WSRC-TR--90-472

DE91 005128

Derivative Classifier

A STUDY OF POST-THERMAL RECOVERY OF THE MACROINVERTEBRATE COMMUNITY OF FOUR MILE CREEK JUNE 1985 - SEPTEMBER 1987 (U)

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NAI-SR-105

A STUDY OF POST-THERMAL RECOVERY OF THE MACROINVERTEBRATE COMMUNITY OF FOUR MILE CREEK JUNE 1985 - SEPTEMBER 1987

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NOVEMBER 1989

This report, NAI-SR-105, was prepared for
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DISCLAIMER

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ACKNOWLEDGEMENTS

This study was initiated and designed by Boris Kondratieff, and Joe O'Hop supervised most of the field and lab work. Many NAI-SE (formerly ECS) employees helped the study through field collection and sample processing. Most identifications were made by Kathy Herring, Barbara Minton, and Bill Painter. Mark Giffin performed taxonomic quality control.

1.0 INTRODUCTION

Four Mile Creek is one of several streams at the Savannah River Site which has received thermal effluents (≤ 70 °C water) from nuclear production operations. From 1955 - mid-1985, Four Mile Creek received ~~thermal~~ effluent from C-Reactor as well as non-thermal and small thermal discharges from F and H Separation Areas. Total discharges from all of these facilities ~~was~~ were ? about ten times higher than the natural flow of the creek (Firth et al. 1986). ~~All~~ water being discharged into Four Mile Creek was originally pumped from the Savannah River.

From June 1984 to June 1985, Normandeau Associates, Inc. (NAI; formerly Environmental and Chemical Sciences, Inc.) sampled Four Mile Creek macroinvertebrate communities as part of a larger study of Savannah River Site streams (see Kondratieff and Kondratieff 1985, and Firth et al. 1986). After shutdown of C-Reactor in June 1985, NAI continued macroinvertebrate sampling at a single location in Four Mile Creek in order to document the recovery of the macroinvertebrate community following cessation of thermal perturbation.

This study reports the results of the artificial substrate sampling of macroinvertebrate communities of Four Mile Creek from June 1985 through September 1987, when

sampling was terminated. Macroinvertebrate taxa richness, densities, and biomass data from this study are compared to Four Mile data collected prior to the shutdown of C-Reactor (Kondratieff and Kondratieff 1985 and Firth et al. 1986), and to comparable macroinvertebrate data from other Savannah River Site streams.

Four Mile Creek is a small stream, about 24 km in length. About 25% of Four Mile Creek flows into Beaver Dam Creek, and about 25% of the creek flows through the Savannah River swamp. The remaining stream flow enters the Savannah River through a break in the natural river levee (except during high river flows, when the stream flows through the swamp system, and eventually mixes with Steel Creek and Pen Branch; Kondratieff and Kondratieff 1985).

For the duration of the study reported here, one study site was sampled, located where the SRS Road A-13.2 bridge crosses the stream (Figure 1-1). This corresponds to the Station 2 site of Kondratieff and Kondratieff (1985), and is probably comparable to Stations 13 and 14 of Firth et al. (1986). Either of these reports can be referred to for a detailed description of the stream.

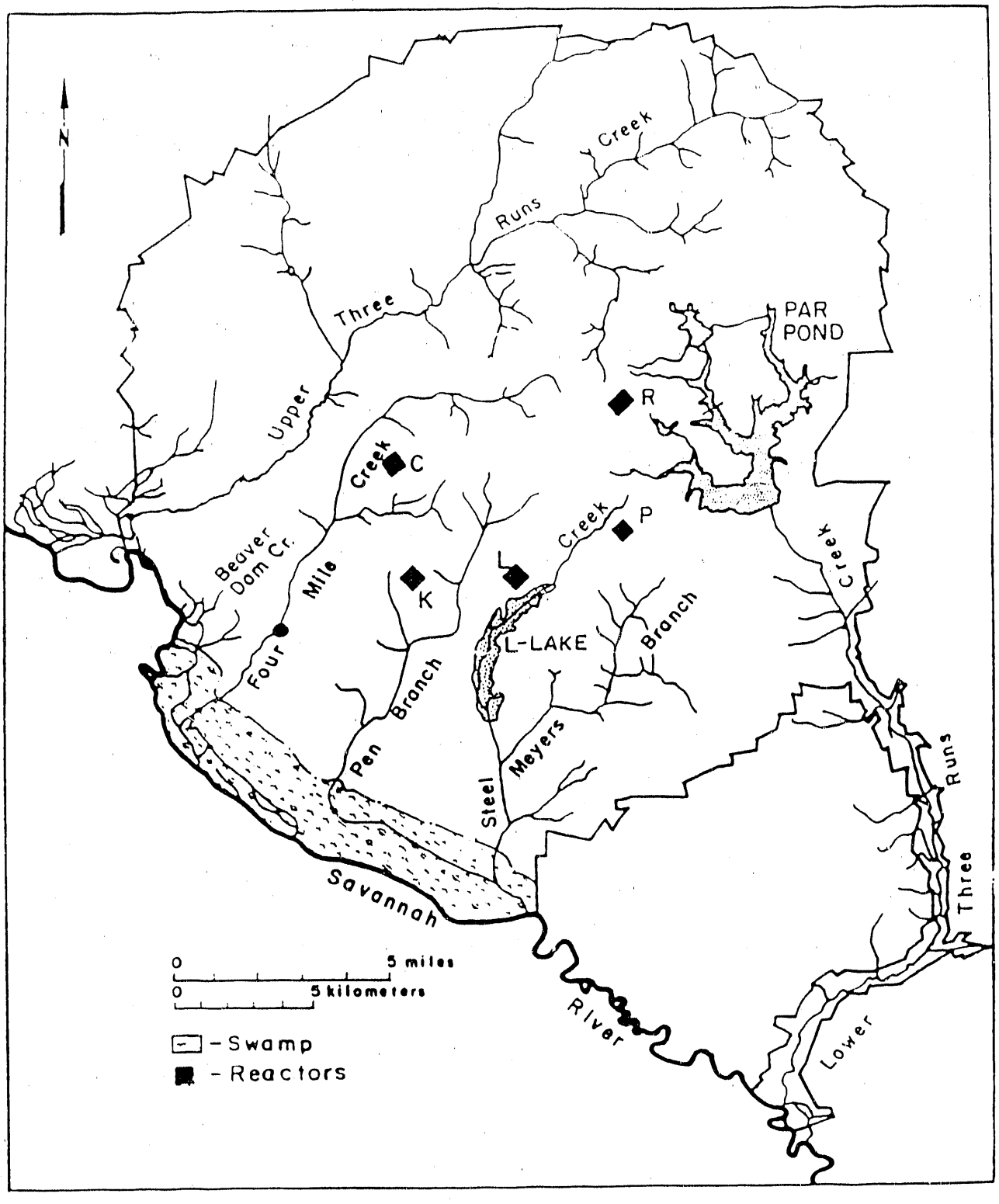

Figure 1-1. A map of the Savannah River Site showing the major aquatic systems; the Four Mile Creek sample location is indicated with a closed dot. June 1985 - September 1987.

2.0 METHODS AND MATERIALS

2.1 FIELD SAMPLING

Macroinvertebrates were sampled with Hester-Dendy multiplate samplers (Hester and Dendy 1962; Fullner 1971). Each sampler consisted of 14 plates of 7.6-cm^2 tempered hardboard (Duron^R, U.S. Gypsum 6) sections 0.3-cm thick, separated by 0.3-cm spacers (Figure 2-1). Total exposed surface area of each multiplate sampler was 0.179 m^2.

Fifty multiplate samplers were deployed in Four Mile Creek in the area above and below the bridge at SRS Road 13.2, on June 24, 1985. Samplers were then retrieved over the period June 25 - August 29, as indicated in Table 2-1. On September 11, five replicate samplers were deployed in the study area and were retrieved after approximately four weeks; monthly deployment and retrieval were continued for the remainder of the study (with the exception of November and December 1985, when no sampling was conducted). Upon retrieval, samplers were quickly placed in a plastic bag, stored on ice, and returned to the laboratory for processing. Current velocity was measured at each station with a Marsh - McBirney Model 201 electronic flowmeter or General Oceanics remote reading digital flowmeter (Model 2031); dissolved-oxygen concentration (DO), temperature, pH, and conductivity were measured with a Hydrolab water quality analyzer (Model No. 8002, 8006, or Surveyor 2) or YSI dissolved oxygen meter

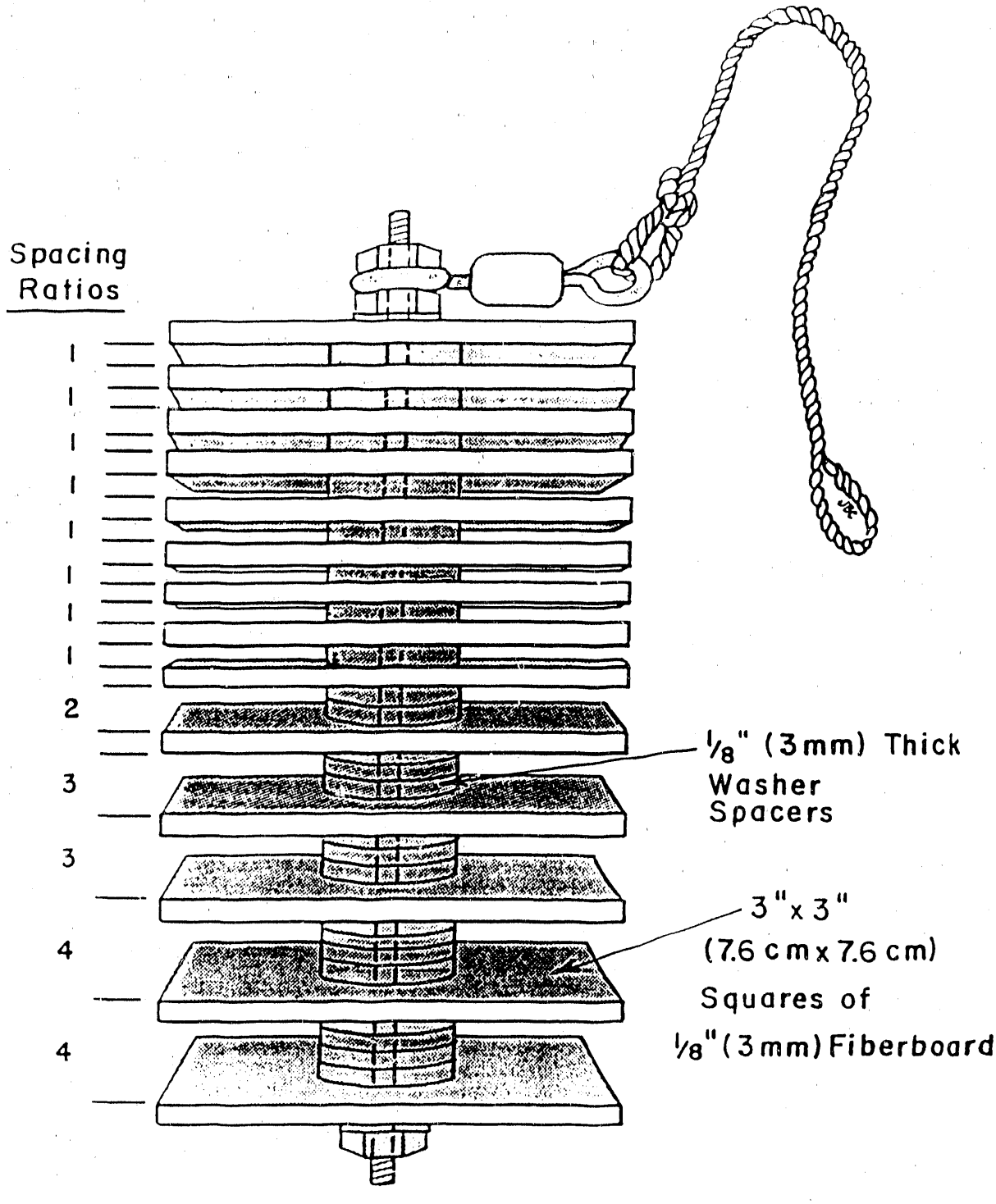

Figure 2-1. Diagram of a Hester-Dendy multiplate sampler.

ble 2-1. Sampling dates, sample sizes, and incubation times for artificial substrate samplers placed in Four Mile Creek. June 1985 - September 1987.

ampling Date	Incubation Time	No. of Samples	
/25/85	1 day	5	
/27/85	3 days	5	
/29/85	5 days	5	
/05/85	11 days	5	
/10/85	16 days	4	
/15/85	21 days	6	
/25/85	31 days	5	
/05/85	42 days	1	
/06/85	43 days	1	
/17/85	54 days	4	
/29/85	66 days	5	
/10/85	4 wks	5	
/07/86	4 wks	4	
/07/86	4 wks	7	(includes 2 samplers from 6/85)
/06/86	4 wks	5	
/04/86	4 wks	5	
/06/86	4 wks	5	
/10/86	4 wks	5	
/03/86	3 wks	5	
/07/86	4 wks	5	
/11/86	4 wks	5	
/03/86	3 wks	5	
/07/86	4 wks	5	
/05/86	4 wks	5	
/09/87	4 wks	5	
/06/87	4 wks	5	
/06/87	4 wks	5	
/06/87	4 wks	5	
/08/87	4 wks	5	
/05/87	4 wks	5	
/06/87	4 wks	5	
/07/87	4 wks	5	
/11/87	4 wks	5	

(Model 58), Orion Research pH meter (Model 231), and Fisher conductivity meter.

2.2 LABORATORY PROCEDURES

In the laboratory, each multiplate sampler was carefully disassembled. The plates of the sampler were gently scrubbed with a soft brush to dislodge attached debris and macroinvertebrates, which were collected on a 0.106-mm mesh sieve (US Standard No. 140). The US No. 140 sieve was used instead of a standard No. 30 sieve (600 μ) in order to collect early instars of insects, which often pass through the coarser No. 30 sieve. All macroinvertebrates were preserved in 10% buffered formalin solution which contained biological stains.

Macroinvertebrates in each sample were sorted from debris using dissecting microscopes, then placed in labeled vials containing 70% alcohol. All organisms were identified to the lowest practical taxonomic level (usually genus) and counted. Principal taxonomic references used in the identification of specimens included Brigham et al. (1982), Brinkhurst (1986), Britton and Fuller (1979), Brown (1972), Edmunds et al. (1976), Hobbs (1972), Holsinger (1972), Johannsen (1934 - 1937), Merritt and Cummins (1984), Michael and Matta (1977), Needham and Westfall (1954), Pennak (1978), Pinder and Reiss (1983), Ross (1944), Usinger (1956), Wiggins (1977), and Wood (1982).

After being counted and identified, all macroinvertebrates in a sample were separated into functional feeding groups according to the trophic classification of Merritt and Cummins (1984; Table 2-2). Since they do not actively feed, pupae were excluded from functional group assignment and biomass determinations. Ash-free dry mass (AFDM) was determined for each functional group (but not pupae). The macroinvertebrates were dried in pre-weighed vessels at 105 ^{o}C for 24 h, cooled, weighed to the nearest μg (pan) or 0.0001 g (crucible) on an analytical balance to obtain dry mass, then were combusted in a muffle furnace at 500 ^{o}C for 1 h, cooled in a desiccator, and weighed to obtain ash mass. AFDM was determined by subtracting ash mass from dry mass (Cummins 1962).

2.3 STATISTICAL ANALYSES

2.3.1 Averages by Sample Period

Density of organisms was calculated per m^2 of substrate available for colonization, by using a conversion factor. Macroinvertebrate biomass from multiplate samplers was converted to g AFDM/m^2.

Sample period mean densities were estimated by averaging the replicate samples as follows:

$$\bar{x}_{ik} = \sum_{l=1}^{s} x_{ikl} / n_i$$

Table 2-2. Macroinvertebrate functional groups and their modes of feeding (Merritt and Cummins 1984).

Functional Group	Feeding Mode
Scrapers	Shear off attached aufwuchs film (periphyton, fungi, bacteria, protozoa, etc.) from under-water substrates.
Collector-gatherers	"Vacuum" sedimented organic deposits from the substrate.
Collector-filterers	Filter suspended particulate organic matter from the water column.
Shredders	Skeletonize whole leaves and leaf fragments or mine or bore into wood.
Piercer-herbivores	Pierce plant tissues or cells and suck fluids.
Piercer-carnivores	Attack animal prey and pierce tissues and cells and suck fluids.
Engulfer-predators	Capture and ingest animals.

where: i = sample collection period

k = grouping (taxonomic or functional)

l = replicate, up to s replicates

n_i = number of replicate samples in the i^{th} sample collection period

x_{ikl} = density or biomass of a taxonomic or functional group in a sample

$\bar{x}_{ik}$ = average density or biomass by sample collection period of a taxonomic or functional group.

2.3.2 Relative Abundance

Relative abundance (percent composition) for a taxonomic or functional group was computed from the collection period averages. It was calculated as the percentage of the total macroinvertebrates represented by a taxonomic or functional group.

2.3.3 Rounding of Data

The rounding of data was always the last step in the generation of report tables. Because data were represented as floating point numbers in the generation of densities or biomass values, calculations were performed at the precision used by the computer (IBM Model 80) and the statistical software package (SAS-PC). Density and percentage data were rounded to one decimal place (0.1), and biomass values were rounded to the fourth decimal place (0.0001 g) as the last step in the calculations. Missing data values were not

included in calculations. The number of data values reflects the number of samples collected and processed, except for two biomass samples. No biomass processing was done for one replicate taken on 27 June 1985 because only one chironomid was collected and it was mounted for identification. One replicate sample taken on 7 August 1986 was lost between identification and biomass determination.

2.3.4 Taxa Richness

Taxa richness values were obtained by counting the total number of taxa identified in a sample, less the number of higher taxonomic groups that had a lower taxon identified within the group. For example, if a specimen could only be identified to the family Chironomidae, and in the same sample another specimen was identified to the tribe Tanytarsini, then only the latter would contribute to the taxa richness for the sample. Mean taxa richness was calculated as the average number of taxa/sampler.

3.0 RESULTS AND DISCUSSION

In the first three months of sampling for this study (June - August 1985), the incubation time for artificial substrates varied from 1 to 66 days (Table 2-1). Because the period of incubation is a confounding variable, this set of data will be considered separately from the monthly data collected in October 1985 - September 1987, when the sampler incubation period was about four weeks. Therefore, each set of data is graphed separately. It should also be noted that the data reported here are not directly comparable to other macroinvertebrate studies conducted on Savannah River Site streams because of the very small mesh size used in this study (106 μ mesh size, compared to 600 μ used in all other macroinvertebrate studies). This difference is probably most significant in macroinvertebrate density comparisons, since small instars of insects were often very abundant in Four Mile Creek samples, resulting in high total densities of organisms.

3.1 TAXA RICHNESS

Mean taxa richness (number of taxa/sampler) was very low in the first few collections in June 1985 (mean taxa richness ranged from 2.6 - 4.4 taxa; Figure 3-1, Appendix Table 1) This may have been due to the thermal perturbation of Four Mile Creek during periods when C-Reactor was on line. Kon-

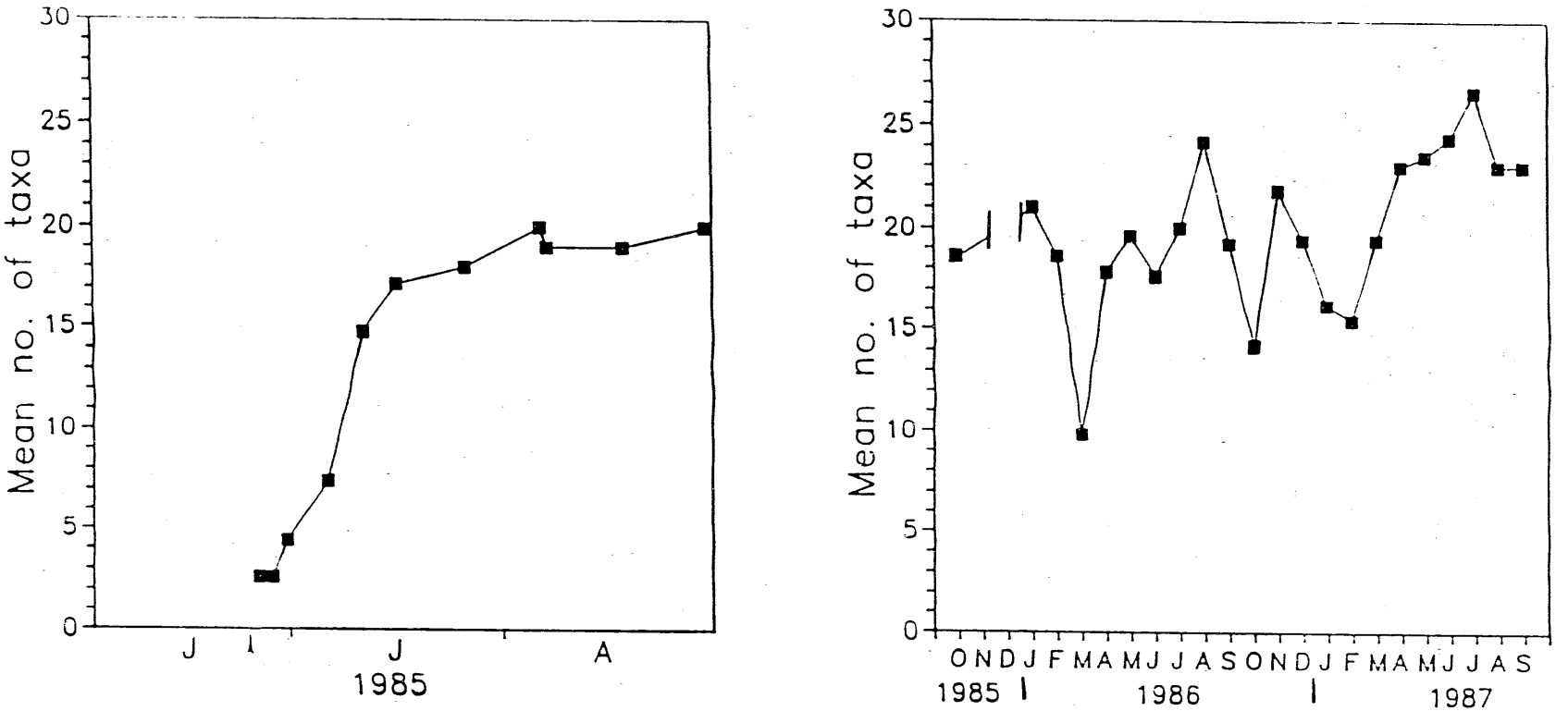

Figure 3-1. Macroinvertebrate taxa richness in Four Mile Creek following shutdown of C-Reactor. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/retrieval of artificial substrates. June 1985 - September 1987.

dratieff and Kondratieff (1985) reported a mean taxa richness of four taxa/site at the A-13.2 bridge crossing during the period January - August 1984, when C-Reactor was on line. However, the relatively short colonization periods (one to five days) would probably have been an important factor contributing to low taxa richness (e.g., Rosenberg and Resh 1982).

By August 5, 1985, taxa richness values began to level off (mean of 20.0 taxa/sampler on that date), with only moderate variations in richness values through October 1985 (Figure 3-1). In 1986, taxa richness exhibited considerable variability, while in 1987, taxa richness was generally higher and less variable than in 1986. The highest taxa richness in 1986 and 1987 was found in summer (the highest mean taxa richness over the study period was 26.6 taxa, found in July 1987; Figure 3-1; Appendix Table 1). A total of 79 taxa was collected in Four Mile Creek over the entire sampling period (June 1985 - September 1987; Table 3-1). By comparison, a total of 16 taxa was found from January - August 1984, when Four Mile Creek was receiving thermal effluents (Kondratieff and Kondratieff 1985).

Mean taxa richness in non-thermal SRS stream sites (also reported in Kondratieff and Kondratieff 1985) ranged from 19.7 - 25.9 taxa/site in 1984, with the total number of mac-

Table 3-1. Macroinvertebrate taxa found on artificial substrates in Four Mile Creek. June 1985 - September 1987.

Taxon	Presence
Class Turbellaria	X
Phylum Nematoda	X
Class Polychaeta	
Manayunkia speciosa	X
Class Oligochaeta	X
Class Hirudinea	X
Class Gastropoda[a]	X
Family Ancylidae	X
Family Physidae	
Physella heterostropha	X
Family Planorbidae[a]	X
Gyraulus parvus	X
Helisoma anceps	X
Helisoma trivolvis	X
Menetus dilatatus	X
Class Pelecypoda[a]	X
Family Corbiculidae	
Corbicula fluminea	X
Order Hydracarina	X
Order Amphipoda[a]	X
Family Talitridae	
Hyalella azteca	X
Order Ephemeroptera[a]	X
Family Baetidae[a]	X
Baetis	X
Callibaetis	X
Pseudocloeon parvulum	X
Family Caenidae	
Caenis	X
Family Ephemerellidae[a]	X
Ephemerella	X
Eurylophella temporalis	X
Serratella	X

[a]Higher order categories not included in count if lower order taxa were identified.

Table 3-1 (continued). Macroinvertebrate taxa found on artificial substrates in Four Mile Creek. June 1985 - September 1987.

Taxon	Presence
Family Heptageniidae[a]	X
Heptagenia	X
Stenacron interpunctatum	X
Stenonema modestum	X
Family Oligoneuriidae	
Isonychia	X
Family Tricorythidae	
Leptohyphes[a]	X
Leptohyphes dolani	X
Tricorythodes	X
Order Odonata[a]	X
Suborder Anisoptera[a]	X
Family Aeshnidae[a]	X
Boyeria[a]	X
Boyeria vinosa	X
Family Corduliidae	
Neurocordulia[a]	X
Neurocordulia molesta	X
Family Gomphidae[a]	X
Hagenius brevistylus	X
Family Macromiidae	
Didymops transversa	X
Macromia	X
Suborder Zygoptera[a]	X
Family Calopterygidae[a]	X
Calopteryx	X
Hetaerina	X
Family Coenagrionidae[a]	X
Argia	X
Enallagma	X
Order Plecoptera[a]	X
Family Perlidae[a]	X
Paragnetina fumosa	X
Paragnetina kansensis	X
Perlesta	X
Order Hemiptera	
Family Corixidae	X

[a]Higher order categories not included in count if lower order taxa were identified.

Table 3-1 (continued). Macroinvertebrate taxa found on artificial substrates in Four Mile Creek. June 1985 - September 1987.

Taxon	Presence
Order Coleoptera	
Family Chrysomelidae	
Pyrrhalta nymphaeae	X
Family Dytiscidae	
Coptotomus	X
Family Elmidae[a]	X
Ancyronyx variegatus	X
Dubiraphia	X
Macronychus glabratus	X
Microcylloepus pusillus	X
Stenelmis	X
Family Gyrinidae	
Dineutus	X
Family Hydrophilidae	X
Family Ptilodactylidae	X
Order Megaloptera	
Family Corydalidae[a]	X
Corydalus cornutus	X
Order Trichoptera[a]	X
Family Hydropsychidae[a]	X
Cheumatopsyche	X
Hydropsyche	X
Macrostemum carolina	X
Family Hydroptilidae[a]	X
Hydroptila	X
Oxyethira	X
Family Leptoceridae[a]	X
Ceraclea	X
Nectopsyche[a]	X
Nectopsyche candida	X
Oecetis	X
Triaenodes[a]	X
Triaenodes tardus	X
Family Philopotamidae	
Chimarra	X
Family Polycentropodidae[a]	X
Cernotina	X
Neureclipsis	X

[a]Higher order categories not included in count if lower order taxa were identified.

Table 3-1 (continued). Macroinvertebrate taxa found on artificial substrates in Four Mile Creek. June 1985 - September 1987.

Taxon	Presence
Order Lepidoptera	
Family Pyralidae[a]	X
Neargyractis	X
Parapoynx	X
Synclita	X
Order Diptera[a]	X
Family Tipulidae[a]	X
Antocha	X
Tipula	X
Family Chaoboridae	
Chaoborus punctipennis	X
Family Simuliidae	
Simulium	X
Family Ceratopogonidae[a]	X
Subfamily Ceratopogoniinae	X
Subfamily Forcipomyiinae	X
Family Chironomidae[a]	X
Subfamily Tanypodinae	X
Subfamily Diamesiinae[a]	X
Potthastia	X
Subfamily Orthocladiinae	X
Subfamily Chironominae	
Tribe Chironomini[a]	X
Stenochironomus	X
Tribe Tanytarsini	X
Family Empididae[a]	X
Chelifera	X
Hemerodromia	X
TOTAL NUMBER OF TAXA	79

[a]Higher order categories not included in count if lower order taxa were identified.

roinvertebrate taxa ranging from 44 - 63. The level of taxonomy, the length of the study period, and the way mean taxa richness was calculated were different between Kondratieff and Kondratieff (1985) and this study. However, in 1984 the mean taxa richness in thermal Four Mile (4 taxa) differed from the mean taxa richness in the nonthermal streams (19.7 - 25.9 taxa) by a factor of 5 to 6. This is the same magnitude of increase from the June 1985 data (2.6 - 4.4 taxa) to the August 1985 data (ca. 20 taxa). Therefore, within two months after C-Reactor shutdown, macroinvertebrate taxa richness in Four Mile Creek was probably comparable to the taxa richness of non-thermal streams.

3.2 DENSITY

Mean total densities of macroinvertebrates were very low over the first three sampling periods in June 1985 (ranging from 25.7 - 450.3 organisms/m^2; Figure 3-2; Appendix Table 1). In July 1985, however, total densities increased sharply; the highest mean total density over the entire study period, 23,631.3 organisms/m^2, was found on July 10. Large numbers of Orthocladiinae and other early instar chironomid larvae were the major component of the July 1985 densities where they comprised up to 98.8% of the macroinvertebrates collected (Appendix Table 2). Chironomids are often among the first colonizers of aquatic habitats that have been severely stressed (e.g., Beck 1977). These data indicate

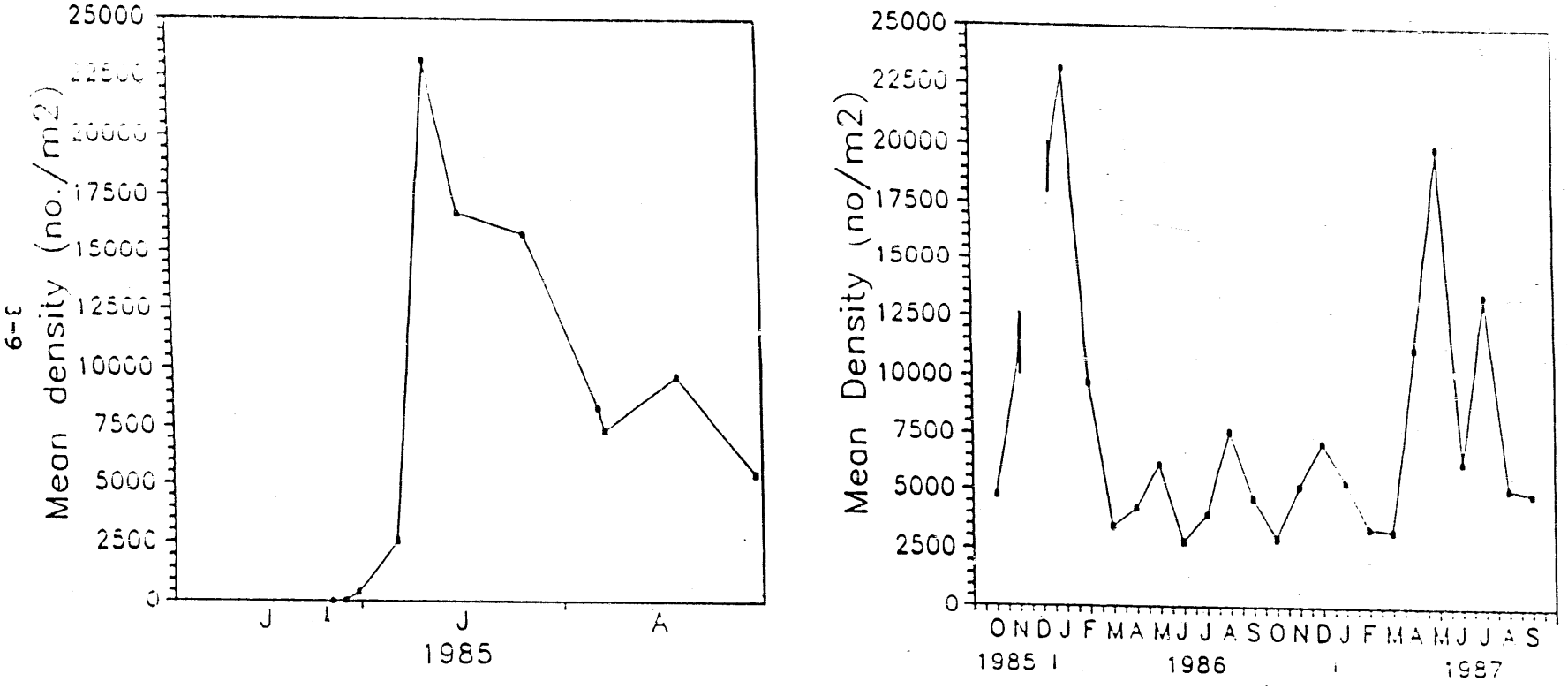

Figure 3-2. Mean density (no./m^2) of total macroinvertebrates in Four Mile Creek following shutdown of C-Reactor. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/retrieval of artificial substrates. June 1985 - September 1987.

that recolonization of Four Mile Creek following reactor shutdown was fairly rapid for certain groups of aquatic insects; sources for recolonization would include drift of organisms from upstream and unimpacted reaches of Four Mile Creek, as well as ambient Savannah River water, and instream reproduction by immigrant winged insects (Kondratieff and Kondratieff 1985).

Mean total densities of macroinvertebrates declined in August 1985 compared to July densities, but were still relatively high (ranging from 5,453.6 - 10,157.8 organisms/m^2; Figure 3-2; Appendix Table 1). In 1986, a density peak was observed in January (23,097.8 organisms/m^2, composed primarily of Chironomini and early instar chironomids; Appendix Tables 1 and 2), while in 1987, the highest mean total density (19,965.4 organisms/m^2) was found in May (Figure 3-2; Appendix Table 1). The range of total mean macroinvertebrate densities in Four Mile Creek was similar in all three years of study (Figure 3-2).

Total densities of macroinvertebrates reported from other Savannah River Site streams (e.g., Firth et al. 1986) are not comparable to those found in this study because of the differences in mesh size used to sieve samples. Studies from other southeastern U.S. streams which are more methodologically comparable, however, indicate that the mean total densities reported here for Four Mile Creek can be

considered fairly typical. Benke et al. (1984), using a 100 μ sieve size, found a mean total density of 43,767 organisms/m^2 in a third-order section of the Satilla River, Georgia and Smock et al. (1985), using a 150 μ sieve size, reported mean total densities of 7,836 to 8,616 organisms/m^2 in Cedar Creek, South Carolina.

Chironomid larvae were the most abundant group of macroinvertebrates found in Four Mile Creek during most of the sample dates, comprising 21.1 to 98.8 % of the organisms collected (Appendix Table 2). Exceptions to this trend were seen in June, July, September, and October 1986, when mayflies (Ephemeroptera) were dominant, accounting for 39.9 to 55.2% of the total densities (Appendix Table 2). The most abundant mayfly taxon during these months was Stenonema modestum (Appendix Table 5). Other exceptions occurred on 6 August 1985 and in November 1986, when caddisflies (Trichoptera) made up 43.6 and 38.1% of the total, respectively (Appendix Table 2). The most abundant caddisfly taxon during these two dates was Chimarra sp. (Appendix Table 5). Very small, early instar chironomids were categorized as unidentified Chironomidae, and were sometimes very abundant in Four Mile Creek samples (Appendix Table 2).

Orthocladiinae and Tanytarsini were the most abundant groups of identifiable chironomids in 1985; the highest mean density of Orthocladiinae, 10,731.8/m^2, was found on July 10

(Figure 3-3, Appendix Table 2). Density peaks were also found in February 1986 (3873.9 Orthocladiinae/m^2), April 1987 (7,509.5 Orthocladiinae/m^2), and May 1987 (7,787.7 Orthocladiinae/m^2; Figure 3-3; Appendix Table 2). The highest mean density of Tanytarsini, 5,798.9/m^2, was found on July 25, 1985, two sampling periods and 15 days after the highest mean density of Orthocladiinae was seen (Figure 3-4; Appendix Table 2). Seasonal abundances of Tanytarsini and Orthocladiinae were similar; the general trend was higher densities in winter and spring with low densities in summer and fall. Peak densities for Tanytarsini during monthly sampling were found in December 1986 (2,882.7/m^2) and May 1987 (4,124.0/m^2; Figure 3-4; Appendix Table 2).

Tanypodinae, as with Tanytarsini, showed a peak in abundance on July 25, 1985 (mean density was 1,945.3 Tanypodinae/m^2); in 1986, Tanypodinae density was highest in January (1,033.5/m^2), whereas 1987 densities were relatively low (Figure 3-5; Appendix Table 2).

Chironomini reached a 1985 peak density of 2,022.3/m^2 on 10 July, but higher abundances were seen during monthly sampling in 1986 and 1987 (Figure 3-6; Appendix Table 2). The highest mean density occurred in January 1986 (6,064.2 Chironomini/m^2) with another peak in August 1986 (3,453.6 Chironomini/m^2; Figure 3-6; Appendix Table 2).

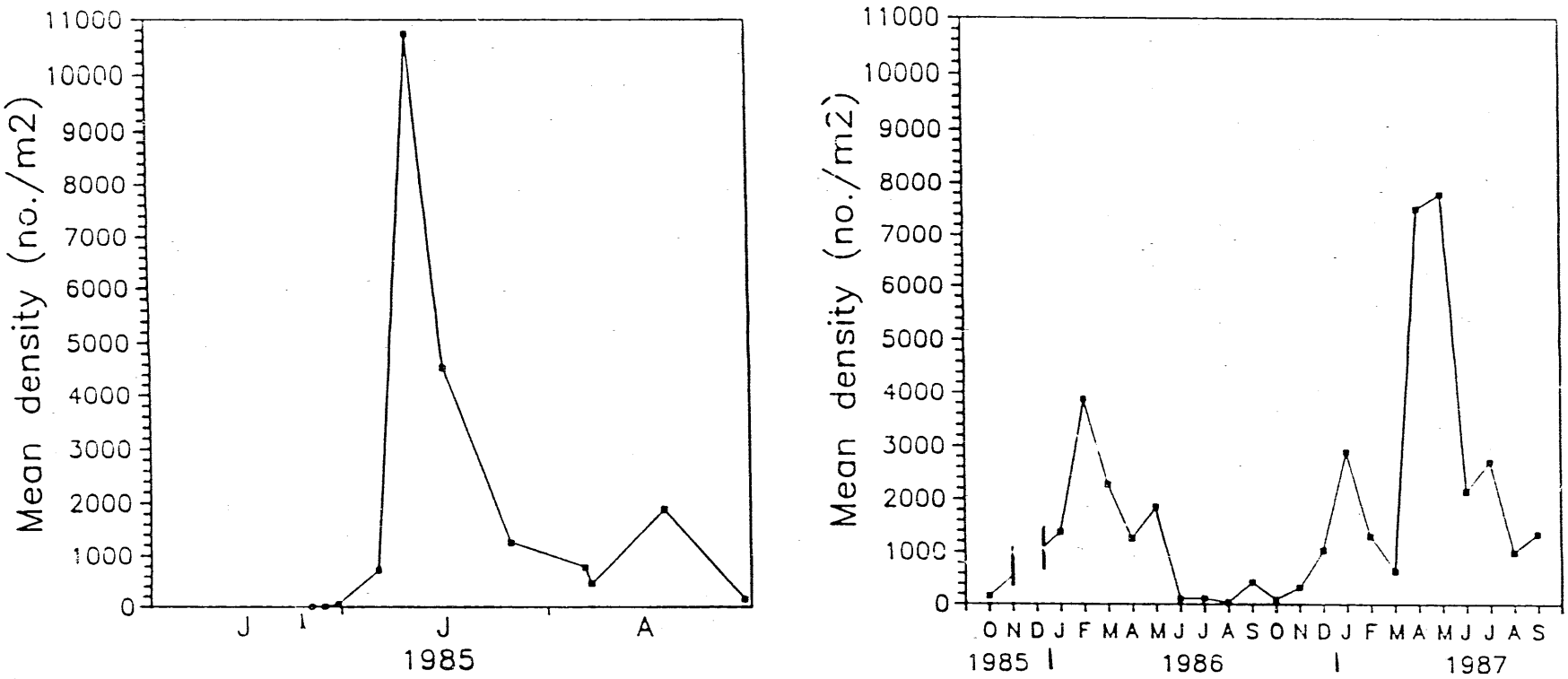

Figure 3-3. Mean density (no./m^2) of Orthocladiinae in Four Mile Creek following shutdown of C-Reactor. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/ retrieval of artificial substrates. June 1985 - September 1987.

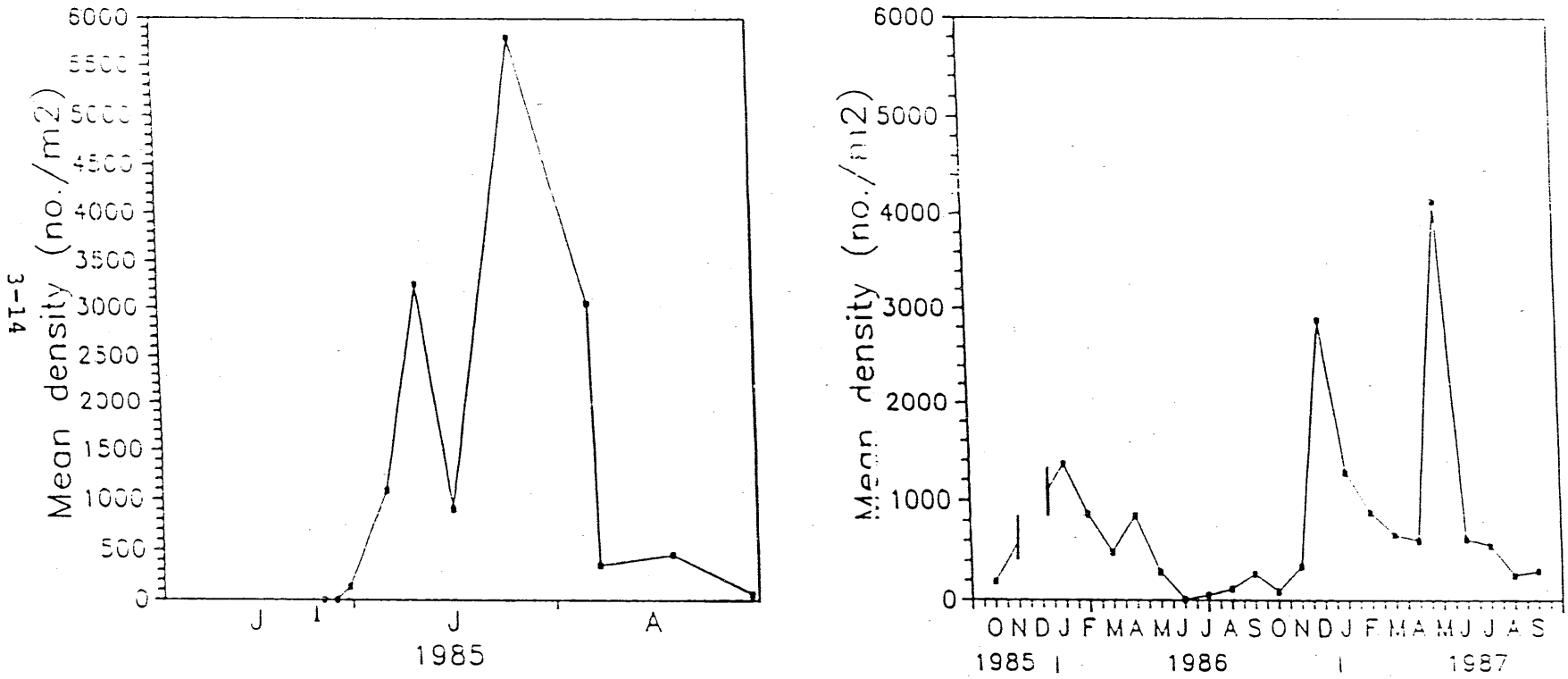

Figure 3-4. Mean density (no./m^2) of Tanytarsini in Four Mile Creek following shutdown of C-Reactor. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/retrieval of artificial substrates. June 1985 - September 1987.

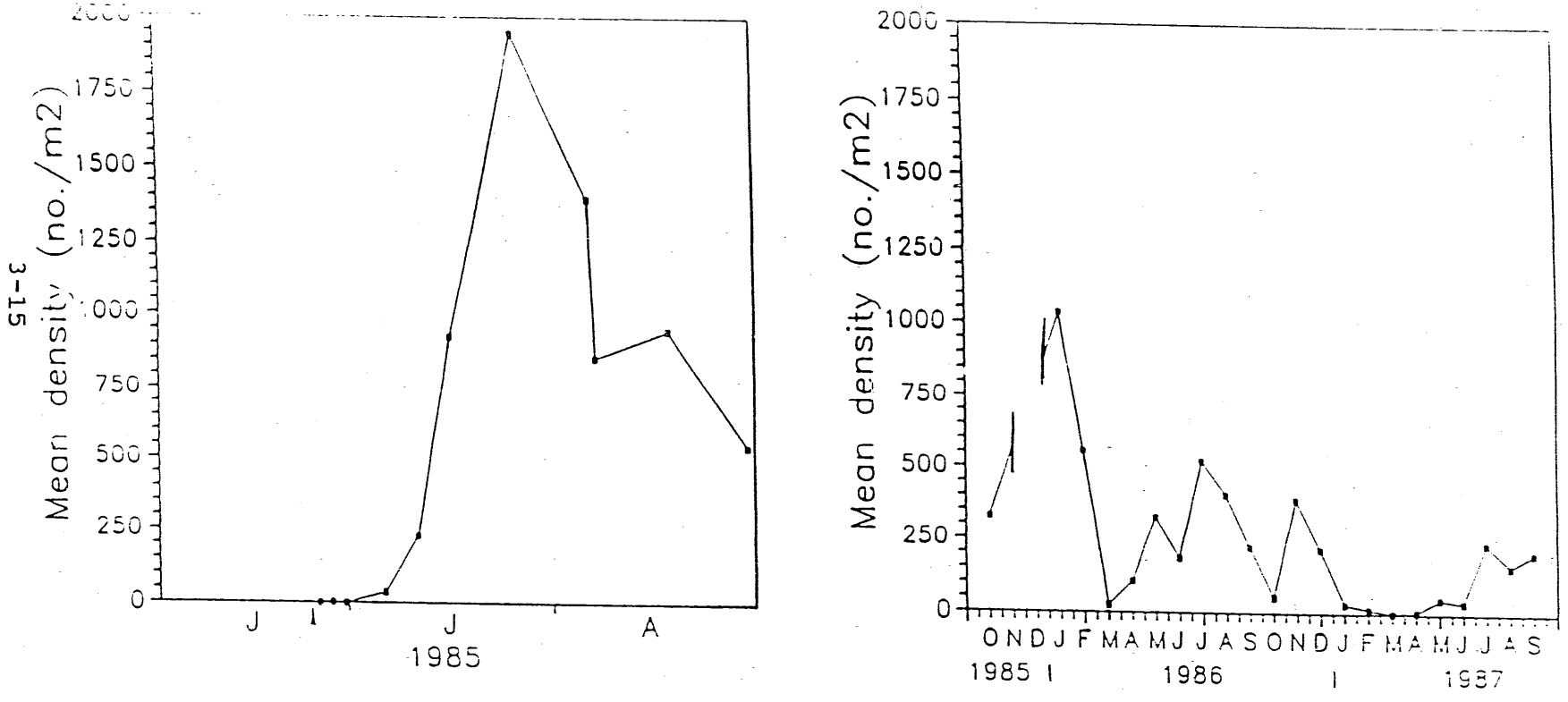

Figure 3-5. Mean density (no./m^2) of Tanypodinae in Four Mile Creek following shutdown of C-Reactor. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/retrieval of artificial substrates. June 1985 - September 1987.

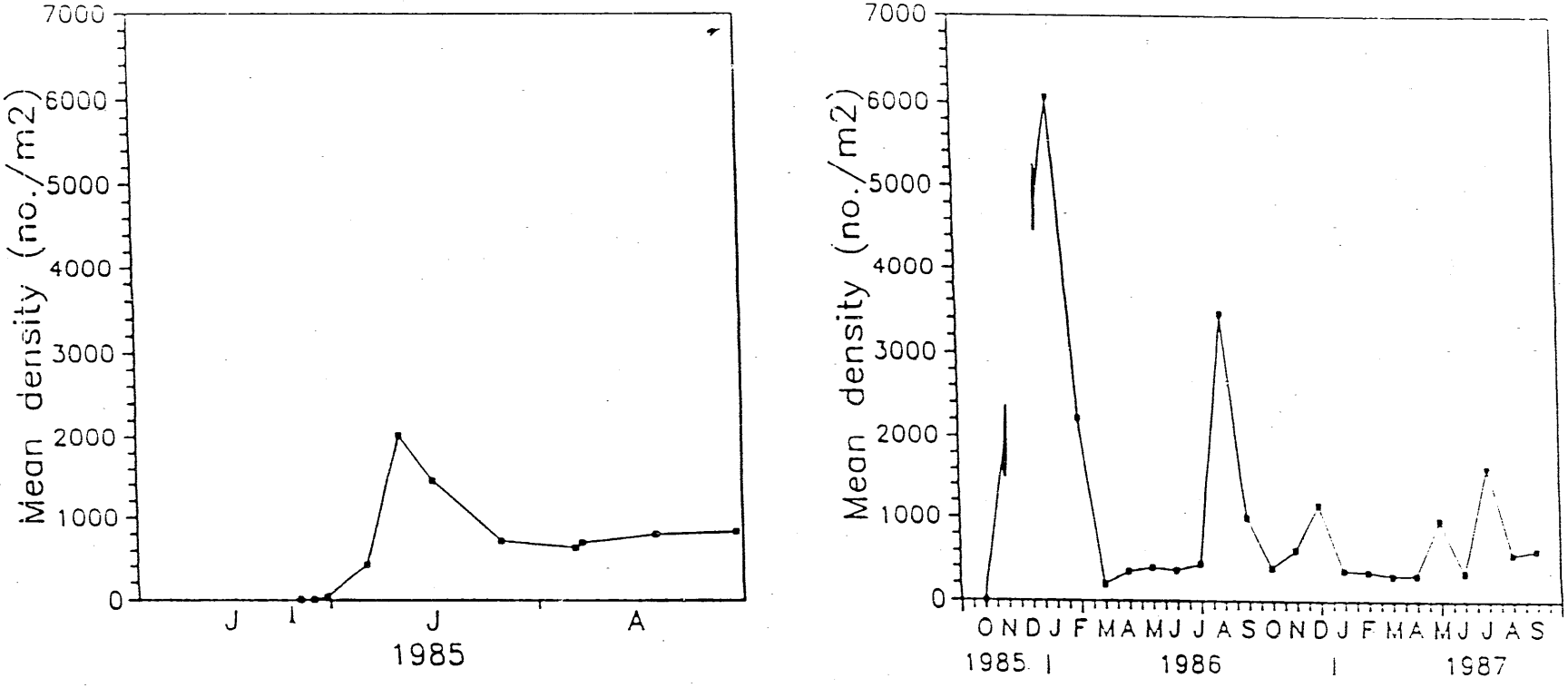

Figure 3-6. Mean density (no./m^2) of Chironomini in Four Mile Creek following shutdown of C-Reactor. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/ retrieval of artificial substrates. June 1985 - September 1987.

Densities of caddisflies (Trichoptera) increased sharply in August 1985, compared to the relatively low densities of earlier sampling dates (the highest mean density in 1985, 3,268.2/m^2, was found on August 6; Figure 3-7; Appendix Table 2). The highest caddisfly density over the study period was found in July 1987 (4,501.7/m^2; Figure 3-7; Appendix Table 2). The most abundant caddisfly taxon in August 1985 was Chimarra sp., and in July 1987 it was Nectopsyche sp. (Appendix Table 5).

Mayfly (Ephemeroptera) densities were also relatively low initially (0 - 2.2 organisms/m^2 in June 1985, 3.4 - 375.4 organisms/m^2 in July 1985), although they increased noticeably in August 1985 (to a high of 1,216.5 organisms/m^2 on August 17; Figure 3-8; Appendix Table 2). Baetis sp. was the most abundant mayfly taxon in August 1985 (Appendix Table 5). In 1986, mayfly densities peaked in January and in late summer (August - September), while in 1987, peaks occurred in May and July (Figure 3-8). The highest mean mayfly density during the study was 2,520.7/m^2, in August 1986 (Appendix Table 2), when Stenonema modestum was the most abundant taxon (Appendix Table 5).

3.3 FUNCTIONAL GROUP COMPOSITION

The classification of benthic macroinvertebrates into functional groups based on their feeding strategies is a way to indirectly assess aquatic community function (Vannote et

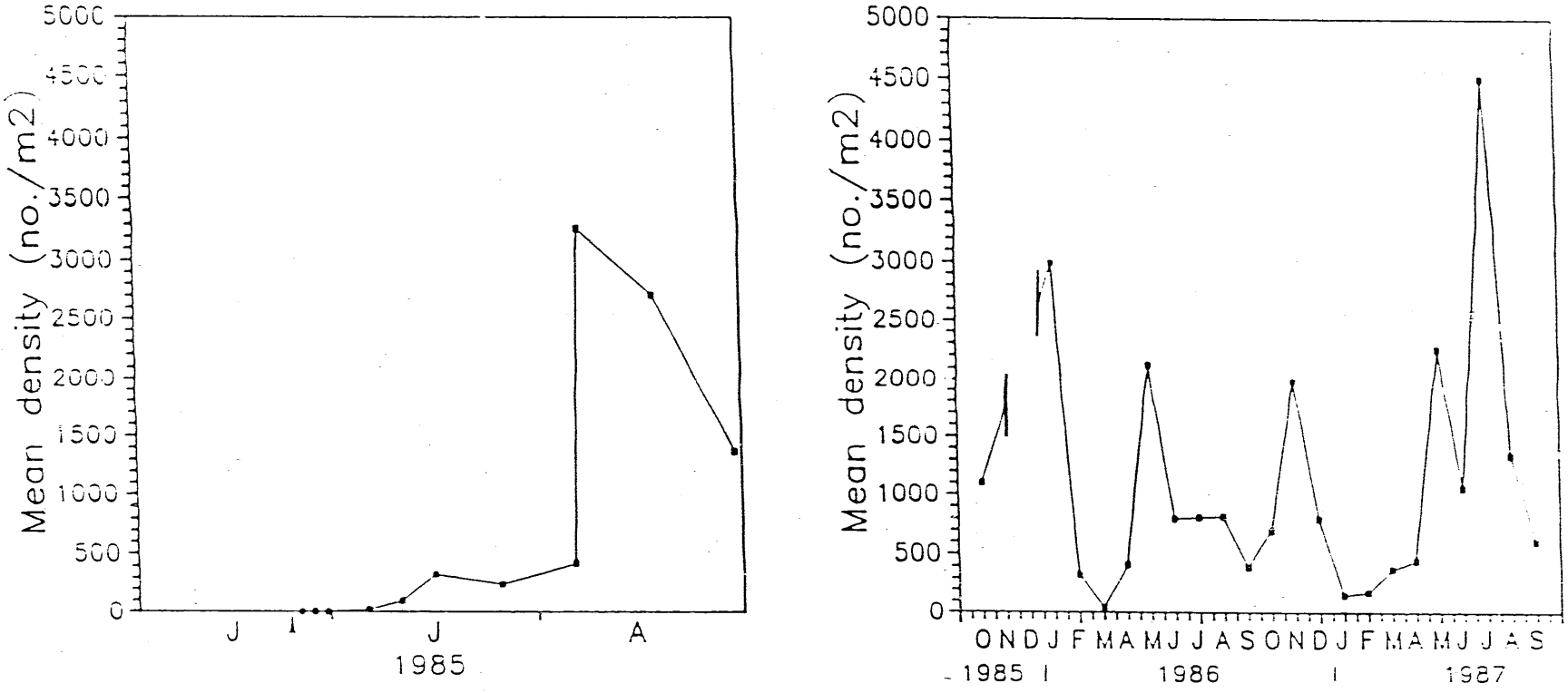

Figure 3-7. Mean density (no./m^2) of Trichoptera in Four Mile Creek following shutdown of C-Reactor. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/retrieval of artificial substrates. June 1985 - September 1987.

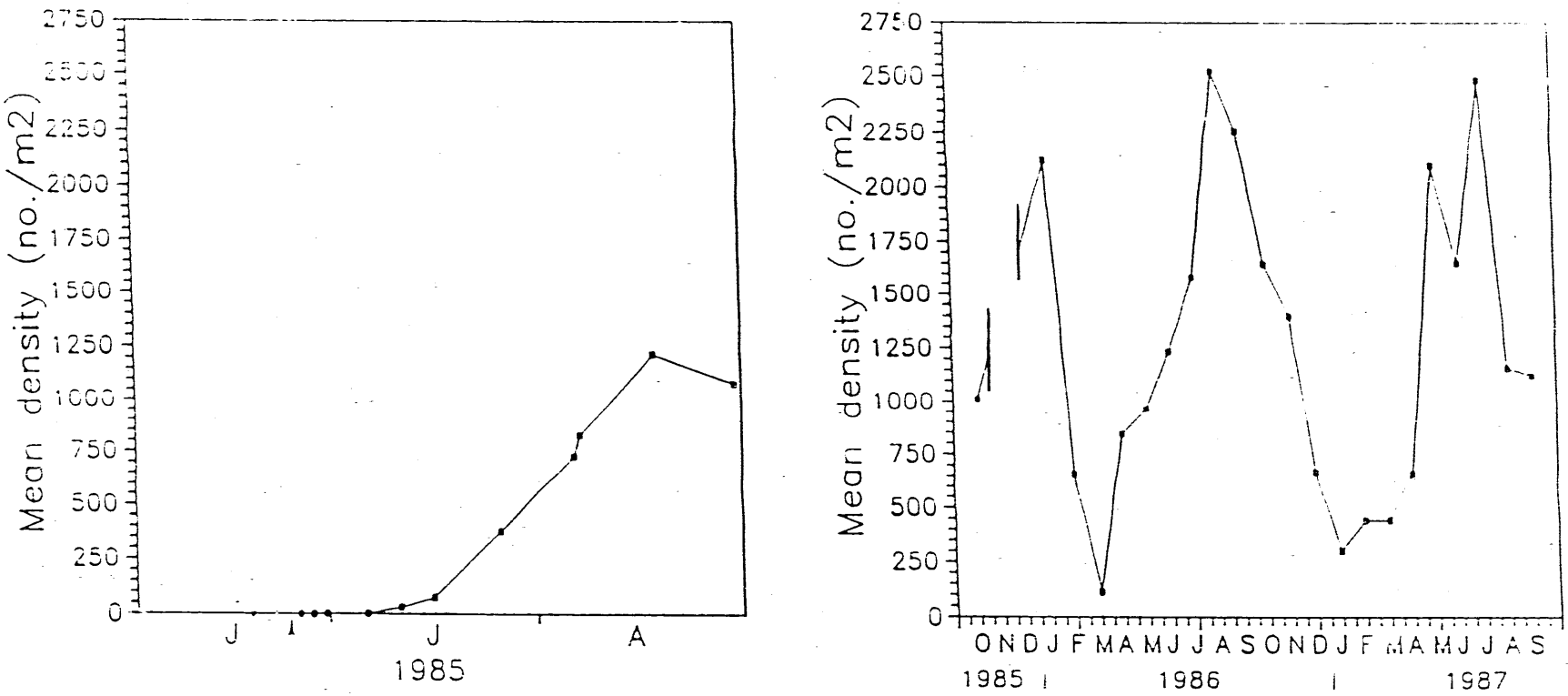

Figure 3-8. Mean density (no./m^2) of Ephemeroptera in Four Mile Creek following shutdown of C-Reactor. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/retrieval of artificial substrates. June 1985 - September 1987.

al. 1980, Merritt and Cummins 1984). In Four Mile Creek, collector-gatherers were generally the numerically dominant functional group (27.9 to 83.8%; Appendix Table 3); the exceptions were 5 and 6 August 1985, and December 1986, when collector-filterers were dominant (40.8 to 51.2%; Appendix Table 3). Collector-gatherers also dominated in Four Mile Creek when thermal effluents were being discharged (98% of total macroinvertebrates; Kondratieff and Kondratieff 1985).

Other (but not all) SRS streams, both thermal and non-thermal, also show dominance by the collector-gatherer functional group (Kondratieff and Kondratieff 1985, Firth et al. 1986), although the relative abundance varies considerably among years. For example, relative abundance in Meyer's Branch, a non-thermal "reference" stream at the SRS, ranged from 44.0 to 66.7% collector-gatherers, and 23.6 to 43.9% collector-filterers over 1985 - 1988 (Lauritsen 1989). In Four Mile Creek, the relative abundance of collector-gatherers ranged from 27.91 to 83.80%, and collector-filterers ranged from 8.27 to 51.17% (Appendix Table 3). Upper Three Runs Creek, another non-thermal SRS stream, has high percentages of shredders and scrapers, typical of the macroinvertebrate fauna of streams that receive large amounts of leaf litter input (it is unusual among SRS streams, however, in that it has a high annual sustained flow and relatively cool annual water temperatures; Morse et al. 1983). In Four Mile Creek the relative abundance of scrapers

and shredders was often less than 1%; peak relative abundances were 20.77% and 34.37% for scrapers and shredders, respectively (Appendix Table 3).

3.4 BIOMASS

Mean biomass levels were very low in the first few sampling intervals, ranging from 0.0003 to 0.0018 g AFDM/m2 in June 1985 (Appendix Table 4). Biomasses increased fairly steadily during 1985, to a high of 1.0115 g AFDM/m2 in October (Figure 3-9; Appendix Table 4). In 1986 the mean biomass levels ranged from 0.0501 g AFDM/m2 in March to 2.5576 g AFDM/m2 in September, while the 1987 range was 0.2829 (February) to 1.8276 (April) g AFDM/m2 (Appendix Table 4). Because the biomass data were highly variable, only the June 1985 samples (one to five days of incubation) appeared to have unusually low levels.

Biomass determinations were made at the level of functional group. Considering overall means, biomasses were highest for predators, followed by collector-gatherers and collector-filterers (Table 3-2). Considering median values, the collector-gatherers were highest, followed by collector-filterers and predators. The median rankings were more similar to the relative importance of functional groups by density (described in Section 3-2), and indicates that the biomass means were influenced by very high values for some samples. The increased importance of predator biomass

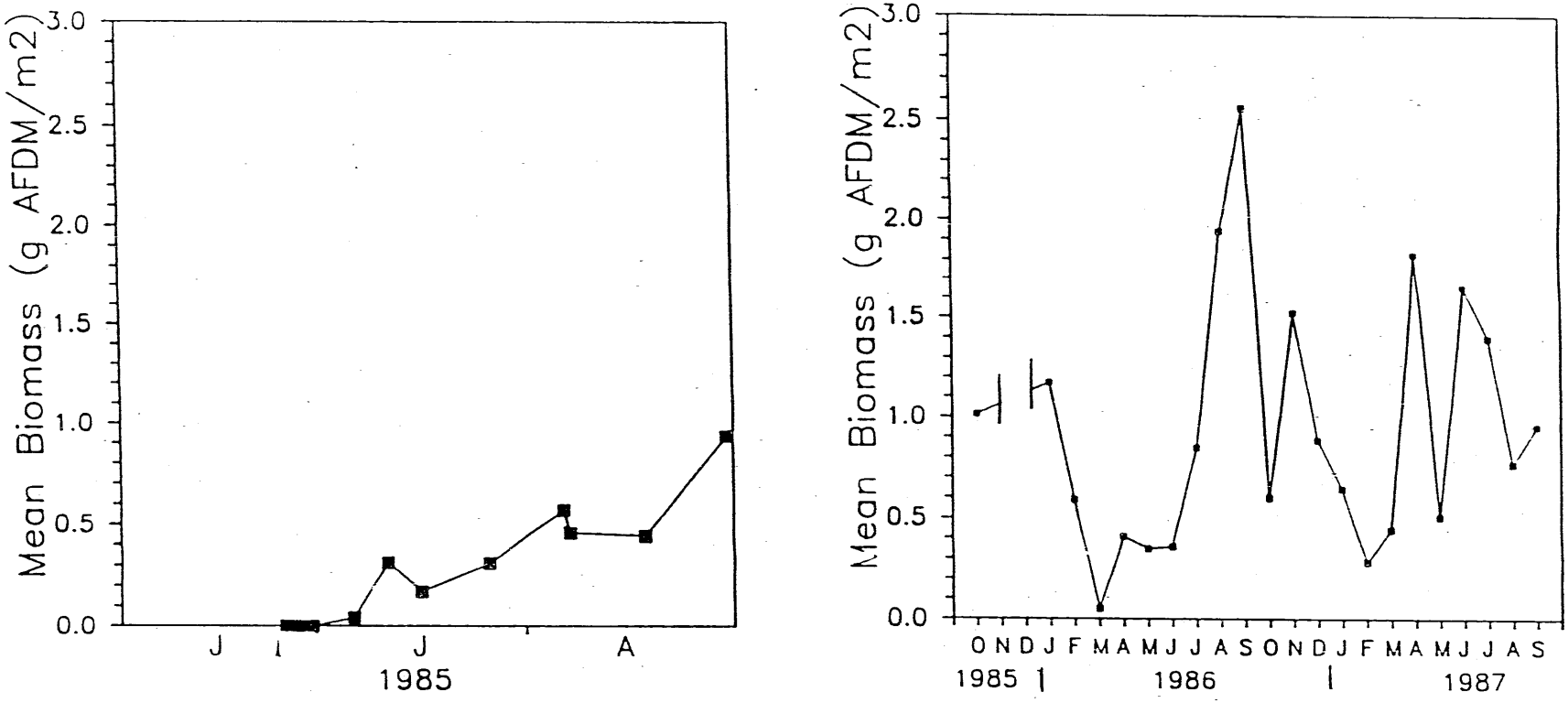

Figure 3-9. Mean biomass of macroinvertebrates on artificial substrate samplers in Four Mile Creek. Arrow in graph on left indicates initial deployment of artificial substrates, which were then retrieved after 1-66 days. Graph on right shows data from monthly deployment/ retrieval of artificial substrates. June 1985 - September 1987.

Table 3-2. Descriptive statistics for macroinvertebrate biomass (as AFDM, in g/m^2) on artificial substrates in Four Mile Creek. Data are arranged by functional group, and include each replicate sample for all incubation periods. June 1985 - September 1987.

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Collector-gatherers	0.1817	0.1215	25.01	156	0.3658	201.4	0.0000	4.2006
Collector-filterers	0.1588	0.0642	21.87	156	0.3173	199.7	0.0000	2.5994
Scrapers	0.0275	0.0002	3.78	156	0.1138	414.1	0.0000	0.7842
Predators	0.3377	0.0202	46.49	156	0.6371	188.7	0.0000	2.4916
Piercer-herbivores	0.0009	0.0000	0.12	156	0.0034	378.1	0.0000	0.0254
Shredders	0.0187	0.0026	2.58	156	0.0439	234.5	0.0000	0.2788
Piercer-carnivore	0.0011	0.0000	0.15	156	0.0034	314.6	0.0000	0.0333
	------		------					
TOTAL	0.7264		100.00					

relative to predator density indicates that they were both scarce and large, which is typical of predators in any system.

In a year-long SRS study, Firth et al. (1986) found average biomasses at thermally impacted stations (excluding the mildly thermal Beaver Dam Creek) ranged from 0.003 to 0.191 g AFDM/m2, while non-thermal stations ranged from 0.073 to 0.715 g AFDM/m2. Excepting the June 1985 data, the Four Mile Creek biomasses in the current study compare well to these levels. In the previous study, mean biomass in functional groups tended to be ranked: predators > collector-gatherers > collector-filterers in non-thermal streams, just as in this study. At thermal stations, however, the tendency was for collector-gatherers to have a higher mean biomass than predators (Firth et al. 1986).

4.0 SUMMARY

In early sampling of Four Mile Creek after C-Reactor was shut down, macroinvertebrate taxa richness was very low (and comparable to earlier data from Four Mile Creek, during periods of thermal stress). Within a month, however, mean taxa richness had increased almost eight-fold, indicating that a diversity of organisms was recolonizing the stream fairly rapidly. Mean macroinvertebrate biomass levels also appeared to recover within about a month, and the distribution of biomass in functional groups was similar to most non-thermal streams on the SRS.

A comparison of total densities of organisms found over time also demonstrates the rapidity with which Four Mile Creek was recolonized. The highest mean density of organisms found over the entire study period occurred sixteen days after reactor shutdown. Although chironomid larvae comprised the bulk of this early density peak, groups such as caddisflies and mayflies increased markedly in abundance within about six weeks after shutdown. The timing of shutdown may also be an important factor contributing to the rapidity of macroinvertebrate recolonization; since summer is the period of peak reproductive activity, recolonization would probably be most rapid during this period.

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APPENDIX

Appendix: Table 1.

Mean taxa richness and statistics for total densities of macroinvertebrates collected from artificial substrates in Four Mile Creek. June 1985 - September 1987.

Date	Mean # Taxa	Total Macroinvertebrate Density						
		Mean	Med	N	SD	CV	Min	Max
85/06/25	2.6	25.7	22.3	5	10.9	42.4	16.8	44.7
85/06/27	2.6	45.8	22.3	5	53.1	115.8	5.6	134.1
85/06/29	4.4	450.3	122.9	5	583.4	129.6	33.5	1407.8
85/07/05	7.4	2574.3	2055.9	5	1393.3	54.1	1430.2	4938.5
85/07/10	14.7	23631.3	23377.1	4	2743.1	11.6	21139.7	26631.3
85/07/15	17.2	16592.2	15614.5	6	10503.2	63.3	1363.1	33798.9
85/07/25	18.0	15808.9	14754.2	5	9324.1	59.0	5033.5	30804.5
85/08/05	20.0	8346.4	8346.4	1	.	.	8346.4	8346.4
85/08/06	19.0	7491.6	7491.6	1	.	.	7491.6	7491.6
85/08/17	19.0	10157.8	10016.8	4	2736.2	26.9	7162.0	13435.8
85/08/29	20.0	5453.6	4888.3	5	2896.8	53.1	2312.8	10145.3
85/10/10	18.4	4719.6	4156.4	5	1813.7	38.4	2860.3	7162.0
86/01/07	21.0	23097.8	21589.4	4	13482.2	58.4	9307.3	39905.0
86/02/07	18.6	9707.9	9089.4	7	5218.4	53.8	3067.0	15927.4
86/03/06	9.8	3433.5	3027.9	5	4155.7	121.0	134.1	10413.4
86/04/04	17.8	4254.7	3787.7	5	1945.1	45.7	2273.7	6854.7
86/05/06	19.6	6125.1	5368.7	5	2001.9	32.7	3927.4	9139.7
86/06/10	17.6	2822.3	2653.6	5	1471.7	52.1	1402.2	5167.6
86/07/03	20.0	3962.0	3905.0	5	1722.7	43.5	1430.2	6257.0
86/08/07	24.2	7655.9	7804.5	5	2271.4	29.7	4312.8	10446.9
86/09/11	19.2	4699.4	3553.1	5	3069.7	65.3	1849.2	8994.4
86/10/03	14.2	2982.1	2357.5	5	1794.2	60.2	1083.8	5743.0
86/11/07	21.8	5212.3	5435.8	5	3479.6	66.8	1692.7	10379.9
86/12/05	19.4	7146.4	6664.8	5	2762.1	38.7	4284.9	11653.6
87/01/09	16.2	5387.7	5162.0	5	2685.9	49.9	2843.6	9519.6
87/02/06	15.4	3406.7	3111.7	5	907.2	26.6	2759.8	4983.2
87/03/06	19.1	3296.1	2508.4	5	1870.5	56.8	1257.0	5849.2
87/04/06	23.0	11232.4	11715.1	5	3507.9	31.2	6838.0	15614.5
87/05/11	23.5	19965.4	17379.9	5	18272.2	91.5	6095.0	50933.0
87/06/05	24.4	6265.9	5564.2	5	4324.7	69.0	1407.8	11055.9
87/07/06	26.6	13465.9	15251.4	5	5422.7	40.3	6715.1	18776.5
87/08/07	23.0	5162.0	3988.8	5	4059.4	78.6	1257.0	11676.0
87/09/04	23.0	4946.4	5061.5	5	2746.5	55.5	1977.7	8703.9

Appendix Table 2.

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=25JUN85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Coleoptera	1.1	0.0	4.35	5	2.5	223.6	0.0	5.6
Lepidoptera	1.1	0.0	4.35	5	2.5	223.6	0.0	5.6
non-Chir. Diptera	3.4	5.6	13.04	5	3.1	91.3	0.0	5.6
unid. Chironomidae	3.4	5.6	13.04	5	3.1	91.3	0.0	5.6
Orthocladiinae	6.7	5.6	26.09	5	9.2	136.9	0.0	22.3
Tanytarsini	4.5	5.6	17.39	5	4.7	104.6	0.0	11.2
Chironomini	5.6	5.6	21.74	5	6.8	122.5	0.0	16.8
TOTAL	25.7		100.00					

Date=27JUN85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Oligochaeta	1.1	0.0	2.44	5	2.5	223.6	0.0	5.6
Hydracarina	2.2	0.0	4.88	5	5.0	223.6	0.0	11.2
Trichoptera	4.5	5.6	9.76	5	4.7	104.6	0.0	11.2
non-Chir. Diptera	1.1	0.0	2.44	5	2.5	223.6	0.0	5.6
unid. Chironomidae	7.8	0.0	17.07	5	12.2	156.5	0.0	27.9
Orthocladiinae	13.4	0.0	29.27	5	18.8	140.1	0.0	39.1
Tanypodinae	2.2	0.0	4.88	5	5.0	223.6	0.0	11.2
Tanytarsini	5.6	0.0	12.20	5	12.5	223.6	0.0	27.9
Chironomini	7.8	0.0	17.07	5	14.6	186.3	0.0	33.5
TOTAL	45.8		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=29JUN85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	1.1	0.0	0.25	5	2.5	223.6	0.0	5.6
Oligochaeta	10.1	5.6	2.23	5	16.5	163.9	0.0	39.1
Ephemeroptera	2.2	0.0	0.50	5	5.0	223.6	0.0	11.2
Coleoptera	1.1	0.0	0.25	5	2.5	223.6	0.0	5.6
unid. Chironomidae	211.2	27.9	46.90	5	379.6	179.8	0.0	882.7
Orthocladiinae	51.4	39.1	11.41	5	42.4	82.6	11.2	122.9
Tanytarsini	136.3	22.3	30.27	5	182.7	134.0	11.2	430.2
Chironomini	34.6	22.3	7.69	5	34.8	100.3	5.6	95.0
Diamesiinae	2.2	0.0	0.50	5	5.0	223.6	0.0	11.2
TOTAL	450.3		100.00					

Date=05JUL85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Oligochaeta	2.2	0.0	0.09	5	5.0	223.6	0.0	11.2
Ephemeroptera	3.4	0.0	0.13	5	5.0	149.1	0.0	11.2
Coleoptera	2.2	0.0	0.09	5	3.1	136.9	0.0	5.6
Trichoptera	20.1	11.2	0.78	5	26.7	132.6	0.0	67.0
non-Chir. Diptera	3.4	0.0	0.13	5	5.0	149.1	0.0	11.2
unid. Chironomidae	269.3	217.9	10.46	5	133.0	49.4	111.7	419.0
Orthocladiinae	728.5	435.8	28.30	5	518.3	71.1	335.2	1519.6
Tanypodinae	35.8	33.5	1.39	5	22.6	63.1	11.2	61.5
Tanytarsini	1088.3	838.0	42.27	5	765.2	70.3	614.5	2441.3
Chironomini	420.1	469.3	16.32	5	141.5	33.7	268.2	592.2
Diamesiinae	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
TOTAL	2574.3		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=10JUL85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	8.4	5.6	0.04	4	10.7	127.7	0.0	22.3
Oligochaeta	340.8	349.2	1.44	4	182.9	53.7	111.7	553.1
Hirudinea	1.4	0.0	0.01	4	2.8	200.0	0.0	5.6
Gastropoda	1.4	0.0	0.01	4	2.8	200.0	0.0	5.6
Hydracarina	5.6	0.0	0.02	4	11.2	200.0	0.0	22.3
Ephemeroptera	30.7	33.5	0.13	4	16.8	54.5	11.2	44.7
Odonata	1.4	0.0	0.01	4	2.8	200.0	0.0	5.6
Coleoptera	4.2	2.8	0.02	4	5.3	127.7	0.0	11.2
Trichoptera	95.0	114.5	0.40	4	57.5	60.6	11.2	139.7
non-Chir. Diptera	7.0	5.6	0.03	4	8.4	120.0	0.0	16.8
unid. Chironomidae	6847.8	7717.9	28.98	4	3547.4	51.8	1821.2	10134.1
Orthocladiinae	10731.8	10391.1	45.41	4	2640.7	24.6	8201.1	13944.1
Tanypodinae	226.3	234.6	0.96	4	88.6	39.2	117.3	318.4
Tanytarsini	3257.0	2765.4	13.78	4	1373.7	42.2	2223.5	5273.7
Chironomini	2022.3	2011.2	8.56	4	832.9	41.2	1022.3	3044.7
Diamesiinae	50.3	33.5	0.21	4	64.2	127.7	0.0	134.1
TOTAL	23631.3		100.00					

Date=15JUL85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	33.5	8.4	0.20	6	56.0	167.0	0.0	145.3
Oligochaeta	216.9	30.7	1.31	6	438.2	202.0	0.0	1106.1
Gastropoda	14.0	0.0	0.08	6	24.9	178.4	0.0	61.5
Hydracarina	14.9	14.0	0.09	6	12.6	84.4	0.0	27.9
Ephemeroptera	73.6	83.8	0.44	6	49.8	67.7	0.0	139.7
Odonata	1.9	0.0	0.01	6	4.6	244.9	0.0	11.2
Coleoptera	5.6	0.0	0.03	6	13.7	244.9	0.0	33.5
Trichoptera	330.5	134.1	1.99	6	483.8	146.4	5.6	1284.9
non-Chir. Diptera	14.9	14.0	0.09	6	12.1	81.0	0.0	33.5
unid. Chironomidae	7963.7	6338.0	48.00	6	7391.8	92.8	234.6	21955.3
Orthocladiinae	4541.9	4374.3	27.37	6	3873.5	85.3	0.0	10860.3
Tanypodinae	784.0	338.0	4.73	6	918.2	117.1	5.6	2016.8
Tanytarsini	1060.5	1282.1	6.39	6	661.8	62.4	5.6	1782.1
Chironomini	1452.5	1659.2	8.75	6	856.3	59.0	0.0	2480.4
Diamesiinae	83.8	0.0	0.51	6	161.1	192.2	0.0	402.2
TOTAL	16592.2		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=25JUL85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	13.4	5.6	0.08	5	18.8	140.1	0.0	44.7
Polychaeta	1.1	0.0	0.01	5	2.5	223.6	0.0	5.6
Oligochaeta	1770.9	480.4	11.20	5	2162.8	122.1	67.0	4888.3
Gastropoda	298.3	206.7	1.89	5	313.0	104.9	11.2	698.3
Hydracarina	10.1	5.6	0.06	5	16.5	163.9	0.0	39.1
Ephemeroptera	375.4	273.7	2.37	5	254.3	67.7	178.8	804.5
Coleoptera	11.2	5.6	0.07	5	13.1	117.3	0.0	27.9
Megaloptera	1.1	0.0	0.01	5	2.5	223.6	0.0	5.6
Trichoptera	241.3	240.2	1.53	5	250.2	103.7	22.3	631.3
non-Chir. Diptera	23.5	22.3	0.15	5	10.7	45.8	11.2	39.1
unid. Chironomidae	3350.8	2385.5	21.20	5	2721.6	81.2	1150.8	8078.2
Orthocladiinae	1249.2	921.8	7.90	5	1230.7	98.5	245.8	3223.5
Tanypodinae	1945.3	1407.8	12.30	5	1603.4	82.4	391.1	4217.9
Tanytarsini	5798.9	7296.1	36.68	5	4695.5	81.0	452.5	10843.6
Chironomini	718.4	564.2	4.54	5	410.5	57.1	284.9	1357.5
TOTAL	15808.9		100.00					

Date=05AUG85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Oligochaeta	5.6	5.6	0.07	1	.	.	5.6	5.6
Gastropoda	11.2	11.2	0.13	1	.	.	11.2	11.2
Hydracarina	11.2	11.2	0.13	1	.	.	11.2	11.2
Ephemeroptera	726.3	726.3	8.70	1	.	.	726.3	726.3
Trichoptera	424.6	424.6	5.09	1	.	.	424.6	424.6
non-Chir. Diptera	16.8	16.8	0.20	1	.	.	16.8	16.8
unid. Chironomidae	1128.5	1128.5	13.52	1	.	.	1128.5	1128.5
Orthocladiinae	782.1	782.1	9.37	1	.	.	782.1	782.1
Tanypodinae	1391.1	1391.1	16.67	1	.	.	1391.1	1391.1
Tanytarsini	3050.3	3050.3	36.55	1	.	.	3050.3	3050.3
Chironomini	636.9	636.9	7.63	1	.	.	636.9	636.9
Diamesiinae	162.0	162.0	1.94	1	.	.	162.0	162.0
TOTAL	8346.4		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=06AUG85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Oligochaeta	11.2	11.2	0.15	1	.	.	11.2	11.2
Gastropoda	5.6	5.6	0.07	1	.	.	5.6	5.6
Hydracarina	95.0	95.0	1.27	1	.	.	95.0	95.0
Ephemeroptera	826.8	826.8	11.04	1	.	.	826.8	826.8
Trichoptera	3268.2	3268.2	43.62	1	.	.	3268.2	3268.2
non-Chir. Diptera	27.9	27.9	0.37	1	.	.	27.9	27.9
unid. Chironomidae	882.7	882.7	11.78	1	.	.	882.7	882.7
Orthocladiinae	463.7	463.7	6.19	1	.	.	463.7	463.7
Tanypodinae	854.7	854.7	11.41	1	.	.	854.7	854.7
Tanytarsini	352.0	352.0	4.70	1	.	.	352.0	352.0
Chironomini	698.3	698.3	9.32	1	.	.	698.3	698.3
Diamesiinae	5.6	5.6	0.07	1	.	.	5.6	5.6
TOTAL	7491.6		100.00					

Date=17AUG85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Oligochaeta	22.3	22.3	0.22	4	25.8	115.5	0.0	44.7
Gastropoda	177.4	184.4	1.75	4	139.4	78.6	0.0	340.8
Hydracarina	131.3	120.1	1.29	4	46.6	35.5	89.4	195.5
Ephemeroptera	1216.5	1243.0	11.98	4	749.7	61.6	491.6	1888.3
Odonata	1.4	0.0	0.01	4	2.8	200.0	0.0	5.6
Coleoptera	57.3	33.5	0.56	4	76.7	133.9	0.0	162.0
Megaloptera	1.4	0.0	0.01	4	2.8	200.0	0.0	5.6
Trichoptera	2706.7	2801.7	26.65	4	950.3	35.1	1502.8	3720.7
non-Chir. Diptera	40.5	41.9	0.40	4	15.4	38.0	22.3	55.9
unid. Chironomidae	1692.7	1689.9	16.66	4	1225.4	72.4	245.8	3145.3
Orthocladiinae	1886.9	949.7	18.58	4	2098.2	111.2	642.5	5005.6
Tanypodinae	946.9	835.2	9.32	4	410.1	43.3	620.1	1497.2
Tanytarsini	459.5	536.3	4.52	4	219.0	47.7	145.3	620.1
Chironomini	798.9	807.3	7.86	4	121.5	15.2	642.5	938.5
Diamesiinae	18.2	19.6	0.18	4	15.4	84.7	0.0	33.5
TOTAL	10157.8		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=29AUG85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Oligochaeta	10.1	5.6	0.18	5	13.9	138.3	0.0	33.5
Gastropoda	1133.0	916.2	20.77	5	822.7	72.6	72.6	2027.9
Pelecypoda	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Hydracarina	95.0	78.2	1.74	5	63.9	67.3	11.2	178.8
Ephemeroptera	1078.2	949.7	19.77	5	780.9	72.4	240.2	2027.9
Odonata	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Coleoptera	38.0	16.8	0.70	5	58.5	154.0	0.0	139.7
Megaloptera	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Trichoptera	1367.6	703.9	25.08	5	1703.4	124.6	223.5	4385.5
non-Chir. Diptera	19.0	22.3	0.35	5	12.9	67.7	5.6	33.5
unid. Chironomidae	120.7	78.2	2.21	5	86.6	71.8	61.5	268.2
Orthocladiinae	152.0	150.8	2.79	5	122.1	80.4	33.5	340.8
Tanypodinae	540.8	430.2	9.92	5	405.7	75.0	134.1	1173.2
Tanytarsini	61.5	22.3	1.13	5	62.5	101.6	11.2	145.3
Chironomini	831.3	715.1	15.24	5	489.7	58.9	296.1	1569.8
Diamesiinae	3.4	0.0	0.06	5	7.5	223.6	0.0	16.8
TOTAL	5453.6		100.00					

Date=10OCT85

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	6.7	0.0	0.14	5	15.0	223.6	0.0	33.5
Oligochaeta	33.5	0.0	0.71	5	50.0	149.1	0.0	111.7
Gastropoda	243.6	122.9	5.16	5	254.2	104.4	55.9	659.2
Hydracarina	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Ephemeroptera	1010.1	1150.8	21.40	5	382.7	37.9	486.0	1463.7
Coleoptera	4.5	5.6	0.09	5	4.7	104.6	0.0	11.2
Megaloptera	3.4	0.0	0.07	5	5.0	149.1	0.0	11.2
Trichoptera	1099.4	413.4	23.30	5	1317.8	119.9	139.7	3307.3
non-Chir. Diptera	7.8	5.6	0.17	5	9.3	119.5	0.0	22.3
unid. Chironomidae	680.4	754.2	14.42	5	409.0	60.1	273.7	1240.2
Orthocladiinae	154.2	156.4	3.27	5	20.4	13.2	122.9	178.8
Tanypodinae	325.1	245.8	6.89	5	145.7	44.8	189.9	530.7
Tanytarsini	185.5	167.6	3.93	5	139.1	75.0	55.9	413.4
Chironomini	949.7	899.4	20.12	5	453.7	47.8	363.1	1519.6
Diamesiinae	14.5	11.2	0.31	5	14.0	96.5	5.6	39.1
TOTAL	4719.6		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=07JAN86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	74.0	44.7	0.32	4	70.9	95.7	27.9	178.8
Oligochaeta	459.5	514.0	1.99	4	144.7	31.5	245.8	564.2
Gastropoda	25.1	5.6	0.11	4	42.9	170.7	0.0	89.4
Hydracarina	11.2	8.4	0.05	4	12.1	108.0	0.0	27.9
Ephemeroptera	2120.1	2134.1	9.18	4	239.2	11.3	1843.6	2368.7
Odonata	1.4	0.0	0.01	4	2.8	200.0	0.0	5.6
Coleoptera	2.8	2.8	0.01	4	3.2	115.5	0.0	5.6
Trichoptera	2986.0	2083.8	12.93	4	2850.6	95.5	676.0	7100.6
non-Chir. Diptera	331.0	338.0	1.43	4	128.1	38.7	173.2	474.9
unid. Chironomidae	7248.6	338.0	31.38	4	13871.6	191.4	262.6	28055.9
Orthocladiinae	1375.7	1455.3	5.96	4	1073.8	78.1	0.0	2592.2
Tanypodinae	1033.5	835.2	4.47	4	816.8	79.0	273.7	2189.9
Tanytarsini	1364.5	1352.0	5.91	4	659.3	48.3	581.0	2173.2
Chironomini	6064.2	4980.[illegible]	26.25	4	6145.4	101.3	0.0	14296.1
TOTAL	23097.8		100.00					

Date=07FEB86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	73.4	27.9	0.76	7	94.1	128.2	5.6	229.1
Oligochaeta	439.7	301.7	4.53	7	323.2	73.5	78.2	988.8
Gastropoda	15.2	11.2	0.16	7	20.1	132.3	0.0	55.9
Hydracarina	15.2	16.8	0.16	7	14.3	94.4	0.0	39.1
Amphipoda	0.8	0.0	0.01	7	2.1	264.6	0.0	5.6
Ephemeroptera	656.8	770.9	6.77	7	418.1	63.7	111.7	1201.1
Odonata	0.8	0.0	0.01	7	2.1	264.6	0.0	5.6
Hemiptera	0.8	0.0	0.01	7	2.1	264.6	0.0	5.6
Coleoptera	0.8	0.0	0.01	7	2.1	264.6	0.0	5.6
Megaloptera	4.8	0.0	0.05	7	6.8	141.7	0.0	16.8
Trichoptera	330.4	173.2	3.40	7	370.0	112.0	33.5	1011.2
non-Chir. Diptera	174.0	162.0	1.79	7	148.5	85.4	0.0	441.3
unid. Chironomid	486.0	541.9	5.01	7	131.8	27.1	307.3	625.7
Orthocladiinae	3873.9	3899.4	39.90	7	1466.2	37.8	1737.4	6329.6
Tanypodinae	553.9	301.7	5.71	7	490.8	88.6	117.3	1279.3
Tanytarsini	869.9	603.4	8.96	7	640.0	73.6	262.6	1804.5
Chironomini	2211.5	1145.3	22.78	7	2062.8	93.3	268.2	5603.4
TOTAL	9707.9		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=06MAR86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Oligochaeta	17.9	11.2	0.52	5	22.1	123.8	0.0	55.9
Gastropoda	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Ephemeroptera	110.6	106.1	3.22	5	94.9	85.8	11.2	234.6
Odonata	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Trichoptera	41.3	16.8	1.20	5	41.9	101.4	5.6	95.0
non-Chir. Diptera	62.6	39.1	1.82	5	69.9	111.8	0.0	145.3
unid. Chironomidae	233.5	83.8	6.80	5	280.3	120.0	16.8	659.2
Orthocladiinae	2272.6	1821.2	66.19	5	2817.8	124.0	72.6	7005.6
Tanypodinae	23.5	22.3	0.68	5	21.1	89.7	0.0	55.9
Tanytarsini	484.9	162.0	14.12	5	815.5	168.2	5.6	1927.4
Chironomini	183.2	229.1	5.34	5	145.2	79.3	16.8	368.7
TOTAL	3433.5		100.00					

Date=04APR86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	4.5	0.0	0.11	5	7.3	163.0	0.0	16.8
Oligochaeta	44.7	16.8	1.05	5	57.5	128.7	5.6	145.3
Gastropoda	58.1	39.1	1.37	5	69.4	119.4	0.0	173.2
Hydracarina	3.4	5.6	0.08	5	3.1	91.3	0.0	5.6
Ephemeroptera	841.3	933.0	19.77	5	437.3	52.0	296.1	1446.9
Odonata	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Trichoptera	414.5	245.8	9.74	5	351.9	84.9	67.0	927.4
non-Chir. Diptera	166.5	83.8	3.91	5	166.5	100.0	27.9	391.1
unid. Chironomidae	168.7	139.7	3.97	5	116.8	69.2	67.0	368.7
Orthocladiinae	1255.9	1558.7	29.52	5	563.6	44.9	541.9	1731.8
Tanypodinae	103.9	122.9	2.44	5	59.6	57.4	27.9	167.6
Tanytarsini	854.7	687.2	20.09	5	550.2	64.4	458.1	1821.2
Chironomini	337.4	212.3	7.93	5	207.6	61.5	156.4	631.3
TOTAL	4254.7		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=06MAY86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Turbellaria	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Nematoda	11.2	11.2	0.18	5	8.8	79.1	0.0	22.3
Oligochaeta	38.0	5.6	0.62	5	66.7	175.7	0.0	156.4
Hirudinea	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Gastropoda	5.6	5.6	0.09	5	5.6	100.0	0.0	11.2
Hydracarina	11.2	5.6	0.18	5	14.2	127.5	0.0	33.5
Ephemeroptera	964.2	787.7	15.74	5	479.4	49.7	474.9	1698.3
Odonata	3.4	0.0	0.05	5	7.5	223.6	0.0	16.8
Coleoptera	7.8	5.6	0.13	5	6.4	81.4	0.0	16.8
Trichoptera	2126.3	3095.0	34.71	5	1884.3	88.6	55.9	4117.3
non-Chir. Diptera	34.6	44.7	0.57	5	19.1	55.2	11.2	50.3
unid. Chironomidae	68.2	44.7	1.11	5	49.1	72.0	22.3	134.1
Orthocladiinae	1852.5	1592.2	30.24	5	849.2	45.8	793.3	3055.9
Tanypodinae	325.1	301.7	5.31	5	127.5	39.2	150.8	463.7
Tanytarsini	287.2	229.1	4.69	5	228.7	79.7	83.8	681.6
Chironomini	387.7	340.8	6.33	5	176.7	45.6	212.3	681.6
TOTAL	6125.1		100.00					

Date=10JUN86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Turbellaria	13.4	0.0	0.48	5	18.8	140.1	0.0	39.1
Nematoda	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
Oligochaeta	55.9	39.1	1.98	5	80.9	144.7	0.0	195.5
Hirudinea	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
Gastropoda	27.9	16.8	0.99	5	31.8	114.0	0.0	78.2
Ephemeroptera	1232.4	1352.0	43.67	5	446.7	36.2	715.1	1670.4
Odonata	16.8	16.8	0.59	5	8.8	52.7	5.6	27.9
Coleoptera	3.4	0.0	0.12	5	5.0	149.1	0.0	11.2
Trichoptera	796.6	385.5	28.23	5	1175.1	147.5	67.0	2871.5
Lepidoptera	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
non-Chir. Diptera	4.5	0.0	0.16	5	7.3	163.0	0.0	16.8
unid. Chironomidae	17.9	16.8	0.63	5	10.7	60.1	5.6	33.5
Orthocladiinae	105.0	72.6	3.72	5	90.6	86.3	22.3	251.4
Tanypodinae	182.1	206.7	6.45	5	69.2	38.0	95.0	245.8
Tanytarsini	12.3	11.2	0.44	5	10.7	87.4	0.0	27.9
Chironomini	350.8	363.1	12.43	5	212.2	60.5	50.3	620.1
TOTAL	2822.3		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=03JUL86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Turbellaria	14.5	5.6	0.37	5	26.4	181.6	0.0	61.5
Nematoda	6.7	5.6	0.17	5	7.3	108.7	0.0	16.8
Oligochaeta	318.4	391.1	8.04	5	175.5	55.1	5.6	419.0
Gastropoda	16.8	11.2	0.42	5	16.3	97.2	0.0	39.1
Hydracarina	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Amphipoda	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Ephemeroptera	1581.0	1558.7	39.90	5	333.2	21.1	1128.5	1983.2
Odonata	35.8	33.5	0.90	5	26.7	74.6	5.6	72.6
Plecoptera	2.2	0.0	0.06	5	3.1	136.9	0.0	5.6
Coleoptera	4.5	5.6	0.11	5	4.7	104.6	0.0	11.2
Megaloptera	29.1	27.9	0.73	5	29.1	100.3	0.0	72.6
Trichoptera	808.9	413.4	20.42	5	883.6	109.2	39.1	2279.3
Lepidoptera	2.2	0.0	0.06	5	3.1	136.9	0.0	5.6
non-Chir. Diptera	3.4	0.0	0.08	5	5.0	149.1	0.0	11.2
unid. Chironomidae	14.5	11.2	0.37	5	17.5	120.4	0.0	44.7
Orthocladiinae	115.1	67.0	2.90	5	106.6	92.6	16.8	290.5
Tanypodinae	521.8	620.1	13.17	5	297.4	57.0	55.9	832.4
Tanytarsini	53.6	50.3	1.35	5	39.6	73.9	0.0	95.0
Chironomini	431.3	396.6	10.89	5	375.2	87.0	128.5	1061.5
TOTAL	3962.0		100.00					

Date=07AUG86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Turbellaria	14.5	5.6	0.19	5	17.9	123.4	0.0	44.7
Nematoda	6.7	5.6	0.09	5	7.3	108.7	0.0	16.8
Oligochaeta	62.6	22.3	0.82	5	79.1	126.5	16.8	201.1
Gastropoda	12.3	11.2	0.16	5	13.9	113.2	0.0	33.5
Hydracarina	6.7	5.6	0.09	5	7.3	108.7	0.0	16.8
Ephemeroptera	2520.7	2407.8	32.92	5	570.8	22.6	1703.9	3201.1
Odonata	30.2	27.9	0.39	5	21.5	71.2	5.6	61.5
Plecoptera	1.1	0.0	0.01	5	2.5	223.6	0.0	5.6
Coleoptera	11.2	5.6	0.15	5	13.1	117.3	0.0	33.5
Megaloptera	41.3	33.5	0.54	5	25.8	62.4	16.8	83.8
Trichoptera	816.8	279.3	10.67	5	865.1	105.9	162.0	2122.9
Lepidoptera	2.2	0.0	0.03	5	3.1	136.9	0.0	5.6
non-Chir. Diptera	4.5	0.0	0.06	5	7.3	163.0	0.0	16.8
unid. Chironomidae	114.0	134.1	1.49	5	56.1	49.2	44.7	178.8
Orthocladiinae	38.0	39.1	0.50	5	21.4	56.4	11.2	61.5
Tanypodinae	403.4	424.6	5.27	5	195.2	48.4	156.4	631.3
Tanytarsini	116.2	122.9	1.52	5	28.3	24.4	83.8	156.4
Chironomini	3453.6	3759.8	45.11	5	1341.9	38.9	2044.7	5162.0
TOTAL	7655.9		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=11SEP86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Gastropoda	7.8	5.6	0.17	5	8.5	108.3	0.0	16.8
Hydracarina	8.9	11.2	0.19	5	6.4	71.3	0.0	16.8
Ephemeroptera	2255.9	1793.3	48.00	5	1524.2	67.6	776.5	4391.1
Odonata	25.7	11.2	0.55	5	36.5	142.2	0.0	89.4
Coleoptera	6.7	5.6	0.14	5	7.3	108.7	0.0	16.8
Megaloptera	39.1	33.5	0.83	5	18.5	47.4	16.8	67.0
Trichoptera	395.5	385.5	8.42	5	313.6	79.3	89.4	843.6
Lepidoptera	3.4	0.0	0.07	5	7.5	223.6	0.0	16.8
non-Chir. Diptera	2.2	0.0	0.05	5	3.1	136.9	0.0	5.6
unid. Chironomidae	32.4	27.9	0.69	5	27.8	85.7	5.6	78.2
Orthocladiinae	435.8	229.1	9.27	5	362.6	83.2	106.1	949.7
Tanypodinae	220.1	184.4	4.68	5	174.1	79.1	55.9	514.0
Tanytarsini	269.3	173.2	5.73	5	311.2	115.6	22.3	804.5
Chironomini	996.6	720.7	21.21	5	507.5	50.9	581.0	1821.2
TOTAL	4699.4		100.00					

Date=03OCT86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	2.2	0.0	0.07	5	3.1	136.9	0.0	5.6
Oligochaeta	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
Ephemeroptera	1645.8	1676.0	55.19	5	498.7	30.3	888.3	2290.5
Odonata	4.5	5.6	0.15	5	2.5	55.9	0.0	5.6
Plecoptera	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
Coleoptera	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
Megaloptera	4.5	0.0	0.15	5	6.1	136.9	0.0	11.2
Trichoptera	692.7	407.8	23.23	5	880.8	127.1	33.5	2156.4
Lepidoptera	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
unid. Chironomidae	14.5	11.2	0.49	5	7.5	51.6	5.6	22.3
Orthocladiinae	91.6	33.5	3.07	5	107.9	117.7	11.2	257.0
Tanypodinae	51.4	39.1	1.72	5	43.2	84.0	11.2	122.9
Tanytarsini	89.4	67.0	3.00	5	72.9	81.6	11.2	206.7
Chironomini	381.0	201.1	12.78	5	341.7	89.7	78.2	849.2
TOTAL	2982.1		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=07NOV86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	8.9	11.2	0.17	5	6.4	71.3	0.0	16.8
Oligochaeta	7.8	5.6	0.15	5	9.3	119.5	0.0	22.3
Gastropoda	10.1	5.6	0.19	5	9.2	91.3	0.0	22.3
Pelecypoda	4.5	5.6	0.09	5	4.7	104.6	0.0	11.2
Hydracarina	14.5	11.2	0.28	5	13.5	92.6	0.0	33.5
Ephemeroptera	1396.6	1536.3	26.80	5	685.3	49.1	480.4	2240.2
Odonata	26.8	22.3	0.51	5	14.5	53.9	11.2	44.7
Plecoptera	2.2	0.0	0.04	5	3.1	136.9	0.0	5.6
Coleoptera	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Megaloptera	3.4	0.0	0.06	5	5.0	149.1	0.0	11.2
Trichoptera	1985.5	726.3	38.09	5	2313.4	116.5	223.5	5435.8
Lepidoptera	3.4	0.0	0.06	5	5.0	149.1	0.0	11.2
non-Chir. Diptera	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
unid. Chironomidae	64.8	61.5	1.24	5	44.6	68.9	27.9	139.7
Orthocladiinae	336.3	324.0	6.45	5	162.5	48.3	156.4	525.1
Tanypodinae	388.8	223.5	7.46	5	294.7	75.8	139.7	765.4
Tanytarsini	343.0	240.2	6.58	5	241.4	70.4	83.8	659.2
Chironomini	608.9	631.3	11.68	5	293.8	48.3	234.6	960.9
Diamesiinae	4.5	5.6	0.09	5	4.7	104.6	0.0	11.2
TOTAL	5212.3		100.00					

Date=05DEC86

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Turbellaria	2.2	0.0	0.03	5	5.0	223.6	0.0	11.2
Nematoda	33.5	27.9	0.47	5	19.8	58.9	11.2	61.5
Oligochaeta	112.8	78.2	1.58	5	78.3	69.3	44.7	229.1
Gastropoda	4.5	0.0	0.06	5	7.3	163.0	0.0	16.8
Pelecypoda	2.2	0.0	0.03	5	5.0	223.6	0.0	11.2
Hydracarina	3.4	0.0	0.05	5	5.0	149.1	0.0	11.2
Ephemeroptera	665.9	564.2	9.32	5	281.8	42.3	385.5	1117.3
Odonata	4.5	5.6	0.06	5	4.7	104.6	0.0	11.2
Megaloptera	5.6	0.0	0.08	5	7.9	141.4	0.0	16.8
Trichoptera	795.5	636.9	11.13	5	695.0	87.4	128.5	1938.5
non-Chir. Diptera	14.5	16.8	0.20	5	8.5	58.3	0.0	22.3
unid. Chironomidae	208.9	201.1	2.92	5	33.0	15.8	178.8	251.4
Orthocladiinae	1035.8	1016.8	14.49	5	204.4	19.7	720.7	1251.4
Tanypodinae	212.3	240.2	2.97	5	88.3	41.6	61.5	290.5
Tanytarsini	2882.7	2731.8	40.34	5	1069.0	37.1	1519.6	4491.6
Chironomini	1148.6	1067.0	16.07	5	606.9	52.8	424.6	2106.1
Diamesiinae	13.4	11.2	0.19	5	12.9	95.9	0.0	33.5
TOTAL	7146.4		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=09JAN87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Turbellaria	3.4	5.6	0.06	5	3.1	91.3	0.0	5.6
Nematoda	19.0	5.6	0.35	5	27.5	145.0	0.0	67.0
Oligochaeta	230.2	240.2	4.27	5	152.5	66.3	72.6	419.0
Gastropoda	7.8	5.6	0.15	5	6.4	81.4	0.0	16.8
Pelecypoda	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Hydracarina	2.2	0.0	0.04	5	5.0	223.6	0.0	11.2
Ephemeroptera	299.4	307.3	5.56	5	126.7	42.3	156.4	486.0
Odonata	2.2	0.0	0.04	5	3.1	136.9	0.0	5.6
Megaloptera	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Trichoptera	150.8	184.4	2.80	5	66.0	43.7	50.3	201.1
non-Chir. Diptera	3.4	0.0	0.06	5	5.0	149.1	0.0	11.2
unid. Chironomidae	120.7	111.7	2.24	5	59.9	49.6	44.7	212.3
Orthocladiinae	2891.6	2581.0	53.67	5	1483.1	51.3	1441.3	5122.9
Tanypodinae	29.1	27.9	0.54	5	21.1	72.5	5.6	61.5
Tanytarsini	1274.9	1173.2	23.66	5	934.5	73.3	402.2	2798.9
Chironomini	347.5	363.1	6.45	5	140.1	40.3	173.2	530.7
Diamesiinae	3.4	0.0	0.06	5	5.0	149.1	0.0	11.2
TOTAL	5387.7		100.00					

Date=06FEB87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	20.1	22.3	0.59	5	10.1	50.5	5.6	33.5
Oligochaeta	77.1	78.2	2.26	5	31.9	41.4	27.9	117.3
Gastropoda	2.2	0.0	0.07	5	5.0	223.6	0.0	11.2
Pelecypoda	5.6	5.6	0.16	5	6.8	122.5	0.0	16.8
Hydracarina	4.5	0.0	0.13	5	6.1	136.9	0.0	11.2
Ephemeroptera	441.3	435.8	12.96	5	214.8	48.7	234.6	737.4
Plecoptera	2.2	0.0	0.07	5	5.0	223.6	0.0	11.2
Coleoptera	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Trichoptera	176.5	178.8	5.18	5	80.0	45.3	67.0	284.9
Lepidoptera	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
non-Chir. Diptera	21.2	16.8	0.62	5	13.9	65.5	11.2	44.7
unid. Chironomidae	117.3	100.6	3.44	5	82.6	70.4	27.9	245.8
Orthocladiinae	1301.7	1257.0	38.21	5	496.4	38.1	843.6	2089.4
Tanypodinae	14.5	16.8	0.43	5	10.1	69.9	0.0	27.9
Tanytarsini	890.5	776.5	26.14	5	291.6	32.8	720.7	1407.8
Chironomini	328.5	296.1	9.64	5	86.8	26.4	262.6	469.3
Diamesiinae	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
TOTAL	3406.7		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=06MAR87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	34.6	5.6	1.05	5	42.4	122.5	0.0	83.8
Oligochaeta	157.5	201.1	4.78	5	94.8	60.2	44.7	251.4
Gastropoda	11.2	0.0	0.34	5	15.3	136.9	0.0	27.9
Pelecypoda	4.5	5.6	0.14	5	4.7	104.6	0.0	11.2
Hydracarina	29.1	33.5	0.88	5	20.7	71.2	0.0	50.3
Ephemeroptera	442.5	407.8	13.42	5	160.1	36.2	257.0	670.4
Odonata	4.5	0.0	0.14	5	7.3	163.0	0.0	16.8
Plecoptera	3.4	0.0	0.10	5	5.0	149.1	0.0	11.2
Coleoptera	3.4	0.0	0.10	5	7.5	223.6	0.0	16.8
Megaloptera	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Trichoptera	381.0	324.0	11.56	5	276.0	72.4	106.1	748.6
Lepidoptera	4.5	5.6	0.14	5	4.7	104.6	0.0	11.2
non-Chir. Diptera	39.1	33.5	1.19	5	16.3	41.6	27.9	67.0
unid. Chironomidae	586.6	491.6	17.80	5	648.8	110.6	16.8	1670.4
Orthocladiinae	646.9	519.6	19.63	5	475.2	73.5	217.9	1463.7
Tanypodinae	2.2	0.0	0.07	5	3.1	136.9	0.0	5.6
Tanytarsini	660.3	514.0	20.03	5	436.4	66.1	251.4	1352.0
Chironomini	283.8	229.1	8.61	5	124.1	43.7	167.6	441.3
TOTAL	3296.1		100.00					

Date=06APR87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
.	5.6	5.6	0.01	1	.	.	5.6	5.6
Turbellaria	3.4	5.6	0.03	5	3.1	91.3	0.0	5.6
Nematoda	105.0	22.3	0.94	5	120.9	115.2	11.2	240.2
Oligochaeta	804.5	435.8	7.16	5	686.1	85.3	223.5	1743.0
Gastropoda	6.7	5.6	0.06	5	9.2	136.9	0.0	22.3
Pelecypoda	4.5	0.0	0.04	5	7.3	163.0	0.0	16.8
Hydracarina	42.5	50.3	0.38	5	24.9	58.5	5.6	72.6
Ephemeroptera	658.1	826.8	5.86	5	239.5	36.4	368.7	838.0
Odonata	6.7	0.0	0.06	5	10.0	149.1	0.0	22.3
Plecoptera	1.1	0.0	0.01	5	2.5	223.6	0.0	5.6
Megaloptera	8.9	11.2	0.08	5	6.4	71.3	0.0	16.8
Trichoptera	450.3	430.2	4.01	5	155.0	34.4	268.2	636.9
non-Chir. Diptera	57.0	33.5	0.51	5	61.9	108.6	11.2	162.0
unid. Chironomidae	669.3	765.4	5.96	5	368.2	55.0	167.6	1156.4
Orthocladiinae	7509.5	8519.6	66.86	5	2429.1	32.3	4463.7	9608.9
Tanypodinae	6.7	5.6	0.06	5	4.7	69.7	0.0	11.2
Tanytarsini	601.1	474.9	5.35	5	453.5	75.4	117.3	1324.0
Chironomini	287.2	262.6	2.56	5	71.4	24.9	201.1	385.5
Diamesiinae	8.9	0.0	0.08	5	17.0	190.6	0.0	39.1
TOTAL	11236.9		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=11MAY87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	63.7	44.7	0.32	5	50.4	79.1	27.9	150.8
Oligochaeta	4.5	5.6	0.02	5	2.5	55.9	0.0	5.6
Gastropoda	3.4	0.0	0.02	5	5.0	149.1	0.0	11.2
Pelecypoda	1.1	0.0	0.01	5	2.5	223.6	0.0	5.6
Hydracarina	726.3	446.9	3.64	5	908.7	125.1	83.8	2307.3
Ephemeroptera	2098.3	1592.2	10.51	5	2199.1	104.8	379.9	5765.4
Odonata	50.3	61.5	0.25	5	33.8	67.1	0.0	83.8
Plecoptera	2.2	0.0	0.01	5	3.1	136.9	0.0	5.6
Coleoptera	29.1	16.8	0.15	5	19.9	68.5	11.2	55.9
Trichoptera	2253.6	2078.2	11.29	5	2241.4	99.5	72.6	5139.7
non-Chir. Diptera	67.0	67.0	0.34	5	24.0	35.8	33.5	100.6
unid. Chironomidae	1735.2	860.3	8.69	5	2058.5	118.6	681.6	5413.4
Orthocladiinae	7787.7	6201.1	39.01	5	5151.7	66.2	2776.5	15715.1
Tanypodinae	48.0	27.9	0.24	5	41.9	87.2	0.0	95.0
Tanytarsini	4124.0	2095.0	20.66	5	5821.6	141.2	318.4	14301.7
Chironomini	966.5	586.6	4.84	5	854.1	88.4	106.1	1927.4
Diamesiinae	4.5	5.6	0.02	5	4.7	104.6	0.0	11.2
TOTAL	19965.4		100.00					

Date=05JUN87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Turbellaria	63.7	50.3	1.02	5	47.8	75.1	11.2	139.7
Nematoda	12.3	5.6	0.20	5	12.1	98.5	0.0	27.9
Oligochaeta	36.9	44.7	0.59	5	31.5	85.4	0.0	78.2
Gastropoda	3.4	0.0	0.05	5	7.5	223.6	0.0	16.8
Pelecypoda	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Hydracarina	152.0	100.6	2.43	5	171.9	113.1	0.0	419.0
Ephemeroptera	1650.3	1916.2	26.34	5	835.6	50.6	553.1	2709.5
Odonata	17.9	16.8	0.29	5	19.1	106.9	0.0	44.7
Colecptera	6.7	5.6	0.11	5	7.3	108.7	0.0	16.8
Megaloptera	7.8	5.6	0.12	5	8.5	108.3	0.0	16.8
Trichoptera	1055.9	798.9	16.85	5	775.2	73.4	508.4	2424.6
Lepidoptera	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
non-Chir. Diptera	17.9	11.2	0.29	5	15.0	83.9	0.0	33.5
unid. Chironomidae	112.8	78.2	1.80	5	113.5	100.6	5.6	257.0
Orthocladiinae	2150.8	1709.5	34.33	5	2125.0	98.8	139.7	5430.2
Tanypodinae	35.8	22.3	0.57	5	36.3	101.6	5.6	89.4
Tanytarsini	619.0	474.9	9.88	5	702.9	113.6	16.8	1782.1
Chironomini	318.4	245.8	5.08	5	267.5	84.0	100.6	782.1
Diamesiinae	2.2	0.0	0.04	5	5.0	223.6	0.0	11.2
TOTAL	6265.9		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=06JUL87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	6.7	0.0	0.05	5	15.0	223.6	0.0	33.5
Oligochaeta	4.5	0.0	0.03	5	7.3	163.0	0.0	16.8
Pelecypoda	2.2	0.0	0.02	5	3.1	136.9	0.0	5.6
Hydracarina	257.0	201.1	1.91	5	210.4	81.9	78.2	581.0
Ephemeroptera	2482.7	2514.0	18.44	5	1385.7	55.8	586.6	3960.9
Odonata	83.8	61.5	0.62	5	47.2	56.4	44.7	156.4
Plecoptera	1.1	0.0	0.01	5	2.5	223.6	0.0	5.6
Coleoptera	24.6	16.8	0.18	5	16.1	65.5	11.2	44.7
Megaloptera	96.1	100.6	0.71	5	52.3	54.4	16.8	162.0
Trichoptera	4501.7	4491.6	33.43	5	1049.2	23.3	3312.8	5698.3
Lepidoptera	15.6	5.6	0.12	5	19.9	127.3	0.0	44.7
non-Chir. Diptera	27.9	39.1	0.21	5	18.9	67.8	0.0	44.7
unid. Chironomidae	846.9	849.2	6.29	5	700.1	82.7	162.0	1754.2
Orthocladiinae	2707.3	2893.9	20.10	5	2075.7	76.7	307.3	5156.4
Tanypodinae	233.5	240.2	1.73	5	143.5	61.4	50.3	441.3
Tanytarsini	552.0	508.4	4.10	5	428.6	77.6	128.5	1156.4
Chironomini	1622.3	1525.1	12.05	5	437.6	27.0	1106.1	2106.1
TOTAL	13465.9		100.00					

Date=07AUG87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Nematoda	6.7	0.0	0.13	5	12.1	180.7	0.0	27.9
Gastropoda	6.7	11.2	0.13	5	6.1	91.3	0.0	11.2
Hydracarina	65.9	39.1	1.28	5	89.2	135.2	5.6	223.5
Ephemeroptera	1156.4	944.1	22.40	5	920.3	79.6	234.6	2614.5
Odonata	15.6	16.8	0.30	5	11.4	73.2	5.6	33.5
Plecoptera	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Coleoptera	20.1	16.8	0.39	5	12.9	63.9	5.6	33.5
Megaloptera	26.8	16.8	0.52	5	15.0	55.9	16.8	50.3
Trichoptera	1338.5	564.2	25.93	5	1572.5	117.5	27.9	3849.2
Lepidoptera	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
non-Chir. Diptera	99.4	117.3	1.93	5	72.1	72.5	5.6	173.2
unid. Chironomidae	463.7	178.8	8.98	5	453.9	97.9	128.5	1117.3
Orthocladiinae	996.6	608.9	19.31	5	908.1	91.1	122.9	2212.3
Tanypodinae	156.4	89.4	3.03	5	110.0	70.3	67.0	307.3
Tanytarsini	252.5	240.2	4.89	5	237.2	93.9	33.5	642.5
Chironomini	554.2	519.6	10.74	5	218.6	39.4	340.8	905.0
TOTAL	5162.0		100.00					

Appendix Table 2 (continued).

Descriptive density (organisms/m^2) statistics and percent composition for major taxonomic groups of macroinvertebrates collected in Four Mile Creek. June 1985 - September 1987.

Date=04SEP87

Taxon	Mean	Med	% Comp	N	SD	CV	Min	Max
Turbellaria	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Nematoda	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Oligochaeta	197.8	212.3	4.00	5	203.7	103.0	0.0	502.8
Gastropoda	4.5	0.0	0.09	5	7.3	163.0	0.0	16.8
Pelecypoda	2.2	0.0	0.05	5	3.1	136.9	0.0	5.6
Hydracarina	30.2	16.8	0.61	5	35.2	116.8	0.0	89.4
Ephemeroptera	1122.9	1106.1	22.70	5	914.6	81.5	0.0	2491.6
Odonata	4.5	5.6	0.09	5	4.7	104.6	0.0	11.2
Coleoptera	31.3	33.5	0.63	5	16.1	51.4	5.6	44.7
Megaloptera	67.0	55.9	1.36	5	45.2	67.4	27.9	134.1
Trichoptera	600.0	536.3	12.13	5	368.3	61.4	257.0	1189.9
non-Chir. Diptera	17.9	16.8	0.36	5	10.7	60.1	5.6	33.5
unid. Chironomidae	415.6	620.1	8.40	5	348.2	83.8	27.9	720.7
Orthocladiinae	1341.9	1469.3	27.13	5	980.2	73.0	279.3	2474.9
Tanypodinae	201.1	178.8	4.07	5	113.3	56.3	83.8	363.1
Tanytarsini	297.2	368.7	6.01	5	236.5	79.6	27.9	592.2
Chironomini	610.1	541.9	12.33	5	316.1	51.8	357.5	1134.1
TOTAL	4946.4		100.00					

Appendix Table 3.

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=25JUN85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Collector-gatherers	16.8	16.8	65.22	5	8.8	52.7	5.6	27.9
Collector-filterers	6.7	5.6	26.09	5	7.3	108.7	0.0	16.8
Scrapers	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Predators	1.1	0.0	4.35	5	2.5	223.6	0.0	5.6
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	1.1	0.0	4.35	5	2.5	223.6	0.0	5.6
Piercer-carnivore	0.0	0.0	0.00	5	0.0	.	0.0	0.0
TOTAL	25.7		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=27JUN85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	1.1	0.0	2.44	5	2.5	223.6	0.0	5.6
Collector-gatherers	30.2	5.6	65.85	5	41.9	139.0	0.0	95.0
Collector-filterers	10.1	5.6	21.95	5	10.7	106.9	0.0	27.9
Scrapers	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Predators	2.2	0.0	4.88	5	5.0	223.6	0.0	11.2
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Piercer-carnivore	2.2	0.0	4.88	5	5.0	223.6	0.0	11.2
TOTAL	45.8		100.00					

Date=29JUN85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Collector-gatherers	311.7	100.6	69.23	5	400.5	128.5	22.3	977.7
Collector-filterers	136.3	22.3	30.27	5	182.7	134.0	11.2	430.2
Scrapers	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Predators	2.2	0.0	0.50	5	5.0	223.6	0.0	11.2
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Piercer-carnivore	0.0	0.0	0.00	5	0.0	.	0.0	0.0
TOTAL	450.2		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=05JUL85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	95.0	89.4	3.69	5	29.6	31.1	55.9	134.1
Collector-gatherers	1333.0	1067.0	51.78	5	624.6	46.9	687.2	2296.1
Collector-filterers	1105.0	843.6	42.93	5	790.4	71.5	614.5	2502.8
Scrapers	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Predators	39.1	33.5	1.52	5	18.9	48.4	16.8	61.5
Piercer-herbivores	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
Shredders	1.1	0.0	0.04	5	2.5	223.6	0.0	5.6
Piercer-carnivore	0.0	0.0	0.00	5	0.0	.	0.0	0.0
TOTAL	2574.3		100.00					

Date=10JUL85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	1540.5	1522.3	6.52	4	416.7	27.0	1167.6	1949.7
Collector-gatherers	18446.9	17569.8	78.06	4	1978.5	10.7	17257.0	21391.1
Collector-filterers	3336.6	2821.2	14.12	4	1382.7	41.4	2335.2	5368.7
Scrapers	1.4	0.0	0.01	4	2.8	200.0	0.0	5.6
Predators	290.5	329.6	1.23	4	102.2	35.2	139.7	363.1
Piercer-herbivores	8.4	8.4	0.04	4	7.2	86.1	0.0	16.8
Shredders	1.4	0.0	0.01	4	2.8	200.0	0.0	5.6
Piercer-carnivore	5.6	0.0	0.02	4	11.2	200.0	0.0	22.3
TOTAL	23631.3		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=15JUL85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	871.5	838.0	5.25	6	541.5	62.1	22.3	1480.4
Collector-gatherers	13422.7	11857.5	80.90	6	8678.4	64.7	1329.6	27955.3
Collector-filterers	1372.4	1625.7	8.27	6	912.9	66.5	5.6	2541.9
Scrapers	14.0	0.0	0.08	6	24.9	178.4	0.0	61.5
Predators	883.6	405.0	5.33	6	1030.2	116.6	5.6	2435.8
Piercer-herbivores	6.5	2.8	0.04	6	9.0	137.3	0.0	22.3
Shredders	6.5	0.0	0.04	6	16.0	244.9	0.0	39.1
Piercer-carnivore	14.9	14.0	0.09	6	12.6	84.4	0.0	27.9
TOTAL	16592.1		100.00					

Date=25JUL85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	446.9	435.8	2.83	5	272.4	61.0	95.0	798.9
Collector-gatherers	7065.9	4374.3	44.70	5	5424.3	76.8	2324.0	15921.8
Collector-filterers	5997.8	7798.9	37.94	5	4835.8	80.6	463.7	11039.1
Scrapers	299.4	206.7	1.89	5	311.8	104.1	11.2	698.3
Predators	1979.9	1441.3	12.52	5	1590.8	80.3	430.2	4223.5
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	8.9	5.6	0.06	5	11.6	129.6	0.0	27.9
Piercer-carnivore	10.1	5.6	0.06	5	16.5	163.9	0.0	39.1
TOTAL	15808.9		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=05AUG85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	860.3	860.3	10.31	1	.	.	860.3	860.3
Collector-gatherers	2329.6	2329.6	27.91	1	.	.	2329.6	2329.6
Collector-filterers	3407.8	3407.8	40.83	1	.	.	3407.8	3407.8
Scrapers	11.2	11.2	0.13	1	.	.	11.2	11.2
Predators	1581.0	1581.0	18.94	1	.	.	1581.0	1581.0
Piercer-herbivores	0.0	0.0	0.00	1	.	.	0.0	0.0
Shredders	145.3	145.3	1.74	1	.	.	145.3	145.3
Piercer-carnivore	11.2	11.2	0.13	1	.	.	11.2	11.2
TOTAL	8346.4		100.00					

Date=06AUG85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	150.8	150.8	2.01	1	.	.	150.8	150.8
Collector-gatherers	2575.4	2575.4	34.38	1	.	.	2575.4	2575.4
Collector-filterers	3514.0	3514.0	46.91	1	.	.	3514.0	3514.0
Scrapers	5.6	5.6	0.07	1	.	.	5.6	5.6
Predators	944.1	944.1	12.60	1	.	.	944.1	944.1
Piercer-herbivores	0.0	0.0	0.00	1	.	.	0.0	0.0
Shredders	206.7	206.7	2.76	1	.	.	206.7	206.7
Piercer-carnivore	95.0	95.0	1.27	1	.	.	95.0	95.0
TOTAL	7491.6		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=17AUG85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	148.0	103.4	1.46	4	95.1	64.2	95.0	290.5
Collector-gatherers	5191.3	4396.6	51.11	4	2494.3	48.0	3245.8	8726.3
Collector-filterers	3095.0	3343.6	30.47	4	1102.0	35.6	1575.4	4117.3
Scrapers	177.4	184.4	1.75	4	139.4	78.6	0.0	340.8
Predators	1065.6	946.9	10.49	4	453.4	42.5	687.2	1681.6
Piercer-herbivores	11.2	0.0	0.11	4	22.3	200.0	0.0	44.7
Shredders	338.0	321.2	3.33	4	69.9	20.7	273.7	435.8
Piercer-carnivore	131.3	120.1	1.29	4	46.6	35.5	89.4	195.5
TOTAL	10157.8		100.00					

Date=29AUG85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	71.5	39.1	1.31	5	79.3	111.0	22.3	212.3
Collector-gatherers	1853.6	1709.5	33.99	5	1141.5	61.6	525.1	3452.5
Collector-filterers	1339.7	703.9	24.56	5	1684.8	125.8	178.8	4318.4
Scrapers	1133.0	916.2	20.77	5	822.7	72.6	72.6	2027.9
Predators	624.6	569.8	11.45	5	447.7	71.7	150.8	1312.8
Piercer-herbivores	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Shredders	335.2	279.3	6.15	5	309.3	92.3	0.0	698.3
[illegible]	95.0	78.2	1.74	5	63.9	67.3	11.2	178.8
TOTAL	5453.7		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=10OCT85

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	131.8	122.9	2.79	5	53.2	40.4	89.4	223.5
Collector-gatherers	2412.3	2340.8	51.11	5	810.6	33.6	1240.2	3212.3
Collector-filterers	1099.4	625.7	23.30	5	1301.9	118.4	83.8	3262.6
Scrapers	243.6	122.9	5.16	5	254.2	104.4	55.9	659.2
Predators	502.8	441.3	10.65	5	160.1	31.8	363.1	770.9
Piercer-herbivores	3.4	5.6	0.07	5	3.1	91.3	0.0	5.6
Shredders	324.0	324.0	6.87	5	194.2	59.9	122.9	569.8
Piercer-carnivore	2.2	0.0	0.05	5	3.1	136.9	0.0	5.6
TOTAL	4719.5		100.00					

Date=07JAN86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	191.3	189.9	0.83	4	47.0	24.6	139.7	245.8
Collector-gatherers	16579.6	14782.1	71.78	4	10914.1	65.8	5988.8	30765.4
Collector-filterers	4409.2	3913.4	19.09	4	2588.4	58.7	1949.7	7860.3
Scrapers	26.5	8.4	0.11	4	42.1	158.8	0.0	89.4
Predators	1198.3	963.7	5.19	4	880.6	73.5	407.8	2458.1
Piercer-herbivores	62.8	72.6	0.27	4	33.0	52.5	16.8	89.4
Shredders	618.7	731.8	2.68	4	433.0	70.0	0.0	1011.2
Piercer-carnivore	11.2	8.4	0.05	4	12.1	108.0	0.0	27.9
TOTAL	23097.6		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=07FEB86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	335.2	346.4	3.45	7	88.1	26.3	201.1	452.5
Collector-gatherers	7356.7	7363.1	75.78	7	3679.6	50.0	2312.8	11949.7
Collector-filterers	1191.5	972.1	12.27	7	851.4	71.5	279.3	2145.3
Scrapers	15.2	11.2	0.16	7	20.1	132.3	0.0	55.9
Predators	608.1	318.4	6.26	7	540.2	88.8	134.1	1352.0
Piercer-herbivores	73.4	55.9	0.76	7	56.0	76.3	16.8	167.6
Shredders	112.5	0.0	1.16	7	154.9	137.6	0.0	363.1
Piercer-carnivore	15.2	16.8	0.16	7	14.3	94.4	0.0	39.1
TOTAL	9707.8		100.00					

Date=06MAR86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	215.6	72.6	6.28	5	249.5	115.7	5.6	525.1
Collector-gatherers	2624.6	2284.9	76.44	5	3108.4	118.4	117.3	7798.9
Collector-filterers	544.1	284.9	15.85	5	804.0	147.8	5.6	1949.7
Scrapers	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Predators	24.6	22.3	0.72	5	23.2	94.5	0.0	61.5
Piercer-herbivores	22.3	11.2	0.65	5	25.3	113.2	5.6	67.0
Shredders	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
Piercer-carnivore	0.0	0.0	0.00	5	0.0	.	0.0	0.0
TOTAL	3433.4		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=04APR86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	179.9	122.9	4.23	5	144.7	80.5	83.8	435.8
Collector-gatherers	2525.1	2581.0	59.35	5	1062.5	42.1	1083.8	3569.8
Collector-filterers	1318.4	977.7	30.99	5	803.9	61.0	648.0	2569.8
Scrapers	58.1	39.1	1.37	5	69.4	119.4	0.0	173.2
Predators	143.0	156.4	3.36	5	73.1	51.1	55.9	234.6
Piercer-herbivores	20.1	22.3	0.47	5	17.0	84.7	0.0	39.1
Shredders	6.7	0.0	0.16	5	10.0	149.1	0.0	22.3
Piercer-carnivore	3.4	5.6	0.08	5	3.1	91.3	0.0	5.6
TOTAL	4254.7		100.00					

Date=06MAY86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	250.3	245.8	4.09	5	161.7	64.6	72.6	486.0
Collector-gatherers	3214.5	3117.3	52.48	5	1090.5	33.9	1793.3	4363.1
Collector-filterers	2175.4	2715.1	35.52	5	1589.1	73.0	340.8	3988.8
Scrapers	5.6	5.6	0.09	5	5.6	100.0	0.0	11.2
Predators	369.8	352.0	6.04	5	115.3	31.2	195.5	480.4
Piercer-herbivores	36.9	22.3	0.60	5	28.9	78.4	11.2	78.2
Shredders	61.5	16.8	1.00	5	103.2	168.0	5.6	245.8
Piercer-carnivore	11.2	5.6	0.18	5	14.2	127.5	0.0	33.5
TOTAL	6125.2		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=10JUN86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	30.2	22.3	1.07	5	25.5	84.5	11.2	72.6
Collector-gatherers	1442.5	1463.7	51.11	5	432.4	30.0	960.9	1927.4
Collector-filterers	724.0	346.4	25.65	5	1165.0	160.9	11.2	2776.5
Scrapers	27.9	16.8	0.99	5	31.8	114.0	0.0	78.2
Predators	245.8	290.5	8.71	5	81.4	33.1	134.1	312.8
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	352.0	368.7	12.47	5	221.4	62.9	61.5	636.9
Piercer-carnivore	0.0	0.0	0.00	5	0.0	.	0.0	0.0
TOTAL	2822.4		100.00					

Date=03JUL86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	44.7	33.5	1.13	5	46.2	103.5	0.0	122.9
Collector-gatherers	2118.4	2357.5	53.47	5	546.1	25.8	1184.4	2553.1
Collector-filterers	781.0	379.9	19.71	5	880.5	112.7	0.0	2240.2
Scrapers	16.8	11.2	0.42	5	16.3	97.2	0.0	39.1
Predators	620.1	726.3	15.65	5	338.5	54.6	78.2	944.1
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	379.9	301.7	9.59	5	332.2	87.5	162.0	960.9
Piercer-carnivore	1.1	0.0	0.03	5	2.5	223.6	0.0	5.6
TOTAL	3962.0		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=07AUG86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	117.3	139.7	1.53	5	60.6	51.6	39.1	189.9
Collector-gatherers	3569.8	3458.1	46.63	5	969.2	27.2	2245.8	4966.5
Collector-filterers	803.4	268.2	10.49	5	835.4	104.0	206.7	2089.4
Scrapers	14.5	11.2	0.19	5	15.1	103.9	0.0	39.1
Predators	512.8	508.4	6.70	5	242.1	47.2	212.3	826.8
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	2631.3	2407.8	34.37	5	1171.0	44.5	1569.8	4307.3
Piercer-carnivore	6.7	5.6	0.09	5	7.3	108.7	0.0	16.8
TOTAL	7655.8		100.00					

Date=11SEP86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	34.6	33.5	0.74	5	26.9	77.7	5.6	78.2
Collector-gatherers	3565.4	2625.7	75.87	5	2278.3	63.9	1357.5	6659.2
Collector-filterers	416.8	413.4	8.87	5	306.2	73.5	139.7	910.6
Scrapers	12.3	5.6	0.26	5	14.5	117.7	0.0	27.9
Predators	309.5	240.2	6.59	5	209.1	67.6	106.1	659.2
Piercer-herbivores	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Shredders	350.8	240.2	7.47	5	296.6	84.5	67.0	692.7
Piercer-carnivore	8.9	11.2	0.19	5	6.4	71.3	0.0	16.8
TOTAL	4699.4		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=03OCT86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	14.5	11.2	0.49	5	7.5	51.6	5.6	22.3
Collector-gatherers	2122.9	1933.0	71.19	5	891.9	42.0	977.7	3402.2
Collector-filterers	769.8	469.3	25.81	5	920.7	119.6	11.2	2251.4
Scrapers	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Predators	61.5	44.7	2.06	5	39.3	64.0	27.9	128.5
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	13.4	5.6	0.45	5	14.6	108.7	5.6	39.1
Piercer-carnivore	0.0	0.0	0.00	5	0.0	.	0.0	0.0
TOTAL	2982.1		100.00					

Date=07NOV86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	52.5	39.1	1.01	5	34.1	65.0	27.9	111.7
Collector-gatherers	2366.5	2575.4	45.40	5	1051.9	44.5	1050.3	3385.5
Collector-filterers	2235.8	1067.0	42.89	5	2454.1	109.8	307.3	6027.9
Scrapers	11.2	5.6	0.21	5	7.9	70.7	5.6	22.3
Predators	435.8	279.3	8.36	5	308.9	70.9	173.2	826.8
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	96.1	83.8	1.84	5	72.2	75.2	27.9	184.4
Piercer-carnivore	14.5	11.2	0.28	5	13.5	92.6	0.0	33.5
TOTAL	5212.4		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=05DEC86

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	192.2	206.7	2.69	5	30.8	16.0	145.3	223.5
Collector-gatherers	3031.3	3050.3	42.42	5	1116.6	36.8	1636.9	4731.8
Collector-filterers	3657.0	3117.3	51.17	5	1625.1	44.4	2335.2	6430.2
Scrapers	4.5	0.0	0.06	5	7.3	163.0	0.0	16.8
Predators	241.3	279.3	3.38	5	101.6	42.1	72.6	340.8
Piercer-herbivores	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Shredders	15.6	11.2	0.22	5	18.7	119.5	0.0	44.7
Piercer-carnivore	3.4	0.0	0.05	5	5.0	149.1	0.0	11.2
TOTAL	7146.4		100.00					

Date=09JAN87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	98.3	100.6	1.82	5	52.0	52.9	27.9	173.2
Collector-gatherers	3816.8	3469.3	70.84	5	1697.7	44.5	2268.2	6346.4
Collector-filterers	1416.8	1368.7	26.30	5	964.6	68.1	519.6	2960.9
Scrapers	7.8	5.6	0.15	5	6.4	81.4	0.0	16.8
Predators	40.2	33.5	0.75	5	29.4	73.1	11.2	89.4
Piercer-herbivores	1.1	0.0	0.02	5	2.5	223.6	0.0	5.6
Shredders	4.5	0.0	0.08	5	7.3	163.0	0.0	16.8
Piercer-carnivore	2.2	0.0	0.04	5	5.0	223.6	0.0	11.2
TOTAL	5387.7		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=06FEB87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	115.1	100.6	3.38	5	80.9	70.3	22.3	240.2
Collector-gatherers	2173.2	2145.3	63.79	5	621.4	28.6	1625.7	3189.9
Collector-filterers	1076.0	1000.0	31.58	5	246.7	22.9	882.7	1508.4
Scrapers	3.4	0.0	0.10	5	5.0	149.1	0.0	11.2
Predators	24.6	27.9	0.72	5	14.0	57.0	0.0	33.5
Piercer-herbivores	0.0	0.0	0.00	5	0.0	.	0.0	0.0
Shredders	10.1	5.6	0.30	5	13.3	132.6	0.0	33.5
Piercer-carnivore	4.5	0.0	0.13	5	6.1	136.9	0.0	11.2
TOTAL	3406.9		100.00					

Date=06MAR87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	51.4	44.7	1.56	5	31.9	62.2	22.3	95.0
Collector-gatherers	2108.4	1966.5	63.97	5	1373.1	65.1	709.5	4318.4
Collector-filterers	1048.0	860.3	31.80	5	675.6	64.5	446.9	2055.9
Scrapers	11.2	0.0	0.34	5	15.3	136.9	0.0	27.9
Predators	27.9	22.3	0.85	5	19.8	70.7	11.2	61.5
Piercer-herbivores	2.2	0.0	0.07	5	3.1	136.9	0.0	5.6
Shredders	17.9	16.8	0.54	5	12.7	71.3	5.6	39.1
Piercer-carnivore	29.1	33.5	0.88	5	20.7	71.2	0.0	50.3
TOTAL	3296.1		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=06APR87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	623.5	592.2	5.55	5	387.1	62.1	106.1	1162.0
Collector-gatherers	9412.3	10821.2	83.80	5	3050.9	32.4	5379.9	12681.6
Collector-filterers	1067.0	955.3	9.50	5	361.1	33.8	726.3	1586.6
Scrapers	21.2	15.8	0.19	5	16.5	77.6	0.0	44.7
Predators	50.3	50.3	0.45	5	4.0	7.9	44.7	55.9
Piercer-herbivores	4.5	0.0	0.04	5	7.3	163.0	0.0	16.8
Shredders	11.2	5.6	0.10	5	13.1	117.3	0.0	33.5
Piercer-carnivore	42.5	50.3	0.38	5	24.9	58.5	5.6	72.6
TOTAL	11232.5		100.00					

Date=11MAY87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	1204.5	826.8	6.03	5	1126.7	93.5	379.9	3184.4
Collector-gatherers	11826.8	8877.1	59.24	5	9151.0	77.4	5000.0	27139.7
Collector-filterers	5997.8	4016.8	30.04	5	7244.3	120.8	419.0	18033.5
Scrapers	8.9	11.2	0.04	5	8.5	94.8	0.0	16.8
Predators	176.5	212.3	0.88	5	63.5	36.0	95.0	240.2
Piercer-herbivores	1.1	0.0	0.01	5	2.5	223.6	0.0	5.6
Shredders	23.5	11.2	0.12	5	37.1	158.3	0.0	89.4
Piercer-carnivore	726.3	446.9	3.64	5	908.7	125.1	83.8	2307.3
TOTAL	19965.4		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=05JUN87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	115.1	83.8	1.84	5	114.3	99.3	5.6	257.0
Collector-gatherers	4172.1	4011.2	66.58	5	2935.2	70.4	793.3	7715.1
Collector-filterers	1546.4	1111.7	24.68	5	1035.1	66.9	469.3	2905.0
Scrapers	4.5	0.0	0.07	5	7.3	163.0	0.0	16.8
Predators	193.3	111.7	3.08	5	166.4	86.1	83.8	480.4
Piercer-herbivores	23.5	5.6	0.37	5	40.6	172.8	0.0	95.0
Shredders	59.2	50.3	0.95	5	23.9	40.4	39.1	100.6
Piercer-carnivore	152.0	100.6	2.43	5	171.9	113.1	0.0	419.0
TOTAL	6266.1		100.00					

Date=06JUL87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	227.9	290.5	1.69	5	136.2	59.8	50.3	379.9
Collector-gatherers	7552.0	8240.2	56.08	5	4210.2	55.7	2770.9	12167.6
Collector-filterers	2545.3	2581.0	18.90	5	1007.3	39.6	1050.3	3888.3
Scrapers	5.6	0.0	0.04	5	12.5	223.6	0.0	27.9
Predators	911.7	916.2	6.77	5	236.4	25.9	642.5	1167.6
Piercer-herbivores	42.5	11.2	0.32	5	70.1	165.0	5.6	167.6
Shredders	1924.0	2000.0	14.29	5	676.7	35.2	1100.6	2921.8
Piercer-carnivore	257.0	201.1	1.91	5	210.4	81.9	78.2	581.0
TOTAL	13466.0		100.00					

Appendix Table 3 (continued).

Descriptive statistics and percent composition of macroinvertebrate densities (organisms/m^2) in functional groups collected in Four Mile Creek. June 1985 - September 1987.

Date=07AUG87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	117.3	156.4	2.27	5	69.1	58.9	22.3	184.4
Collector-gatherers	2968.7	1782.1	57.51	5	2405.5	81.0	698.3	6681.6
Collector-filterers	977.7	860.3	18.94	5	960.3	98.2	100.6	2597.8
Scrapers	8.9	11.2	0.17	5	6.4	71.3	0.0	16.8
Predators	411.2	268.2	7.97	5	215.8	52.5	262.6	748.6
Piercer-herbivores	71.5	27.9	1.39	5	80.8	113.0	5.6	167.6
Shredders	540.8	530.7	10.48	5	385.9	71.4	150.8	1106.1
Piercer-carnivore	65.9	39.1	1.28	5	89.2	135.2	5.6	223.5
TOTAL	5162.0		100.00					

Date=04SEP87

Functional Group	Mean	Med	% Comp	N	SD	CV	Min	Max
Non-feeding	93.9	117.3	1.90	5	40.0	42.6	33.5	128.5
Collector-gatherers	3595.5	2759.8	72.69	5	2279.3	63.4	1519.6	6770.9
Collector-filterers	749.7	642.5	15.16	5	503.3	67.1	212.3	1452.5
Scrapers	12.3	5.6	0.25	5	14.5	117.7	0.0	27.9
Predators	322.9	273.7	6.53	5	177.0	54.8	122.9	575.4
Piercer-herbivores	19.0	16.8	0.38	5	22.9	120.6	0.0	55.9
Shredders	122.9	134.1	2.48	5	45.2	36.8	50.3	162.0
Piercer-carnivore	30.2	16.8	0.61	5	35.2	116.8	0.0	89.4
TOTAL	4946.4		100.00					

Appendix Table 4.

Descriptive statistics for macroinvertebrate biomass (as AFDM, in g/m^2) on artificial substrates in Four Mile Creek. Data were calculated for each date, and include all replicate samples that were successfully analyzed. June 1985 - September 1987.

Date	Mean	Med	N	SD	CV	Min	Max
25JUN85	0.001	0.0004	5	0.0027	152.4	0.0003	0.0065
27JUN85	0.0003	0.0002	4	0.0001	49.1	0.0002	0.0006
29JUN85	0.0015	0.0008	5	0.0020	131.2	0.0003	0.0051
05JUL85	0.0426	0.0438	5	0.0126	29.6	0.0240	0.0583
10JUL85	0.3133	0.3278	4	0.0456	14.6	0.2469	0.3504
15JUL85	0.1696	0.1951	6	0.0850	50.2	0.0129	0.2611
25JUL85	0.3107	0.2227	5	0.1511	48.6	0.1788	0.5291
05AUG85	0.5707	0.5707	1	.	.	0.5707	0.5707
06AUG85	0.4567	0.4567	1	.	.	0.4567	0.4567
17AUG85	0.4417	0.4651	4	0.1037	23.5	0.3104	0.5262
29AUG85	0.9342	0.8476	5	0.4660	49.9	0.4013	1.6742
10OCT85	1.0115	0.4999	5	1.1179	110.5	0.1784	2.8868
07JAN86	1.1701	0.7886	4	1.1479	98.1	0.2540	2.8492
07FEB86	0.5881	0.1495	7	0.6499	110.5	0.0654	1.5456
06MAR86	0.0501	0.0303	5	0.0482	96.1	0.0040	0.1234
04APR86	0.4063	0.4160	5	0.1639	40.3	0.1626	0.6247
06MAY86	0.3477	0.3711	5	0.2763	79.5	0.0704	0.6957
10JUN86	0.3580	0.2333	5	0.2683	74.9	0.1727	0.8105
03JUL86	0.8459	0.4905	5	0.8280	97.9	0.3269	2.2969
07AUG86	1.9408	2.1391	4	0.7856	.5	0.8255	2.6596
11SEP86	2.5576	2.6109	5	0.7461	29.2	1.7398	3.6823
03OCT86	0.5983	0.5473	5	0.1771	29.6	0.4174	0.8771
07NOV86	1.5236	0.7579	5	1.6433	107.9	0.6966	4.4583

Appendix Table 4 (continued).

Descriptive statistics for macroinvertebrate biomass (as AFDM, in g m^{-2}) on artificial substrates in Four Mile Creek. Data were calculated for each date, and include all replicate samples that were successfully analyzed. June 1985 - September 1987.

Date	Mean	Med	N	SD	CV	Min	Max
05DEC86	0.8839	0.2306	5	0.9466	107.1	0.1890	2.1366
09JAN87	0.6419	0.6374	5	0.4338	67.6	0.1810	1.3375
06FEB87	0.2829	0.2678	5	0.1199	42.4	0.1619	0.4818
06MAR87	0.4419	0.2370	5	0.4215	95.4	0.0730	1.0868
06APR87	1.8276	1.3498	5	1.2712	69.6	0.6802	3.2901
11MAY87	0.5058	0.5531	5	0.1652	32.7	0.2267	0.6665
05JUN87	1.6563	2.1037	5	0.8719	52.6	0.4957	2.4981
06JUL87	1.3943	1.3839	5	0.6502	46.6	0.7228	2.3071
07AUG87	0.7626	0.7796	5	0.3984	52.2	0.1516	1.2441
04SEP87	0.9515	1.0885	5	0.4019	42.2	0.4456	1.3786

Appendix Table 5.

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	25JUN85	27JUN85	29JUN85	05JUL85	10JUL85	15JUL85	25JUL85	05AUG85	06AUG85	17AUG85
Class Turbellaria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phylum Nematoda	0.0	0.0	1.1	0.0	8.4	33.5	13.4	0.0	0.0	0.0
Manayunkia	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Class Oligochaeta	0.0	1.1	10.1	2.2	340.8	216.9	1770.9	5.6	11.2	22.3
Class Hirudinea	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Class Gastropoda	0.0	0.0	0.0	0.0	1.4	7.4	21.2	0.0	0.0	16.8
Family Ancylidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physella heterostropha	0.0	0.0	0.0	0.0	0.0	6.5	277.1	11.2	5.6	160.6
Family Planorbidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gyraulus parvus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Helisoma anceps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Helisoma trivolvis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Menetus dilatatus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Class Pelecypoda	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corbicula fluminea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Order Hydracarina	0.0	2.2	0.0	0.0	5.6	14.9	10.1	11.2	95.0	131.3
Order Amphipoda	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hyalella azteca	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Order Ephemeroptera	0.0	0.0	0.0	0.0	2.8	1.9	0.0	0.0	0.0	1.4
Family Baetidae	0.0	0.0	2.2	0.0	1.4	0.0	36.9	0.0	5.6	53.1
Baetis	0.0	0.0	0.0	2.2	4.2	8.4	211.2	659.2	681.6	1040.5
Callibaetis	0.0	0.0	0.0	0.0	8.4	1.9	0.0	0.0	0.0	0.0
Pseudocloeon parvulum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	25JUN85	27JUN85	29JUN85	05JUL85	10JUL85	15JUL85	25JUL85	05AUG85	06AUG85	17AUG85
Caenis	0.0	0.0	0.0	0.0	7.0	8.4	7.8	44.7	27.9	5.6
Leptohyphes dolani	0.0	.	.	.	.	.	.	.	.	.
Family Ephemerellidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ephemerella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eurylophella temporalis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serratella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Heptageniidae	0.0	0.0	0.0	1.1	2.8	5.6	3.4	0.0	0.0	2.8
Heptagenia	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Stenacron interpunctatum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stenonema modestum	0.0	0.0	0.0	0.0	4.2	2.8	38.0	5.6	22.3	23.7
Isonychia	0.0	0.0	0.0	0.0	0.0	0.0	2.2	11.2	5.6	9.8
Leptohyphes	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Tricorythodes	0.0	0.0	0.0	0.0	0.0	44.7	74.9	5.6	83.8	78.2
Order Odonata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Suborder Anisoptera	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Family Aeshnidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Boyeria spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Boyeria vinosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neurocordulia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neurocordulia molesta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Gomphidae	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	25JUN85	27JUN85	29JUN85	05JUL85	10JUL85	15JUL85	25JUL85	05AUG85	06AUG85	17AUG85
Hagenius brevistylus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Didymops transversa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Macromia spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Suborder Zygoptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Calopterygidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calopteryx spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hetaerina spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Coenagrionidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Argia spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Enallagma spp.	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Order Plecoptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Perlidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paragnetina fumosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paragnetina kansensis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Corixidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pyrrhalta nymphaeae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Coptotomus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Elmidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ancyronyx variegatus	0.0	0.0	0.0	1.1	2.8	5.6	10.1	0.0	0.0	53.1
Dubiraphia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Macronychus glabratus	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Microcylloepus pusillus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	25JUN85	27JUN85	29JUN85	05JUL85	10JUL85	15JUL85	25JUL85	05AUG85	06AUG85	17AUG85
Stenelmis	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dineutus	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	2.8
Family Hydrophilidae	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Family Ptilodactylidae	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Family Corydalidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corydalus cornutus	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.4
Order Trichoptera	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	16.8	2.8
Family Hydropsychidae	0.0	0.0	0.0	5.6	11.2	12.1	1.1	11.2	111.7	110.3
Cheumatopsyche spp.	0.0	1.1	0.0	4.5	15.4	25.1	40.2	61.5	726.3	773.7
Hydropsyche spp.	0.0	0.0	0.0	5.6	37.7	211.4	133.0	307.3	715.1	493.0
Macrostemum carolina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0
Family Hydroptilidae	0.0	0.0	0.0	1.1	5.6	0.0	0.0	0.0	0.0	8.4
Hydroptila	0.0	0.0	0.0	0.0	1.4	7.4	2.2	0.0	0.0	2.8
Oxyethira	0.0	0.0	0.0	0.0	4.2	8.4	1.1	0.0	0.0	0.0
Family Leptoceridae	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Ceraclea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nectopsyche	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nectopsyche candida	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oecetis	0.0	0.0	0.0	0.0	4.2	1.9	13.4	0.0	5.6	11.2
Triaenodes spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Triaenodes tardus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chimarra	0.0	3.4	0.0	1.1	15.4	63.3	48.0	27.9	1036.9	1201.2

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	25JUN85	27JUN85	29JUN85	05JUL85	10JUL85	15JUL85	25JUL85	05AUG85	06AUG85	17AUG85
Family Polycentropodidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cernotina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neureclipsis	0.0	0.0	0.0	0.0	0.0	0.0	2.2	11.2	55.9	43.3
Family Pyralidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neargyractis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Parapoynx	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Synclita	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Order Diptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Tipulidae	0.0	0.0	0.0	1.1	0.0	0.9	1.1	0.0	0.0	0.0
Antocha	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tipula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaoborus punctipennis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Simulium	2.2	1.1	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Family Ceratopogonidae	0.0	0.0	0.0	0.0	1.4	8.4	7.8	16.8	0.0	1.4
Subfamily Ceratopogoniinae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subfamily Forcipomyiinae	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Family Chironomidae	3.4	7.8	211.2	269.3	6847.8	7963.7	3350.8	1128.5	882.7	1692.7
Subfamily Tanypodinae	0.0	2.2	0.0	35.8	226.3	284.0	1945.3	1301.1	894.7	946.9
Subfamily Diamesiinae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potthastia	0.0	0.0	2.2	1.1	50.3	83.8	0.0	162.0	5.6	18.2

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	25JUN85	27JUN85	29JUN85	05JUL85	10JUL85	15JUL85	25JUL85	05AUG85	06AUG85	17AUG85
Subfamily Orthocladiinae	6.7	13.4	51.4	728.5	10731.8	4541.9	1249.2	782.1	463.7	1886.9
Tribe Chironomini	5.6	7.8	34.6	420.1	2022.3	1446.9	710.6	491.6	491.6	462.3
Stenochironomus	0.0	0.0	0.0	0.0	0.0	5.6	7.8	145.3	206.7	336.6
Tribe Tanytarsini	4.5	5.6	136.3	1088.3	3257.0	1060.5	5798.9	3050.3	352.0	459.5
Family Empididae	1.1	0.0	0.0	2.2	5.6	4.7	13.4	0.0	27.9	39.1
Chelifera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hemerodromia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	25.7	45.8	450.3	2574.3	23631.3	16592.2	15808.9	8346.4	7491.6	10157.8

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	29AUG85	10OCT85	07JAN86	07FEB86	06MAR86	04APR86	06MAY86	10JUN86	03JUL86	07AUG86
Class Turbellaria	0.0	0.0	0.0	0.0	0.0	0.0	1.1	13.4	14.5	14.5
Phylum Nematoda	0.0	6.7	74.0	73.4	1.1	4.5	11.2	1.1	6.7	6.7
Manayunkia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Class Oligochaeta	10.1	33.5	459.5	439.7	17.9	44.7	38.0	55.9	318.4	62.6
Class Hirudinea	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0
Class Gastropoda	43.6	101.7	0.0	5.6	0.0	25.7	0.0	0.0	2.2	1.1
Family Ancylidae	0.0	0.0	25.1	2.4	1.1	5.6	2.2	2.2	8.9	6.7
Physella heterostropha	1087.2	141.9	0.0	7.2	0.0	26.8	3.4	25.7	5.6	3.4
Family Planorbidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gyraulus parvus	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Helisoma anceps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Helisoma trivolvis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Menetus dilatatus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Class Pelecypoda	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corbicula fluminea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Order Hydracarina	95.0	1.1	11.2	15.2	0.0	3.4	11.2	0.0	1.1	6.7
Order Amphipoda	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Hyalella azteca	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Order Ephemeroptera	3.4	0.0	8.4	0.0	0.0	0.0	11.2	0.0	88.3	110.6
Family Baetidae	2.2	45.8	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Baetis	862.6	603.4	951.1	282.5	87.2	553.1	234.6	79.3	83.8	70.4
Callibaetis	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pseudocloeon parvulum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	29AUG85	10OCT85	07JAN86	07FEB86	06MAR86	04APR86	06MAY86	10JUN86	03JUL86	07AUG86
Caenis	11.2	3.4	1.4	0.0	0.0	0.0	11.2	39.1	188.8	328.5
Leptohyphes dolani	.	.	.	.	.	.	.	.	.	.
Family Ephemerellidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ephemerella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eurylophella temporalis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serratella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Heptageniidae	10.1	6.7	7.0	2.4	1.1	4.5	11.2	0.0	62.6	166.5
Heptagenia	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stenacron interpunctatum	0.0	0.0	4.2	4.8	0.0	3.4	1.1	19.0	5.6	27.9
Stenonema modestum	19.0	319.6	1142.5	367.1	22.3	280.4	497.2	963.1	841.3	1531.8
Isonychia	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Leptohyphes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Tricorythodes	168.7	27.9	0.0	0.0	0.0	0.0	197.8	131.8	310.6	281.6
Order Odonata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Suborder Anisoptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Aeshnidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Boyeria spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Boyeria vinosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0
Neurocordulia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neurocordulia molesta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Gomphidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	29AUG85	10OCT85	07JAN86	07FEB86	06MAR86	04APR86	06MAY86	10JUN86	03JUL86	07AUG86
Hagenius brevistylus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Didymops transversa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Macromia spp.	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Suborder Zygoptera	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0
Family Calopterygidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calopteryx spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Hetaerina spp.	1.1	0.0	0.0	0.0	0.0	0.0	2.2	1.1	0.0	1.1
Family Coenagrionidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	19.0	0.0
Argia spp.	0.0	0.0	1.4	0.8	0.0	0.0	0.0	10.1	16.8	27.9
Enallagma spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0
Order Plecoptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Family Perlidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
Paragnetina fumosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paragnetina kansensis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Corixidae	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Pyrrhalta nymphaeae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coptotomus	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Elmidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ancyronyx variegatus	35.8	2.2	1.4	0.0	0.0	0.0	1.1	0.0	0.0	5.6
Dubiraphia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Macronychus glabratus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0
Microcylloepus pusillus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	3.4

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	29AUG85	10OCT85	07JAN86	07FEB86	06MAR86	04APR86	06MAY86	10JUN86	03JUL86	07AUG86
Stenelmis	0.0	1.1	1.4	0.3	0.0	0.0	0.0	0.0	0.0	2.2
Dineutus	2.2	0.0	0.0	0.0	0.0	0.0	6.7	1.1	2.2	0.0
Family Hydrophilidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Ptilodactylidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Corydalidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0
Corydalus cornutus	1.1	3.4	0.0	4.8	0.0	0.0	0.0	0.0	23.5	41.3
Order Trichoptera	0.0	10.1	1.4	0.0	0.0	0.0	15.6	0.0	0.0	1.1
Family Hydropsychidae	30.2	12.3	18.2	0.8	0.0	11.2	72.6	7.8	1.1	19.0
Cheumatopsyche spp.	208.9	115.1	128.5	9.6	2.2	90.5	93.9	53.6	61.5	140.8
Hydropsyche spp.	436.9	107.3	360.3	40.7	6.7	143.0	181.0	53.6	43.6	125.1
Macrostemum carolina	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Family Hydroptilidae	0.0	0.0	5.6	7.2	0.0	1.1	0.0	0.0	0.0	0.0
Hydroptila	0.0	3.4	68.4	70.2	21.2	38.0	213.4	0.0	0.0	0.0
Oxyethira	4.5	1.1	7.0	10.4	1.1	1.1	0.0	0.0	0.0	1.1
Family Leptoceridae	1.1	0.0	0.0	1.6	0.0	2.2	1.1	0.0	0.0	0.0
Ceraclea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nectopsyche	0.0	0.0	0.0	0.0	0.0	0.0	3.4	45.8	41.3	101.7
Nectopsyche candida	2.2	11.2	0.0	0.0	1.1	10.1	0.0	0.0	0.0	0.0
Oecetis	40.2	34.6	30.7	7.2	0.0	38.0	11.2	27.9	12.3	19.0
Triaenodes spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Triaenodes tardus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7
Chimarra	613.4	684.9	2311.5	176.4	8.9	72.6	1517.3	572.1	634.6	386.6

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	29AUG85	10OCT85	07JAN86	07FEB86	06MAR86	04APR86	06MAY86	10JUN86	03JUL86	07AUG86
Family Polycentropodidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.2
Cernotina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neureclipsis	30.2	119.6	53.1	6.4	0.0	6.7	16.8	35.8	13.4	11.2
Family Pyralidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neargyractis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Parapoynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.2	2.2
Synclita	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Order Diptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Tipulidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Antocha	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tipula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Chaoborus punctipennis	0.0	0.0	0.0	0.8	0.0	0.0	6.7	2.2	0.0	0.0
Simulium	6.7	1.1	248.6	138.1	62.6	163.1	10.1	1.1	0.0	0.0
Family Ceratopogonidae	5.6	2.2	12.6	12.8	0.0	0.0	0.0	0.0	0.0	1.1
Subfamily Ceratopogoniinae	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	1.1	2.2
Subfamily Forcipomyiinae	1.1	0.0	2.8	0.8	0.0	0.0	1.1	0.0	0.0	0.0
Family Chironomidae	120.7	680.4	7248.6	486.0	233.5	168.7	68.2	17.9	14.5	114.0
Subfamily Tanypodinae	540.8	325.1	1033.5	553.9	23.5	103.9	325.1	182.1	521.8	403.4
Subfamily Diamesiinae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potthastia	3.4	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	29AUG85	10OCT85	07JAN86	07FEB86	06MAR86	04APR86	06MAY86	10JUN86	03JUL86	07AUG86
Subfamily										
Orthocladiinae	152.0	154.2	1375.7	3873.9	2272.6	1255.9	1852.5	105.0	115.1	38.0
Tribe Chironomini	441.3	636.9	5445.5	2099.0	183.2	337.4	329.6	45.8	93.9	929.6
Stenochironomus	389.9	312.8	618.7	112.5	0.0	0.0	58.1	305.0	337.4	2524.0
Tribe Tanytarsini	61.5	185.5	1364.5	869.9	484.9	854.7	287.2	12.3	53.6	116.2
Family Empididae	4.5	4.5	67.0	21.5	0.0	3.4	14.5	1.1	1.1	1.1
Chelifera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Homeodromia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5453.6	4719.6	23097.8	9707.9	3433.5	4254.7	6125.1	2822.3	3962.0	7655.9

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	11SEP86	03OCT86	07NOV86	05DEC86	09JAN87	06FEB87	06MAR87	06APR87	11MAY87	05JUN87
Class Turbellaria	0.0	0.0	0.0	2.2	3.4	0.0	0.0	3.4	0.0	63.7
Phylum Nematoda	0.0	2.2	8.9	33.5	19.0	20.1	34.6	105.0	63.7	12.3
Manayunkia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Class Oligochaeta	0.0	1.1	7.8	112.8	230.2	77.1	157.5	804.5	4.5	36.9
Class Hirudinea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Class Gastropoda	0.0	0.0	1.1	0.0	3.4	0.0	5.6	1.1	0.0	0.0
Family Ancylidae	6.7	0.0	8.9	4.5	3.4	2.2	5.6	4.5	2.2	2.2
Physella heterostropha	1.1	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1	0.0
Family Planorbidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gyraulus parvus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Helisoma anceps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Helisoma trivolvis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Menetus dilatatus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1
Class Pelecypoda	0.0	0.0	1.1	0.0	0.0	0.0	3.4	2.2	0.0	1.1
Corbicula fluminea	0.0	0.0	3.4	2.2	1.1	5.6	1.1	2.2	1.1	0.0
Order Hydracarina	8.9	0.0	14.5	3.4	2.2	4.5	29.1	42.5	726.3	152.0
Order Amphipoda	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hyalella azteca	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Order Ephemeroptera	0.0	0.0	4.5	0.0	0.0	1.1	0.0	2.2	864.8	39.1
Family Baetidae	0.0	0.0	0.0	0.0	1.1	0.0	116.2	210.1	389.9	42.5
Baetis	80.4	43.6	21.2	25.7	44.7	198.9	17.9	14.5	11.2	3.4
Callibaetis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pseudocloeon parvulum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.5	5.6	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek.
June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	11SEP86	03OCT86	07NOV86	05DEC86	09JAN87	06FEB87	06MAR87	06APR87	11MAY87	05JUN87
Caenis	492.7	40.2	242.5	19.0	0.0	1.1	0.0	0.0	128.5	246.9
Leptohyphes dolani	.	.	.	.	.	.	.	.	.	.
Family Ephemerellidae	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Ephemerella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eurylophella temporalis	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Serratella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0
Family Heptageniidae	0.0	0.0	4.5	0.0	0.0	0.0	48.0	60.3	486.0	452.5
Heptagenia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stenacron interpunctatum	1.1	0.0	0.0	0.0	1.1	0.0	1.1	0.0	0.0	0.0
Stenonema modestum	1327.4	1519.6	1119.6	617.9	252.5	240.2	258.1	354.2	63.7	570.9
Isonychia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Leptohyphes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tricorythodes	354.2	42.5	3.4	1.1	0.0	0.0	1.1	1.1	148.6	292.7
Order Odonata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Suborder Anisoptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Aeshnidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0
Boyeria spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5
Boyeria vinosa	0.0	1.1	0.0	0.0	1.1	0.0	0.0	0.0	1.1	0.0
Neurocordulia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Neurocordulia molesta	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Gomphidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	11SEP86	03OCT86	07NOV86	05DEC86	09JAN87	06FEB87	06MAR87	06APR87	11MAY87	05JUN87
Hagenius brevistylus	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Didymops transversa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Macromia spp.	2.2	0.0	0.0	0.0	1.1	0.0	0.0	1.1	0.0	1.1
Suborder Zygoptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	6.7
Family Calopterygidae	0.0	0.0	2.2	1.1	0.0	0.0	0.0	0.0	35.8	0.0
Calopteryx spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hetaerina spp.	1.1	0.0	5.6	0.0	0.0	0.0	0.0	0.0	3.4	0.0
Family Coenagrionidae	0.0	1.1	11.2	1.1	0.0	0.0	3.4	0.0	1.1	1.1
Argia spp.	12.3	1.1	7.8	2.2	0.0	0.0	0.0	3.4	0.0	3.4
Enallagma spp.	8.9	0.0	0.0	0.0	0.0	0.0	1.1	2.2	1.1	0.0
Order Plecoptera	0.0	0.0	0.0	0.0	0.0	1.1	1.1	0.0	2.2	0.0
Family Perlidae	0.0	0.0	2.2	0.0	0.0	0.0	0.0	1.1	0.0	0.0
Paragnetina fumosa	0.0	1.1	0.0	0.0	0.0	1.1	2.2	0.0	0.0	0.0
Paragnetina kansensis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Corixidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pyrrhalta nymphaeae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coptotomus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Elmidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.2
Ancyronyx variegatus	0.0	0.0	1.1	0.0	0.0	0.0	3.4	0.0	0.0	0.0
Dubiraphia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Macronychus glabratus	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Microcylloepus pusillus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	11SEP86	03OCT86	07NOV86	05DEC86	09JAN87	06FEB87	06MAR87	06APR87	11MAY87	05JUN87
Stenelmis	3.4	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1
Dineutus	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.8	3.4
Family Hydrophilidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Ptilodactylidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Corydalidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corydalus cornutus	39.1	4.5	3.4	5.6	1.1	0.0	1.1	8.9	0.0	7.8
Order Trichoptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.1	0.0
Family Hydropsychidae	12.3	0.0	2.2	2.2	0.0	2.2	1.1	1.1	444.7	0.0
Cheumatopsyche spp.	16.8	21.2	109.5	41.3	12.3	20.1	33.5	43.6	353.1	172.1
Hydropsyche spp.	34.6	79.3	88.3	26.8	25.7	54.7	60.3	82.7	263.7	73.7
Macrostemum carolina	0.0	3.4	1.1	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Family Hydroptilidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9
Hydroptila	0.0	0.0	1.1	3.4	2.2	1.1	2.2	4.5	1.1	6.7
Oxyethira	1.1	0.0	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0
Family Leptoceridae	0.0	0.0	3.4	1.1	0.0	0.0	2.2	0.0	4.5	5.6
Ceraclea	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Nectopsyche	212.3	6.7	68.2	13.4	4.5	8.9	12.3	10.1	23.5	48.0
Nectopsyche candida	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oecetis	21.2	0.0	10.1	1.1	0.0	0.0	4.5	5.6	15.6	46.9
Triaenodes spp.	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	5.6	2.2
Triaenodes tardus	13.4	5.6	10.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Chimarra	81.6	576.5	1674.9	691.6	98.3	89.4	259.2	297.2	1059.2	663.7

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	11SEP86	03OCT86	07NOV86	05DEC86	09JAN87	06FEB87	06MAR87	06APR87	11MAY87	05JUN87
Family Polycentropodidae	0.0	0.0	7.8	2.2	0.0	0.0	2.2	1.1	4.5	10.1
Cernotina	0.0	0.0	3.4	1.1	1.1	0.0	0.0	0.0	0.0	3.4
Neureclipsis	2.2	0.0	4.5	7.8	4.5	0.0	2.2	4.5	0.0	5.6
Family Pyralidae	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Neargyractis	1.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Parapoynx	0.0	1.1	2.2	0.0	0.0	1.1	3.4	0.0	0.0	1.1
Synclita	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Order Diptera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Family Tipulidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Antocha	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tipula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaoborus punctipennis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Simulium	1.1	0.0	0.0	0.0	0.0	13.4	26.8	40.2	20.1	1.1
Family Ceratopogonidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subfamily Ceratopogoniinae	1.1	0.0	0.0	5.6	3.4	3.4	3.4	8.9	3.4	3.4
Subfamily Forcipomyiinae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	1.1
Family Chironomidae	32.4	14.5	64.8	208.9	120.7	117.3	586.6	669.3	1735.2	112.8
Subfamily Tanypodinae	220.1	51.4	388.8	212.3	29.1	14.5	2.2	6.7	48.0	35.8
Subfamily Diamesiinae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	4.5	2.2
Potthastia	0.0	0.0	4.5	13.4	3.4	1.1	0.0	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1985 - September 1987.

Taxon	Mean Density (no/m^2)									
	11SEP86	03OCT86	07NOV86	05DEC86	09JAN87	06FEB87	06MAR87	06APR87	11MAY87	05JUN87
Subfamily Orthocladiinae	435.8	91.6	336.3	1035.8	2891.6	1301.7	646.9	7509.5	7787.7	2150.8
Tribe Chironomini	872.6	381.0	593.3	1148.6	347.5	328.5	283.8	286.0	966.5	310.6
Stenochironomus	124.0	0.0	15.6	0.0	0.0	0.0	0.0	1.1	0.0	7.8
Tribe Tanytarsini	269.3	89.4	343.0	2882.7	1274.9	890.5	660.3	601.1	4124.0	619.0
Family Empididae	0.0	0.0	1.1	8.9	0.0	4.5	0.0	0.0	3.4	0.0
Chelifera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
Hemerodromia	0.0	0.0	0.0	0.0	0.0	0.0	8.9	6.7	26.8	11.2
Total	4699.4	2982.1	5212.3	7146.4	5387.7	3406.7	3296.1	11231.3	19965.4	6265.9

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1987 - September 1987.

Taxon	Mean Density (no/m^2)		
	06JUL87	07AUG87	04SEP87
Class Turbellaria	0.0	0.0	1.1
Phylum Nematoda	6.7	6.7	1.1
Manayunkia	0.0	0.0	0.0
Class Oligochaeta	4.5	0.0	197.8
Class Hirudinea	0.0	0.0	0.0
Class Gastropoda	0.0	2.2	0.0
Family Ancylidae	0.0	1.1	3.4
Physella heterostropha	0.0	0.0	1.1
Family Planorbidae	0.0	1.1	0.0
Gyraulus parvus	0.0	0.0	0.0
Helisoma anceps	0.0	1.1	0.0
Helisoma trivolvis	0.0	0.0	0.0
Menetus dilatatus	0.0	1.1	0.0
Class Pelecypoda	2.2	0.0	2.2
Corbicula fluminea	0.0	0.0	0.0
Order Hydracarina	257.0	65.9	30.2
Order Amphipoda	0.0	0.0	0.0
Hyalella azteca	0.0	0.0	0.0
Order Ephemeroptera	463.7	298.3	26.8
Family Baetidae	261.5	39.1	107.3
Baetis	7.8	1.1	53.6
Callibaetis	0.0	0.0	0.0
Pseudocloeon parvulum	0.0	0.0	2.2

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1987 - September 1987.

Taxon	Mean Density (no/m^2)		
	06JUL87	07AUG87	04SEP87
Caenis	453.6	191.1	402.2
Leptohyphes dolani	.	.	.
Family Ephemerellidae	0.0	0.0	0.0
Ephemerella	0.0	1.1	0.0
Eurylophella temporalis	0.0	0.0	0.0
Serratella	0.0	0.0	0.0
Family Heptageniidae	935.2	337.4	178.8
Heptagenia	0.0	0.0	0.0
Stenacron interpunctatum	1.1	0.0	0.0
Stenonema modestum	207.8	150.8	254.7
Isonychia	1.1	0.0	0.0
Leptohyphes	0.0	0.0	0.0
Tricorythodes	150.3	137.4	97.2
Order Odonata	1.1	0.0	0.0
Suborder Anisoptera	3.4	0.0	0.0
Family Aeshnidae	0.0	0.0	0.0
Boyeria spp.	0.0	0.0	0.0
Boyeria vinosa	0.0	0.0	0.0
Neurocordulia	0.0	0.0	0.0
Neurocordulia molesta	0.0	0.0	0.0
Family Gomphidae	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1987 - September 1987.

Taxon	Mean Density (no/m^2)		
	06JUL87	07AUG87	04SEP87
Hagenius brevistylus	0.0	0.0	0.0
Didymops transversa	0.0	0.0	1.1
Macromia spp.	0.0	3.4	0.0
Suborder Zygoptera	8.9	1.1	2.2
Family Calopterygidae	2.2	7.8	0.0
Calopteryx spp.	0.0	0.0	0.0
Hetaerina spp.	2.2	0.0	0.0
Family Coenagrionidae	20.1	0.0	0.0
Argia spp.	14.5	2.2	0.0
Enallagma spp.	31.3	1.1	1.1
Order Plecoptera	1.1	0.0	0.0
Family Perlidae	0.0	0.0	0.0
Paragnetina fumosa	0.0	0.0	0.0
Paragnetina kansensis	0.0	1.1	0.0
Family Corixidae	0.0	0.0	0.0
Pyrrhalta nymphaeae	0.0	0.0	0.0
Coptotomus	0.0	0.0	0.0
Family Elmidae	8.9	7.8	5.6
Ancyronyx variegatus	6.7	7.8	16.8
Dubiraphi[illegible]	3.4	0.0	0.0
Macronych[illegible]s glabratus	0.0	1.1	2.2
Microcylloepus pusillus	0.0	0.0	1.1

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1987 - September 1987.

Taxon	Mean Density (no/m^2)		
	06JUL87	07AUG87	04SEP87
Stenelmis	5.6	2.2	5.6
Dineutus	0.0	1.1	0.0
Family Hydrophilidae	0.0	0.0	0.0
Family Ptilodactylidae	0.0	0.0	0.0
Family Corydalidae	2.2	0.0	1.1
Corydalus cornutus	93.9	26.8	65.9
Order Trichoptera	10.1	0.0	3.4
Family Hydropsychidae	112.8	48.0	6.7
Cheumatopsyche spp.	509.5	330.7	67.0
Hydropsyche spp.	164.2	63.7	105.0
Macrostemum carolina	0.0	2.2	2.2
Family Hydroptilidae	10.1	35.8	4.5
Hydroptila	38.0	65.9	15.6
Oxyethira	4.5	0.0	0.0
Family Leptoceridae	4.5	3.4	1.1
Ceraclea	0.0	0.0	0.0
Nectopsyche	1816.8	386.6	81.6
Nectopsyche candida	0.0	0.0	0.0
Oecetis	474.9	114.0	44.7
Triaenodes spp.	64.3	7.8	3.4
Triaenodes tardus	0.0	0.0	0.0
Chimarra	1255.9	271.5	260.3

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1987 - September 1987.

Taxon	Mean Density (no/m^2)		
	06JUL87	07AUG87	04SEP87
Family Polycentropodidae	12.3	2.2	0.0
Cernotina	4.5	2.2	0.0
Neureclipsis	19.0	4.5	4.5
Family Pyralidae	1.1	0.0	0.0
Neargyractis	0.0	0.0	0.0
Parapoynx	14.5	1.1	0.0
Synclita	0.0	0.0	0.0
Order Diptera	0.0	0.0	0.0
Family Tipulidae	0.0	0.0	0.0
Antocha	0.0	0.0	0.0
Tipula	0.0	0.0	0.0
Chaoborus punctipennis	0.0	0.0	0.0
Simulium	6.7	3.4	5.6
Family Ceratopogonidae	0 0	0.0	0.0
Subfamily Ceratopogoniinae	14 5	87.2	10.1
Subfamily Forcipomyiinae	0.0	2.2	0.0
Family Chironomidae	846.9	463.7	415.6
Subfamily Tanypodinae	233.5	156.4	201.1
Subfamily Diamesiinae	0.0	0.0	0.0
Potthastia	0.0	0.0	0.0

Appendix Table 5 (continued).

Mean densities (no/m^2) of individual taxa for each sampling date in Four Mile Creek. June 1987 - September 1987.

Taxon	Mean Density (no/m^2)		
	06JUL87	07AUG87	04SEP87
Subfamily Orthocladiinae	2707.3	996.6	1341.9
Tribe Chironomini	1595.5	408.9	572.1
Stenochironomus	26.8	145.3	38.0
Tribe Tanytarsini	552.0	252.5	297.2
Family Empididae	0.0	0.0	0.0
Chelifera	0.0	0.0	0.0
Hemerodromia	6.7	6.7	2.2
Total	13465.9	5162.0	4946.4

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