Palpomyia" sp.	1	1	31	11
Chironomidae				
Chironominae				
Chironomini				
Cryptochironomus sp.	1			
Microtendipes sp.	10		3	
Polypedilum convictum	4		5	
Polypedilum illinoense	3			
Chironomini sp.		3		4
Tanytarsini				
Tanytarsus sp.	2		2	
Tanytarsini sp.		3		2
Orthocladiinae				
Cardiocladius sp.?	1			
Corynoneura sp.	2		4	
Epoicocladius sp.	3		2	
Eukiefferiella brehmi group			1	
E. brevicalcar group			25	
Heleniella sp.			1	
Parachaetocladius sp.	1		10	
Parametriocnemus sp.	10		13	
Smittia sp.	1			
Thienemanniella sp.	2		2	
Tvetenia bavarica group	4		14	
Orthocladiinae sp.		3		4

Prodiamesinae				
Odontomesa sp.	1			
Tanypodinae				
Thienemannimyia group	2			
Tanypodinae sp.			1	1
Chironomidae sp		6	3	1
Dixidae (Dixa sp.)	8		4	
Dolichopodidae sp.	2			
Simuliidae sp.	9		19	
Tipulidae				
Dicranota sp.	8		1	
Hexatoma sp.	3	2	17	1
Limnophila sp.? (fuzzy, with 4 long fuzzy anal lobes, Fig. 21.5 in M & C)	1			
Tipula "abdominalis"	6		41	
Tipulidae sp. (Triogoma-like)	1			

DAE 94-56: 44 of 83 taxa (53%) and 360 of 536 specimens (67%) were EPTs. DAE 94-56(100): 13 of 25 taxa (52%) and 60 of 103 specimens (58%) were EPTs. Effort = 8.5 hours; 9.9 taxa per hour; 75 specimens per hour(per hour data includes sample of 100, with one new taxon added from that sample; 6.5 specimens per taxon.

DAE 94-91: 35 of 75 taxa (47%) and 616 of 1088 specimens (57%) were EPTs. DAE 94-91(100): 11 of 23 taxa (48%) and 63 of 100 specimens (63%) were EPTs. Effort = 8.5 hours; 9.3 taxa per hour; 140 specimens per hour (per hour data includes sample of 100; 3 non-EPT taxa and 1 EPT taxon from the sample of 100 were not present in the qualitative sample); 14.5 specimens per taxon.

DAE 94-56 and DAE 94-91 combined: 54 of 106 total taxa (51%) and 976 of 1624 specimens (60%) were EPTs. DAE 94-56(100) and DAE 94-91(100) combined: 19 of 33 taxa (58%) and 123 of 203 specimens (61%) were EPTs. No taxa were in the samples of 100 that were not taken in one of the qualitative samples.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-91, Station 10, WR-B, Warden Branch, fishes. We electrofished upstream for 25 minutes, completing a reach of 76 m, with an effort equivalent to that of the first pass of a three-pass depletion study. Collectors RB Evans and CJ Paxton. Released fishes (in parentheses in the table) were identified by the collectors.

Cat. #	Taxon	No. (mm SL)
44.6222	Rhinichthys atratulus (40) +	23 (16-65)
44.6221	Notropis rubricroceus	7 (49-55)

12-BT-B BUTLER BRANCH—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-55 and DAE 94-90, site BT-B, Butler Branch at junction Butler Branch Road and Picadilly Lane, Kobbly Knob, Sevier Co., Tenn., 15 June 1994. We worked a reach extending from ca. 30 yards above Butler Branch Road crossing downstream to ca. 50 yards below Picadilly Lane. Substrate 80% gravel, 15% boulder and cobble, 5% sand and silt. The stream is 3 to 12 ft wide, with average width about 6 ft, and maximum depth 1.5 ft. Canopy about 80% above Picadilly Lane and 50% below Picadilly Lane. Sample of 100 invertebrates taken in reach between Picadilly Lane and Butler Branch Road crossings. *Eurycea bislineata, Desmognathus quadrimaculatus*, and larval fish, probably *Rhinichthys atratulus*, seen on 15 June. Collectors 15 June DA Etnier, CE Skelton, CJ Paxton, CH Heacock, JT Baxter, SJ Fraley, 9.5 hours effort. Abundant invertebrate taxa on 15 June were *Elimia* snails, peltoperlids, *Diplectrona modesta*, and *Leuctra*. Collectors on 1 October DA Etnier, KL Harpster, LD Bonds, RS Brown, 7 hours effort. Abundant invertebrate taxa on 1 October were *Elimia* snails, *Diplectrona modesta*, and *Tipula*. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera taxa preceded with an asterisk have been catalogued at UT.

Taxon	94-55 15 Jun	94-55 (100)	94-90 1 Oct	94-90 (100)
Annelida				
Hirudinea (Erpobdella sp.?)			1	
Oligochaeta	17	3	1	3
Mollusca				
Pleuroceridae				
Elimia clavaeformis	13	1	10	1
Arachnida				
Hydracarina	1			
Crustacea				
Decapoda				
Cambarus bartoni	5			
Cambarus sp. (early instars)			3	
Cambarus longirostris				1
Insecta				
Plecoptera				
Chloroperlidae				
Chloroperlidae sp. (early instars)	1			
Leuctridae				
Leuctra sp.	32		2	
Leuctridae sp. (early instars)	8	1		
Nemouridae				
Amphinemura delosa/nigritta	3			
Peltoperlidae				
Peltoperlidae sp. (early instars)	20	16	4	1
Perlidae				
Acroneuria abnormis	24	2	7	1
Acroneuria sp. (early instars)	2	5	1	

Perlodidae				
Malirekus hastatus			1	1
Malirekus/Yugus sp. (early)	3			
Perlodidae sp. (early instars)		1		
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	2			
Acentrella sp. (slender, no bands or distinct fringe on cerci)	3			
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	6			
Acentrella sp. (early instars)	3			
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	5	1		
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	1		1	
Ephemerellidae				
Eurylophella funeralis			8	2
Eurylophella sp. (early instars)	2			
Ephemeridae				
Ephemera sp.	10		1	
Heptageniidae				
Epeorus dispar (small 1st gill)	5		7	
Epeorus rubidus/subpallidus	1		1	
Epeorus sp. (early instars)			7	
Heptagenia aphrodite	1			
Heptagenia thetis	30	9		
Heptagenia sp. (early instars)	1		1	
Stenacron carolina	35		1	
Stenonema carlsoni			3	1
Stenonema pudicum	31		18	9
Stenonema terminatum	2			
Stenonema sp. (early instars)		1	5	2
Leptophlebiidae				
Paraleptophlebia sp. cf. guttata	26			
Paraleptophlebiidae sp. (early)	2			
Oligoneuridae				
Isonychia sp.	24	7		
Odonata				
Aeshnidae				
Boyeria graffiana	1			
Boyeria vinosa			10	
Boyeria sp. (early instars)	1			

Calopterygidae				
Calopteryx maculata/dimidiata	1		1	
Cordulegastridae				
Cordulegaster erronea	7		3	
Cordulegaster maculata	1			
Cordulegaster sp. (early instars)	8			
Gomphidae				
Gomphurus rogersi	2			
Lanthus vernalis	38	2	17	3
Stylogomphus albistylus	7		5	
Heteroptera				
Gerridae				
Gerris remigis	2		4	
Gerris sp. nymphs	1			
Veliidae				
Mesovelia sp.			2	
Rhagovelia obesa			6	
Megaloptera				
Corydalidae				
Nigronia fasciata	1		2	
Nigronia serricornis	2		2	
Nigronia sp. (early instars)	3			
Trichoptera				
Glossosomatidae				
Agapetus minutus (7 male pupae)	36		1	
Glossosoma nigrior (2 male pupae)	17			
Hydropsychidae				
Diplectrona modesta	53	25	42	46
Parapsyche cardis			1	
Hydropsychidae sp. (early instars)	1	1		
Lepidostomatidae				
Lepidostoma sp.	12	1		
Limnephilidae				
Goera sp. (empty cases)	1			
Pycnopsyche gentilis	4		1	
Pycnopsyche guttifer group	7			
Pycnopsyche luculenta group	2			
Molannidae				
Molanna sp. (early pupa, case)	1		1	
Philopotamidae				
Dolophilodes distinctus	8			
Polycentropodidae				
Polycentropus sp.	2			
Rhyacophilidae				
Rhyacophila sp. cf. carolina	3			
Rhyacophila fuscula	3			
*Rhyacophila glaberrima	1			
Uenoidae				
Neophylax mitchelli (1 male pupa)	3		5	

Coleoptera				
Dryopidae				
Helichus basalis adults			1	
Helichus fastigiatus adults	2			
Elmidae				
Optioservus sp. larvae				1
Oulimnius latiusculus adults	0	1		
Promoresia tardella adults			1	
Stenelmis sp. adults	3	1	3	
Psephenidae				
Psephenus herricki	3		10	1
Diptera				
Ceratopogonidae				
"Palpomyia" sp.			1	2
Chironomidae				
Chironominae				
Chironomini				
Microtendipes sp.	8			
Polypedilum convictum	6		1	
Polypedilum illinoense	2			
Polypedilum scalaenum	1			
Chironomini sp.		1		
Tanytarsini				
Zavrelia sp?	1			
Tanytarsini sp.		1		
Orthocladiinae				
Brillia sp.	1			
Cardiocladius sp.			1	
Corynoneura sp.	3		1	
Epoicocladius sp.	5			
Eukiefferiella claripennis grp.	2			
Limnophyes sp.	1			
Parametriocnemus sp.	13			
Thienemanniella sp.	3			
Tvetenia bavarica group	4			
Orthocladiinae sp.		11		2
Tanypodinae				
Thienemannimyia group	6			
Chironomidae sp.	2	2		
Dixidae (Dixa sp.)	3			
Dolichopodidae sp.	1			
Simuliidae	14	13	22	7
Tipulidae				
Hexatoma sp.	2			
Limnophila sp.	1			
Pseudolimnophila sp.	6			
Tipula "abdominalis"	9	2	10	16
Tipula sp. (Fig. 11.3)	1			

DAE 94-55: 37 of 76 taxa (49%) and 437 of 651 specimens (67%) were EPTs. DAE 94-55(100), 9 of 19 taxa (47%) and 72 of 106 specimens (68%) EPTs. Effort = 9.5 hours; 8.1 taxa per hour; 80 specimens per hour (per hour data includes sample of 100); 8.6 specimens per taxon.

DAE 94-90: 19 of 43 taxa (44%) and 119 of 237 specimens (50%) were EPTs. DAE 94-90(100): 7 of 17 taxa (41%) and 63 of 100 specimens (63%) were EPTs. Effort = 7 hours; 6.1 taxa per hour; 48 specimens per hour (per hour data includes sample of 100); 5.5 specimens per taxon.

DAE 94-55 and DAE 94-90 combined: 39 of 86 total taxa (45%) and 556 of 888 specimens (63%) were EPTs (no taxa added to total taxa from samples of 100). DAE 94-55(100) and DAE 94-90(100) combined: 13 of 27 taxa (48%) and 135 of 206 specimens (66%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-90, site 11, BT-B, Butler Branch at junction Butler Branch Road and Picadilly Lane, Kobbly Knob, Sevier Co., Tenn., 1 October 1994. We electrofished a 68-m reach extending from 14 m below Picadilly Lane to 20 m above Butler Branch Road. Effort was equivalent to the first pass of a three-pass deplection study. Collectors RB Evenas, CJ Paxton, 20 minutes of electrofishing. Released fishes (in panentheses) were identified by the collectors.

Cat. #	Taxon	No. (mm SL)
44.6227	Rhinichthys atratulus (42) +	22 (20-60)

13-MA-B MATTHEW CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-45 and 94-83, Matthew Creek, at old barn 100 m above second Matthew Creek ford on Mathis Road, Station 12, MA-B. The tributary is 4-8 ft wide, with a maximum depth of 6 inches. Much less silty than MAT2-B (24 Sept 1994); 40% gravel, 45% rounded cobbles, 10% boulders, 5% sand, no silt. Average canopy about 80%. Collectors on 7 June 1994 JT Baxter, SJ Fraley, CH Heacock, CJ Paxton, 6 2/3 hours effort. Collectors on 24 September DA Etnier, EL Etnier, SJ Fraley, CE Skelton, RB Evans, CJ Paxton, 8.75 hrs effort. Det. DAE, ELE, JTB.

Taxon	94-45 7 Jun	94-45 (100)	94-83 24 Sep	94-83 (100)
Annelida				
Oligochaeta			3	2
Mollusca				
Pleuroceridae				
Elimia clavaeformis	9		5	
Arachnida				
Hydracarina	0	2		
Crustacea				
Decapoda				
Cambarus bartoni	2		3	
Cambarus longirostris	1		2	1
Insecta				
Plecoptera				
Chloroperlidae				
Haploperla brevis	1			
Chloroperlidae sp. (early instar)			1	
Leuctridae				
Leuctra sp.	36	2	7	1
Leuctridae sp. (early instars)				1
Nemouridae				
Amphinemura wui	1	1		
Amphinemoura delosa/nigritta			1	
Amphinemura sp.	1		3	1
Peltoperlidae				
Peltoperlidae sp. (early instars)	27	20	16	1
Perlidae				
Acroneuria abnormis	14	1	17	1
Eccoptura xanthenes	1		1	
Paragnetina immarginata	1			
Perlesta frisoni?	11	2		
Perlodidae				
Isoperla sp. cf. holochlora	3	1		
Isoperla sp. (early instars)	4			
Malirekus hastatus			23	1

Malirekus/Yugus (early instars)	0	1		
Remenus bilobatus	1	1		
Pteronarcyidae				
Allonarcys sp. (early instar)	1	1	3	
Allonarcys (convex pronotum)			2	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, paired dots on abdomen; abd. segs. 4, 5, 9 pale,6 dark; no band or dist. fringe on cerci)	38	7	10	
Acentrella sp. (slender, fringe and weak band on cerci; segs. 6, 7, & 10 dark; abd. with paired smudges near midline)	15	10	23	2
Acentrella sp. (early instars)	5	2	21	3
Baetis sp. cf. brunneicolor (pale, paired commas on abd; gills with prominant trachea)	0	1	1	1
Baetis sp. cf. intercalaris (large pale areas on abd; segs. 5 and 9 pale; 5 w/ paired dark spots)	40	4	17	5
Baetis sp. (early instars)	2			2
Centroptilum sp.	1		10	
Baetiscidae				
Baetisca carolina			1	
Baetisca sp. (early instar)				1
Ephemeridae				
Ephemera sp.	3		3	
Ephemerellidae				
Drunella longicornis	1			
Ephemerella dorothea/argo	53	5		
Ephemerella invaria	0	1		
Ephemerella rossi	1			
Eurylophella funeralis			2	
Eurylophella sp. (early instars)			11	2
Serratella deficiens	1			
Heptageniidae				
Epeorus rubidus/subpallidus	5		2	
Epeorus dispar (small 1st gill)	4		7	
Epeorus sp. (early instars)	1		3	
Heptagenia aphrodite			1	
Heptagenia juno			2	
Heptagenia sp. (early instars)	3			
Stenonema carlsoni	10		4	
Stenonema pudicum	14	3	67	2
Stenonema sp. (early instars)	17		32	6

Leptophlebiidae				
Habrophlebiodes sp.	23	1		
Paraleptophlebia adoptiva/mollis	1			
Oligoneuridae				
Isonychia sp.	18	1	4	
Odonata				
Aeshnidae				
Boyeria vinosa			3	
Calopterygidae				
Calopteryx maculata/dimidiata			1	
Cordulegastridae				
Cordulegaster erronea	5		1	
Gomphidae				
Lanthus vernalis	34		23	1
Stylogomphus albistylus	1		3	
Heteroptera				
Corixidae				
Sigara sp.			2	
Gerridae				
Gerris remigis			4	
Gerris sp. (nymphs)	1			
Veliidae				
Rhagovelia obesa			3	
Megaloptera				
Corydalidae				
Nigronia serricornis	1			
Trichoptera				
Glossosomatidae				
Agapetus minutus (3 male pupae)	8			
Glossosoma sp.	29		2	1
Hydropsychidae				
Ceratopsyche sparna			1	
Cheumatopsyche sp.			2	
Diplectrona modesta	46	5	19	9
Parapsyche cardis			3	
Lepidostomatidae				
Lepidostoma sp. (cases)	0	1	1	
Limnephilidae				
Pycnopsyche gentilis group (cases)			1	
Pycnopsyche luculenta group	2		1	
Odontoceridae				
Psilotreta frontalis			2	
Psilotreta sp. (early instars)	2			
Philopotamidae				
Chimarra sp.			1	
Dolophilodes distinctus	38	2	21	6
Rhyacophilidae				
Rhyacophila carolina	1			
Rhyacophila fuscula	3		2	1

Uenoidae				
Neophylax mitchelli	1			
Neophylax sp. (cases)			1	
Coleoptera				
Carabidae				
Chlaenius sp. (?)			1	
Elmidae				
Optioservus sp. larvae	1		1	
Oulimnius latiusculus (adults)	1			1
Oulimnius latiusculus (larvae)			3	
Promoresia tardella (adults)	1		21	2
Stenelmis sp. (adults)	9	2	4	1
Elmidae sp. (larvae, early)			2	
Eubriidae				
Ectopria sp.	1		1	
Psephenidae				
Psephenus herricki	6		19	2
Diptera				
Athericidae (Atherix sp.)			2	
Blephariceridae	2		1	
Ceratopogonidae				
Atrichopogon sp.	1		1	
"Palpomyia" sp.	1		17	1
Chironomidae	42		104	24
Chironominae				
Chironomini				
Microtendipes sp.			3	
Polypedilum convictum	1		4	
Polypedilum fallax group			1	
Chironomini sp.				3
Tanytarsini				
Cladotanytarsus sp.	1			
Tanytarsus sp.	1		1	
Diamesinae				
Diamesa sp.	1			
Orthocladiinae				
Brillia sp.	2			
Corynoneura sp.	3		3	
Cricotopus/Orthocladius sp.	3			
Epoicocladius sp.			1	
Eukiefferiella brehmi group?	1			
E. brevicalcar group	3		14	
E. claripennis group	1		2	
E. gracei group?			2	
E. pseudomontana group	3			
Heleniella sp.			3	
Limnophyes sp.	1		1	
Parachaetocladius sp.			1	
Parametriocnemus sp.	5		27	
Smittia sp.	1			

Symposiocladius lignicola			1	
Synorthocladius semivirens			1	
Thienemanniella sp.	8		17	
Tvetenia bavarica group	1		12	
Orthocladiinae sp.	1	17		21
Tanypodinae				
Nilotanypus sp.	2			
Thienemannimyia group	1		1	
Chironomidae sp.	2		4	
Dixidae (Dixa sp.)	3		3	
Empididae sp.	1		1	
Simuliidae sp.	13	12	17	16
Tipulidae				
Dicranota sp.	12	2		
Hexatoma sp.		2	15	1
Limnophila sp. (4 fuzzy anal lobes, Fig. 21.5 in M & C)	13		2	
Tipula sp. "abdominalis")	8		17	6

DAE 94-45: 38 of 82 taxa (46%) and 488 of 662 specimens (74%) were EPTs. DAE 94-45(100): 21 of 27 taxa (78%) and 73 of 110 specimens (66%) were EPTs. Effort = 6 2/3 hours; 13.0 taxa per hour; 116 specimens per hour (per hour data includes sample of 100, with 4 EPT taxa and one non-EPT taxon added that were absent from the qualitative sample); 6.0 specimens oer taxon.

DAE 94-83: 35 of 83 taxa (42%) and 352 of 632 specimens (56%) were EPTs. DAE 94-83(100): 15 of 29 taxa (52%) and 47 of 105 specimens (45%) were EPTs. Effort = 8.75; 9.5 taxa per hour; 84 specimens per hour (per hour data includes sample of 100, which produced no new taxa); 7.6 specimens per taxon.

DAE 94-45 and DAE 94-83 combined: 60 of 109 total taxa (55%) and 840 of 1294 specimens (65%) were EPTs (one EPT and one non-EPT taxon from the samples of 100 that were not present in either qualitative sample are included in total taxa). DAE 94-45(100) and DAE 94-83(100): 27 of 43 taxa (63%) and 120 of 215 specimens (56%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-83, Station 12, MA-B, fishes. Matthew Creek at old barn 100 m above 2nd ford over Matthew Creek on Mathis Road, Sevier County, Tennessee, 24 September 1994. The area sampled extends from the opposite the lower end of the barn upstream 100 meters.
Because of the damaged shocker, fishes were colected with a 10-ft long by 6-ft deep seine, collectors CE Skelton, RB Evans, CJ Paxton. Effort 30 minutes, or 1.5 man-hours. Released fishes identified by CE Skelton. Width 4–8 ft, mean width 6 ft, maximum depth 0.5 ft in this reach. Substrate 40% gravel, 45% rounded cobbles, 10% boulders, 5% sand, no silty sand substrates present. Canopy about 80%, with a few small clearings. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6208	Rhinichthys atratulus (34)	27 (23-60)

44.6209	Semotilus atromaculatus	1 (80)
129.477	Cottus bairdi	6 (50-66)
91.4521	Etheostoma flabellare	3 (22-56)

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-44 and DAE 94-84, Matthew Creek tributary, Station 13, MAT1-B, located upstream of second ford on Mathis Road, about 1 3/4 mile from the intersection of Mathis Road with Rocky Flats Road, at an abandoned house 100 yards up trail along Matthew Creek, Sevier Co., Tenn., 7 June and 24 Sept. 1994. Substrate 60% broken cobble-sized slabrock, 30% gravel, 5% bedrock, 5% sand. The canopy is about 5% in the deforested area, and 100% above the deforested area. The tributary is intermittent, disappearing underground at tree line and reappearing about 15 m above its confluence with Matthew Creek. Width is 1-4 ft, and maximum depth about 5 inches. Sample of 100 taken 15 m above tree line. No fish noticed. *Desmognathus quadrimaculatus* and *D. ochrophaeus* present. Collectors on 7 June JT Baxter, CJ Paxton, CH Heacock, SJ Fraley, 6 2/3 hours of effort. Collectors on 24 Sept. DA & EL Etnier, SJ Fraley, CE Skelton, RB Evans, CJ Paxton, 6 hours effort. On 24 Sept. *Diplectrona*, heptageniids, *Elimia,* peltoperlids, and *Lanthus* were very abundant. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera taxa preceded with an asterisk have been catologued in the UT collection.

Taxon	94-44 7 Jun	94-44 (100)	94-84 24 Sep	94-84 (100)
Annelida				
Oligochaeta	13	7	7	1
Mollusca				
Gastropoda				
Pleuroceridae				
Elimia clavaeformis	13	1	11	
Arachnida				
Hydracarina	0	1		
Crustacea				
Decapoda				
Cambarus bartoni	3		5	3
Insecta				
Plecoptera				
Chloroperlidae				
Sweltsa sp.	2	1	1	2
Leuctridae				
Leuctra sp.	1	4	19	5
Leuctridae sp. (early instars)	25	4		
Nemouridae				
Amphinemura delosa/nigritta	1			
Amphinemura sp. (early instars)			0	1
Peltoperlidae				
Peltoperlidae sp. (early instars)	27		8	1
Perlidae				
Acroneuria abnormis	21	1	22	3

Eccoptura xanthenes	1			
Perlidae sp. (early instars)	1		5	
Perlodidae				
Clioperla/Isoperla (early instars)			2	1
Malirekus hastatus			8	
Malirekus/Yugus sp. (early)	8	1		
Ephemeroptera				
Baetidae				
Acentrella sp. (early instars)		2		
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	0	1	3	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)			1	
Baetidae sp. (early instars)	7		3	
Ephemeridae				
Ephemera sp.	4		3	
Heptageniidae				
Epeorus dispar	1		10	
Epeorus sp. (early instars)	6		1	
Heptagenia juno			1	
Heptagenia thetis	49	9	8	
Heptagenia sp. (early instars)		3		9
Stenacron carolina			1	
Stenonema carlsoni	10	1	43	
Stenonema pudicum			1	
Stenonema sp. (early instars)				7
Leptophlebiidae				
Habrophlebia vibrans			1	
Habrophlebiodes sp.	30	20	4	
Paraleptophlebia adoptiva/mollis	36	28		
Paraleptophlebia guttata	5	3	2	
Leptophlebiidae sp. (early)			3	1
Oligoneuridae				
Isonychia sp.	9	3	1	
Odonata				
Aeshnidae				
Boyeria vinosa			1	
Cordulegastridae				
Cordulegaster sp. (early instars)	0	3	2	
Gomphidae				
Lanthus vernalis	9	1	9	
Heteroptera				
Gerridae				
Gerris sp. (nymphs)	1			
Veliidae				
Rhagovelia obesa			4	
Trichoptera				
Glossosomatidae				

Agapetus minutus (mature pupae and 8 larvae)	31	1		
Glossosoma sp.	6			
Hydropsychidae				
Diplectrona modesta	49	6	57	25
Parapsyche cardis			17	
Hydropsychidae sp. (early, prob. all Diplectrona)				39
Lepidostomatidae				
Lepidostoma sp.	10		1	
Limnephilidae				
Pycnopsyche gentilis group (cases)	1		1	
Molannidae				
Molanna sp. (empty cases)			1	
Odontoceridae				
Psilotreta sp. cf. labida (early)	1			
Psilotreta sp. (empty cases)			1	
Philopotamidae				
Dolophilodes distinctus	1		7	
Wormaldia sp.	18	1	3	
Polycentropodidae				
Polycentropus sp.	0	1	2	
Rhyacophilidae				
Rhyacophila carolina sp. group	1		1	
*Rhyacophila nigrita (1 male pupa)	4			
Rhyacophila sp. cf. nigrita			4	1
Uenoidae				
*Neophylax mitchelli	7		3	
Coleoptera				
Carabidae				
Chlaenius sp.?	1			
Elmidae				
Optioservus ovalis adults			1	
Promoresia tardella adults			1	
Stenelmis sp. adults			1	
Eubriidae				
Ectopria sp.	1		5	
Diptera				
Athericidae (Atherix sp.)			1	
Ceratopogonidae ("Palpomyia" sp.)	1	1	5	
Chironomidae				
Chironominae				
Chironomini				
Microtendipes sp.	3			
Paralauterborniella sp.			4	
Polypedilum convictum	1		2	
Orthocladiinae				
Brillia sp.	2			
Corynoneura sp.	1			
Eukiefferiella brevicalcar grp?			1	

Heleniella sp.			1	
Heterotrissocladius sp.			1	
Parametriocnemus sp.	1		12	
Psectrocladius sp.			2	
Tvetenia bavarica group	1		3	
Orthocladiinae sp.		4		1
Tanypodinae				
Thienemannimyia group			1	
Tanypodinae sp.		1		1
Chironomidae sp.		1	1	
Dixidae (Dixa sp.)	3		2	
Simuliidae	7		7	
Tipulidae				
Hexatoma sp.	3		2	
Hexatoma sp.? (spir. lobes short, semicircular, with heavy fringe of setae, dorsal lobes with a few long setae too, spiracles very prominent)			0	1
Pseudolimnophila sp.?	2			
Tipula "abdominalis"			3	
Tipula sp. (moss inhabitant)			1	

DAE 94-44: 27 of 45 taxa (60%) and 373 of 439 specimens (85%) were EPTs. DAE 94-44(100): 16 of 24 taxa (67%) and 90 of 110 specimens (82%) EPTs. Effort = 6.67 hours; 7.3 taxa per hour; 82 specimens per hour (taxa and specimens per hour include sample of 100 data, with 4 new taxa added from that sample); 9.8 specimens per taxon.

DAE 94-84: 32 of 59 taxa (54%) and 249 of 345 specimens (72%) were EPTs. DAE 94-84(100): 11 of 16 taxa (69%) and 95 of 102 specimens (93%) were EPTs. Effort = 6 hours; 10.2 taxa per hour; 74 specimens per hour (per hour data includes sample of 100, with two new taxa added from that sample); 5.8 specimens per taxon.

DAE 94-44 and DAE 94-84 combined: 37 of 73 total taxa (51%) and 622 of 784 specimens (79%) were EPTs (includes 2 non-EPT taxa from samples of (100) that were non in qualitative samples). DAE 94-44(100) and DAE 94-84(100) combined: 20 of 29 taxa (69%) and 185 of 212 specimens (87%) were EPTs.

14-DNW-A DUNN CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-60 and DAE 95-1, site 15, DNW-A, West Branch of Dunn Creek just downstream of U.S. Highway 321, just east of mailbox address 5124, Worley's, Sevier County, Tennessee, 12 June 1994 and 19 February 1995. The creek averages 5-6 feet wide and has a maximum depth of about 8 inches. Substrate is 65% cobbles and boulder, 20% gravel, 10% bedrock, and 5% sand and silt. Aquatic vegetation was absent except for a few small patches of moss. Canopy way about 70% in June, and essentially absent in February. Collectors on 12 June SJ Fraley, DA and EL Etnier, CH Heacock, CE Skelton, JT Baxter, 8 hours effort. Abundant taxa on 12 June included Peltoperlidae, gastropods, *Acentrella*, simuliids, *Diplectrona*. Collectors on 19 February CJ Paxton, MH Hughes, RB Evans, CE Skelton, 7.25 hours. Abundant taxa on 19 February included *Diplectrona, Ephemera*, Heptageniidae, *Tipula*, Leptophlebiidae, Ephemerellidae. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera taxa preceded with an asterisk have been catalogued at UT.

15-MAT2-B MATTHEW CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-43 and DAE 94-82, Matthew Creek tributary 2, Station 14, MAT2-B, located just above ford over Matthew Creek at 4802 Mathis Road, 7 June and 24 September 1994. We worked a reach extending about 100 yards above and below the footbridge at that address. The tributary averages about 5 ft wide, with a maximum depth of 15 inches. Substrate 45% cobble-sized slabrocks, 45% gravel and round cobbles, 5% silty sand, 5% bedrock shelves; canopy 25% above and 50% below footbridge. The section below the footbridge parallels Mathis Road, and appears to have been channelized. Collectors on 7 June JT Baxter, SJ Fraley, CH Heacock, CJ Paxton, 7.2 hours effort. *Diplectrona* abundant. Collectors on 24 September, DA Etnier, EL Etnier, SJ Fraley, CE Skelton, RB Evans, CJ Paxton, 6.5 hours effort. Abundant taxa included peltoperlids, *Diplectrona, Elimia* snails, heptageniids, simuliids, ceratopogonids, *Psephenus*. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Det. DA Etnier, KL Harpster.

Taxon	94-43 7 Jun	94-43 (100)	94-82 24 Sept	94-82 (100)	
Annelida					
Oligochaeta 6		1	6	2	
Mollusca					
Pleuroceridae					
Elimia clavaeformis		11		8	
Crustacea					
Decapoda					
Cambarus bartoni		4		2	
Cambarus longirostris		1		4	
Cambarus sp. (early instar)					1
Insecta					
Plecoptera					
Chloroperlidae					
Sweltsa sp.		1			
Leuctridae					
Leuctra sp.		73	1	14	1
Leuctridae sp., early instars					
Nemouridae					
Amphinemura delosa/nigritta		23	1		
Amphinemura sp. (early instars)				2	
Peltoperlidae					
Peltoperlidae sp. (early instars)		19	2	13	2
Perlidae					
Acroneuria abnormis		2		3	
Eccoptura xanthenes		1		3	
Perlodidae					
Isoperla holochlora		1			
Isoperla sp. (early instars)		1			
Malirekus hastatus				0	1

Remenus bilobatus	1			
Pteronarcyidae				
Allonarcys			1	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	58	3	0	1
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	3	1	4	
Acentrella sp. (early instars)	2	3		
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	15	2		
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	49	6	48	4
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)			1	
Baetidae (early instars)	14		19	
Ephemeridae				
Ephemera sp.	22		24	
Ephemerellidae				
Drunella cornuta (9 mm long)	1			
Drunella longicornis	1			
Ephemerella catawba	1			
Eurylophella funeralis			4	
Heptageniidae				
Epeorus dispar (small 1st gill)	13		12	
Epeorus rubidus/subpalidus	16		31	1
Epeorus sp. (early instars)	6		9	1
Heptagenia aphrodite	6		10	
Heptagenia juno	1			1
Heptagenia thetis	10		15	2
Heptagenia sp. (early instars)		1		
Stenacron carolina	3		1	
Stenonema carlsoni	7		7	1
Stenonema ithaca/modestum	1			
Stenonema pudicum	30	4	101	15
Stenonema sp. (early instars)	31	3	29	10
Leptophlebiidae sp (early instars)			11	
Habrophlebiodes sp.	7	2		
Paraleptophlebia adoptiva/mollis	3			
Paraleptophlebia sp. cf. guttata (max. palp long & slender)	12	1		

Oligoneuridae				
Isonychia sp.	11	1	16	9
Odonata				
Cordulegastridae				
Cordulegaster erronea	4			
Cordulegaster maculata	1			
Cordulegaster sp. (early instars)			1	
Gomphidae				
Gomphurus rogersi	1			
Lanthus vernalis	3		8	
Heteroptera				
Gerridae				
Gerris sp. (nymphs)	5			
Veliidae				
Rhagovelia obesa	3		4	
Megaloptera				
Nigronia fasciata	1		1	
Trichoptera				
Glossosomatidae				
Agapetus sp.	1			
Glossosoma sp.	17	2	6	
Hydropsychidae				
Ceratopsyche macleodi	1		1	
Ceratopsyche sparna			5	1
Cheumatopsyche sp.			18	3
Diplectrona modesta	43	14	104	32
Hydropsychidae sp. (early instars)			2	5
Lepidostomatidae				
Lepidostoma sp. (case)			1	
Limnephilidae				
Pycnopsyche gentilis	1			
Pycnopsyche guttifer group	1		1	
Pycnopsyche luculenta group	1			
Philopotamidae				
Dolophilodes distinctus	23	2	42	4
Wormaldia sp.			1	
Polycentropodidae				
Polycentropus cinereus male pupa	1			
Polycentropus sp.	1		1	
Rhyacophilidae				
Rhyacophila fuscula	1		1	
Uenoidae				
Neophylax sp. (damaged)	1			
Coleoptera				
Elmidae				
Oulimnius latiusculus adults	3	3	2	
Promeresia elegans			1	
Promeresia tardella adults	1		5	
Stenelmis sp. adults	1			
Elmidae sp. (early instar)				1

Psephenidae				
Psephenus herricki	15	4		2
Ptilodactylidae				
Anchytarsus bicolor			3	
Diptera				
Blephariceridae sp.	7	1	2	1
Ceratopogonidae				
"Palpomyia" sp.			20	1
Chironomidae				
Chironominae				
Chironomimi				
Polypedilum convictum	1		4	
Tanytarsini				
Tanytarsini sp.	0	2		
Diamesinae				
Diamesa sp.	3			
Orthocladiinae				
Epoicocladius sp.			1	
Eukiefferiella brevicalcar grp.			2	
E. claripennis grp	3			
E. devonica group?			1	
Heleniella sp.			3	
Heterotrissocladius sp.?			1	
Metriocnemus sp.?			1	
Parametriocnemus sp.	7		9	
Tvetenia bavarica group	1		2	
Ortholadiinae sp.		5		
Chironomidae sp.	*35	3		
Dixidae (Dixa sp.)	2		14	1
Dolichopodidae			1	
Simuliidae	10	35	11	1
Tipulidae				
Dicranota sp.	3			
Limnophila sp. cf. macrocera (Fig. 22.34 in M & C)	1			
Limnophila sp. (spirac. lobes fuzzy, Fig. 21.5 in M & C)	1			
Tipula "abdominalis"	3	1	2	
Tipula sp. (Fig. 11.3)			2	

*Vial dropped after specimens counted, only 15 salvaged.

DAE 94-43: 40 of 67 taxa (60%) and 537 of 674 specimens (80%) were EPTs. DAE 94-43(100): 15 of 23 taxa (65%) and 49 of 104 specimens (47%) were EPTs. Effort = 7.2 hours; 9.4 taxa per hour; 108 specimens per hour (per hour data includes sample of 100, which produced one new taxon); 10.1 specimens per taxon.

DAE 94-82: 31 of 59 taxa (53%) and 561 of 682 specimens (82%) were EPTs. DAE 94-82(100): 14 of 22 taxa (64%) and 94 of 104 specimens (90%) were EPTs. Effort = 6.5 hours; 9.4 taxa per

hour; 121 specimens per hour (per hour dat includes sample of 100, with 2 EPT taxa present in (100) that were absent from qualitative sample); 11.6 specimens per taxon.

DAE 94-43 and DAE 94-82 combined: 48 of 87 total taxa (55%) and 1098 of 1356 specimens (81%) were EPTs (one taxon added from samples of (100) that was absent from both qualitative samples. DAE 94-43(100) and DAE 94-82(100) combined: 21 of 33 taxa (64%) and 143 of 208 specimens (69%) were EPTS.

Taxon	94-60 12 Jun	94-60 (100)	95-1 19 Feb	95-1 (100)
Annelida				
Oligochaeta 2	2	4	3	
Mollusca				
Pleuroceridae				
Elimia clavaeformis	14	3	10	
Arachnida				
Hydracarina			2	
Crustacea				
Decapoda				
Cambarus bartoni	4		2	
Insecta				
Plecoptera				
Chloroperlidae				
Sweltsa sp.			6	2
Leuctridae				
Leuctra sp.	13		2	
Nemouridae				
Amphinemura wui			9	1
Soyedina sp.			1	
Peltoperlidae				
Peltoperla sp.			9	
Peltoperlidae sp., early instars	16			
Perlidae				
Acroneuria abnormis	1		3	
Acroneuria sp. (early instars)	1			
Eccoptura xanthenes	5	2	16	1
Perlesta frisoni?	1	1		
Perlodidae				
Cultus decisus			1	
Isoperla similis			22	
Isoperla sp. (early instars)			4	
Malirekus hastatus			31	
Malirekus/Yugus sp. (early)	56	10		
Remenus bilobatus	1			
Ephemeroptera				
Baetidae				
Acentrella sp. (slender, no bands or distinct fringe on cerci)	46	38		

Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	57	13	5	2
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	1			
Baetis sp. (early instars)			1	
Ephemeridae				
Ephemera sp.	11		43	
Ephemerelllidae				
Drunella sp.	2			
Ephemerella dorothea			26	9
Ephemerella invaria			1	
Eurylophella funeralis			12	
Heptageniidae				
Epeorus dispar (small 1st gill)	7		11	2
Epeorus sp. cf. pleuralis			11	7
Epeorus sp. (early instars)			3	8
Heptagenia thetis			9	
Heptagenia sp. (early instars)	1			
Stenacron carolina	1			
Stenacron sp. (early instars)			1	
Stenonema carlsoni	10	7	77	5
Stenonema pudicum			12	
Leptophlebiidae				
Habrophlebiodes sp.	9	2		
Paraleptophlebia adoptiva/mollis	5		25	12
Paraleptophlebia sp. cf. guttata	1			
Oligoneuridae				
Isonychia sp.	30			
Siphloneuridae				
Ameletus cryptostimulus			4	
Odonata				
Aeshnidae				
Boyeria graffiana			1	
Boyeria vinosa			4	
Calopterygidae				
Calopteryx maculata/dimidiata			3	
Cordulegastridae				
Cordulegaster erronea	9		8	
Gomphidae				
Lanthus vernalis	24		14	1
Heteroptera				
Gerridae				
Gerris remigis			1	
Gerris sp. nymphs	7			
Veliidae				
Rhagovelia obesa	6	2		
Megaloptera				
Corydalidae				

Nigronia fasciata			2	
Nigronia serricornis	2			
Sialidae				
Sialis sp.			1	
Trichoptera				
Glossosomatidae				
*Agapetus minutus (21 pupae)	29			
Glossosoma nigrior (many male pupae)	22	2	6	
Hydropsychidae				
Ceratopsyche macleodi	10			
Ceratopsyche sp. (early instars)	6			
Cheumatopsyche sp.	1			
Diplectrona modesta	81	2	25	43
Hydropsychidae sp. (early instars)	2			
Lepidostomatidae				
Lepidostoma sp.	5			
Limnephilidae				
Goera fuscula			3	
Pycnopsyche gentilis	1		7	2
Pycbnopsyche guttifer group	1		9	
Pycnopsyche luculenta group	2		6	
Molannidae				
Molanna blenda	1		2	
Philopotamidae				
Dolophilodes distinctus (1 pupa)	4	1	1	
Wormaldia sp.			0	1
Polycentropodidae				
Polycentropus sp.			1	
Odontoceridae				
Psilotreta labida	3		13	1
Rhyacophilidae				
Rhyacophila carolina group	6			
Rhyacophila nigrita group			2	1
Uenoidae				
Neophylax consimilis			2	
Neophylax mitchelli	5			
Coleoptera				
Elmidae				
Optioservus ovalis adults	1	1		
Oulimnius latiusculus adults	1			
Stenelmis sp. adults	9			
Eubriidae				
Ectopria sp.			1	
Diptera				
Athericicae (Atherix sp.)	2	1	3	
Ceratopogonidae ("Palpomyia" sp.			2	
Chironomidae				
Chironominae				
Chironomini	0	1		

Diamesinae				
Diamesa sp.	10		2	
Orthocladiinae				
Brillia sp.			1	
Corynoneura sp.			1	
Epoicocladius sp.			14	
Eukiefferiella brevicalcar group			4	
Heterotrissocladius sp.			4	
Parametriocnemus sp.	1		4	
Synorthocladius semivirens			1	
Thienemanniella sp.			3	
Tvetenia bavarica group	3		1	
Orthocladiinae sp.		1		7
Tanypodinae				
Thienemannimyia group	10		1	
Dixidae (Dixa sp.)	6	1	5	
Simuliidae	21	3	0	1
Tipulidae				
Dicranota sp.	2		5	1
Erioptera sp. (cf. Fig. 11.10)			1	
Hexatoma sp.	10		5	2
Limnophila sp. (cf. Fig. 21.5)	1		3	
Limnophila sp. cf. macrocera			1	
Tipula "abdominalis"	6		7	3

DAE 94-60: 34 of 57 taxa (60%) and 454 of 635 specimens (71%) were EPTs. DAE 94-60(100): 10 of 19 taxa (53%) and 79 of 96 specimens (82%) were EPTs. Effort = 8 hours; 7.2 taxa per hour; 91 specimens per hour (per hour figures include sample of 100 data, with one non-EPT taxon added from that sample); 11.1 specimens per taxon.

DAE 95-1: 35 of 69 taxa (51%) and 422 of 535 specimens (79%) were EPTs. DAE 95-1(100): 14 of 21 taxa (67%) and 97 of 116 specimens (84%) were EPTs. Effort = 7.25 hours; 9.8 taxa per hour; 90 specimens per hour (per hour data includes sample of 100, with one EPT and one non-EPT taxon added that were not in qualitative sample); 7.8 specimens per taxon.

DAE 94-60 and DAE 95-1 combined: 51 of 91 total taxa (56%) and 876 of 1170 specimens (75%) were EPTs. DAE 94-60(100) and DAE 95-1(100) combined: 20 of 33 taxa (61%) and 176 of 212 specimens (83%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-82, Station 14, MAT2-B, fishes. Tributary to Matthew Creek at 4802 Mathis Road, Sevier County, Tennessee, 24 September 1994. The area sampled extends 72 meters above and 50 meters below the private footbridge across the creek, but the shocker malfunctioned in the reach below the footbridge, and only the lower 5 meters was sampled, so 77 meters was sampled. Effort 35 minutes, shocking upstream. Collectors RB Evans, CJ Paxton, effort of single-pass electrofishing depletion estimate. Released fishes identified by DA Etnier. Width 4–6 ft, mean width 5 ft, maximum depth 0.5 ft in this reach. Substrate 60% gravel, 30% slabrock cobbles and boulders, 5% bedrock shelves, 5% sand and silty sand. Canopy 70% above and 50% below

driveway. Numbers in parentheses indicate specimens released. The stream has an unusually high silt load, perhaps resulting from the driveway at 4802 Mathis Road, and activities on that property.

Cat. #	Taxon	No. (mm SL)
44.6207	Rhinichthys atratulus (7)	21 (20-63)
129.476	Cottus bairdi	3 (63-68)
91.4521	Etheostoma flabellare	5 (55-67)

16-DN-A DUNN CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-40 and DAE 95-2, East Branch of Dunn Creek, site # 16, DNE-A, at Rocky Flats Road, Sevier Co., Tenn., 6 June 1994 and 19 February 1995. Substrate 60% boulder, 20% cobble, 10% gravel, 10% sand; canopy complete except at and above bridge, where it was 30 to 70% on 6 June; canopy was only 10-20% on 19 February, as most canopy species are deciduous. Mean width 10 to 25 ft, maximum depth ca. 2 ft. Collectors on 6 June DA Etnier, PA Myer, CE Skelton, CJ Paxton, CH Heacock, SJ Fraley, 9 hours of effort. Collectors on 19 February DA & EL Etnier, JT Baxter, RL Hix, KL Harpster, 12.25 hours effort. Abundant taxa on 19 Feb. included *Epeorus*, peltoperlids, beatids, ephemerellids, *Lepidostoma, Lanthus, Atherix, Tipula, Paraleptophlebia, Pycnopsyche luculenta* group, *Stenonema*. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera taxa preceded with an asterisk have been catologued in the UT collection.

Taxon	94-45 6 Jun		94-45 (100)	95-2 19 Feb	95-2 (100)		
Platyhelminthes							
Planarians	0	2					
Annelida							
Oligochaeta 3				3	5	1	
Arachnida (Hydracarina)				1	1	2	
Mollusca							
Gastropoda							
Pleuroceridae							
Elimia clavaeformis						5	
Crustacea							
Decapoda							
Cambarus sp. cf. bartoni				2			
Cambarus longirostris				4		2	
Amphipoda 9							
Insecta							
Plecoptera							
Chloroperlidae							
Haploperla brevis				1			
Sweltsa sp.				1		7	1
Leuctridae							
Leuctra sp.						6	2
Leuctridae sp., early instars				13	2		1
Nemouridae							
Amphinemura wui				3		17	
Soyedina sp.						1	
Peltoperlidae							
Peltoperla sp.						29	
Peltoperlidae sp. (early instars)				12	5		
Perlidae							
Acroneuria abnormis				13		3	
Agnetina sp. (early instars)				3			

Eccoptura xanthenes	1			
Perlidae sp. (early instars)			1	
Perlodidae				
Isoperla similis			1	
Cultus decisus			3	
Diploperla duplicata			4	
Isoperla holochlora	21	1	45	4
Isoperla sp. (not holochlora, abd. uniform gray, head dark w/pale spots in triangle, laterad of triangle, and anterior to ant. ocellus)			1	
Malirekus hastatus			18	
Malirekus/Yugus (early instars)	3	2		
Remenus bilobatus	3			
Perlodidae sp. (early instars)	3		4	
Pteronarcyidae				
Allonarcys sp. (short spines)	4	1	4	
Pteronarcyidae sp. (early instars)	9			
Taeniopterygidae				
Taenionema atlanticum			2	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	37	4		
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	15	6		
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	56	6	25	3
Baetidae sp. (early instars)	3			
Ephemerellidae				
Drunella cornuta/cornutella	30			
Drunella lata	11			
Drunella sp. (early instars)	9	4	0	1
Ephemerella dorothea	3		210	12
Ephemerella catawba	1			
Ephemerella hispida			12	
Ephemerella rossi	35	5		
Eurylophella funeralis	1	1	16	
Serratella deficiens	4			
Ephemerellidae sp. (early instars)	1			
Ephemeridae				
Ephemera sp.	3		1	
Heptageniidae				
Cinygmula subaequalis	1		11	5

Epeorus dispar (small 1st gill)	18	1	10	1
Epeorus sp. cf. pleuralis			76	15
Epeorus rubidus/subpallidus	21		3	
Epeorus sp. (early instars)	5	2	33	6
Heptagenia sp. cf. hebe	9	4		
Heptagenia thetis			3	
Stenacron pallidum	1		1	
Stenonema ithaca/modestum	1			
Stenonema pudicum	41	1	82	2
Stenonema sp. (early instars)	2			
Heptageniidae sp. (early instars)	6			
Leptophlebiidae				
Habrophlebia vibrans	1			
Paraleptophlebia adoptiva/mollis	5	1	37	1
Paraleptophlebiidae sp. (early)	4			
Oligoneuridae				
Isonychia sp.			2	
Siphlonuridae				
Ameletus cryptostimulus			5	
Ameletus lineatus			3	
Odonata				
Aeshnidae				
Boyeria graffiana	1			
Cordulegastridae				
Cordulegaster erronea	1			
Gomphidae				
Lanthus vernalis	15		8	
Heteroptera				
Gerridae				
Gerris remigis	2		2	
Gerris sp. (nymphs)	6			
Megaloptera				
Corydalidae				
Nigronia serricornis			2	
Trichoptera				
Glossosomatidae				
Glossosoma sp.	11	1	5	
Hydropsychidae				
Ceratopsyche macleodi			5	
Ceratopsyche sparna	1			
Cheumatopsyche sp.	15		13	1
Diplectrona modesta	96	13	23	4
Hydropsyche betteni/depravata	1			
Hydropsychidae sp., early instars		2		
Lepidostomatidae				
Lepidostoma sp.	12	1	13	
Limnephilidae				
Goera fuscula			2	
Pycnopsyche gentilis			2	
Pycnopsyche guttifer group			1	

Pycnopsyche luculenta group	4		22	
Philopotamidae				
Dolophilodes distinctus	59	5	22	
Polycentropodidae				
Polycentropus sp. 1	2		2	
Polycentropus sp. 2	3			
Rhyacophilidae				
Rhyacophila carolina sp. group	6		2	1
Rhyacophila fuscula	11		8	3
Rhyacophila nigrita	1		3	
*Rhyacophila torva	1			
Rhyacophila sp. (early instars)			1	
Sericostomatidae				
Fattigia pele	1		1	
Uenoidae				
*Neophylax sp. cf. aniqua	2			
Neophylax sp. cf. consimilis			14	
Neophylax sp. cf. oligius			1	
Coleoptera				
Elmidae				
Optioservus ovalis adults	5	1		
Optioservus sp. larvae	1	1	1	
Oulimnius latiusculus adults	1	2		
Promoresia tardella adults	1			
Eubriidae				
Ectopria sp.			1	
Ptilodactylidae				
Anchytarsus bicolor	2			
Staphylinidae sp. cf. Fig. 19.7			1	
Diptera				
Athericidae (Atherix sp.)	1		11	
Blephariceridae (Blepharicera sp.)	5			
Ceratopogonidae				
"Palpomyia" sp. (patterned abd., long head)	2	1	9	4
"Palpomyia" sp. (plain abd., short head)			1	
Chironomidae				
Chironominae				
Chironomini				
Demicryptochironomus sp.	3			
Microtendipes sp.	1		3	
Phaenopsectra sp.	2			
Polypedilum convictum			2	
Polypedilum fallax group	1		1	
Polypedilum illinoense	1			
Polypedilum scalaenum?	1			
Tanytarsini				
Rheotanytarsus sp.	2		2	

Tanytarsus sp.	3		11	
Tanytarsini sp.				7
Diamesinae				
Diamesa sp.	1		7	
Orthocladiinae				
Brillia sp.	1		18	
Cardiocladius sp.	2			
Corynoneura sp.	8		5	
Cricotopus tremulus group	3			
Cricotopus/Orthoacladius sp.	12			
Epoicocladius sp.	1		1	
Eukiefferiella brehmi group			8	
E. brevicalcar group	3		28	
E. claripennis group	12		9	
E. devonica group			2	
E. gracei group	10			
E. pseudomontana group	10		2	
Heleniella sp.			1	
Limnophyes sp.			1	
Nanocladius sp.			7	
Orthocladius (Euorthocladius)	5			
Parachaetocladius sp.			1	
Parametriocnemus sp.	22		64	
Psectrocladius sp.			1	
Synorthocladius semivirens	1		1	
Thienemanniella sp.	10		4	
Tvetenia bavarica group	6		4	
Orthocladiinae sp.	1		2	19
Prodiamesinae				
Prodiamesa sp.	1			
Tanypodinae				
Labrundinia sp.	1			
Paramerina sp.?	1			
Thienemannimyia group	4		1	
Chironomidae sp.	1	30	5	
Dixidae (Dixa sp.)	1		3	
Dolichopodidae (Rhaphium sp.?)			1	
Empididae	1	1	2	
Muscidae (Limnophora sp.?)			1	
Simuliidae	11		6	
Tipulidae				
Antocha sp.			3	
Dicranota sp.	23	1	12	
Hexatoma sp.	2		1	
Molophilus sp. (cf. Fig. 22.5)			1	
Tipula "abdominalis"	8		5	1
Tipula sp. (cf. Fig. 22.4)			1	

Tipulidae sp. (large; short anal processes, dorsal ones very black, spiracles large & dark)	1	
Tipulidae sp. (pupae)	3	3

DAE 94-40: 54 of 100 taxa (54%) and 659 of 884 specimens (75%) were EPTs. DAE 94-40(100): 19 of 27 taxa (70%) and 64 of 103 specimens (62%) were EPTs. Effort = 9 hours; 11.1 taxa/hour; 98 specimens/hour (taxa and specimens per hour include sample of 100 data; no new taxa from sample of 100); 9.1 specimens per taxon.

DAE 95-2: 47 of 97 taxa (48%) and 816 of 1092 specimens (75%) were EPTs. DAE 95-2(100): 15 of 22 taxa (68%) and 64 of 103 specimens (62%) were EPTs. Effort = 12.25 hours; 7.9 taxa per hour; 89 specimens per hour (per hour data include sample of 100, which included one EPT and one non-EPT taxon not included in qualitative sample); 11.3 specimens per taxon.

DAE 94-40 and DAE 95-2 combined: 65 of 135 total taxa (48%) and 1475 of 1976 specimens (75%) were EPTs (total taxa includes one non-EPT taxon from samples of 100 not present in either qualitative sample). DAE 94-40(100) and DAE 95-2(100) combined: 25 of 37 taxa (68%) and 128 of 206 specimens (62%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Dunn Creek, Hester-Dendy artificial substrate samples, upstream station, DC-US, retrieved 7 June 1994.

Taxon	**1**	**2**	**3**	**4**	**5**
Annelida					
Oligochaeta	1	0	0	1	1
Arachnida					
Hydracarina	1	0	0	0	0
Insecta					
Plecoptera					
Capniidae					
Allocapnia sp.	4	6	4	2	1
Leuctridae					
Leuctra sp.		1			
Peltoperlidae					
Peltoperlidae sp. (early instars)	1	0	1	0	3
Perlodidae					
Diploperla sp. (early instars)	1	0	1	0	0
Malirekus hastatus	1	0	3	0	2
Pteronarcyidae					
Allonarcys sp.	0	1	1	1	0
Ephemeroptera					
Ephemerellidae					
Ephemerella sp. (early instars)	1	0	0	0	0
Eurylophella funeralis	2	1	0	0	0
Heptageniidae					

Stenonema pudicum	1	0	1	0	1
Stenonema sp. (early instars)	2	2	0	0	0
Trichoptera					
Polycentropodidae					
Polycentropus sp.	1	0	0	0	0
Psychomyidae					
Lype diversa	0	0	2	1	0
Rhyacophilidae					
Rhyacophila sp. cf. nigrita	3	0	1	0	0
Diptera					
Chironomidae					
Chironominae					
Chironomini sp.	16	36	15	19	14
Tanytarsini	3	6	2	9	1
Orthocladiinae	45	95	55	96	69
Tanypodinae	6	3	3	1	4
Chironomidae sp.	0	5	0	3	1
Empididae sp.	1	0	0	1	0
Tipulidae					
Tipula "abdominalis"	1	0	0	0	0

Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa 8	8	4	4	6	5
Non-EPT specimens	514	74	145	75	13090
EPT taxa	12	9	5	8	34
EPT specimens	53	17	11	14	47
Percent EPT taxa	69	53	55	67	3344
Percent EPT specimens	9	19	7	16	37

Note: Chironomid identifications to species appear below; for the above analysis, chironomids were considered only at the level of subfamily or tribe. Total taxa are obtained by treating all five replicates as a single sample. Column entries that are taxonomically conservative, such as "*Stenonema* sp. (early instars)" are not considered as separate taxa if other *Stenonema* were identified to species in the sample.

Chironomidae				
Chironominae				
Chironomini				
Polypedilum convictum		3	2	51
Polypedilum fallax group		1	3	47
Polypedilum illinoense			1	
Polypedilum sp.?		1		
Chironomini sp.			4	2
Tanytarsini				
Rheotanytarsus sp.			2	7
Tanytarsus sp.		1		
Tanytarsini sp.				1

Orthocladiinae					
Corynoneura sp.		13	2	15	2429
Cricotopus tremulus group				1	
Cricotopus/Orthocladius sp.				1	
Eukiefferiella brehmi group		1			
Eukiefferiella claripennis group	1				
Eukiefferiella gracei group				1	
Parakiefferiella sp.					1
Parametriocnemus sp.		8		5	312
Psectrocladius sp. 1					2
Psectrocladius sp. 2 (hook-head)				1	
Symposiocladius lignicola		3		6	94
Thienemanniella sp.		1		7	367
Tvetenia bavarica group		1		3	2
Orthocladiinae sp.		4		7	135
Tanypodinae					
Thienemannimyia group		2		2	12
Tanypodinae sp.		2			1
Chironomidae sp.			5	3	2

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Dunn Creek, Hester-Dendy artificial substrate samples, upstream station, retrieved 25 October 1994.

Taxon	**1**	**2**	**3**	**4**	**5**
Annelida					
Oligochaeta	1	0	0	0	0
Insecta					
Plecoptera					
Capniidae					
Allocapnia sp.	2	5	4	2	1
Peltoperlidae sp. (early instars)	1	0	1	0	3
Perlodidae					
Diploperla sp.	1	0	1	0	0
Malirekus hastatus	1	0	3	0	2
Pteronarcyidae					
Pteronarcys (Allonarcys) sp.	0	1	1	1	0
Ephemeroptera					
Ephemerellidae					
Ephemerella sp. (early instars)	1	0	0	0	0
Eurylophella funeralis	2	1	0	0	0
Heptageniidae					
Epeorus sp. (early instars)	1	0	0	0	0
Stenonema pudicum	1	0	1	0	1
Stenonema sp. (early instars)	1	2	0	0	0
Trichoptera					
Hydropsychidae sp. (early instars)	1	0	0	0	0

Psychomyidae					
Lype diversa	0	0	2	1	0
Rhyacophilidae					
Rhyacophila nigrita group	3	0	1	0	0
Diptera					
Chironomidae					
Chironominae					
Orthocladiinae sp.					1
Tipulidae					
Tipula "abdominalis"	1	0	0	0	0
Summary Total	**1**	**2**	**3**	**4**	**5**

Non-EPT taxa
Non-EPT specimens

EPT taxa
EPT specimens

Percent EPT taxa
Percent EPT specimens

Note: Chironomid taxa and specimens to be added to data later.
Total taxa data are obtained by treating the five replicates as a single sample. Column entries that are taxonomically conservative, such as "*Stenonema* sp. (early instars)" are not considered as separate taxa if other *Stenonema* are identified to species in that sample.

FISH SURVEY DATA —
• QUANTITATIVE TRIPLE-PASS DEPLETION METHOD

STATION 16, DN-A. Population Estimates, 1 November 1994. A 106.8-meter reach was sampled. Widths, measured at 10-meter intervals from the lower end of the staion, were 0(2.7 m), 10(3.8), 20(1.6), 30(1.8), 40(4.0), 50(6.5), 60(3.2), 70(2.2), 80(2.1), 90(3.5), 106.8(1.9), mean width 3.03 m. Two shocker unites were used. Collectors were Steve Moore, Matt Kulp, Aaron Whaley, Alan Loy, John Hammonds, J.T. Baxter, Steve Fraley, and Brian Evans. (Number of specimens captured per sample plus maximum likelihood estimate of population size followed by 95% Confidence Interval. NA= not applicable)

	I	II	IIIPop (95% CI)
stoneroller (Campostoma anomalum)	25	5	536 (35-39)
river chub (Nocomis micropogon)	1	0	01 (*)
blacknose dace (Rhinichthys atratulus)	72	19	13109 (104-116)
longnose dace (Rhinichthys cataractae)	18	5	530 (28-35)
rainbow trout > 90 mm TL (Oncorhynchus mykiss)	10	1	112 (12-13)

brook trout			
(Salvelinus fontinalis)	1	0	01 (*)
mottled sculpin			
(Cottus bairdi)	58	12	1897 (88-108)
Totals for Station	185	42	42287 (273-301)

*—all fish caught on first pass

STATION DN-A. Capture Probabilities, Standing Crop Biomass, and Biomass 95% Confidence Intervals for 1 November 1994. (Weight is in grams, and 95% confidence intervals for biomass are estimated by multiplying average weight for each species by the upper and lower limits of the 95% CI for population size. NA= not applicable)

	Capture Prob.	Wt. (95% CI)
stoneroller		
(Campostoma anomalum)	.6604	1059 (1029-1147)
river chub		
(Nocomis micropogon)	NA	50 (NA)
blacknose dace		
(Rhinichthys atratulus)	.6341	328 (312-348)
longnose dace		
(Rhinichthys cataractae)	.5714	314 (294-368)
rainbow trout > 90 mm TL		
(Oncorhynchus mykiss)	.8000	488 (488-529)
brook trout		
(Salvelinus fontinalis)	NA	8 (NA)
mottled sculpin		
(Cottus bairdi)	.5399	604 (546-670)
Average/Totals for Station	.5991	2851 (NA)

STATION DN-A. Range in Length of Non-gamefish. (Data in columns are maximum and minimum total length in millimeters for each species.

	I	II	III
stoneroller	118-191	118-172	135-145
river chub	172	NA	NA
blacknose dace	34-82	59-78	56-85
longnose dace	84-127	79-135	88-124
mottled sculpin	36-104	41-102	57-102

Length/Weight Data for Gamefish From Station DN-A. (total length in millimeters followed by weight in grams for each individual)

17-DN-B DUNN CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-41 and DAE 94-75, site number 17, DN-B, Dunn Creek at 5229 and 5219 Mathis Branch Road, off Rocky Flats Road, Sevier Co., Tenn., 6 June and 19 September 1994. The creek is 12 to 30 ft wide, with a mean width of about 20 ft and a maximum depth of 2.5 ft. Canopy was absent in the downstream portion of the reach that parallels the road, and nearly 100% upstream where the creek diverges from the road. Substrate was 85% boulder and cobble, 10% sand, and 5% gravel, with areas of silty sand virtually absent. The sample of 100 specimens was taken in a cobble area just downstream of the small island at the parking area. Some moss was present on boulders in the swiftest current. Collectors on 6 June DA Etnier, PA Myer, CE Skelton, SJ Fraley, CH Heacock, and CJ Paxton, 9 hours effort. Snails and limpets far more abundant that at DN-A. 10 Sept. collectors DA Etnier, CJ Paxton, RB Evans, CE Skelton, LD Bonds, 6 hours effort. Abundant taxa on 10 Sept. included peltoperlids, *Atherix, Epeorus*, crayfishes, *Allonarcys, Stenonema*, Simuliidae. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Det. DAE, KLH

Taxon	94-41 6 Jun	94-41 (100)	94-75 10 Sep	94-75 (100)
Annelida				
Oligochaeta	10		2	
Mollusca				
Pleuroceridae				
Elimia clavaeformis	10		4	3
Ancylidae				
Ferrissia sp.	4		1	
Crustacea				
Decapoda				
Cambarus bartoni	2			
Cambarus longirostris	1		5	
Cambarus sp. (early instars)	1			
Arachnida				
Hydracarina	1			
Insecta				
Plecoptera				
Chloroperlidae				
Chloroperlidae sp. (early instars)			1	
Leuctridae				
Leuctra sp.			22	4
Leuctridae sp. (early instars)	34	1		
Peltoperlidae				
Peltoperlidae sp. (early instars)	9		6	3
Perlidae				
Acroneuria abnormis	1		2	
Acroneuria carolinenses	1			
Eccoptura xanthenes	2		2	
Paragnetina immarginata	2	1	1	
Perlesta frisoni?	1			

Perlidae sp. (early instars)			4	
Perlodidae				
Isoperla holochlora	38		1	
Malirekus hastatus			33	10
Malirekus/Yugus sp. (early)	1			
Remenus bilobatus	1			
Perlodidae sp. (early instars)	2			
Pteronarcyidae				
Allonarcys sp.	18	3	9	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	68	34	9	4
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	24	28	7	4
Acentrella sp. (early instars)	16		9	2
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	36	6	22	1
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	11		2	
Baetis sp. (early (instars)	6		5	
Centroptilum sp.			1	
Ephemeridae				
Ephemera sp.	9		3	
Ephemerelllidae				
Drunella conestee			14	1
Drunella cornuta/cornutella	48	3		
Drunella walkeri	9			
Drunella sp. (early instars)	1			
Ephemerella catawba	4	1	1	
Ephemerella invaria	1			
Ephemerella rossi	4			
Ephemerella sp. (early instars)	8			
Eurylophella funeralis	1			
Serratella carolina			3	
Serratella deficiens	10			
Heptageniidae				
Epeorus rubidus/subpallidus	46	3	55	3
Epeorus dispar (small first gill)	11		12	1
Epeorus sp. cf. pleuralis	3			
Epeorus sp. (early instars)	11		4	1
Heptagenia juno	5		8	1
Heptagenia thetis	1		2	
Heptagenia sp. (early instars)	4		3	

Rhithrogena sp. cf. amica	9			
Stenacron pallidum	2			
Stenonema carlsoni			1	
Stenonema ithaca/modestum	3		2	
Stenonema pudicum	21	2	32	10
Stenonema sinclairi	1			
Stenonema sp. (early instars)	3			
Heptageniidae sp. (early instars)			4	
Leptophlebiidae				
Habrophlebia vibrans	3			
Habrophlebiodes sp.	9	1		
Paraleptophlebia adoptiva/mollis	1	1	1	
Paraleptophlebia sp. cf. guttata	6		6	
Leptophlebiidae sp. (early)			7	
Oligoneuridae				
Isonychia sp.	3		6	
Odonata				
Gomphidae				
Lanthus vernalis	12		7	
Stylogomphus albistylus	2		1	
Heteroptera				
Gerridae				
Gerris remigis	6			
Gerris sp. nymphs	7		3	
Veliidae				
Rhagovelia obesa			5	
Megaloptera				
Corydalidae				
Nigronia serricornis	2		4	1
Trichoptera				
Glossosomatidae				
Glossosoma sp.	32		2	
Hydropsychidae				
Ceratopsyche macleodi			1	
Ceratopsyche slossonae	2			
Ceratopsyche sp. (female pupae)			1	
Cheumatopsyche sp.	23		5	1
Diplectrona modesta	45	2	8	
Parapsyche cardis			1	
Hydropsychidae sp. (early instars)	5			
Lepidostomatidae				
Lepidostoma sp.	5		1	
Leptoceridae				
Ceraclea sp. cf. nepha/protonepha	1			
Limnephilidae				
Goera sp.	1		1	
Pycnopsyche luculenta sp. group	10			
Philopotamidae				
Dolophilodes distinctus	32	1	8	1
Polycentropodidae				

Polycentropus sp.	2			
Rhyacophilidae				
Rhyacophila carolina group	7	3		
Rhyacophila fuscula	20		4	
Uenoidae				
Neophylax consimilis	8			
Neophylax sp. (cases)			1	
Coleoptera				
Elmidae				
Optioservus sp.	1			
Optioservus ovalis adults			0	1
Oulimnius latiusculus adults	2	1	0	1
Promoresia elegans larvae	8		5	
Promoresia tardella larvae		1		
Promoresia tardella adults	10		7	
Stenelmis sp. adults	0	1	1	
Eubriidae				
Ectopria sp.			1	
Psephenidae				
Psephenus herricki	6		7	2
Ptilodactylidae				
Anchytarsus bicolor	5		3	
Diptera				
Athericicae (Atherix sp.)	5		27	8
Blephariceridae (Blepharicera sp.)	11		11	1
Ceratopogonidae ("Palpomyia" sp.)	1		1	
Chironomidae				
Chironominae				
Chironomini				
Paralauterborniella sp.	1			
Phaenopsectra sp.	1			
Polypedilum convictum			3	
Polypedilum illinoense	2			
Chironomini sp				1
Tanytarsini				
Rheotanytarsus sp.			2	
Tanytarsus sp.	2		2	
Tanytarsini sp.				2
Orthocladiinae				
Brillia sp.	1			
Cardiocladius sp.	1			
Corynoneura sp.	2			
Cricotopus/Orthocladius sp.	11			
Eukiefferiella brehmi group	4		2	
E. claripennis group	15		2	
E. devonica group	2		1	
E. pseudomontana group	3		1	
Orthocladius (Euorthocladius)	2			
Parachaetocladius sp.			1	
Parametriocnemus sp.	5		1	

Psectrocladius sp.			1	
Rheocricotopus sp.			1	
Thienemanniella sp.	3			
Tvetenia bavarica group	2			
Orthocladiinae sp.		1		1
Prodiamesinae				
Prodiamesa sp.	1			
Tanypodinae				
Thienemannimyia group	5			
Chironomidae sp.	5			
Dixidae (Dixa sp.)	5		2	
Empididae sp.	5			
Simuliidae sp.	5	2	33	14
Tipulidae				
Dicranota sp.	15		5	
Hexatoma sp.	4		2	
Limnophila sp. cf. macrocera (Fig. 22.34 in M & C)	1			
Limnophila sp. (Fig. 21.5 in M & C, but anal lobes setose, not fuzzy)	1			
Tipula "abdominalis"	1			
Tipula sp. (Fig. 11.3)			1	

DAE 94-41: 52 of 100 taxa (52%) and 701 of 919 specimens (76%) were EPTs. DAE 94-41(100): 15 of 20 taxa (75%) and 90 of 96 specimens (94%) were EPTs. Effort = 9 hours; 11.2 taxa per hour;
113 specimens per hour (per hour data includes sample of 100, with one non-EPT taxon added from that sample); 9.2 specimens per taxon.

DAE 94-75: 38 of 71 taxa (54%) and 333 of 488 specimens (68%) were EPTs. DAE 94-75(100): 13 of 24 taxa (54%) and 47 of 82 specimens (57%) were EPTs. Effort = 6 hours; 12.2 taxa per hour (includes 2 non-EPT taxa present in sample of 100 but absent from qualitative sample); 95 specimens per hour (per hour data includes sample of 100); 6.9 specimens per taxon.

DAE 94-41 and DAE 94-75 combined: 58 of 113 total taxa (51%) and 1034 of 1407 specimens (73%) were EPTs (no new taxa added by the samples of 100). DAE 94-41(100) and DAE 94-75(100) combined: 21 of 34 taxa (62%) and 137 of 178 specimens (77%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Dunn Creek, Hester-Dendy artificial substrate samples, downstream station, DC-DS, retrieved 7 June 1994.

Taxon 1	**2**	**3**	**4**	**5**
Insecta				
Plecoptera				
Leuctridae				

Leuctridae sp. (early instars)		1			1
Nemouridae					
Nemouridae sp. (early instars)		1			
Peltoperlidae					
Peltoperlidae sp. (early instars)	6	19	7		18
Perlidae					
Acroneuria abnormis				1	
Perlesta sp. (early instars)				17	1
Perlodidae					
Isoperla holochlora	2		2	2	
Remenus bilobatus	1	1	2	1	
Perlodidae sp. (early instars)	1	5		6	3
Pteronarcyidae					
Allonarcys sp.	1	1	1	3	2
Ephemeroptera					
Baetidae					
Baetis intercalaris/pluto (early)			1		
Baetis sp. (early instars)					1
Ephemerellidae					
Ephemerella rossi				1	1
Eurylophella sp. (early instars)	1	2			
Serratella deficiens				1	
Heptageniidae					
Stenonema pudicum				1	1
Stenonema sp. (early instars)			1		
Heptageniidae sp. (early instars)				1	
Trichoptera					
Hydropsychidae					
Cheumatopsyche sp.	1				1
Diplectrona modesta	1	2	4	11	4
Hydropsychidae sp. (early instars)	1				
Lepidostomatidae					
Lepidostoma sp.	1	1	1		1
Philopotamidae					
Dolophilodes distinctus	1	5	3		2
Philopotamidae sp. (early instars)			4		2
Rhyacophilidae					
Rhyacophila carolina group		1			
Coleoptera					
Elmidae					
Optioservus sp.			1		2
Stenelmis sp. (adults)				1	
Diptera					
Athericidae					
Atherix sp.	3				2
Chironomidae					
Chironominae					
Chironomini sp.	7	15	4	19	14
Tanytarsini sp.	1	0	3	15	1
Orthocladiinae sp.	27	58	51	96	64

Tanypodinae sp.	2	0	2	1	0
Chironomidae sp.	2				
Empididae sp.		1			
Tipulidae					
Dicranota sp.		1	1	2	1

Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa 8	5	4	6	6	6
Non-EPT specimens	397	42	75	62	13484
EPT taxa	19	9	10	9	912
EPT specimens	165	17	39	26	4538
Percent EPT taxa	70	64	71	60	6067
Percent EPT specimens	29	29	34	30	2531

Note: Chironomids specimens determined to genus/species are listed below; in the above analysis, chironomid data are treated only at the level of subfamily or tribe. Conservative taxa, such as "Perlodidae sp." are not considered as additional taxa if other perlodids in the sample have been identified to genus or genus and species.

Chironomidae					
Chironominae					
Chironomini					
Polypedilum convictum		1	4	3	43
Polypedilum fallax group		2			
Polypedilum illinoense			1		
Tanytarsini					
Rheotanytarsus sp.		2			
Tanytarsus sp.		1			2
Zavrelia sp.?		1			
Orthocladiinae					
Brillia sp.			4	1	
Corynoneura sp.		16	10	4	118
Eukiefferiella claripennis group	1				1
E. pseudomontana group			1		
Parametriocnemus sp.		20	15	15	3923
Psectrocladius sp.?		1			11
Psectrocladius/Monopsectrocladius?	2				
Smittia sp.			1		
Symposiocladius lignicola		3	2	3	14
Thienemanniella sp.		5	3	1	13
Tvetenia bavarica group		5	7	5	810
Tanypodinae					
Thienemannimyia group		1		1	

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Dunn Creek, Hester-Dendy artificial substrate samples, downstream station, DC-DS, retrieved 25 October 1994.

Taxon	**1**	**2**	**3**	**4**	**5**
Annelida					
Oligochaeta	1	0	0	0	0
Insecta					
Plecoptera					
Capniidae					
Allocapnia sp.	0	0	0	1	1
Peltoperlidae sp. (early instars)	1	0	2	2	0
Perlidae					
Acroneuria abnormis	1	0	0	0	0
Eccoptura xanthenes	0	0	0	0	1
Perlodidae					
Malirekus hastatus	2	2	1	0	0
Ephemeroptera					
Ephemerellidae					
Eurylophella funeralis	0	2	0	0	0
Heptageniidae					
Stenonema pudicum	1	2	0	0	2
Stenonema sp. (early instars)	0	1	0	2	0
Trichoptera					
Hydropsychidae					
Diplectrona modesta	2	0	0	0	0
Philopotamidae					
Dolophilodes distinctus	1	0	0	0	0
Psychomyidae					
Lype diversa	0	0	1	2	0
Rhyacophilidae					
Rhyacophila fuscula	0	2	0	0	1
Diptera					
Chironomidae					
Chironominae					
Chironomini	7	10	1	13	11
Tanytarsini	1	0	4	13	1
Orthocladiinae	27	14	18	28	5
Tanypodinae	2	0	1	1	0
Tipulidae					
Tipula "abdominalis"	1	0	1	0	0

Summary **Total**	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa 6	6	2	5	4	3
Non-EPT specimens	160	39	24	25	5517

EPT taxa	11	6	4	3	44
EPT specimens	33	8	9	4	75
Percent EPT taxa	65	50	67	38	5057
Percent EPT specimens	17	17	27	14	1123

Note: Total taxa data are obtained by treating the five replicates as a single sample. Column entries that are taxonomically conservative, such as "*Stenonema* sp. (early instars)" are not considered as separate taxa if other *Stenonema* are identified to species in that sample.

FISH SURVEY DATA —
• QUANTITATIVE TRIPLE-PASS DEPLETION METHOD

STATION 17, DN-B. Population Estimates, 1 November 1994. A 105-meter reach was sampled. Stream widths, measured at 10-m intervals starting at the lower end of the reach, were 0(4.8 m), 10(4.2), 20(6.9), 30(4.2), 40(5.7), 50(5.6), 60(6.5), 70(4.4), 80(2.8), 90(3.7), 105(2.6), mean width 4.67 m. Two shocker units were employed. Collectors were Steve Moore, Matt Kulp, Aaron Whaley, Alan Loy, John Hammonds, J.T. Baxter, Steve Fraley, and Brian Evans. (Number of specimens captured per sample plus maximum likelihood estimate of population size followed by 95% Confidence Interval.)

	I	II	III	Pop (95% CI)
stoneroller				
(Campostoma anomalum)	54	16	6	78 (76-82)
warpaint shiner				
(Luxilus coccogenis)	1	1	1	3 (3-8)
saffron shiner				
(Notropis rubricroceus)	9	3	1	13 (13-14)
blacknose dace				
(Rhinichthys atratulus)	180	68	19	277 (268-286)
longnose dace				
(Rhinichthys cataractae)	29	7	4	41 (40-44)
northern hogsucker				
(Hypentelium nigricans)	7	1	0	8 (8)
rainbow trout > 90 mm TL				
(Oncorhynchus mykiss)	0	3	0	3 (3-8)
mottled sculpin				
(Cottus bairdi)	99	78	19	226 (203-249)
fantail darter				
(Etheostoma flabellare)	18	8	4	32 (30-37)
Totals for Station	397	185	54	678 (657-699)

STATION DN-B. Capture Probabilities, Standing Crop Biomass, and Biomass 95% Confidence Intervals for 1 November 1994. (Weight is in grams, and 95% confidence intervals for biomass are estimated by multiplying average weight for each species by the upper and lower limits of the 95% CI for population size. NA= not applicable)

	Capture Prob.	Wt. (95% CI)
stoneroller (Campostoma anomalum)	.6909	1987 (1938-2091)
warpaint shiner (Luxilus coccogenis)	.5000	47 (47-126)
saffron shiner (Notropis rubricroceus)	.7222	58 (58-63)
blacknose dace (Rhinichthys atratulus)	.6625	697 (670-715)
longnose dace (Rhinichthys cataractae)	.6897	308 (300-330)
northern hogsucker (Hypentelium nigricans)	.8889	214 (NA)
rainbow trout > 90 mm TL (Oncorhynchus mykiss)	.5000	320 (320-854)
mottled sculpin (Cottus bairdi)	.4876	1607 (1441-1768)
fantail darter (Etheostoma flabellare)	.5769	96 (90-111)
Average/Totals for Station	.6028	5334 (NA)

STATION DN-B. Range in Length of Non-gamefish. (Data in columns are maximum and minimum total length in millimeters for each species.

	I	II	III
stoneroller	103-170	112-153	111-148
warpaint shiner	117	107	116
saffron shiner	65-85	67-75	76
blacknose dace	30-92	34-88	33-78
longnose dace	56-113	62-106	91-106
northern hogsucker	41-219	33	
mottled sculpin	42-97	55-101	51-94
fantail darter	24-89	34-74	66-76

Length/Weight Data for Gamefish From Station DN-B. (total length in millimeters followed by weight in grams for each individual)

rainbow trout—172(56),200(91),246(173)

18-OG-A OGLE SPRING BRANCH—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-47 and DAE 94-88, site number 18, OG-A, Ogle Spring Branch above ROW, at 430 Apple Orchard Road, Sevier County, Tennessee, 11 June and 1 October 1994. The site sampled extends about about 15 m below and 50 m above the fence that originates at 430 Apple orchard Road and continues across the creek. The Creek is 2 to 12 ft wide, with a mean width of about 5 ft and a maximum depth of .8 ft. Canopy was about 80%, and made up mostly of *Rhododendron*. Light intensity was sufficiently low to make working here rather difficult. Substrate was mostly fine gravel above the outfall from the adjacent small pond, and 50% boulder, 30% gravel, and 20% silty sand below the outfall. Collectors on 11 June DA and EL Etnier, SJ Fraley, CH Heacock, JT Baxter, and CJ Paxton, 8 hours effort. Abundant taxa included *Diplectrona modesta*, Simuliidae, *Lanthus vernalis*, and *Elimia* snails. *Desmognathus fusculus/ochrophaeus* and *D. quadrimaculatus* were present. Collectors on 1 October DA Etnier, LD Bonds, KL Harpster, SE McLain, and RS Brown, 10 hours effort. Abundant taxa included *Diplectrona modesta*, *Elimia* snails, Dixidae, Heptageniidae, Philopotamidae, *Ephemera*, and Ceratopogonids. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera taxa preceded with an asterisk have been incorporated into the research collection at UT. 94-47 Det. SJ Fraley, DA Etnier; 94-88 Det. DA Etnier, KL Harpster.

Taxon	94-47 11 Jun	94-47 (100)	94-88 1 Oct	94-88 (100)
Annelida				
Oligochaeta	10	6	5	7
Mollusca				
Pleuroceridae				
Elimia clavaeformis	10	3	8	4
Crustacea				
Decapoda				
Cambarus bartoni	1	1	6	1
Cambarus longirostris	1	1	2	
Cambaridae sp.	4			
Insecta				
Plecoptera				
Leuctridae				
Leuctra sp.	12	2		
Leuctridae sp., early instars			10	
Nemouridae				
Amphinemura wui	4			
Peltoperlidae				
Tallaperla sp.	10	1		
Peltoperlidae sp., early instars			6	
Perlidae				
Acroneuria abnormis			1	
Perlodidae				
Isoperla holochlora	1			
Malirekus/Yugus sp.			2	

Perlodidae sp. (early instars)			4	
Ephemeroptera				
Baetidae				
Acentrella sp. (slender, no bands or distinct fringe on cerci)	6	1		
Baetis sp. cf. brunneicolor	0	1	0	1
Ephemeridae				
Ephemera sp.	23	2	30	12
Ephemerelllidae				
Drunella sp. (early instars)	0	1		
Ephemerella sp. cf. catawba (6 denticles on tarsal claw, slight protub. on abd. terga)	4			
Ephemerella rossi	1			
Ephemerella sp. (early instars)	1			
Eurylophella funeralis			24	1
Eurylophella sp. (early instars)	5			
Heptageniidae				
Heptagenia sp. (early instars)	2		1	
Stenacron carolina	15		3	
Stenacron sp. (early instars)		2	31	
Stenonema carlsoni	9		2	
Stenonema pudicum	24	1	25	
Stenonema sp. (early instars)	4		55	8
Leptophlebiidae				
Habrophlebiodes sp.	20			
Paraleptophlebia adoptiva/mollis			2	
Paraleptophlebia guttata (max. palp long and slender)	23	4		
Paraleptophlebia sp. cf. guttata (max palp short, thicker than antennae)			8	
Leptophlebiidae sp. (early)	4		8	
Oligoneuridae				
Isonychia sp.	2			
Odonata				
Calopterygidae				
Calopteryx sp. (early instars)			2	
Cordulegastridae				
Cordulegaster erronea	17		4	
Cordulegaster maculata	4			
Cordulegaster sp. (early)	5		2	
Gomphidae				
Gomphurus rogersi	3		1	
Lanthus vernalis	24	1	11	3
Heteroptera				
Gerridae				
Gerris remigis	2			
Gerris sp. nymphs	5		4	
Veliidae				

Microvelia sp.			5	
Rhagovelia obesa	2		16	
Megaloptera				
Corydalidae				
Nigronia fasciata	1		1	
Nigronia serricornis	2		1	
Sialidae				
Sialis sp.			0	1
Trichoptera				
Glossosomatidae				
Agapetus minutus (male pupa)	1			
Glossosoma sp.	4			
Hydropsychidae				
Cheumatopsyche sp.	2		12	1
Diplectrona modesta	52	5	50	18
Hydropsychidae sp. (early)	5	3		
Lepidostomatidae				
Lepidostoma sp.	8		1	
Limnephilidae				
Goera sp. (empty cases)	1			
Pycnopsyche gentilis	8		1	
Pycnopsyche guttifer group	10		1	
Pycnopsyche luculenta group	12		3	
Molannidae				
Molanna blenda	1			
Philopotamidae				
Chimarra sp.	0	2	14	3
Dolophilodes distinctus	1		2	
Wormaldia sp.	0	1	3	
Polycentropodidae				
Polycentropus cinereus male pupa	1			
Polycentropus sp.	9		2	1
Psychomyiidae				
Lype diversa			1	
Rhyacophilidae				
Rhyacophila carolina group	1			
Rhyacophila fuscula			4	
Rhyacophila glaberrima	5			
Rhyacophila nigrita male pupae	1			
Rhyacophila sp. cf. nigrita	5		9	5
Uenoidae				
Neophylax mitchelli	5			
*Neophylax oligius	3			
Neophylax sp. (empty cases)			1	
Coleoptera				
Dytiscidae				
Celina sp. (adults)	0	1		
Elmidae				
Oulimnius latiusculus adults	5	3	1	1
Optioservus sp.	1	1	1	

Stenelmis sp. adults	3		3	
Elmidae sp. (early instars)				1
Eubriidae (Ectopria sp.)	5		2	
Ptilodactylidae				
Anchytarsus bicolor	4	10	6	6
Diptera				
Ceratopogonidae				
"Palpomyia" sp.			5	1
Chironomidae				
Chironominae				
Chironomini				
Demicryptochironomus sp.	1			
Microtendipes sp.	3			
Paralauterborniella sp.			1	
Tanytarsini				
Cladotanytarsus sp.	1			
Tanytarsus sp.	1			
Diamesinae				
Diamesa sp.	2			
Orthocladiinae				
Epoicocladius sp.	4		1	
Eukiefferiella claripennis grp.	5			
Parachaetocladius sp.			5	
Parametriocnemus sp.	15		4	
Tvetenia bavarica group	4			
Orthocladiinae sp.				5
Tanypodinae				
Thienemannimyia group	14			
Zavrelimyia sp.			1	
Chironomidae sp.	3	24	12	
Dixidae (Dixa sp.)	2		21	3
Dolichopodidae sp.	1	1	1	
Simuliidae sp.	2		4	3
Tipulidae				
Dicranota sp.	5	2	3	
Hexatoma sp.	3	1		
Limnophila sp.?	7	4		
Pseudolimnophila sp.?	8	11	1	
Tipula "abdominalis"	4		16	
Tipula sp. (Fig. 11.3)	2			
Tipula sp. (moss inhabitant)	1		1	

DAE 94-47: 33 of 70 taxa (47%) and 305 of 502 specimens (61%) were EPTs (chironomids to be added). DAE 94-47(100): 12 of 27 taxa (44%) and 26 of 96 specimens (27%) were EPTs. Effort = 8 hours; 9.4 taxa per hour; 50 specimens per hour (per hour data includes sample of 100; 5 taxa in 94-47(100) were not found in 94-47); 8.2 specimens per taxon.

DAE 94-88: 32 of 63 taxa (51%) and 336 of 494 specimens (68%) were EPTs. DAE 94-88(100): 11 of 20 taxa (55%) and 58 of 94 specimens (62%) were EPTs. Effort = 10 hours; 6.5 taxa per

hour; 59 specimens per hour (per hour data includes sample of 100 specimens with 2 taxa added from that sample); 7.8 specimens per taxon.

DAE 94-47 and 94-88 combined: 42 of 87 taxa (48%) and 641 of 996 (64%) of specimens were EPTs (the 76 total taxa includes taxa from the sample of 100 that were not taken in the qualitative samples). DAE 94-47(100) and 94-88(100) combined: 16 of 35 taxa (46%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-88, Station 189, OG-A, fishes. Ogle Spring Branch above ROW, at 430 Apple Orchard Road, Sevier County, Tennessee, 1 October 1994. REach sampled extends 15 meters below and 36 meters above barbed wire fence crossing creek from above address. Shocking time 40 minutes, shocking upstream. Collectors CJ Paxton, RB Evans, effort of single-pass electrofishing depletion estimate. Released fishes identified by collectors. Mean width 5 ft, maximum depth 0.8 ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6220	Rhinichthys atratulus (10)	18 (19-60)
90.1637	Micropterus salmoides (probable escapee from farm pond located just above station)	1 (190)

19-OG-B OGLE BRANCH—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-39 and DAE 94-74, site number 19, OG-B, Ogle Branch at Rocky Flats Road, 0.1 mi n of Mathis Branch Rd., Sevier Co., Tenn., 4 June and 10 September 1994. The creek is 8 to 12 ft wide, with a maximum depth of 1.5 ft. Canopy was about 50% above the bridge and only about 30% in the short reach worked below the bridge. Substrate was 75% boulder and cobble, 20% sand, 3% gravel, and 2% silty areas. The sample of 100 specimens was taken in a gravel area in the riffle below the bridge. Some moss was present on boulders, especially above the bridge. Collectors on 4 June DA Etnier, PA Myer, CE Skelton, JT Baxter, SJ Fraley, and CJ Paxton, 9 hours effort; collectors on 10 September DA Etnier, CE Skelton, CJ Paxton, LD Bonds, RB Evans, 5.5 hours effort. *Rhinichthys atratulus* was present, and *Desmognathus* salamanders were seen. Abundant invertebrates on 10 September included *Diplectrona*, Heptageniidae, Pleuroceridae, Ceratopogonidae, Simuliidae, Peltoperlidae, and crayfish. Trichoptera taxa preceded with an asterisk have been catalogued at UT. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Det. DA Etnier, EL Etnier,

Taxon	94-39 4 Jun	94-39 (100)	94-74 10 Sep	94-74 (100)
Annelida				
Oligochaeta	6		2	2
Mollusca				
Pleuroceridae				
Elimia clavaeformis	9	2	8	6
Arachnidae				
Hydracarina			1	
Crustacea				
Decapoda				
Cambarus bartoni	2		2	1
Cambarus longirostris	5		4	2
Insecta				
Plecoptera				
Leuctridae				
Leuctra sp.	21	1	5	1
Leuctridae sp. (early instars)	8	2	18	2
Nemouridae				
Amphinemura sp.			1	
Peltoperlidae				
Peltoperlidae sp. (early instars)	21	3	10	
Perlidae				
Acroneuria abnormis	3		5	
Eccoptura xanthenes			1	
Perlidae sp. (early instars)	2			
Perlodidae				
Isoperla holochlora	12			
Isoperla sp. (early instars)			1	
Malirekus hastatus			25	2

Remenus bilobatus	20			
Perlodidae sp. (early instars)		6	1	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	16	3		
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	28	9	3	6
Acentrella sp. (early instars)		21		
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	31	3	17	8
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	6		5	
Baetidae, early or cerci broken	6	2	8	3
Ephemeridae				
Ephemera sp.	19		16	1
Ephemerelllidae				
Drunella conestee			1	
Drunella cornuta/cornutella	53	3		
Ephemerella dorothea	7			
Ephemerella invaria	2			
Ephemerella sp. cf. catawba (but only 5 denticles on tarsal claw)	0	1		
Eurylophella funeralis			7	
Eurylophella sp. (early instars)			4	
Serratella sp. (early instars)			1	
Heptageniidae				
Epeorus dispar (small 1st gill)			2	1
Epeorus rubidus/subpallidus	24		30	12
Epeorus sp. (early instars)			12	
Heptagenia juno	13			
Heptagenia thetis	2		1	
Stenacron pallidum	1			
Stenonema carlsoni			1	
Stenonema ithaca/modestum	1			
Stenonema pudicum	43		21	27
Stenonema sp. (early instars)			4	
Leptophlebiidae				
Habrophlebiodes sp.	0	1		
Paraleptophlebia adoptiva/mollis	3			
Paraleptophlebia sp. cf. guttata (max. palp long & slender as antenna)	32	2		
Paraleptophlebia sp. cf. guttata				

(max palp short, thicker than antenna)	4			
Leptophlebiidae sp. (early)	1		8	
Oligoneuridae				
Isonychia sp.	11	1	2	
Odonata				
Aeshnidae				
Boyeria graffiana			1	
Calopterygidae				
Calopteryx sp. (early instars)			1	
Cordulegastridae				
Cordulegaster erronea	4		1	
Cordulegaster maculata	2		1	
Cordulegaster sp. (early instars)			5	
Gomphidae				
Lanthus vernalis	12		7	
Stylogomphus albistylus	2			
Heteroptera				
Gerridae				
Gerris remigis			1	
Gerris sp. nymphs	2			
Veliidae				
Rhagovelia obesa			3	
Megaloptera				
Corydalidae				
Nigronia fasciata	1			
Nigronia serricornis			1	
Nigronia sp. (early instars)			1	
Trichoptera				
Glossosomatidae				
Glossosoma sp.	33	3	8	
Hydropsychidae				
Ceratopsyche sparna			4	
Ceratopsyche sp. (female pupa with dark, unpatterned head)	1			
Cheumatopsyche sp.	2		13	3
Diplectrona modesta	90	17	34	5
Parapsyche cardis			1	
Hydropsychidae sp. (early instars)			6	2
Lepidostomatidae				
Lepidostoma sp.	7			
Limnephilidae				
Goera fuscula			1	
*Pycnopsyche gentilis (male pupae from fall sample)	3		8	
Pycnopsyche guttifer group	1			
*Pycnopsyche luculenta (male pupa from fall sample)	6		3	
Philopotamidae				
Dolophilodes distinctus	5		8	

Wormaldia moesta (1 male pupa)	14	4	1	
Philopotamidae sp. (early instars)			2	
Polycentropodidae				
Polycentropus sp.	2			
Psychomyiidae				
Lype diversa adults			1	
Rhyacophilidae				
Rhyacophila carolina	9	1	3	
Rhyacophila fuscula	4			
Uenoidae				
*Neophylax consimilis	43		26	
*Neophylax mitchelli	4			
Coleoptera				
Elmidae				
Oulimnius latiusculus adults	3		5	4
Stenelmis sp. adults	0	1		
Eubriidae				
Ectopria sp.	2		6	
Ptilodactylidae				
Anchytarsus bicolor	3			
Diptera				
Athericicae (Atherix sp.)	1		1	
Ceratopogonidae				
"Palpomyia" sp.			1	
Chironomidae				
Chironominae				
Chironomini				
Dicrotendipes neomodestus?	1			
Phaenopsectra sp.	1			
Polypedilum fallax group	1		1	
Stichtochironomus sp.	3			
Tanytarsini				
Micropsectra sp.	1			
Tanytarsus sp.			2	
Diamesinae				
Diamesa sp.	1		1	
Orthocladiinae				
Brillia sp.	1			
Cricotopus/Orthocladius sp.	3			
Corynoneura sp.	3			
Epoicocladius sp.	3		2	
Eukiefferiella claripennis grp.	19			
Limnophyes sp.	1			
Parachaetocladius sp.			8	
Parametriocnemus sp.	7		5	
Rheocricotopus sp.			2	
Thienemanniella sp.	6		4	
Tvetenia bavarica group	8		2	
Orthocladiinae sp.	1	1		3
Prodeamesinae				

Prodiamesa sp.	1			
Tanypodinae				
Thienemannimyia group	2			
Chironomidae sp.	2	7		
Dixidae (Dixa sp.)	5			
Simuliidae	36	5	10	
Tipulidae				
Dicranota sp.	16	1	8	
Tipula "abdominalis"	4	1	0	1
Tipula sp. (big slender gray one, spir. disc as in Fig. 11.3	3			
Tipulidae sp. (small, slender, Hexatoma-like with tiny head, no swollen abdomen, weak mandibles, 2 long lobes and 2 ca. 2/3 as long, each covered with stiff hairs 2-3 X diameter of lobe, perpendicular to lobe & separated at their bases by diameter of lobe.	4			

DAE 94-39: 38 of 75 taxa (52%) and 614 of 801 specimens (77%) were EPTs. DAE 94:39(100): 15 of 21 taxa (71%) and 83 of 101 specimens (82%) were EPTs. Effort = 9 hours; 8.7 taxa per hour (with 2 EPT taxa and 1 non-EPT taxon in sample of 100 that were not present in qualitative sample); 100 specimens per hour; 10.7 specimens per taxon.

DAE 94-74: 34 of 62 taxa (55%) and 329 of 426 specimens (77%) were EPTs. DAE 94-74(100): 10 of 17 taxa (59%) and 73 of 92 specimens (79%) were EPTs. Effort = 5.5 hours; 11.6 taxa per hour; 94 specimens per hour (per hour data includes sample of 100, with 2 taxa added from that sample); 6.9 specimens per taxon.

DAE 94-39 and DAE 94-74 combined: 52 of 99 total taxa (53%) and 943 of 1227 specimens (78%) were EPTs (the 84 total taxa includes 3 taxa from the samples of 100 that were not taken in the qualitative samples. DAE 94-39(100) and DAE 94-74(100) combined: 20 of 30 taxa (67%) and 156 of 193 specimens (81%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-74, Station 19, OG-B, fishes. Ogle Spring Branch at Rocky Flats Road, Sevier County, Tennessee, 10 September 1994. The area sampled extends from the upper end of the pond 90 meters below Rocky Flats Road to 54 meters above the road, a reach of 144 meters. Shocking time 65 minutes, shocking upstream. Collectors CJ Paxton, RB Evans, effort of single-pass electrofishing depletion estimate. Released fishes identified by DA Etnier. Width 8 to 12 ft, mean about 10 ft, and maximum depth 1.5 ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
31.177	Oncorhynchus mykiss	2 (75-125)
Released	(9, TL 3.5 (4) + 4, 4.5, 4.5, 6, 7 in)	
44.6188	Rhinichthys atratulus (302)	45 (15-70)

20-CR-A CARSON BRANCH—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-46 and DAE 94-89, site number 20, OGT-A, tributary to Ogle Spring Branch ca. 1/4 mi north of 430 Apple Orchard Road (site 18) Sevier Co., Tenn., 11 June and 1 Oct. 1994. The creek is 4 to 6 ft wide, with a maximum depth of 1 ft. Canopy is about 60-70%. Substrate 35% boulder and cobble, 35% gravel, and 30% silt and silty sand. *Desmognathus* salamanders were seen on both collecting dates. Collectors on 11 June DA & EL Etnier, SJ Fraley, JT Baxter, CJ Paxton, CH Heacock, 10.5 hours effort. Abundant macroinvertebrates included pleurocerid snails, *Lanthus*, and simuliids. Collectors 1 October EL Etnier, SJ Fraley, CE Skelton, JT Baxter, 8.5 hours effort. Abundant taxa on 1 October were pleurocerid snails, ceratopogonids, *Diplectrona, Acroneuria abnormis*, philopotamids, *Ephemera*, and heptageniids. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichopteran taxa preceded with an asterisk have been catalogued at UT. Det. DA Etnier, KL Harpster, CH Heacock.

Taxon	94-46 11 Jun	94-46 (100)	94-89 1 Oct	94-89 (100)
Platyhelminthes				
Planarians	1			
Annelida				
Oligochaeta	14	1	3	4
Mollusca				
Pleuroceridae				
Elimia clavaeformis	12	1	4	1
Arachnida				
Hydracarina			0	1
Crustacea				
Decapoda				
Cambarus bartoni	11		3	
Cambarus longirostris	4	1	2	
Insecta				
Plecoptera				
Chloroperlidae				
Sweltsa sp.			8	
Leuctridae				
Leuctra sp.	68	11	26	6
Nemouridae				
Amphinemura delosa/nigritta	2			
Amphinemura wui	1			
Nemouridae sp. (not Amphinemura)			1	1
Peltoperlidae				
Peltoperlidae sp. (early instars)	21	2	15	
Perlidae				
Acroneuria abnormis	21	1	32	
Eccoptura xanthenes	4		15	

Perlidae sp. (early instars)	2			
Perlodidae				
Isoperla sp. cf. holochlora	1			
Isoperla similis			3	2
Malirekus hastatus			22	
Remenus bilobatus	3			
Perlodidae sp. (early instars)	10	1		
Ephemeroptera				
Baetidae				
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	83	10	6	1
Acentrella sp. (early instars)	59	12		
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	2		13	1
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	26	2	35	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	2			
Centroptilum sp.	2			
Baetidae sp. (early instars)	6		4	1
Ephemerellidae				
Drunella cornuta/cornutella	1			
Eurylophella funeralis			2	
Eurylophella sp. (early instars)	6		12	
Ephemeridae				
Ephemera sp.	25		23	1
Heptageniidae				
Epeorus dispar (small 1st gill)	6		1	
Epeorus rubidus/subpallidus	3			
Epeorus sp. (early instars)	1		15	
Heptagenia thetis	10	1	32	3
Stenacron carolina	14			
Stenacron sp. (early instars)			1	
Stenonema carlsoni (no spines on 5)	28		26	3
Stenonema pudicum	1		34	3
Stenonema sp. (early instars)	1	3	78	3
Leptophlebiidae				
Habrophlebia vibrans	2		1	
Habrophlebiodes sp.	49	11		
Paraleptophlebia adoptiva/mollis	9	3	3	
Paraleptophlebia sp. cf. guttata	7			
Leptophlebiidae sp. (early instars)			37	11
Oligoneuridae				
Isonychia sp.	19			

Odonata				
Aeshnidae				
Boyeria vinosa	2		3	2
Boyeria sp. (early instars)	1			
Cordulegastridae				
Cordulegaster erronea	35	3	16	
Cordulegaster maculata			1	
Gomphidae				
Gomphurus rogersi	1		1	
Lanthus vernalis	72	2	42	3
Stylogomphus albistylus	1		1	
Heteroptera				
Gerridae				
Gerris remigis	1		1	
Gerris sp. (nymphs)	1			
Veliidae				
Mesovelia sp.			1	
Rhagovelia obesa	4		4	3
Megaloptera				
Corydalidae				
Nigronia fasciata	3		1	
Trichoptera				
Glossosomatidae				
Agapetus minutus (9 male pupae)	35			
Glossosoma sp.	4		4	
Hydropsychidae				
Ceratopsyche macleodi			1	
Diplectrona modesta	81	10	137	17
Lepidostomatidae				
Lepidostoma sp.	18			
Limnephilidae				
Pycnopsyche gentilis	2		1	
Pycnopsyche guttifer group	1			
Pycnopsyche luculenta group	1			
Limnephilidae sp. (early)			1	
Odontoceridae				
Psilotreta sp. (early instars)	1		3	
Philopotamidae				
Dolophilodes distinctus	20	1	35	
Wormaldia sp.	7	1	1	2
Polycentropodidae				
Polycentropus sp.	2		1	1
Psychomyidae				
Lype diversa	1		1	
Rhyacophilidae				
Rhyacophila carolina group	2		1	1
Rhyacophila sp. cf. glaberrima	1			
Rhyacophila fuscula			1	
Rhyacophila sp. cf. nigrita			7	
Rhyacophila sp. (early instars)	1			

Uenoidae				
Neophylax mitchelli	2			
*Neophylax oligius	2			
Coleoptera				
Elmidae				
Ancyronyx variegatus adults			0	1
Optioservus sp.			3	
Oulimnius latiusculus adults	1	5		
Stenelmis sp. larvae	1			
Stenelmis sp. adults	9		7	
Eubriidae				
Ectopria sp.	3		8	
Diptera				
Ceratopogonidae				
"Palpomyia" sp.			13	3
Chironomidae				
Chironominae				
Chironomini				
Polypedilum convictum	5		5	
Chironomini sp.		2	1	
Tanytarsini				
Cladotanytarsus sp.	3			
Rheotanytarsus sp.	1		1	
Tanytarsus sp.	1		2	
Diamesinae				
Diamesinae sp.	1			
Orthocladinae				
Brillia sp.	2		2	
Corynoneura sp.	3		3	
Epoicocladius sp.	6		5	
Eukiefferiella brehmi group	1		1	
E. brevicalcar group			16	
E. claripennis group	2		2	
Limnophyes sp.	1			
Lopescladius sp.	1		4	
Parachaetocladius sp.			1	
Parametriocnemus sp.	33		26	
Psectrocladius sp.?			1	
Synorthocladius semivirens	3		1	
Thienemanniella sp.	5		8	
Tvetenia bavarica group	9		22	
Xylotopus sp.			1	
Orthocladiinae sp.		5		16
Tanypodinae				
Nilotanypus sp.	3			
Thienemannimyia group	3			
Tanypodinae sp.		2		
Chironomidae sp.	1		2	1
Dixidae (Dixa sp.)	3		10	1
Ptychopteridae				

Bittacomorpha sp.	1			
Simuliidae sp.	28	13	18	7
Tipulidae				
Dicranota sp.	3	2		
Hexatoma sp.	11	1	22	2
Limnophila sp. (4 long caud lobes pointed and covered with fuzzy hairs, cf Fig. 21.5)	3		2	
Longurio sp.	1			
Tipula "abdominalis"	6		22	
Tipula sp. (moss inhabitant)			5	

DAE 94-46: 43 of 87 taxa (49%) and 676 of 993 specimens (68%) were EPTs. DAE 94-46(100): 13 of 25 taxa (52%) and 69 of 107 specimens (64%) were EPTs. Effort = 10.5 hours; 8.3 taxa per hour; 105 specimens per hour (per hour data includes sample of 100; no new taxa added from that sample); 11.4 specimens per taxon.

DAE 94-89: 32 of 73 taxa (44%) and 639 of 936 specimens (68%) were EPTs. DAE 94-89(100): 14 of 26 taxa (54%) and 57 of 102 specimens (56%) were EPTs. Effort = 8.5 hours; 8.8 taxa per hour; 122 specimens per hour (per hour data includes sample of 100, with two non-EPT taxa present that were absent from qualitative sample); 12.8 specimens per taxon.

DAE 94-46 and DAE 94-89 combined: 50 of 106 total taxa (47%) and 1315 of 1929 total specimens (68%) were EPTs (total taxa includes one non-EPT from sample of 100 not present in either qualitative sample). DAE 94-46(100) and DAE 94-89(100): 20 of 38 taxa (53%) and 136 of 209 specimens (65%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-89, Station 20, OGT-A, fishes. Tributary to Ogle Spring Branch
Flats Road, Sevier County, Tennessee, 1 October 1994. The area sampled extends 134 meters, 40 m above and 94 m below the 90 degree turn in the stream.
Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
class	Rhinichthys atratulus (28)	20 (22-60)

21-CR-B CARSON BRANCH—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-48 and DAE 94-76, site number 21, OGT-B, tributary to Ogle Spring at Otto Williams Road, ca. 0.5 road miles east of Rocky Flats Road, Sevier Co., Tenn., 11 June and 10 Sept. 1994. The creek is 3 to 6 ft wide, with a maximum depth of 1 ft. Canopy is about 80% above the bridge and only about 30% in the short reach worked below the bridge. Substrate 40% sand and silt, 30% boulder and cobble, and 30% gravel, with fine substrates predominant near the road crossing. The sample of 100 specimens was taken in a gravel area in a riffle about 70 m above the road. Some moss was present on boulders, especially above the bridge. *Rhinichthys atratulus* was present, and *Desmognathus* salamanders were seen on both collecting dates. Abundant macroinvertebrates included pleurocerid snails on both dates; *Diplectrona* and *Isonychia* on 11 June; peltoperlids and heptageniids on 10 September. Collectors on 11 June DA and EL Etnier, JT Baxter, SJ Fraley, CH Heacock, and CJ Paxton, 10.5 hours effort. Collectors for 94-76, 10 September: DA Etnier, RB Evans, LD Bonds, CJ Paxton, and CE Skelton, 6 hours of effort. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Det. DAE

Taxon	94-48 11 Jun	94-48 (100)	94-76 10 Sep	94-76 (100)		
Annelida						
Oligochaeta 10				2	1	
Hirudinea						
Placobdella sp.			1		1	
Mollusca						
Pleuroceridae						
Elimia clavaeformis			13	3	5	3
Sphaeriidae						
Sphaerium sp.			1			
Crustacea						
Decapoda						
Cambarus bartoni			3	3	0	1
Cambarus longirostris			2		3	2
Cambaridae sp. (early)			1			
Arachnida						
Hydracarina sp.			0	1		
Insecta						
Plecoptera						
Leuctridae						
Leuctra sp.			28	8	1	
Leuctridae sp. (early instars)					2	
Nemouridae						
Amphinemura delosa/nigrita			7	1		
Peltoperlidae						
Peltoperlidae sp. (early instars)			35	1	10	11
Perlidae						
Acroneuria abnormis					2	

Acroneuria felicis	1			
Perlodidae				
Malirekus hastatus	11		3	
Remenus bilobatus	2			
Perlodidae sp. (early instars)	4			
Pteronarcyidae				
Allonarcys sp.			1	
Ephemeroptera				
Baetidae				
Acentrella sp. (slender, no bands or distinct fringe on cerci)			0	2
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	22			
Baetis sp. cf. brunneicolor	17			
Baetis sp. cf. pluto	1			
Baetidae sp. (early instars)	6			
Ephemerellidae				
Drunella cornuta (9.5, ll mm)	2			
Ephemerella catawba	1			
Eurylophella minimella			4	1
Eurylophella sp. (early instars)	6			
Ephemeridae				
Ephemera sp.	23	1	8	1
Heptageniidae				
Epeorus dispar (small 1st gill)	2		3	
Epeorus rubidus/subpallidus	7			
Heptagenia aphrodite	1			
Heptagenia thetis	1			
Heptagenia sp. (early instars)	3			
Stenacron carolina	12			
Stenonema pudicum	114	9	72	29
Heptageniidae sp. (early instars)	1			
Leptophlebiidae				
Habrophlebia vibrans			1	
Habrophlebiodes sp.	1			
Paraleptophlebia sp. cf. guttata	2			
Oligoneuridae				
Isonychia sp.	80	37	8	
Odonata				
Aeshnidae				
Boyeria vinosa			0	1
Calopterygidae				
Calopteryx maculata/dimidiata	1		1	
Hetaerina sp.	2			
Cordulegastridae				
Cordulegaster erronea	20	2	5	
Cordulegaster maculata	2			
Gomphidae				

Gomphurus rogersi	12	1	2	
Lanthus vernalis	20	6	6	1
Stylogomphus albistylus	6		3	
Heteroptera				
Gerridae				
Gerris remigis			3	
Gerris sp. (nymphs)	9			
Veliidae				
Rhagovelia obesa	1	2	8	
Megaloptera				
Corydalidae				
Nigronia fasciata	5			
Nigronia serricornis	1			
Sialidae (Sialis sp.)	2			
Trichoptera				
Glossosomatidae				
Agapetus minutus (2 male pupae)	20			
Glossosoma sp.	5			
Hydropsychidae				
Cheumatopsyche sp.			3	
Diplectrona modesta	58	12	3	
Parapsyche cardis			3	1
Hydropsychidae (early instars)	2	2	1	
Lepidostomatidae				
Lepidostoma sp.	5	1		
Limnephilidae				
Goera sp. cases	1			
Pycnopsyche gentilis	3		1	
Pycnopsyche guttifer group	3			
Pycnopsyche luculenta group	2			
Pycnopsyche sp. (pupa, no case)			1	
Odontoceridae				
Psilotreta sp. (empty cases)	1		1	
Philopotamidae				
Dolophilodes distinctus	23	1	5	
Polycentropodidae				
Polycentropus sp.	2			
Rhyacophilidae				
Rhyacophila carolina group	12		1	
Rhyacophila fuscula	1			
Rhyacophila glaberrima	4			
Uenoidae				
Neophylax concinnus	7			
Neophylax consimilis (male, female pupae, larvae)	17		14	
Neophylax mitchelli	5		1	
Coleoptera				
Elmidae				
Optioservus sp.	2		0	1
Oulimnius latiusculus adults	4		1	4

Promoresia tardella adults			0	1
Stenelmis sp. adults	8		3	4
Eubriidae				
Ectopria sp.	1		4	1
Psephenidae				
Psephenus herricki	3		1	
Diptera				
Ceratopogonidae				
Palpomyia sp.			0	1
Chironomidae				
Chironominae				
Chironomini				
Cryptochironomus sp.			1	
Microtendipes sp.			1	
Paralauterborniella sp.			1	
Polypedilum sp.?			1	
Chironomini sp.		3		
Tanytarsini				
Cladotanytarsus sp.	4			
Rheotanytarsus sp.	1			
Orthocladiinae				
Corynoneura sp.	1			
Epoicocladius sp.	5		2	
Eukiefferiella claripennis grp.	1			
Parachaetocladius sp.			1	
Parametriocnemus sp.	25		9	
Symposiocladius lignicola			1	
Thienemanniella sp.	2			
Orthocladiinae sp.	2	4		3
Tanypodinae				
Thienemannimyia group	2			
Tanypodinae sp.		2		
Chironomidae sp.	1		2	
Dixidae (Dixa sp.)	5	2		
Muscidae? (white wrinkled maggot with two adjacent stump-like protuberances at caudal end)	2			
Empididae sp.	1			
Simuliidae sp.	14	2	11	7
Tipulidae				
Dicranota sp.	2			
Limnophila macrocera	2			
Limnophila sp. (4 long caud lobes pointed and covered with short perpendicular hairs, cf. M & C Fig. 21.5)	6			
Tipula "abdominalis"	13	1	1	27
Tipula sp. (moss inhabitant)			1	
Tipula sp. (Fig. 11.3) (large, with long white gills)	10			

DAE 94-48: 39 of 79 taxa (49%) and 461 of 694 specimens (67%) were EPTs. DAE 94-48(100): 9 of 22 taxa (41%) and 73 of 103 specimens (71%) were EPTs. Effort = 10.5 hours; 7.6 taxa per hour; 76 specimens per hour (per hour data includes sample of 100, with one new taxon added from that sample); 8.8 specimens per taxon.

DAE 94-76: 19 of 45 taxa (42%) and 150 of 233 specimens (64%) were EPTs. DAE 94-76(100): 6 of 21 taxa (29%) and 46 of 104 specimens (44%) were EPTs. Effort = 6 hours; 8.5 taxa per hour; 56 specimens per hour (per hour information includes data from 100-specimen sample, with 6 new taxa added from that sample); 5.0 specimens per taxon.

DAE 94-48 and DAE 94-76 combined: 45 of 95 total taxa (47%) and 611 of 927 specimens (66%) were EPTs (total taxa includes those from samples of 100 that were absent from qualitative samples). DAE 94-48(100) and DAE 94-76(100) combined: 12 of 33 taxa (36%) and 119 of 207 specimens (57%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-76, Station 21, OGT-B, fishes. Tributary to Ogle Spring Branch at Otto Williams Road, ca. 0.5 road miles east of Rocky Flats Road, Sevier County, Tennessee, 10 September 1994. The area sampled extends from 35 meters below to 58 meters above Otto Williams road, a reach of 93 meters. Shocking time 35 minutes, shocking upstream. Collectors CJ Paxton, RB Evans, effort of single-pass electrofishing. Released fishes identified by DA Etnier. Width to ft, mean about ft, and maximum depth ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6189	Rhinichthys atratulus (24)	18 (19-70)
44.6190	Semotilus atromaculatus	1 (105)

22-CH-B CHAVIS CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-37 and DAE 94-85, site number 22, CH-B, Chavis Creek at 4435 Ball Hollow Road, Cocke County, Tennessee, 4 June and 25 September 1994. Collectors on 4 June DA Etnier, PA Myer, CE Skelton, CJ Paxton, JT Baxter, SJ Fraley, 9 hours effort; collectors on 25 Sept. JM Young, DA Etnier, EL Etnier, CH Heacock, RB Evans, SJ Fraley, 8 hours effort. Worked reach from about 70 m below culvert to about 50 m above. Substrate 70% gravel, 15% sand and silt, 10% cobbles, and 5% bedrock, these last coarse substrates mostly above culvert. Width 4-6 ft, depth to 1.5 ft in pools, low gradient, canopy 0 at road, 50% in field above culvert, 70% below. Abundant invertebrate taxa included Peltoperlidae, *Diplectrona, Tipula*, Simuliidae, *Psephenus*, and Heptageniidae. *Desmognathus ochrophaeus, D. quadrimaculatus*, and *Eurycea bislineata* seen. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Trichoptera taxa preceded with an asterisk have been catalogued at UT. Det. RBE, DAE, KLH.

Taxon	94-37 4 Jun	94-37 (100)	94-85 25 Sep	94-85 (100)		
Annelida						
Oligochaeta 3			2	5		
Mollusca						
Pleuroceridae						
Elimia clavaeformis			9	6	11	
Crustacea						
Decapoda						
Cambarus bartoni			6		2	
Cambarus longirostris					4	1
Cambarus sp. cf. diogenes					1	
Cambarus sp. (early instars)			2			
Insecta						
Plecoptera						
Chloroperlidae						
Sweltsa sp.					7	
Chloroperlidae sp. (adults)			1			
Leuctridae						
Leuctra sp.			23	1	3	
Leuctridae sp. (early instars)			3	1		
Nemouridae						
Amphinemura delosa/nigritta			8	1		
Peltoperlidae						
Peltoperlidae sp., early instars			19		11	2
Perlidae						
Acroneuria abnormis			6		20	
Beloneuria sp.					15	
Eccoptura xanthenes			7		20	1
Perlidae (early instars)			4		1	
Perlodidae						

Isoperla holochlora	8			
Isoperla sp. (early instars)	3			
Malirekus hastatus			12	
Remenus bilobatus	6			
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	31	26		
Acentrella sp. (slender, no bands or distinct fringe on cerci)	16	6		
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)			3	
Acentrella sp. (damaged)	2			
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	2	1	2	6
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	27	3	11	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	4		6	
Baetis sp. cf. propinquus			1	
Centroptilum sp.			2	
Baetidae sp. (early & damaged)			5	
Baetiscidae				
Baetisca carolina			4	7
Caenidae				
Caenis sp.			1	6
Ephemeridae				
Ephemera sp.	4		8	1
Ephemerellidae				
Ephemerella sp. cf. catawba	0	3		
Ephemerella dorothea	14	2		
Eurylophella doris species group	1			
Eurylophella funeralis			2	
Eurylophella sp. (early instars)				3
Serratella deficiens	2			
Heptageniidae				
Cinygmula subaequalis	3	2		
Epeorus rubidus/subpallidus	9		1	
Epeorus sp. (early instars)	1			
Heptagenia aphrodite	1		1	4
Heptagenia thetis	1			
Heptagenia sp. (early instars)	1			
Stenacron sp. (early instars)			1	

Stenonema pudicum	19		156	21
Stenonema terminatum	3			
Leptophlebiidae				
Habrophlebia vibrans	1			
Habrophlebiodes sp.	9			
Paraleptophlebia sp. cf. guttata	2			
Odonata				
Aeshnidae				
Boyeria graffiana	1		1	
Boyeria vinosa			9	1
Calopterygidae				
Calopteryx dimidiata/maculata	9		16	
Cordulegastridae				
Cordulegaster erronea	8		9	
Cordulegaster maculata	14		11	
Gomphidae				
Gomphurus rogersi	23		22	
Lanthus vernalis	8	1	12	2
Stylogomphus albistylus	3		8	4
Heteroptera				
Gerridae				
Gerris sp. nymphs	9			
Veliidae				
Microvelia sp.			1	
Rhagovelia obesa	6		8	
Megaloptera				
Corydalidae				
Nigronia fasciata			2	
Nigronia serricornis			5	
Nigronia sp. (adult)	1			
Sialidae				
Sialis sp.			1	
Trichoptera				
Glossosomatidae				
Agapetus minutus (33 male pupae)	47	9		
Glossosoma nigrior (2 male pupae)	2		5	
Hydropsychidae				
Cheumatopsyche sp.			21	2
Diplectrona modesta	30	6	53	2
Hydropsyche betteni/depravata	3			
Hydropsychidae sp. (early instars)			2	
Lepidostomatidae				
Lepidostoma sp.	4			
Limnephilidae				
Goera fuscula			1	
Pycnopsyche gentilis	2			
Pycnopsyche guttifer species group, cases only			1	
Pycnopsyche luculenta sp. group	3		1	
Pycnopsyche sp. (early instars)			1	

Molannidae				
Molanna sp. (cases)			1	
Odontoceridae				
*Psilotreta frontalis	3		5	
Psilotreta sp. (early instars)	1		1	
Philopotamidae				
Dolophilodes distinctus	2		5	
Rhyacophilidae				
Rhyacophila carolina species group	2			
Rhyacophila fuscula	1			
Rhyacophila sp. (black head and pronotum, nigrita group)			1	
Uenoidae				
Neophylax consimilis	9			
Neophylax sp. (cases)			1	
Coleoptera				
Dryopidae				
Helichus basalis adults	1		2	2
Elmidae				
Optioservus ovalis adults	1	1	1	3
Optioservus sp. larvae	1			
Oulimnius latiusculus adults	4	2		
Promoresia elegans larvae			2	
Promoresia tardella adults			7	
Stenelmis sp. larvae				1
Stenelmis sp. adults	3		1	
Psephenidae				
Psephenus herricki	12		9	1
Ptilodactylidae				
Anchytarsus bicolor			1	
Diptera				
Athericidae (Atherix sp.)			3	
Ceratopogonidae				
"Palpomyia" sp.			2	20
Chironomidae				
Chironominae				
Chironomini				
Chironomus/Einfeldia sp.	4			
Demicryptochironomus sp.			1	
Paratendipes sp.			1	
Polypedilum convictum	1			
Polypedilum fallax group	2			
Stenochironomus sp.			1	
Stichtochironomus sp.	1			
Chironomini sp.		1		4
Tanytarsini				
Rheotanytarsus sp.			5	
Orthocladiinae				
Brillia sp.	2		1	
Corynoneura sp.			1	

Cricotopus bicinctus group	20			
Cricotopus tremulus group	3		1	
Cricotopus/Orthocladius sp.			1	
Eukiefferiella claripennis grp.	6			
Parakiefferiella sp.?	1			
Parametriocnemus sp.	11		2	
Psectrocladius sp.	3			
Tvetenia bavarica group	1			
Orthocladiinae sp.		12		1
Tanypodinae				
Thienemannimyia group	7		2	
Trissopelopia sp.	1			
Tanypodinae sp.		3		2
Chironomidae sp.	2	1		
Dixidae (Dixa sp.)	9		6	
Simuliidae	19	7	14	
Tabanidae				
Tabanus sp.	1			
Tipulidae				
Dicranota sp.	22	1		
Hexatoma sp.	8		14	4
Tipula "abdominalis"	4		33	
Tipula sp. (Fig. 11.3)	1		1	

DAE 94-37: 37 of 77 taxa (48%) and 350 of 600 specimens (58%) were EPTs. DAE 94-37(100): 10 of 20 taxa (50%) and 61 of 98 (62%) were EPTs. Effort = 9 hours; 8.7 taxa per hour; 78 specimens per hour (per hour data includes sample of 100; one EPT taxon was added from the sample of 100); 9.3 specimens per taxon.

DAE 94-85: 33 of 76 taxa (43%) and 392 of 633 specimens (62%) were EPTs. DAE 94-85(100): 11 of 24 taxa (46%) and 55 of 101 specimens (54%) were EPTs. Effort = 8 hours; 9.5 taxa per hour; 91 specimens per hour (per hour data includes sample of 100; no new taxa added from sample of 100); 8.3 specimens per taxon.

DAE 94-37 and DAE 94-85 combined: 52 of 99 taxa (53%) and 742 of 1233 specimens (60%) were EPTs. DAE 94-37(100) and DAE 94-85(100) combined: 20 of 38 taxa (53%) and 116 of 198 specimens (59%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-85, Station 22 CH-B, fishes. Chavis Creek at 4435 Ball Hollow Road, Cocke County, Tennessee, 25 September 1994. We electrofished a 100-meter reach centered on the driveway at the above address. Effort 25 minutes, shocking upstream. Collectors CJ Paxton, RB Evans, effort of single-pass electrofishing depletion estimate. Released fishes identified by collectors. Mean width 5 ft, maximum depth 1.5 ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6210	Notropis rubricroceus	2 (40-50)
44.6211	Rhinichthys atratulus (220)	22 (20-66)
44.6212	Semotilus atromaculatus (39)	11 (20-120)
45.1171	Catostomus commersoni	1 (55)

23-IC-B CAMP CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-36 and DAE 94-87, Indian Camp Creek, site number 23, IC-B, at Costner Road, Sevier Co., Tenn., 3 June and 25 September 1994. Substrate 30% boulder, 30% gravel, 40% cobble, canopy complete except at bridge & immediately below, where it was 30 to 70%; mean width 20 to 30 ft, maximum depth ca. 2 ft. On 3 June cobbles and boulders very impacted, periphyton on rocks showed some bluegreens, no aquatic vegetation, insects very scarce—everything seen was kept with the exception of simuliids, chironomids, oligochaetes, and pleurocerids. Also on 3 June *Cottus bairdi* and *Etheostoma swannanoa* seen; *Campostoma* seen in breeding activity immediately below bridge. Collectors on 3 June DA Etnier, CE Skelton, CJ Paxton, CH Heacock, JT Baxter, 6 2/3 person-hours of effort. On 25 September insects were much more abundant, the cobbles and boulders seemed less impacted, and moss was present on some of the boulders in the swiftest current. Collectors 25 September JM Young, DA Etnier, EL Etnier, CH Heacock, RB Evans, SJ Fraley, 9 hours effort. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Det. KLH, DAE.

Taxon	94-36 3 Jun	94-36 (100)	94-87 25 Sep	94-87 (100)
Annelida				
Oligochaeta	5	2	4	1
Mollusca				
Pleuroceridae				
Elimia clavaeformis	9		14	
Arachnida				
Hydracarina	1		1	
Insecta				
Plecoptera				
Chloroperlidae				
Chloroperlidae sp. (early instars)			2	
Leuctridae				
Leuctridae sp. (early instars)	3			
Nemouridae				
Amphinemura delosa/nigrittta	1			
Amphinemura sp. (early instars)			1	1
Peltoperlidae sp. (early instars)			1	
Perlidae				
Acroneuria abnormis	3			
Acroneuria carolinensis	1			
Paragnetina immarginata			1	
Perlesta placida	1			
Perlodidae				
Isoperla holochlora	6			
Isoperla sp. (early instars)			1	
Malirekus/Yugus (early instars)			13	
Perlodidae sp. (early instars)			1	
Pteronarcyidae				

Allonarcys sp.	7		5	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	11	3	42	6
Acentrella sp. (slender, no bands or distinct fringe on cerci)			17	3
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)			1	
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	2	1	4	3
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)			14	1
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	3			
Caenidae				
Caenis sp.			1	
Ephemerellidae				
Eurylophella sp. (early instars)			0	1
Ephemeridae				
Ephemera sp.			4	
Heptageniidae				
Epeorus dispar			4	
Epeorus rubidus/subpallidus			6	
Heptagenia juno			1	1
Heptagenia thetis			1	
Stenacron pallidum	2			
Stenacron sp. (early instars)			1	
Stenonema ithaca/modestum			2	1
Stenonema pudicum	1		116	23
Leptophlebiidae				
Paraleptophlebia sp. cf. guttata (max. palp long & slender as antennae)	5	3	6	1
Paraleptophlebia sp. cf. guttata (max palp short, thicker than antennae)	2			
Odonata				
Aeshnidae				
Boyeria vinosa			1	
Gomphidae				
Lanthus vernalis	10		5	
Heteroptera				

Gerridae				
Gerris remigis			1	
Gerris sp. nymphs	9		4	
Megaloptera				
Corydalidae				
Nigronia serricornis	1		6	
Trichoptera				
Glossosomatidae				
Glossosoma sp. (larvae, pupae)	1		11	
Hydropsychidae				
Arctopsyche irrorata			8	
Ceratopsyche macleodi			1	
Ceratopsyche sparna			0	1
Ceratopsyche sp. (female pupae)				1
Cheumatopsyche sp.	9	2	7	2
Diplectrona modesta	6		4	
Hydropsychidae sp. (early instars)	1		7	2
Lepidostomatidae				
Lepidostoma sp.	1			
Limnephilidae				
Goera fuscula			4	
Goera sp. early pupae	1			
Pycnopsyche luculenta sp. group, cases	1		1	
Molannidae				
Molanna sp., cases			1	
Philopotamidae				
Dolophilodes distinctus			22	4
Polycentropodidae				
Polycentropus sp.	2		2	
Sericostomatidae?				
Fattigia pele empty case	1			
Uenoidae				
Neophylax consimilis	1			
Neophylax sp.			4	
Coleoptera				
Dryopidae				
Helichus basalis adults	1			
Elmidae				
Optioservus sp. larvae	0	1	0	1
Oulimnius latiusculus adults	1			
Promoresia elegans larvae			3	
Promoresia tardella adults			2	
Eubriidae (Ectopria sp.)			5	
Diptera				
Athericicae (Atherix sp.)	6		25	18
Blephariceridae (Blepharicera sp.)			1	
Ceratopogonidae ("Palpomyia" sp.)	2		2	6
Chironomidae				
Chironominae				

Chironomini				
Demicryptochironomus sp			1	
Microtendipes sp.	2			
Phaenopsectra sp.	5		2	
Polypedilum convictum	4			
Polypedilum fallax	1			
Polypedilum illinoense	1			
Chironomini sp.		1		
Tanytarsini				
Rheotanytarsus sp.			2	
Tanytarsini sp.	0	3		
Diamesinae				
Diamesa sp.	13		2	
Orthocladiinae		59		2
Cardocladius sp.	1		1	
Corynoneura sp.	2			
Cricotopus tremulus group	5		1	
Cricotopus/Orthocladius sp.	18		1	
Eukiefferiella brehmi group?			7	
E. brevicalcar?	1			
E. claripennis group	28		1	
E. pseudomontana group	8		4	
Orthocladius obumbratus	5			
Orthocladius (Euorthocladius)	8			
Parakiefferiella sp.	1			
Parametriocnemus sp.	10		4	
Rheocricotopus sp.	6		5	
Tvetenia bavarica group			2	
Orthocladiinae sp.	1			
Prodiamesinae				
Prodiamesa sp.	1			
Tanypodinae				
Thienemannimyia group	10		7	
Tanypodinae sp.		1		
Chironomidae sp.	5	24		1
Dixidae				
Dixa sp.			3	
Simuliidae	14	1	19	11
Tipulidae				
Antocha sp.	1			
Dicranota sp.	21	1		
Hexatoma sp.	14	2	8	2
Limonia sp.	2			
Tipula "abdominalis"	1		1	

DAE 94-36: 23 of 59 taxa (39%) and 72 of 307 specimens (23%) were EPTs. DAE 94-36(100): 4 of 13 taxa (31%) and 9 of 104 specimens (9%) were EPTs. Effort = 6 2/3 hours; 9.1 taxa per hour; 62 specimens per hour (per hour data includes sample of 100, with 2 non-EPT taxa added from that sample); 5.2 specimens per taxon.

DAE 94-87: 34 of 67 taxa (51%) and 334 of 480 specimens (70%) were EPTs. DAE 94-87(100): 14 of 21 taxa (67%) and 52 of 97 specimens (54%) were EPTs. Effort = 9 hours; 7.8 taxa per hour; 64 specimens per hour (per hour data includes sample of 100, with 2 EPT taxa and one non-EPT taxon added from that sample); 7.2 specimens per taxon.

DAE 94-36 and 94-87 combined: 43 of 90 total taxa (48%) were EPTs (includes 2 EPT taxa and 1 non-EPT taxon taken in samples of 100 but not in qualitative samples); 365 of 787 specimens (46%) were EPTs. DAE 94-36(100 and 94-87(100) combined: 14 of 24 taxa (58%) and 60 of 201 specimens (30%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-65, Station 23, IC-B, fishes. Indian Camp Creek at Costner, Road, Cocke County, Tennessee, 28 August 1994. Sampled from picnic table 52 m below center of bridge on Costner Road upstream 75 m above bridge to end of 2.5-ft deep pool, 127 meter reach. Shocking time 40 minutes, mostly shocking downstream into set seine. Collectors DA Etnier, CH Heacock, JT Baxter, CE Skelton, effort of single-pass electrofishing, but stream too large to make adequate depletion run with a single shocker. Width 18-28 ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
Released	Salvelinus fontinalis, est. 6 in. TL	
44.6185	Campostoma anomalum (28)	14 (20-135)
44.6186	Rhinichthys atratulus	12 (19-65)
44.6187	Rhinichthys cataractae (49)	46 (18-80)
45.1165	Hypentelium nigricans	1 (135)
129.472	Cottus bairdi (83)	58 (27-72)
91.4516	Etheostoma swannanoa (1)	3 (59-65)

24-SH-B SANDY HOLLOW CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-38 and DAE 94-86, site number 24, SH-B, Sandy Hollow Creek, from mouth at Indian Camp Creek upstream ca. 100 meters, Cocke County, Tennessee, 4 June and 25 September 1994. The upper end of the reach worked is where multiflora rose and other brushy vegetation makes access very difficult. Substrate 60% gravel, 20% boulder and cobble, 20% silt-covered gravel. The east side of the creek is in cow pasture, and the creek is very silty and eutrophic. Trees on the west bank provide 60% canopy. Average stream width 6–8 ft, with maximum depth 1 ft. Collectors on 4 June DA Etnier, PA Myer, CE Skelton, CJ Paxton, JT BAxter, SF Fraley, 9 hours effort. Collectors on 25 September DA & EL Etnier, JM Young, CH Heacock, RB Evans, SJ Fraley, 9 hours effort. Vertebrates seen on 4 June included *Eurycea bislineata, Rana palustris, Nerodea sipedon, Campostoma anomalum, Rhinichthys atratulus, Semotilus atromaculatus, Cottus bairdi,* and *Etheostoma swannanoa.* Darters were absent on 25 Sept., with heptageniids, philopotamids, *Gomphurus rogersi*, peltoperlids, *Nigronia, Calopteryx, Acroneuria*, and *Eccoptura* vary abundant on that date. Benthic macroinvetebrates very abundant both dates. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Det. DA Etnier, KL Harpster.

Taxon	94-38 4 Jun	94-38 (100)	94-86 25 Sep	94-86 (100)
Annelida				
Oligochaeta	2	2	7	6
Mollusca				
Pleuroceridae				
Elimia clavaeformis	9		13	
Crustacea				
Decapoda				
Cambarus bartoni			1	
Cambarus longirostris	2		10	3
Insecta				
Plecoptera				
Chloroperlidae				
Haploperla brevis			2	
Sweltsa sp.			1	
Chloroperlidae sp. (early instars)			1	
Leuctridae				
Leuctra sp.	13	7	2	4
Zealeuctra sp	7			
Leuctridae sp. (early instars)		16		
Nemouridae				
Amphinemura delosa/nigritta	4	1		
Peltoperlidae				
Peltoperlidae sp. (early instars)	18	4	15	8
Perlidae				
Acroneuria abnormis	3		26	
Eccoptura xanthenes	6		18	7

Perlidae sp. (early instars)		1	1	
Perlodidae				
Isoperla holochlora	4			
Malirekus hastatus			4	
Remenus bilobatus	6			
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	8	1	2	
Acentrella sp. (slender, no bands or distinct fringe on cerci)	1			
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	6	2	1	
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	2		10	2
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	6			
Baetis sp. (early, damaged, or faded specimens)	46			
Ephemeridae				
Ephemera sp.			1	
Ephemerellidae				
Dannella simplex	1			
Eurylophella funeralis			14	
Eurylophella sp. (early instars)	0	2		
Serratella deficiens	2			
Heptageniidae				
Epeorus dispar (small 1st gill)	8			
Epeorus rubidus/subpallidus	31		11	
Epeorus sp. (early instars)	14		1	
Heptagenia aphrodite	14			
Heptagenia juno			2	
Heptagenia maculipennis			1	
Heptagenia thetis	4			
Heptagenia sp. (early instars)	10	1		
Stenacron carolina			1	
Stenacron pallidum			7	2
Stenonema carlsoni			1	
Stenonema ithaca/modestum			1	
Stenonema pudicum	50		116	18
Stenonema sp. (early instars)			13	7
Heptageniidae sp. (early instars)				1
Leptophlebiidae				
Habrophlebiodes sp.	19	8	5	
Paraleptophlebia adoptiva/mollis	1			

Paraleptophlebia guttata (max. palp long and slender)	9	3	1	1
Leptophlebiidae sp. (early)	7	2	1	1
Oligoneuridae				
Isonychia sp.	3	1		
Odonata				
Aeshnidae				
Boyeria graffiana	2		3	
Boyeria vinosa	1		5	
Boyeria sp. (early instars)	1			
Calopterygidae				
Calopteryx maculata/dimidiata	4		18	
Cordulegastridae				
Cordulegaster erronea			5	
Cordulegaster maculata	6		8	
Gomphidae				
Gomphus lividus			2	
Gomphurus rogersi	10		17	
Lanthus vernalis	6		15	3
Stylogomphus albistylus	8		5	
Heteroptera				
Gerridae				
Gerris remigis	2		4	
Gerris sp. nymphs	5		1	
Veliidae				
Rhagovelia obesa	17		4	
Megaloptera				
Corydalidae				
Nigronia fasciata	2		1	
Nigronia serricornis	7		16	3
Sialidae				
Sialis sp.			1	
Trichoptera				
Glossosomatidae				
Agapetus minutus (3 male pupae)	15			
Glossosoma nigrior (2 male pupae)	18		3	
Hydropsychidae				
Cheumatopsyche sp.			3	
Diplectrona modesta	22		24	6
Hydropsyche betteni/depravata			13	
Lepidostomatidae				
Lepidostoma sp.			1	
Limnephilidae				
Goera sp. (empty cases)	1		1	
Pycnopsyche guttifer group	2		1	
Pycnopsyche luculenta group	6		2	
Odontoceridae				
Psilotreta frontalis			1	1
Philopotamidae				
Chimarra sp.			5	1

Dolophilodes distinctus	103	10	36	6
Polycentropodidae				
Polycentropus sp.			0	1
Psychomyidae				
Lype diversa			1	
Rhyacophilidae				
Rhyacophila carolina sp. group	3		1	
Rhyacophila fuscula	1			
Rhyacophila sp. cf. nigrita			0	1
Uenoidae				
Neophylax concinnus	1			
Neophylax consimilis (3 male pupae in fall sample)	54		5	
Coleoptera				
Dryopidae				
Helichus basalis adults			2	
Elmidae				
Oulimnius latiusculus adults			1	2
Promoresia tardella adults			3	
Stenelmis sp. adults	4		5	2
Eubriidae				
Ectopria sp.	1		3	
Psephenidae				
Psephenus herricki	2		7	2
Ptilodactylidae				
Anchytarsus bicolor	1		3	1
Diptera				
Ceratopogonidae ("Palpomyia") sp.	0	2	1	2
Chironomidae				
Chironominae				
Chironomini				
Chironomus/Einfeldia sp.	1			
Demicryptochironomus sp.	1			
Paratendipes sp.			2	
Polypedilum convictum	7		1	
Polypedilum scalaenum			1	
Stichtochironomus sp.	1			
Chironomini sp.				1
Tanytarsini				
Rheotanytarsus sp.			1	
Diamesinae				
Pagastia sp.	1			
Orthocladiinae				
Brillia sp.	1			
Corynoneura sp.	1			
Cricotopus bicinctus	1		4	
Cricotopus tremulus group	1			
Cricotopus/Orthocladius sp.	3			
Eukiefferiella claripennis grp.	11			
Nanocladius sp.	2			

Parakiefferiella sp.			1	
Parametriocnemus sp.	29		9	
Thienemanniella sp.	4		4	
Tvetenia bavarica group	21		4	
Orthocladiinae sp.				5
Tanypodinae				
Procladius sp.			1	
Thienemannimyia group	3		2	
Zavrelimyia sp.	1			
Tanypodinae sp.				1
Chironomidae sp.	2	33		
Dixidae (Dixa sp.)	7	1	1	
Psychodidae (Psychoda sp.)	1	1		
Simuliidae sp.	29	4	10	2
Tipulidae				
Dicranota sp.	2			
Hexatoma sp.			3	1
Limnophila sp.	1			
Tipula "abdominalis"	8		9	1
Tipula sp. (Fig. 11.3)	1	1	8	

DAE 94-38: 36 of 78 taxa (46%) and 529 of 765 specimens (69%) were EPTs. DAE 94-38(100): 13 of 20 taxa (65%) and 59 of 103 specimens ((57%) were EPTs. Effort = 9 hours; 8.9 taxa per hour (1 EPT and 1 non-EPT added from sample of 100); 96 specimens per hour (per hour data includes sample of 100).

DAE 94-86: 37 of 79 taxa (47%) and 355 of 578 specimens (61%) were EPTs. DAE 94-86(100): 13 of 28 taxa (46%) and 67 of 103 specimens (65%) were EPTs. Effort = 9 hours; 8.8 taxa per hour (includes 2 EPT taxa from sample of 100 that were not in qualitative sample); 76 specimens per hour (includes specimens from sample of 100).

DAE 94-38 and DAE 94-86 combined: 54 of 109 total taxa (50%) and 883 of 1343 specimens (66%) were EPTs. DAE 94-38(100) and DAE 94-86(100) combined: 21 of 39 taxa (54%) and 126 of 206 specimens (61%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-64, Station 24, SH-B, fishes. Sandy Hollow Branch, lower 90 meters above confluence with Indian Camp Creek, plus spot shocking in several pools in next 50 meters above area where riparian vegetation becomes too thick to penetrate, 28 August 1994. Collectors DA Etnier, CH Heacock, JT Baxter, CE Skelton. Time spent shocking = 40 minutes in lower 90 meters + 10 minutes above, for 50 minutes of effort of single-pass electrofishing. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6167	Campostoma anomalum	22 (19–55)
44.6180	Rhinichthys atratulus (222)	140 (8–70)
44.6179	Rhinichthys cataractae	1 (36)
44.6181	Semotilus atromaculauts (8)	16 (25–80)
45.1164	Hypentelium nigricans	2 (40–45)
	Etheostoma swannanoa—seen on 4 June invert sample, not taken this sample	
129.470	Cottus bairdi (11)	17 (48–75)

25-CB-A COSBY CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-35 amd SJF 94-29, site 25, CB-A, Cosby Creek 0.2 mi n of Indian Creek Rd., across from Foothills Restaurant, and immediately below mouth of Indian Camp Creek, 3 June and 22 October 1994. Mean width ca. 40 ft, pool & riffle habitat, 30-50% canopy. Substrate 85% boulder & cobble, 10% silty sand, 5% gravel. Some overhanging banks, pools to 4 ft deep. Some *Podostemum* and *Fontinalis* on rocks in swift current. Less silty than CB-B, and better habitat. Collectors on 3 June DA Etnier, CH Heacock, CJ Paxton, CE Skelton, JT Baxter, 11 hours effort; collectors on 22 October SJ Fraley, EL Etnier, KL Harpster, CH Heacock, CJ Paxton, 12.5 hours effort. Trichoptera entries preceded with an asterisk have been catologued at UT. Det. DAE, ELE, SJF.

Taxon	94-35 3 Jun	94-35 (100)	94-29 22 Oct	94-29 (100)
Annelida				
Oligochaeta	14	16	30	1
Mollusca				
Pleuroceridae				
Elimia clavaeformis	15		9	
Physidae				
Physella sp	1		2	
Arachnida				
Hydracarina	4	1	4	
Crustacea				
Decapoda				
Cambarus longirostris	3		5	
Cambarus bartoni	2		1	
Cambarus sp. (not lngr. or bartoni)	1			
Insecta				
Plecoptera				
Capniidae				
Allocapnia sp.			14	
Chloroperlidae				
Haploperla brevis			2	
Sweltsa sp.			6	
Leuctridae				
Leuctra sp.			1	
Leuctridae sp., early instars	7		1	
Peltoperlidae				
Peltoperlidae sp., early instars	7		20	
Perlidae				
Acroneuria abnormis	1		21	
Acroneuria carolinensis	3		4	
Paragnetina immarginata	1		17	
Perlodidae				
Cultus decisus			7	

Diploperla sp. (early instars)			2	
Helopicus subvarians			2	
Isogenoides hansoni			3	
Isoperla sp. cf. bilineata	1			
Isoperla sp. cf. holochlora (dark head with pale spot ant. to anterior ocellus	11		51	
Malirekus hastatus			24	
Remenus bilobatus	2			
Yugus sp. cf. arinus	4			
Pteronarcyidae				
Allonarcys sp. (very long abd. spines, lat. margin pronotum very concave)			3	
Allonarcys sp. (short spines, convex lat. marg. pronotum)			3	
Allonarcys sp.	10	1	12	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	139	12	66	10
Acentrella sp. (slender, dark fringe, but band +/0 on cerci; 5, 6, & 9 dark; paired dark spots on abdomen)	2	3	1	
Acentrella sp. (early instars)	3	2	1	
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	9	4	17	1
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	16	2	6	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)			58	
Baetis sp. cf. pluto (seg. 5 pale, 8 with 4 dark dots, weak central trachea)			2	
Baetis sp. (early instars)	7			
Centroptilum sp.	1		2	
Baetidae, early instars	1	1	4	
Baetiscidae				
Baetisca carolina	3		6	
Caenidae				
Caenis sp.			6	
Ephemeridae				
Ephemera sp.	2		1	
Ephemerelllidae				

Dannella simplex	1			
Drunella cornuta/cornutella	12			
Drunella lata	3			
Ephemerella dorothea	1			
Ephemerella invaria	3		11	2
Ephemerella sp. cf. rossi (rows of spicules less noticeable than usual)			13	
Ephemerella sp. (early instars)			28	
Eurylophella doris sp. group	51			
Eurylophella funeralis	1		1	
Eurylophella sp. (early instars)			2	
Serratella deficiens	24	2		
Serratella sp. (early instars)			13	
Heptageniidae				
Epeorus rubidus/subpallidus	62	4		
Epeorus sp., early instars	8		16	3
Heptagenia sp. cf. julia	1			
Heptagenia juno	5			
Heptagenia sp. cf. thetis	2		13	
Rhithrogena sp. cf. amica	2			
Stenacron pallidum	2		8	
Stenonema ithaca/modestum	9		152	16
Stenonema pudicum	10		120	13
Stenonema sp. (early instars)			40	
Leptophlebiidae				
Habrophlebiodes sp.	4		1	
Paraleptophlebia adoptiva/mollis			30	2
Paraleptophlebia sp. cf. guttata (long, slender max. palp)	9	3	1	
Neoephemeridae				
Neoephemera purpurea	1		3	
Oligoneuridae				
Isonychia sp.	12		21	6
Odonata				
Aeshnidae				
Boyeria vinosa	2		21	
Calopterygidae				
Calopteryx maculata/dimidiata	11		25	
Cordulegastridae				
Cordulegaster maculata			1	
Gomphidae				
Gomphus lividus	1		2	
Lanthus vernalis	7		2	
Stylogomphus albistylus	2		3	
Macromiidae				
Macromia sp.	2			
Heteroptera				
Belostomatidae				
Belostoma flumineum			1	

Corixidae				
Sigara sp.	1			
Gerridae				
Gerris marginatus	1			
Gerris remigis	3			
Notonectidae				
Notonecta sp.	1			
Veliidae				
Rhagovelia obesa	1		2	
Megaloptera				
Corydalidae				
Corydalus cornutus			1	
Nigronia serricornis	5		7	
Trichoptera				
Brachycentridae				
Micrasema rickeri			1	
Micrasema wataga	1			
Micrasema wataga? (early pupae)	1			
Calamoceratidae				
Heteroplectron americanum			1	
Glossosomatidae				
Glossosoma sp.	29		3	
Hydropsychidae				
Ceratopsyche alhedra			1	
Ceratopsyche bronta	1		5	2
Ceratopsyche morosa			8	1
Ceratopsyche sparna	1		83	5
Ceratopsyche sp., early instars	3			
Cheumatopsyche harwoodi male pupae	3			
Cheumatopsyche sp.	39	1	104	11
Diplectrona modesta	11		1	
*Hydropsyche sp. cf. scalaris			2	
Hydropsychidae sp., early instars	3		8	
Lepidostomatidae				
Lepidostoma sp.	1			
Leptoceridae				
Triaenodes sp. cf. tardus	1			
Limnephilidae				
Goera calcarata	1			
Goera sp., early pupa	1			
Pycnopsyche gentilis (empty cases)			1	
Pycnopsyche luculenta sp. group	8			
Philopotamidae				
Dolophilodes distinctus	6		43	5
Polycentropodidae				
Polycentropus sp.	7		4	
P. cinereus? (early male pupa)	1			
Psychomyiidae				
Lype diversa	1			
Psychomyia sp.			1	

Rhyacophilidae				
Rhyacophila carolina	4			
Rhyacophila fuscula			20	
Rhyacophila sp. cf. nigrita			1	
Uenoidae				
Neophylax consimilis	7		1	
Coleoptera				
Carabidae sp.			2	
Dryopidae				
Helichus basalis adults	9		3	
Helichus fastigiatus adults	1			
Dytiscidae				
Agabetes sp. adults	1			
Coptotomus sp. adults	1			
Laccophilus sp. adults	1			
Elmidae				
Dubiraphia sp. adults	1			
Microcylloepus pusillus adults			1	
Optioservus sp. larvae			1	
Oulimnius latiusculus adults	2		1	
Promoresia elegans larvae	2		3	
Promoresia tardella adults			4	
Hydrophilidae				
Tropisternus lateralis adults			2	
Hydrophilidae sp.	1			
Psephenidae				
Psephenus herricki	6		7	
Ptilodactylidae				
Anchytarsus bicolor			1	
Diptera				
Athericidae (Atherix sp.)	6		19	7
Blephariceridae larvae & pupae	7			
Ceratopogonidae				
"Palpomyia" sp.	7	3	1	
Chironomidae sp.				
Chironominae				
Chironomini				
Chironomus/Einfieldia sp.	3			
Demicryptochironomus sp.	1		1	
Dicrotendipes cf. neomodestus	4			
Microtendipes sp.	5		1	
Phaenopsectra sp.	14			
Polypedilum convictum	17		7	
Polypedilum illinoense	5			
Stichtochironomus sp.	1			
Chironomini sp.		5		
Tanytarsini				
Rheotanytarsus sp.	7		6	
Tanytarsus sp.	3			

Diamesinae				
Diamesa sp.	1			
Pagastia sp.	1			
Sympotthastia sp.	1			
Orthocladiinae				
Brillia sp.			2	
Cardiocladius sp.	8		4	
Corynoneura sp.	3		16	
Cricotopus bicinctus	4			
Cricotopus tremulus group	1		1	
Cricotopus/Orthocladius sp.	2		2	
Eukiefferiella brehmi group	1		2	
E. claripennis group	2		7	
E. devonica group?	10		4	
E. gracei group	1			
E. pseudomontana group	4			
Eukiefferiella sp. (early)	2			
Nanocladius sp.	2		4	
Orthocladius obumbratus	3		3	
Orthocladius (Euorthocladius)	6		3	
Parametriocnemus sp.	15		14	
Psectrocladius sp.	9			
Rheocricotopus sp.	1		1	
Synorthocladius semivirens	2		5	
Theinemanniella sp.	8		4	
Tvetenia bavarica group	10		16	
Tvetenia discoloripes group	1			
Orthocladiinae sp. (early)	6	17	2	4
Prodiamesinae				
Odontomesa sp.	1			
Tanypodinae				
Thienemannimyia group	11		2	
Chironomidae sp.	5	3	6	
Dixidae (Dixa sp.)	4			
Empididae sp.	2		1	
Simuliidae sp.	32	14	24	16
Tabanidae (Chrysops sp.)	1			
Tipulidae				
Antocha sp.	2		6	1
Dicranota sp.	7			
Hexatoma sp.	8	1	1	
Tipula "abdominalis"	1		4	
Tipula sp. ("moss animal")			1	
Tipula sp. (Fig. 11.3)			1	

DAE 94-35: 52 of 127 taxa (41%) and 583 of 944 specimens (62%) were EPTs. DAE 94-35(100): 9 of 16 taxa (56%) and 35 of 96 specimens (36%) were EPTs. Effort = 11 hours; 15.3 taxa per hour; 95 specimens per hour (per hour data includes sample of 100; no taxa were added to qualitative list from sample of 100); 7.4 specimens per taxon.

SJF 94-29: 57 of 113 taxa (50%) and 1109 of 1440 specimens (77%) were EPTs. SJF 94-29(100): 13 of 18 taxa (72%) and 67 of 96 specimens (70%) were EPTs. Effort = 12.5 hours; 9.0 taxa per hour; 123 specimens per hour (per hour data includes sample of 100; no taxa were added to qualitative list from sample of 100); 9.8 specimens per taxon.

DAE 94-35 and SJF 94-29 combined: 75 of 162 total taxa (46%) and 1692 of 2384 specimens (71%) were EPTs. DAE 94-35(100) and SJF 94-29(100) combined: 18 of 27 taxa (67%) and 102 of 192 specimens (53%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Cosby Creek, Hester-Dendy artificial substrate samples, upstream station, CC-US, retrieved 25 October 1994.

Taxon	**1**	**2**	**3**	**4**	**5**	
Annelida						
Oligochaeta				2	1	2
Insecta						
Plecoptera						
Capniidae						
Allocapnia sp.	1	1		3	4	
Perlidae						
Paragnetina immarginata			1			2
Perlodidae						
Clioperla clio				1	1	
Diploperla sp.						1
Isoperla sp. (early instars)				3		
Ephemeroptera						
Caenidae						
Caenis sp.				2		
Ephemerellidae						
Ephemerella sp. (early instars)	1	10		4	7	1
Eurylophella sp. (early instars)	1	2		4	5	
Serratella sp. (early instars)					1	
Heptageniidae						
Stenonema ithaca/modesta	7	2		3	4	2
Stenonema pudicum	3	2		5	2	1
Stenonema sp. (early instars)	2	8		12		6
Leptophlebiidae						
Habrophlebiodes sp.				1		
Trichoptera						
Hydropsychidae						
Cheumatopsyche sp.	3	1			1	2
Philopotamidae						
Dolophilodes distinctus	1					1
Polycentropodidae						
Polycentropus sp.	1				1	1
Psychomyidae						

Lype diversa		1		1	1	
Diptera						
Chironomidae						
Chironominae						
Chironomini sp.	9	15	15	17	17	
Tanytarsini sp.	223	122	115	227	101	
Orthocladiinae sp.	15	21	20	28	19	
Tanypodinae sp.		1				
Empididae sp.		1				

Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa 6	3	5	4	4	4
Non-EPT specimens	971	247	160	152	273139
EPT taxa	16	8	8	9	109
EPT specimens	131	20	28	38	2718
Percent EPT taxa	73	73	62	69	7169
Percent EPT specimens	12	7	15	20	911

Note: Total taxa data are obtained by treating the five replicates as a single sample. Column entries that are taxonomically conservative, such as "*Stenonema* sp. (early instars)" are not considered as separate taxa if other *Stenonema* are identified to species in that sample.

FISH SURVEY DATA —
• QUANTITATIVE TRIPLE-PASS DEPLETION METHOD

STATION 25, CB-A, Cosby Creek. Population Estimates, 30 October 1994. The site has its upstream boundary at a conspicuous rock ledge ca. 20 m below the mouth of Indian Camp Creek and extends downstream 115 m. Widths, measured in meters (in parentheses) at 15-meter intervals starting from the lower end of the reach, were 0(10.5 m), 15(10.1), 30(8.8), 45(8.5), 60(9.2), 75(11.1), 90(10.8), 105(8.3), 115(6.0), for a mean width of 9.3 meters. Three shocker units were used. Collectors were Brian Evans, Chris Paxton, Dave Etnier, Sylvia McLain, Charles Heacock, Rebecca Brown, J.T. Baxter, Steve Fraley, Kelly Harpster, Mike Murphy, Steve Moore, Matt Kulp, Alan Loy, Aaron Whaley, John Hammonds, Sean McAfee, and David Alaban. (Number of specimens captured per sample plus maximum likelihood estimate of population size followed by 95% Confidence Interval.)

	I	II	IIIPop (95% CI)
American brook lamprey (Lampetra appendix)	1	0	12 (2-15)
stoneroller (Campostoma anomalum)	1142	216	1141499 (1486-1512)
saffron shiner (Notropis rubricroceus)	409	127	50608 (595-621)
blacknose dace (Rhinichthys atratulus)	148	35	32228 (216-240)

longnose dace			
(Rhinichthys cataractae)	323	118	25480 (470-490)
creek chub			
(Semotilus atromaculatus)	2	0	02 (*)
northern hogsucker			
(Hypentelium nigricans)	28	4	335 (35-36)
rainbow trout > 90 mm TL			
(Oncorhynchus mykiss)	4	1	05 (5)
mottled sculpin			
(Cottus bairdi)	265	50	53386 (373-399)
rockbass			
(Ambloplites rupestris)	3	4	19 (8-15)
redline darter			
(Etheostoma rufilineatum)	1	0	01 (*)
snubnose darter			
(Etheostoma simoterum)	4	6	112 (11-18)
Swannanoa darter			
(Etheostoma swannanoa)	96	29	29173 (156-190)
Totals for Station	2462	590	3093432 (3404-3460)

*—all fish caught on first pass

STATION CB-A. Capture Probabilities, Standing Crop Biomass, and Biomass 95% Confidence Intervals. (Weight is in grams, and 95% confidence intervals for biomass are estimated by multiplying average weight for each species by the upper and lower limits of the 95% CI for population size. NA= not applicable)

	Capture Prob.	Wt. (95% CI)
American brook lamprey		
(Lampetra appendix)	.5000	15 (15-113)
stoneroller		
(Campostoma anomalum)	.7371	29141 (28828-29333)
saffron shiner		
(Notropis rubricroceus)	.6667	251 (238-248)
blacknose dace		
(Rhinichthys atratulus)	.6091	251 (238-264)
longnose dace		
(Rhinichthys cataractae)	.6893	1545 (1504-1568)
creek chub		
(Semotilus atromaculatus)	NA	2 (NA)
northern hogsucker		
(Hypentelium nigricans)	.7778	1612 (1612-1658)
rainbow trout > 90 mm TL		
(Oncorhynchus mykiss)	.8333	356 (NA)
mottled sculpin		
(Cottus bairdi)	.6367	2316 (2238-2394)

rockbass		
(Ambloplites rupestris)	.4706	399 (355-666)
redline darter		
(Etheostoma rufilineatum)	NA	5 (NA)
snubnose darter		
(Etheostoma simoterum)	.5000	16 (15-25)
Swannanoa darter		
(Etheostoma swannanoa)	.5168	625 (562-684)
Average/Totals for Station	.6850	36535 (NA)

STATION CB-A. Range in Length of Non-gamefish. (Data in columns are maximum and minimum total length in millimeters for each species.

	I	II	III
American brook lamprey	13	NA	108
stoneroller	24-200	26-184	35-191
saffron shiner	24-75	24-79	31-80
blacknose dace	22-93	30-85	33-85
longnose dace	29-116	40-105	34-112
creek chub	41-45	NA	NA
northern hogsucker	32-305	38-109	35-44
mottled sculpin	41-107	41-92	44-92
redline darter	70	NA	NA
snubnose darter	33-57	23-43	40
Swannanoa darter	33-88	28-80	27-84

Length/Weight Data for Gamefish From Station CB-A. (total length in millimeters followed by weight in grams for each individual)

rainbow trout—120(19),179(70),186(71),195(78),222(118)
rockbass—47(2),49(2,2,3),57(3),182(109),221(231)

26-CB-B COSBY CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-34 and SJF 94-28, site 26, CB-B, Cosby Creek above and below Wallace C. Large bridge, Jones Cove Road, Cocke County, Tennessee, 3 June and 28 October 1994. Forty to sixty feet wide, ca. 5% canopy, maximum depth 2 ft. Substrate 85% granitic boulders, 15% bedrock, 5% gravel. Boulders in pools heavily silted. Sample of 100 tken in cobble riffle under middle span of bridge. Collectors on 3 June DA Etnier, CE Skelton, CJ Paxton, CH Heacock, JT Baxter, 12 hours of effort. Collectors on 28 October EL Etnier, SJ Fraley, CH Heacock, KL Harpster, CJ Paxton, 11.67 hours of effort. *Atherix*, Simuliidae, chironomids, *Isonychia*, baetids, peltoperlids, heptageniids, and *Cheumatopsyche* very abundant on 28 October. Trichopteran taxa preceded with an asterisk have been catalogued at UT.

Taxon	94-34 3 Jun	94-34 (100)	94-28 28 Oct	94-28 (100)
Platyhelminthes				
Planarians	1		2	
Annelida				
Oligochaeta	16		46	5
Mollusca				
Pleuroceridae				
Elimia clavaeformis	5		8	
Ancylidae				
Ferrissia sp.	2		3	
Physidae				
Physella sp	1			
Arachnida				
Hydracarina	1		19	
Crustacea				
Decapoda				
Cambarus longirostris	5		4	
Cambarus sp., early instar	1			
Orconectes forceps			1	
Insecta				
Plecoptera				
Capniidae				
Allocapnia sp.			46	
Chloroperlidae				
Haploperla brevis			1	
Sweltsa sp.			1	
Leuctridae				
Leuctra sp.			11	
Leuctridae sp. (early instars)	5			
Nemouridae				
Amphinemura wui	2			
Peltoperlidae				
Peltoperlidae sp. (early instars)	4		14	1

Perlidae				
Acroneuria abnormis	3		1	
Acroneuria evoluta	1			
Acroneuria carolinensis	6		4	1
Paragnetina immarginata	8		18	2
Perlodidae				
Clioperla clio			5	
Cultus decisus			6	
Diploperla sp.			5	1
Helopicus subvarians			5	
Isogenoides hansoni			2	
Isoperla sp. cf. holochlora	20			
Isoperla sp. (early instars)			58	2
Malirekus hastatus			12	1
Remenus bilobatus	2			
Yugus sp. cf. arinus	1			
Pteronarcyidae				
Allonarcys sp. (weak spines)	9		4	
Allonarcys sp. (strong spines, concave pronotal margins)			1	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	193	67	39	2
Acentrella sp. (slender, no bands or distinct fringe on cerci)	5			
Baetis sp. cf. brunneicolor (pale, paired commas on abd.; gills with prominent trachea)	26	4	12	1
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	6		9	3
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, segment 10 pale)	22		31	2
Baetis sp. cf. propinquus	3			
Baetidae sp. (early instars)	4		10	
Baetiscidae				
Baetisca carolina			14	
Caenidae				
Caenis sp.			8	
Ephemeridae				
Ephemera sp.	1			
Ephemerellidae				
Ephemerella catawba	1		3	
Ephemerella dorothea	1			
Ephemerella invaria	1		10	2
Ephemerella sp. (early instars)			81	2

Eurylophella doris sp. group	31			
Eurylophella funeralis			1	
Eurylophella sp. (early instars)			3	
Serratella deficiens	23	1		
Serratella sp. (early instars)			3	
Heptageniidae				
Epeorus rubidus/subpallidus	4		1	
Epeorus sp. (early instars)			26	
Heptagenia juno	1			
Heptagenia sp. (early instars)			4	
Stenacron carolina			1	
Stenacron interpunctatum			1	
Stenacron pallidum	2		4	
Stenacron sp. (early instars)			3	
Stenonema ithaca/modestum	2		111	12
Stenonema pudicum	2		88	4
Stenonema sp. (early instars)			32	8
Heptageniidae new genus?			3	
Leptophlebiidae				
Habrophlebia vibrans	1			
Paraleptophlebia adoptiva/mollis	3		15	
Paraleptophlebia sp. cf. guttata (max. palp long & slender)	4		1	
Paraleptophlebia sp. cf. guttata (max palp short, thick)	4			
Paraleptophlebia sp., no gills	2			
Neoephemeridae				
Neoephemera purpurea			1	
Oligoneuridae				
Isonychia sp.	2		28	13
Odonata				
Aeshnidae				
Boyeria vinosa	4		6	
Calopterygidae				
Calopteryx maculata/dimidiata	8		22	
Cordulegastridae				
Cordulegaster erronea			1	
Cordulegaster maculata			2	
Cordulegaster sp. (early instars)			1	
Gomphidae				
Gomphurus rogersi	2		3	
Gomphus lividus	2		6	
Lanthus vernalis	4		4	
Stylogomphus albistylus	3			
Heteroptera				
Corixidae				
Hesperocorixa sp. adults			1	
Sigara sp. adults	3			
Gerridae				
Gerris sp. nymphs	4			

Notonectidae			
Notonecta sp.	1		
Veliidae			
Rhagovelia obesa	2	5	
Megaloptera			
Corydalidae			
Corydalus cornutus		1	
Nigronia serricornis	7	7	
Trichoptera			
Brachycentridae			
Micrasema sp. (early or cases)	3	1	
Glossosomatidae			
Glossosoma sp.	3	1	
Hydropsychidae			
Ceratopsyche bronta		16	1
Ceratopsyche morosa		2	
Ceratopsyche sparna		84	16
*Cheumatopsyche harwoodi (male pupae)	1		
*Cheumatopsyche sp.	36	38	9
Diplectrona modesta	9		
*Hydropsyche n. sp. cf. scalaris		1	
Hydropsychidae sp. (early instars)	1	6	
Leptoceridae			
*Triaenodes sp. cf. tardus	4		
Limnephilidae			
Goera calcarata male pupae	1		
Goera sp.		1	
Pycnopsyche guttifer group	1		
Pycnopsyche luculenta group	2		
Philopotamidae			
Chimarra sp.		1	
Dolophilodes distinctus		18	4
Polycentropodidae			
Polycentropus sp.		1	
Rhyacophilidae			
Rhyacophila carolina	2	1	
Rhyacophila fuscula	3	18	
Rhyacophila fuscula male pupae	1		
*Rhyacophila glaberrima	1		
Rhyacophila sp. cf. nigrita		6	
Rhyacophila sp. (early instars)			1
Uenoidae			
Neophylax consimilis	2		
Neophylax sp. (cases)		1	
Coleoptera			
Carabidae sp.		2	
Dryopidae			
Helichus basalis adults	11	3	
Dytiscidae			

Laccophilus sp. adults			1	
Elmidae				
Promoresia elegans larvae			2	
Promoresia tardella larvae			1	
Promoresia tardella adults	1		1	
Stenelmis sp. adults	1			
Hydrophilidae				
Tropisternus collaris adults			1	
Tropisternus lateralis adults	2			
Tropisternus natator adults			2	
Psephenidae				
Psephenus herricki	9		9	1
Ptilodactylidae				
Anchytarsus bicolor	1			
Diptera				
Athericidae (Atherix sp.)	14	4	16	4
Blephariceridae sp.	1			
Ceratopogonidae				
"Palpomyia" sp.	4		1	
Ceratopogonidae sp. (pupae)			1	
Chironomidae				
Chironominae				
Chironomini				
Chironomus/Einfeldia sp.	1			
Demicryptochironomus sp.	1			
Dicrotendipes neomodestus?	1			
Microtendipes sp.	9		8	
Paratendipes sp.	1			
Phaenopsectra sp.	13		1	
Polypedilum convictum	12		8	
Polypedilum illinoense	3			
Polypedilum scalaenum	1			
Stictochironomus sp.	1			
Chironomini sp.			2	3
Tanytarsini				
Cladotanytarsus sp.			1	
Micropsectra sp.	3			
Rheotanytarsus sp.	1		18	
Tanytarsus sp.	1		2	
Tanytarsini sp.	1	1		1
Diamesinae				
Diamesa sp.			1	
Pagastia sp.	3			
Potthastia gaedii group	1			
Sympotthastia sp.			1	
Orthocladinae				
Brillia sp.	4		4	
Cardiocladius sp.	14		1	
Corynoneura sp.	2		34	
Cricotopus bicinctus group	4		2	

C. tremulus group	5		1	
Cricotopus/Orthocladius sp.	12			
Eukiefferiella brehmi group			4	
E. brevicalcar group			2	
E. claripennis group	5		7	
E. devonica group	3		19	
E. pseudomontana group	1			
Lopescladius sp.	1		6	
Nanocladius sp.	2		1	
Orthocladius obumbratus	7			
Orthocladius (Euorthocladius)	12		4	
Parametriocnemus sp.	12		20	
Psectrocladius sp.	11			
Rheocricotopus sp.	3		3	
Synorthocladius semivirens			7	
Thienemanniella sp.	18		35	
Tvetenia bavarica group	3		14	
Orthocladinae sp.	4	24	9	5
Prodiamesinae				
Odontomesa sp.	1			
Prodiamesa sp.	2			
Tanypodinae				
Thienemannimyia group	8		4	
Tanypodinae		1		
Chironomidae sp.	10	5	8	
Dixidae	2			
Empididae sp.			4	
Simuliidae	105	6	26	4
Tabanidae (cf. Leucotabanus)			3	
Tipulidae				
Antocha sp.	2		1	
Dicranota sp.	2			
Hexatoma sp.	10		3	
Limonia sp. (M & C Fig. 22.31)			1	
Tipula "abdominalis"			2	2
Tipula sp. (Fig. 11.3)			7	
Tipulidae pupae	2			

DAE 94-34: 45 of 113 taxa (40%) and 475 of 918 specimens (52%) were EPTs. DAE 94-34(100): 3 of 8 taxa (38%) and 72/113 specimens (64%) EPTs. Effort = 12 hours; 9.4 taxa per hour; 80 specimens per hour (per hour data includes sample of 100; no taxa were added from sample of 100); 8.1 specimens per taxon.

SJF 94-28: 55 of 119 taxa (46%) and 933 of 1388 specimens (67%) were EPTs. SJF 94-28(100): 19 of 27 taxa (70%) and 88 of 113 specimens (78%) were EPTs. Effort = 11.67 hours; 8.0 specimens per hour; 129 specimens per hour (per hour data includes sample of 100; no taxa were added from sample of 100); 7.8 specimens per taxon.

DAE 94-34 and SJF 94-28 combined: 70 of 163 total taxa (43%) and 1408 of 2306 specimens (61%) were EPTs (no new taxa encountered in samples of 100). DAE 94-34(100) and SJF 94-28(100) combined: 20 of 29 taxa (69%) and 160 of 226 specimens (71%) were EPTs.

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Cosby Creek, Hester-Dendy artificial substrate samples, downstream station, CC-DS, retrieved 7 June 1994.

Taxon	**1**	**2**	**3**	**4**	**5**	
Annelida						
Oligochaeta	2	3	1	38	2	
Insecta						
Plecoptera						
Leuctridae						
Leuctridae sp. (early instars)				3		
Nemouridae						
Amphinemura delosa/nigritta	1		1			
Nemouridae sp. (early instars)		2		2		
Peltoperlidae						
Peltoperlidae sp. (early instars)	5	8	9	25	4	
Perlidae						
Agnetina capitata	1					
Perlodidae						
Isoperla holochlora	4	7	8	8	4	
Remenus bilobatus	1					
Perlodidae sp. (early instars)		4	3	6		
Pteronarcyidae						
Allonarcys sp.				2		
Ephemeroptera						
Baetidae						
Acentrella sp. (broad, no fringe)	1			2	1	
Acentrella sp. (early instars)	1					
Ephemerellidae						
Eurylophella sp. (early instars)				1		
Serratella deficiens	2		1	1		
Serratella sp. (early instars)				1		
Megaloptera						
Corydalidae						
Nigronia serricornis			1	2	1	
Trichoptera						
Brachycentridae						
Micrasema sp. (empty cases)	1					
Hydropsychidae						
Ceratopsyche macleodi	1					
Ceratopsyche sparna				2	1	
Cheumatopsyche sp.	3	1	2			
Hydropsychidae sp. (early instars)				4		

Rhyacophilidae						
Rhyacophila carolina group		1	2		3	
Rhyacophila fuscula		1				
Coleoptera						
Elmidae						
Optioservus sp.		1				
Promoresia elegans				1		1
Promoresia sp. (early instars)					1	
Stenelmis sp. (adults)						

Taxon		**1**	**2**	**3**	**4**	**5**
Diptera						
Athericidae						
Atherix sp.	2	1			7	1
Ceratopogonidae sp.					1	
Chironomidae (larvae)			3	3	21	
(pupae)				9	27	
Chironomidae						
Chironominae						
Chironomini	38	41		88	152	130
Tanytarsini	101	121		92	156	30
Orthocladiinae sp.	250	237		410	1202	282
Tanypodinae sp.	2	3		3	14	4
Chironomidae sp.	10	7		26	80	1
Empididae	1					
Simuliidae	9	14		4	13	1
Tipulidae						
Antocha sp.					1	
Dicranota sp.				1	1	1

Summary redo non-ept Total		**1**	**2**	**3**	**4**	**5**
Non-EPT taxa	13	6	3	5	105	
Non-EPT specimens	166	21	17	19	1055	
EPT taxa		16	12	5	51010	
EPT specimens	140	23	24	24	6010	
Percent EPT taxa	59	67	62	50	56	67
Percent EPT specimens	46	52	58	56	37	67

Note: Chironomid taxa are listed below; in data above chironomids are listed only by subfamily/tribe.
Total taxa data are obtained by treating the five replicates as a single sample. Column entries that are taxonomically conservative, such as "Perlodidae sp. (early instars)" are not considered as separate taxa if other perlodids are identified to genus or genus and species in that sample.

Chironomidae					
Chironominae					
Tanytarsini					
Rheotanytarsus sp.		2		1	
Tanytarsus sp.?		1			
Orthocladiinae					
Corynoneura sp.		1	1		4
Parametriocnemus sp.				1	21
Symposiocladius lignicola			1		9
Thienemanniella sp.		2			5
Tvetenia bavarica group			1	1	2
Tanypodinae					
Thienemannimyia group					1
Chironomidae sp.		4		9	24

BENTHIC MACROINVERTEBRATE SURVEY DATA
• HESTER DENDY-MULTIPLATE SAMPLING

Cosby Creek, Hester-Dendy artificial substrate samples, downstream station, CC-DS, retrieved 25 October 1994.

Taxon	**1**	**2**	**3**	**4**	**5**	
Annelida						
Oligochaeta		6	2	7		1
Arachnida						
Hydracarina sp.			1			
Insecta						
Plecoptera						
Capniidae/Leuctridae						
(early instars)		1	1			
Chloroperlidae						
Sweltsa sp.			1			
Peltoperlidae						
Peltoperlidae sp. (early instars)		2	3	2	1	2
Perlidae						
Paragnetina immarginata		2				
Perlodidae						
Clioperla clio		3	1	1		6
Diploperla sp. (early instars)		1	1			
Isoperla sp. (early instars)		2		1		1
Malirekus hastatus					1	
Ephemeroptera						
Caenidae						
Caenis sp.				2		
Ephemerellidae						
Ephemerella sp. (early instars)			8	18	1	6
Eurylophella funeralis				1		
Eurylophella sp. (early instars)		4				
Serratella sp. (early instars)		2	2		1	

Ephemerellidae sp. (early instars)	4				
Heptageniidae					
Epeorus sp. (early instars)		1			2
Heptagenia sp.		1			
Stenonema ithaca/modestum	3	1	3	1	4
Stenonema pudicum	3	1	2		
Stenonema sp. (early instars)	9	11	9	7	7
Leptophlebiidae					
Habrophlebiodes sp.			1		
Trichoptera					
Hydropsychidae					
Ceratopsyche sparna	2			1	
Cheumatopsyche sp.		1		2	
Hydropsychidae sp. (early instars)		1	1		
Psychomyidae					
Lype diversa		1	1		
Taxon 1	**2**	**3**	**4**	**5**	
Diptera					
Chironomidae					
Chironominae					
Chironomini sp.	27	6	25	56	28
Tanytarsini	42	149	121	78	173
Orthocladiinae sp.	17	13	20	14	7
Tanypodinae sp.	2	2	2	2	3
Empididae sp.		1			
Simuliidae sp.					1
Summary Total	**1**	**2**	**3**	**4**	**5**
Non-EPT taxa	8	5	7	5	46
Non-EPT specimens	808	94	175	175	150214
EPT taxa		20	11	13	1176
EPT specimens	158	38	35	42	1528
Percent EPT taxa	71	69	65	69	6450
Percent EPT specimens	16	29	17	19	912

Note: Total taxa data are obtained by treating the five replicates as a single sample. Column entries that are taxonomically conservative, such as "Hydropsychidae sp. (early instars)" are not considered as separate taxa if other hydropsychids are identified to genus or genus and species in that sample.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

STATION 26, CB-B. Population Estimates, 29 October 1994. The 120-m reach sampled extends from 5 m above the W. C. Large Bridge on Jone Cove Road upstream to 15 m above the Foothills Parkway sign on U.S. 321. Widths in meters, measured every 15 m from the donwstream end, were 0(18 m), 15(15.5), 30(13.2), 45(12.4), 60(12.4), 75(10.0), 90(8.7), 105(11.3), 120(11.1), meand width 12.5 m. Collectors were Charles Heacock, Chris Paxton, Steve Moore, Matt Kulp, Sean McAfee, David Alaban, Alan Loy, Steve Fraley, and John Hammonds. Three shocker unites were employed. (Number of specimens captured per sample plus maximum likelihood estimate of population size followed by 95% Confidence Interval.)

	I	II	IIIPop (95% CI)
American brook lamprey (Lampetra appendix)	2	2	04 (4-6)
stoneroller (Campostoma anomalum)	651	504	3102220 (1988-2452)
whitetail shiner (Cyprinella galactura)	2	5	349 (10-505)
bigeye chub (Hybopsis amblops)	3	2	440 (**)
saffron shiner (Notropis rubricroceus)	1301	487	1892090 (2058-2122)
telescope shiner (Notropis telescopus)	47	7	1473 (68-81)
blacknose dace (Rhinichthys atratulus)	132	66	20234 (221-247)
longnose dace (Rhinichthys cataractae)	23	8	640 (37-47)
white sucker (Catostomus commersoni)	1	0	01 (*)
northern hogsucker (Hypentelium nigricans)	46	23	883 (77-92)
rainbow trout > 90 mm TL (Oncorhynchus mykiss)	0	2	02 (2-15)
mottled sculpin (Cottus bairdi)	282	188	124834 (724-944)
rockbass (Ambloplites rupestris)	4	2	517 (**)
sunfish (?) (Lepomis sp.)	2	0	02 (*)
fantail darter (Etheostoma flabellare)	18	9	741 (34-55)
redline darter (Etheostoma rufilineatum)	1	0	12 (2-15)
snubnose darter (Etheostoma simoterum)	35	25	1393 (73-119)

Swannanoa darter (Etheostoma swannanoa)	60	37	25162 (122-202)
Totals for Station	2610	1367	7295511 (5362-5636)

*—all specimens caught in first pass, no analysis possible
**—data not in descending order, results unreliable

STATION CB-B. Capture Probabilities, Standing Crop Biomass, and Biomass 95% Confidence Intervals for 29 October 1994. (Weight is in grams, and 95% confidence intervals for biomass are estimated by multiplying average weight for each species by the upper and lower limits of the 95% CI for population size. NA= not applicable)

	Capture Prob.	Wt. (95% CI)
American brook lamprey (Lampetra appendix)	.6667	42 (42-63)
stoneroller (Campostoma anomalum)	.3018	20924 (18687-23048)
whitetail shiner (Cyprinella galactura)	.0725	519 (106-5353)
bigeye chub (Hybopsis amblops)	NA	124 (NA)
saffron shiner (Notropis rubricroceus)	.6215	2179 (2058-2200)
telescope shiner (Notropis telescopus)	.5763	65 (61-73)
blacknose dace (Rhinichthys atratulus)	.5860	376 (354-395)
longnose dace (Rhinichthys cataractae)	.5606	104 (96-122)
whiter sucker (Catostomus commersoni)	NA	161 (NA)
northern hogsucker (Hypentelium nigricans)	.5746	3149 (2918-3487)
rainbow trout > 90 mm TL (Oncorhynchus mykiss)	.5000	161 (161-1208)
mottled sculpin (Cottus bairdi)	.3394	5560 (4851-6325)
rockbass (Ambloplites rupestris)	NA	836 (NA)
sunfish (?) (Lepomis sp.)	NA	37 (37*)
fantail darter (Etheostoma flabellare)	.4359	90 (75-121)
redline darter (Etheostoma rufilineatum)	.5000	6 (6-45)
snubnose darter (Etheostoma simoterum)	.3967	213 (168-274)

Swannanoa darter (Etheostoma swannanoa)	.3708	494 (366-606)
Average/Totals for Station	.4732	35041 (NA)

STATION CB-B. Range in Length of Non-gamefish. (Data in columns are maximum and minimum total length in millimeters for each species.

	I	II	III
American brook lamprey	181	170-189	NA
stoneroller	26-182	30-185	31-193
whitetail shiner	62-95	101-127	52-106
bigeye chub	70-75	68-74	68-83
saffron shiner	25-81	27-84	27-85
telescope shiner	31-45	32-74	36-93
blacknose dace	22-86	25-94	30-71
longnose dace	32-90	41-98	42-87
white sucker	246	NA	NA
northern hogsucker	41-321	47-256	87-227
mottled sculpin	51-141	35-129	42-125
fantail darter	39-68	35-75	59-69
redline darter	40	NA	73
snubnose darter	40-73	33-70	30-67
Swannanoa darter	42-81	28-80	39-82

Length/Weight Data for Gamefish From Station CB-B. (total length in millimeters followed by weight in grams for each individual)

rainbow trout—190(79),195(82)
rockbass—27(1),42(1),50(2),51(2),54(3),115(31),156(74),158(720),160(87),163(81),219(187)

27-WBT1-B WEBB CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

DAE 94-95, Station 27, WBT1-B, fishes. Webb Creek tributary

Sevier County, Tennessee, 20 October 1994. The area sampled extends from near the mouth of the creek 100 meters upstream. Effort = 20 minutes, shocking upstream. Collectors CJ Paxton, RB Evans, effort of single-pass electrofishing depletion estimate. Released fishes identified by RB Evans. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6228	Rhinichthys atratulus (16)	20 (35-70)
44.6225	Semotilus atromaculatus (6)	1 (70)
45.1176	Hypentelium nigricans	1 (43)
90.1638	Lepomis macrochirus	1 (35)

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

CES 94-16 and DAE 94-95, Station 27, WBT1-W, unnamed northern tributary to Webb Creek ca. 1/4 mile west of Station 7 (WB-A, Webb Creek at most easterly bridge on US 321), Sevier County, Tennessee, 23 June and 2 October 1994. Surveyed a 120-meter reach from the mouth of the creek upstream. Collectors on 23 June JT Baxter, CH Heacock, CE Skelton, 6 hours effort; collectors on 2 October JT Baxter, CJ Paxton, EL Etnier, SJ Fraley, 3 2/3 hours effort. Mean width 2-4 ft, maximum depth to 1.5 ft in pools. Substrate 85% gravel, 10% silty sand, 5% cobble on 23 June; much siltier, with 80% of substrate with conspicuous silt burden on 2 October. Canopy 85% complete. *Desmognathus* and *Eurycea* salamanders, *Nerodea sipedon* seen on 23 June. Abundant invertebrates on 2 October included *Peltoperla, Stylogomphus,* and *Hexatoma.* Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Det. KLH, DAE, CES

Taxon 23 Jun	94-16 (100)	94-16 2 Oct	94-95 (100)	94-95
Annelida				
Oligochaeta	16	16	2	4
Mollusca				
Pleuroceridae				
Elimia clavaeformis	7		4	
Pleurocera parvum	1			
Crustacea				
Decapoda				
Cambarus bartoni	5	1		
Insecta				
Plecoptera				
Chloroperlidae				
Sweltsa sp.			1	

Chloroperlidae sp. (early)				2
Leuctridae				
Leuctra sp.	4	5	30	16
Leuctridae sp. (early instars)	7	1		
Nemouridae				
Amphinemura delosa/nigritta	7			
Amphinemura sp. (early instars)		1		
Peltoperlidae				
Tallaperla sp.	13	5		
Peltoperlidae sp. (early instars)			15	5
Perlidae				
Acroneuria abnormis	3	4	3	2
Acroneuria sp. (early instars)	5			
Perlidae sp. (early instars)	1			
Perlodidae				
Clioperla clio	0	1		
Perlodidae sp. (early instars)			5	
Ephemeroptera				
Ephemerellidae				
Eurylophella funeralis	0	1	15	2
Ephemeridae				
Ephemera sp.	5	1	3	5
Heptageniidae				
Stenacron carolina	4	1	3	
Stenonema carlsoni	9	1	16	7
Stenonema sp. (early instars)	8	4	3	
Heptageniidae sp. (early instars)				1
Leptophlebiidae				
Habrophlebiodes sp.	10	11	1	
Paraleptophlebia adoptiva/mollis			2	
Paraleptophlebia sp. cf. guttata (max. palp long & slender)	1	2		
Paraleptophlebia sp. cf. guttata (max. palp short & thick)	5	1		
Leptophlebiidae sp. (early)	3	1	30	26
Odonata				
Aeshnidae				
Boyeria grafiana	1		1	
Boyeria vinosa	3		1	
Calopterygidae				
Calopteryx maculata/dimidiata			6	
Calopteryx sp. (early instars)				1
Cordulegastridae				
Cordulegaster erronea	4		9	
Cordulegaster maculata	1			
Cordulegaster sp. (early instars)	1	2		
Gomphidae				
Gomphurus rogersi	1			
Gomphus lividus	8			
Lanthus vernalis	19	8	11	2

Heteroptera				
Gerridae				
Gerris sp. (nymphs)	2			
Veliidae				
Mesovelia sp.			5	
Rhagovelia obesa	3		5	
Megaloptera				
Corydalidae				
Nigronia fasciata	3	2	3	
Nigronia serricornis	1			
Sialidae				
Sialis sp.	1		1	
Trichoptera				
Calamoceratidae				
Heteroplectron americana	1		3	
Glossosomatidae				
Agapetus minutus (1 male pupa)	7			
Hydropsychidae				
Diplectrona modesta	36	8	16	1
Lepidostomatidae				
Lepidostoma sp.	4			
Limnephilidae				
Pycnopsyche gentilis	2			
Pycnopsyche guttifer group	0	1		
Pycnopsyche luculenta group			1	
Pycnopsyche sp. (early instars)			2	1
Odontoceridae				
Psilotreta frontalis	7		5	
Psilotreta sp. (early instars)				1
Philopotamidae				
Wormaldia sp.	9		2	1
Phryganeidae				
Ptilostomis sp. (case)	1			
Polycentropodidae				
Polycentropus sp.	0	1	0	1
Rhyacophilidae				
Rhyacophila glaberrima	1			
Uenoidae				
Neophylax concinnus	1			
Neophylax mitchelli	1			
Neophylax sp. (early instars)			7	
Coleoptera				
Dryopidae				
Helichus basalis adults	1			
Helichus fastigiatus adults	3		3	
Elmidae				
Stenelmis sp. adults	7		1	
Eubriidae				
Ectopria sp.	1		1	
Hydrophilidae				

Hydrophilidae sp.	1			
Ptilodactylidae				
Anchytarsus bicolor	5	7	4	1
Diptera				
Ceratopogonidae ("Palpomyia" sp.)			0	1
Chironomidae				
Chironominae				
Chironomini				
Chironomini sp.			0	2
Tanytarsini				
Rheotanytarsus sp.			3	
Orthocladiinae				
Epoicocladius sp.			1	
Parametriocnemus sp.	4		15	
Thienemanniella sp.	1			
Orthocladiinae sp.				11
Tanypodinae				
Thienemannimyia group	8		4	
Zavrelimyia group			1	
Chironomidae sp.		15		5
Dixidae (Dixa sp.)	5	1	6	
Ptychopteridae (Ptychoptera sp.)	1			
Simuliidae	5			1
Stratiomyiidae (Allognosta sp.)			1	
Tabanidae sp.			1	
Tipulidae				
Dicranota sp. (M&C Fig. 21.9)				
Hexatoma sp.	0	2		
Limnophila sp. cf. macrocera	1			
Limnophila sp. (fuzzy anal appendages, cf. Fig. 21.5, M&C)	1		0	1
Tipula "abdominalis"	6	1	37	4
Tipula sp. (Fig. 11.3)	2			

CES 94-16: 18 of 41 taxa (44%) and 174 of 301 specimens (58%) were EPTs. CES 94-16(100): 15 of 25 taxa (60%) and 70 of 102 specimens (69%) were EPTs. Effort = 6 hours; 7.7 taxa per hour; 67 specimens per hour (per hour data includes sample of 100, with 5 new taxa added from that sample); 7.3 specimens per taxon.

DAE 94-95: 17 of 41 taxa (41%) and 163 of 289 specimens (56%) were EPTS. DAE 94-95(100): 13 of 23 taxa (57%) and 71 of 104 specimens (68%) were EPTs. Effort = 3.67 hours; 12.3 taxa per hour; 107 specimens per hour (per hour data includes sample of 100, which contained two EPT and two non-EPT taxa not present in qualitative sample); 7.0 ssspecimens per taxon.

CES 94-16 and DAE 94-95 combined: 28 of 71 total taxa (39%) and 337 of 590 specimens (57%) were EPTs (total taxa includes two EPT and two non-EPT taxa from samples of 100 that were absent from both qualitative samples). CES 94-16(100) and DAE 94-95(100) combined: 18 of 34 taxa (53%) and 141 of 206 specimens (68%) were EPTs.

28-SP-B SHEEP PEN BRANCH—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

CES 94-17 and DAE 94-93, Station 28, SP-W, Sheep Pen Branch, 50-m reach extends upstream from Mill Dam Branch, Webb Creek tributary, Sevier County, Tennessee, 23 June and 1 October 1994. Turn left 50 meters north of 427 Ball Mountain Road, go 1/4 mile, and walk down steep hill to the left 1/4 mile to the creek. Collectors on 23 June CH Heacock, JT Baxter, CE Skelton, 4.5 man hours of effort; collectors on 1 October DA Etnier, CE Skelton, JT Baxter, SJ Fraley, 11 hours effort. Substrate 80% gravel, 18% cobble and boulder, 2% sand and silty sand. Canopy mostly *Rhododendron*, about 75%. Mean width about 4 ft, depth to 8 inches. *Diplectrona*, Peltoperlidae, and *Isonychia* very abundant on 23 June, *Eurycea* sp. and *Desmognathus* sp. seen. Pleurocerids, Peltoperlids, and *Diplectrona* very abundant on 1 October. No fish seen on either date. Trichoptera taxa preceded with an asterisk have been catalogued at UT. Zeros in the qualitative data column indicate taxa that were taken in the sample of 100, but not in the qualitative sample.

Taxon 23 Jun	94-17 (100)	94-17 1 Oct	94-93 (100)	94-93
Platyhelminthes				
Planarians	1			
Annelida				
Oligochaeta	6	2	3	1
Mollusca				
Pleuroceridae				
Elimia clavaeformis	6		5	
Crustacea				
Decapoda				
Cambarus bartoni	3	1	2	
Cambarus sp. (early instars)			1	
Insecta				
Plecoptera				
Chloroperlidae				
Sweltsa sp.			4	
Chloroperlidae sp. (early instars)	1			
Leuctridae				
Leuctra sp.	15	9	29	3
Nemouridae				
Amphinemura wui			2	
Peltoperlidae				
Peltoperlidae sp. (early instars)	29	5	9	12
Perlidae				
Acroneuria abnormis	19	1	14	6
Agnetina sp. (early instars)	3			
Beloneuria sp. (early instars)	0	2		
Eccoptura xanthenes			5	
Perlidae sp. (early instars)		3		
Perlodidae				

Clioperla clio			9	
Isoperla sp. cf. similis (spot in ocellar triangle, no pale stripe or pale spots on abdomen	1			
Malirekus hastatus			18	1
Malirekus/Yugus (early instars)	27	4		
Remenus bilobatus	1			
Perlodidae sp. (none of the above, early instar)			1	
Ephemeroptera				
Ephemerellidae				
Ephemerella catawba	2			
Eurylophella funeralis			8	
Eurylophella sp. (early instars)	1	1		
Ephemeridae				
Ephemera sp.	3		3	1
Heptageniidae				
Epeorus dispar	9			
Heptagenia thetis	21		2	
Heptagenia sp. (early instars)		12	7	1
Stenacron sp. (early instars)	0	1	0	1
Stenonema sp. cf. carlsoni (no hair setae, no ventral pigment, but no lateral spines anterior to segment 6)	17		61	26
Stenonema sp. (early instars)	4	1		
Heptageniidae sp. (early instars)			3	
Leptophlebiidae				
Paraleptophlebia sp. cf. guttata	8	2		
Paraleptophlebia adoptiva/mollis	15	3	18	4
Oligoneuridae				
Isonychia sp.	31	5	1	
Odonata				
Cordulegastridae				
Cordulegaster erronea	8	3	3	
Gomphidae				
Lanthus vernalis	9	2	2	1
Heteroptera				
Gerridae				
Gerris remigis	2			
Gerris sp. (nymphs)	5		3	
Veliidae				
Rhagovelia obesa	1		4	
Megaloptera				
Corydalidae				
Nigronia fasciata	1			
Trichoptera				
Glossosomatidae				
*Agapetus minutus male pupae	1			
Glossosoma nigrior pupae	5			

Hydropsychidae				
Diplectrona modesta	26	9	26	36
Parapsyche cardis	10		8	
Hydropsychidae sp. (early instars)		1	3	
Lepidostomatidae				
Lepidostoma sp.	7			
Limnephilidae				
*Pycnopsyche flavata (case only in fall sample)	1		1	
Pycnopsyche luculenta group	1			
Molannidae				
Molanna blenda			4	
Odontoceridae				
Psilotreta sp. (early instars)	2			
Philopotamidae				
Dolophilodes distinctus	3	1	7	
Wormaldia sp.	6	1		
Philopotamidae sp. (early instars)			1	
Polycentropodidae				
Polycentropus sp.	0	1		
Rhyacophilidae				
Rhyacophila carolina group	1	1	0	1
Rhyacophila sp. cf. nigrita	7		4	1
Uenoidae				
*Neophylax mitchelli (male pupa in fall sample)	14		1	
Coleoptera				
Dryopidae				
Helichus fastigiatus adults	1			
Elmidae				
Optioservus ovalis adults	1			
Oulimnius latiusculus adults			1	
Stenelmis sp. adults	7		6	
Eubriidae				
Ectopria sp.	2		1	
Eubriidae sp.? (hairy little thing shaped like Ectopria)	2			
Hydrophilidae				
Hydrophilidae sp.	1			
Diptera				
Ceratopogonidae				
"Palpomyia" sp.	1	1	1	1
Chironomidae				
Chironominae				
Chironomini				
Microtendipes sp.	2			
Polypedilum convictum	4			
Chironomini sp.		1		1
Tanytarsini				
Tanytarsini sp.	0	2	0	1

Orthocladiinae				
Corynoneura sp.	1			
Epoicocladius sp.			1	
Eukiefferiella brevicalcar grp.			1	
Parachaetocladius sp.			3	
Parametriocnemus sp.	12		9	
Orthocladiinae sp.		6		4
Tanypodinae				
Thienemannimyia group	11			
Tanypodinae sp.		2		
Chironomidae sp.		1		1
Dixidae (Dixa sp.)	4	1	8	1
Simuliidae	4	2	1	
Tipulidae				
Dicranota sp.	0	1		
Hexatoma sp.	9	3	19	4
Limnophila sp.?	2			
Pseudolimnophila sp.			1	
Tipula "abdominalis-like", but with 2 short, 2 medium, and 2 long resp. lobes smooth & straight	1		4	
Tipula sp. (Fig. 11.3)	1			

CES 94-17: 30 of 57 taxa (53%) and 291 of 399 specimens (73%) were EPTs. CES 94-17(100): 17 of 30 taxa 57%) and 66 of 94 specimens (70%) were EPTs. Effort = 4.5 hours; 13.8 taxa per hour; 110 specimens per hour (per hour data includes sample of 100, with 5 new taxa added from that sample); 7.0 specimens per taxon.

DAE 94-93: 22 of 42 taxa (52%) and 249 of 338 specimens (74%) were EPTs. DAE 94-93(100): 12 of 20 taxa (60%) and 92 of 107 specimens 86%) were EPTs. Effort = 11 hours; 4.1 taxa per hour; 40 specimens per hour (per hour data includes specimens from sample of 100, with 3 new taxa added from that sample); 8.0 specimens per taxon. Note that doubling of effort did not result in increasing number of taxa (nor number of specimens).

CES 94-17 and DAE 94-93 combined: 34 of 68 total taxa (50%) and 540 of 737 specimens (73%) were EPTs (the 68 total taxa includes four taxa from the samples of 100 that were not taken in the qualitative samples). CES 94-17(100) and DAE 94-93(100) combined: 20 of 33 taxa (61%) and 158 of 201 specimens (79%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-93, station 28, SP-W, Sheep Pen Branch. On 1 October 1994 we seined for fishes in the reach where the benthic invertebrate collections were taken. No fishes were taken.

31-WBT3-B WEBB CREEK—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

CES 94-20, Station 31, WBT3-B, unnamed northern tributary to Webb Creek 0.15 air miles west (downstream) of mouth of Timothy Creek and WBT2-B, Pittman Center, Sevier County, Tennessee, 28 June and 2 October 1994. Surveyed a 75-meter reach from the mouth of the creek upstream. Mean width 1 to 2 ft, maximum depth in pools 9 in. Substrate 60% gravel and 35% mud and organic debris, 5% cobble; canopy 90% complete. Collectors on 28 June CE Skelton, and JT Baxter, 1.5 hours effort. The creek was too small to provide an opportunity to take a meaningful sample of 100 specimens. This site was dry when visited on 2 October 1994. Abundant taxa on 28 June were peltoperlids, *Cambarus bartoni*, and *Diplectrona*. Det. DAE.

Taxon	94-19 28 Jun
Platyhelminthes	
Planarians	1
Annelida	
Oligochaeta	3
Crustacea	
Decapoda	
Cambarus bartoni	2
Isopoda	
Lirceus sp.	1
Insecta	
Plecoptera	
Leuctridae	
Leuctra sp.	9
Peltoperlidae sp. (early instars)	5
Ephemeroptera	
Heptageniidae	
Epeorus dispar (small 1st gill)	1
Stenacron carolina	10
Stenonema carlsoni	17
Leptophlebiidae	
Habrophlebiodes sp.	4
Paraleptophlebia guttata	5
Odonata	
Cordulegastridae	
Cordulegaster erronea	2
Trichoptera	
Hydropsychidae	
Cheumatopsyche sp.	1
Diplectrona modesta	4
Lepidostomatidae	
Lepidostoma sp.	3
Philopotamidae	
Wormaldia sp.	2

Uenoidae	
Neophylax mitchelli	3
Diptera	
Chironomidae	
Chironominae	
Chironomini	
Polypedilum convictum	1
Orthocladiinae	
Parametriocnemus sp.	3
Tvetenia bavarica group	3
Tanypodinae	
Thienemannimyia group	1
Chironomidae sp.	3
Dixidae (Dixa sp)	4
Simuliidae	2
Tipulidae	
Dicranota sp.	2
Hexatoma sp.	3
Limnophila macrocera	1
Tipula "abdominalis"	1

CES 94-20: 12 of 27 taxa (44%) and 64 of 97 specimens (66%) were EPTs. Effort = 1.5 hours; 18 taxa per hour; 65 specimens per hour; 8.1 specimens per taxon.

32-LB-B LAUREL BRANCH—Stream Biological Survey

BENTHIC MACROINVERTEBRATE SURVEY DATA
• OPPORTUNISTIC SAMPLING

CES 94-18 and DAE 94-97, Station 29, LB-B, Laurel Branch, Little Pigeon River tributary at Pittman Center, Sevier County, Tennessee, 28 June and 2 October 1994. Sample from 100-m reach starting .35 miles above mouth and extending upstream. Substrate 70% cobble and boulder, 15% gravel, 10% bedrock, 10% sand and silt. Canopy 60%, width 10-18 ft, maximum depth to 2.5 ft, silt conspicuous when substrate disturbed. Abundant invertebrate taxa on 28 June included *Peltoperla, Stenonema, Acroneuria abnormis, Diplectrona modesta. Eurycea* and *Desmognathus* salamanders seen. Collectors on 28 June MH Hughes, CJ Paxton, FJ Kriegler, JT Baxter, CE Skelton, 11.25 hours of effort. Collectors on 2 October EL Etnier, KL Harpster, SJ Fraley, CJ Paxton, JT Baxter, LD Bonds, 7.67 hours of effort. Invertebrata taxa very abundant on 2 October were peltoperlids, *Diplectrona, Psephenus, Glossosoma, Epeorus, Allonarcys*, Simuliidae, *Tipula "abdominalis"*. Zeros in the qualitative data columns indicate taxa that were taken in the samples of 100, but not in the qualitative samples. Det. KLH, DAE, ELE.

Taxon	94-18 28 Jun	94-18 (100)	94-97 2 Oct	94-97 (100)
Annelida				
Oligochaeta	4	2	7	6
Mollusca				
Pleuroceridae				
Elimia clavaeformis	3		11	1
Arachnida (Hydracarina)			1	
Crustacea				
Decapoda				
Cambarus bartoni	4	1	2	
Cambarus sp. (early instars)			2	
Insecta				
Plecoptera				
Chloroperlidae				
Chloroperlidae sp. (early Instars)	1		1	
Leuctridae				
Leuctra sp.			4	
Leuctridae sp. (early instars)	39	8		
Nemouridae				
Amphinemura delosa/nigritta			2	
Amphinemura sp. (early instars)	1			
Peltoperlidae				
Peltoperla sp.			2	
Peltoperlidae sp. (early instars)	15		9	4
Perlidae				
Acroneuria abnormis	55	5	15	16
Perlesta sp.	2			
Perlidae (early instars, probably all A. abnormis)			52	

Perlodidae				
Clioperla clio			1	
Isoperla sp. cf. holochlora	14	1	1	
Malirekus hastatus			9	
Malirekus/Yugus sp. (early)	13	3		
Pteronarcyidae				
Allonarcys sp. (weak spines)	15		6	
Ephemeroptera				
Baetidae				
Acentrella sp. (broad, segs. 4, 5, 9 pale, 6 dark, abd. w/pairs of dark dots; no dark band or conspicuous fringe on cerci)	13	1	0	1
Acentrella sp. (slender, no bands or distinct fringe on cerci)	5	5	2	
Acentrella sp. (early instars)	3	2	3	
Baetis sp. cf. intercalaris (5 & 9 pale, 5 with 2 dark spots; large pale areas on abdomen)	10	2	28	
Baetis sp. cf. pluto (slender, gill trachea weak, 1-9 uniform gray, 10 pale)			3	
Baetis sp. (early instars)	1		12	1
Ephemeridae				
Ephemera sp.	2			
Ephemerelllidae				
Drunella cornuta (9 mm, mature)	1			
Ephemerella catawba	5			
Ephemerella sp. (early instars)			1	
Eurylophella sp. (early instars)	1		2	
Serratella deficiens	5			
Ephemerellidae sp. (early instars)	2			
Heptageniidae				
Epeorus dispar (small 1st gill)	9		17	
Epeorus rubidus/subpallidus	33	3	13	2
Epeorus sp. (early instars)	6	1	32	
Heptagenia aphrodite			4	
Heptagenia juno	1		1	
Heptagenia thetis	25	13	1	
Heptagenia sp. (early instars)	21		3	
Rhithrogena sp.	1			
Stenacron pallidum	2		0	1
Stenonema carlsoni			6	
Stenonema ithaca/modestum	1			
Stenonema pudicum	48	6	72	5
Stenonema sp. (early instars)	2	1	32	7
Leptophlebiidae				
Paraleptophlebia adoptiva/mollis	1		1	
Paraleptophlebia sp. cf. guttata	7			
Leptophlebiidae sp. (early)		2	7	

Oligoneuridae				
Isonychia sp.	32	8	1	
Odonata				
Aeshnidae				
Boyeria graffiana			2	
Boyeria vinosa			2	
Boyeria sp. (early instars)	1			
Cordulegastridae				
Cordulegaster erronea	2		1	
Cordulegaster maculata	6		1	
Gomphidae				
Gomphurus rogersi	9		6	
Lanthus vernalis	13		14	1
Ophiogomphus incurvatus	1			
Stylogomphus albistylus	8		9	
Heteroptera				
Gerridae				
Gerris remigis			4	
Gerris sp. nymphs	6		1	
Veliidae				
Microvelia sp.			2	
Rhagovelia obesa			5	
Megaloptera				
Corydalidae				
Nigronia serricornis	3	1	1	
Trichoptera				
Brachycentridae				
Micrasema rickeri			1	
Glossosomatidae				
Agapetus sp. (early pupae)	1			
Glossosoma nigrior (10 male pup.)	23	2	48	1
Hydropsychidae				
Ceratopsyche sparna	9		25	
Cheumatopsyche harwoodi (male pupa)	1			
Cheumatopsyche sp.	3		8	
Diplectrona modesta	33	5	70	32
Hydropsyche betteni/depravata			1	1
Parapsyche cardis	1			
Hydropsychidae sp. (early instars)	5	1	36	
Lepidostomatidae				
Lepidostoma sp.	4			
Leptoceridae				
Triaenodes sp. (empty cases)	1			
Limnephilidae				
Pycnopsyche guttifer sp. group	3			
Pycnopsyche luculenta sp. group	3			
Odontoceridae				
Psilotreta frontalis			1	
Philopotamidae				

Dolophilodes distinctus	10		22	
Wormaldia sp.	3	2		
Rhyacophilidae				
Rhyacophila carolina species group	1		1	
Rhyacophila fuscula	13		8	
Rhyacophila sp. cf. nigrita	3		10	1
Uenoidae				
Neophylax mitchelli	5			
Coleoptera				
Dryopidae				
Helichus basalis adults			1	
Elmidae				
Optioservus avalis adults	0	1		
Optioservus sp. larvae			1	
Oulimnius latiusculus adults			1	
Promoresia tardella adults	2		7	
Stenelmis sp. adults	6	1	10	2
Psephenidae				
Psephenus herricki	6	1	11	1
Ptilodactylidae				
Anchytarsus bicolor	1			
Diptera				
Blephariceridae (Blepharicera sp.)			1	
Ceratopogonidae ("Palpomyia" sp.)			1	3
Chironomidae				
Chironominae				
Chironomini				
Demicryptochironomus sp.	2			
Microtendipes sp.	1			
Phaenopsectra sp.	1			
Polypedilum convictum	4		1	
Chironomini sp.		4	1	
Tanytarsini				
Rheotanytarsus sp.			1	
Tanytarsus sp.	1			
Orthocladiinae				
Brillia sp.	2			
Cardiocladius sp.	1			
Corynoneura sp.	1		5	
Cricotopus/Orthocladius sp.	1			
Eukiefferiella brehmi group	3		1	
E. brevicalcar group			23	
E. claripennis group			9	
E. devonica group	1			
Parachaetocladius sp.			3	
Parametriocnemus sp.	9		5	
Thienemanniella sp.	1		7	
Tvetenia bavarica group	17		2	
Orthocladiinae sp.		13	2	6
Tanypodinae				

Thienemannimyia group	3	1		
Chironomidae sp.			3	
Dixidae (Dixa sp.)	4	1	3	
Empididae sp.	0	1		
Simuliidae sp.	13	2	20	7
Tabanidae sp.	1			
Tipulidae				
Dicranota sp.	14			
Hexatoma sp.	1		3	2
Tipula "abdominalis"	3		34	2
Tipula sp. (moss inhabitant)	2			

CES 94-18: 44 of 83 taxa (53%) and 514 of 676 specimens (76%) were EPTs. CES 94-18(100): 15 of 27 taxa (56%) and 71 of 100 specimens (71%) were EPTs. Effort = 11.25 hours; 7.5 taxa per hour; 69 specimens per hour (per hour data includes sample of 100 specimens, with 2 non-EPT taxa added that were not in the qualitative sample); 8.3 specimens per taxon.

DAE 94-97: 34 of 71 taxa (48%) and 574 of 801 specimens (72%) were EPTs. DAE 94-97(100): 11 of 21 taxa (52%) and 72 of 103 specimens (70%) were EPTs. Effort = 7.67 hours; 9.5 taxa per hour; 118 specimens per hour (per hour data includes sample of 100, with 2 EPT taxa present that were not in qualitative sample); 11.3 specimens per taxon.

CES 94-18 and DAE 94-97 combined: 51 of 94 total taxa (54%) and 1088 of 1477 specimens (74%) were EPTs (no new taxa added from samples of 100). CES 94-18(100) and DAE 94-97(100) combined: 18 of 35 taxa (51%) and 143 of 203 specimens (70%) were EPTs.

FISH SURVEY DATA —
• SINGLE PASS ELECTROSHOCK SAMPLING

DAE 94-97, Station 29, LB-B, fishes. Laurel Branch, tributary to Little Pigeon River, Pittman Center, Sevier County, Tennessee, 20 October 1994. The area sampled is a 300-meter reach with its lower end ca. 13 mile above the creek mouth. meters above and 50 meters below McKinzie Way. Effort 30 minutes, shocking upstream. Collectors CJ Paxton, RB Evans, effort of single-pass electrofishing depletion estimate. Released fishes identified by RB Evans and CE Skelton. Mean width 14 ft, maximum depth 2.5 ft in this reach. Numbers in parentheses indicate specimens released.

Cat. #	Taxon	No. (mm SL)
44.6230	Campostoma anomalum	1 (120)
44.6231	Rhinichthys atratulus (33)	20 (39-72)
44.6232	Rhinichthys cataractae	1 (95)
31.179	Oncorhynchus mykiss (12)	1 (114)