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A BASELINE STUDY OF THE EFFECTS OF WETLAND HYDROLOGY AND WATER QUALITY ON THE MICROINVERTEBRATE COMMUNITY OF HOPKINS PRAIRIE, OCALA NATIONAL FOREST, FLORIDA

JUNE 1988 TO NOVEMBER 1989

Prepared for

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EXECUTIVE SUMMARY

1. This study was conducted by the St. Johns River Water Management District to gather baseline information on the effects of wetland hydrology and other physical and chemical parameters on the aquatic microinvertebrate community of Hopkins Prairie, Ocala National Forest, Florida.

2. Hydrologic/water quality data and water quality and microinvertebrate samples were collected monthly by the District from June 1988 through November 1989 (except for May and June 1989 when the prairie went dry) from a single research platform located in the prairie.

3. Throughout most of this study water quality in Hopkins Prairie was acidic, moderately to highly colored, and soft watered with low to moderate conductivity, very low alkalinity, low to moderate levels of phosphorus, and very low chlorophyll a concentrations. Minimum dissolved oxygen levels ranged between 4 and 5 mg/L during most of the summer months and were highest in fall/winter. Water depth usually varied between 0.6 and 1.2 m; the shallowest depths in each year were recorded in the summer.

4. A total of 121 microinvertebrate taxa was identified from Hopkins Prairie during this study. This included 19 pro-

tozoans, 58 rotifers, 28 cladocerans, and 10 copepods. The community was comprised largely of shallow-water taxa and was similar in composition to other swamp and marsh habitats.

5. Monthly variation in microinvertebrate taxa richness (number of taxa) and density appeared to be influenced to some degree by fluctuation in water depth. Decreasing depth coincided with a reduction in both parameters. This may be related to increased predation pressure on the microinvertebrates as the water became shallower. On most dates, rotifers were the most common taxa with cladocerans being the next most abundant group. The microinvertebrate community was numerically dominated by rotifers, cladocerans, or copepods, with no one group being most important for more than three consecutive months.

7. Statistical analysis (cluster analysis) indicated that temporal differences existed in the microinvertebrate community which appeared to be seasonal in nature. However, the most pronounced community differences were for dates before versus after the drying of the prairie. The desiccation and subsequent reflooding of the prairie was the most significant environmental factor influencing community structure.

FIGURES

FIGURES

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1.0 INTRODUCTION

The community structure and ecology of wetland (i.e., marsh and swamp) microinvertebrate communities have been little studied by limnologists compared to the littoral zone zooplankton community of lakes and ponds (Schoenberg 1988). Anderson et al. (1977) characterized the zooplankton community of the Great Dismal Swamp, Virginia, as being numerically dominated by rotifers (61 of 84 total species identified), with substantially fewer cladocerans (18 species) and copepods (5 species). More recent work has attempted to relate changes in the distribution and abundance of microinvertebrates in wetlands to changes in environmental conditions. Fluctuations in rotifer community structure in Montandon Marsh, Pennsylvania, did not correlate with shifts in abiotic factors other than temperature (Goddard and McDiffett 1983). Water depth was included as a variable in this analysis, but had little apparent impact on the community. In a 21-month study of Little Cooter Prairie in the Okefenokee Swamp, Georgia (Schoenburg 1988), density and biomass of microinvertebrates (mainly cladocerans; measured on a volumetric basis) tended to vary directly with temperature and inversely with water depth. Loftus et al. (1986) hypothesized that hydroperiod characteristics of a marsh, to a large degree, determine the structure of vertebrate and invertebrate com-

munities; microinvertebrate density and biomass in areas of the Everglades with a short hydroperiod appeared to be reduced relative to areas with longer hydroperiods.

Normandeau Associates Inc. (NAI) was contracted by the St. Johns River Water Management District (District) to provide an analysis of the effects of wetland hydrology, water quality, and other pertinent physico-chemical conditions on the microinvertebrate community of Hopkins Prairie, Ocala National Forest, Florida. The objectives of this report are to:

1. Present a graphical analysis of the hydrologic, water quality, and other physico-chemical data collected from Hopkins Prairie,

2. Document the temporal trends in microinvertebrate abundance in Hopkins Prairie. Specifically, present data on total densities, densities within major taxonomic groups, and densities of numerically important taxa,

3. Describe the microinvertebrate community relative to the temporal variability in overall taxa richness, taxa richness within major taxonomic groups, and Shannon-Wiener taxa diversity,

4. Graphically and statistically examine the microinvertebrate density, taxa richness, and taxa diversity data for possible relationships with hydrologic and other important physico-chemical variables.

2.0 METHODS AND MATERIALS

2.1 STUDY SITE

Hopkins Prairie is located in the Ocala National Forest (Figure 2-1), a relatively pristine, protected freshwater wetland in central Florida. The District operated a research platform in the prairie during this study which was equipped with instrumentation to monitor environmental parameters (e.g., water level, temperature, rainfall, etc.). All micro-invertebrates, water quality samples, and other physico-chemical field data were collected by District personnel directly from, or in the general vicinity of, this platform.

The macrophyte community in the general area of the platform varied between a "grassy flat" dominated by Rhyncho-spora inundata and Amphicarpum muhlenbergianum to a deep-water marsh community dominated by Nymphaea odorata, Eriocaulon compressum, and Eleocharis elongata. Macrophytes in the immediate vicinity of the research platform during this study were more reflective of a deep-water marsh (G.B. Hall, pers. comm.).

2.2 FIELD PROCEDURES

Three replicate microinvertebrate samples were collected monthly from June 1988 through April 1989 and from July 1989

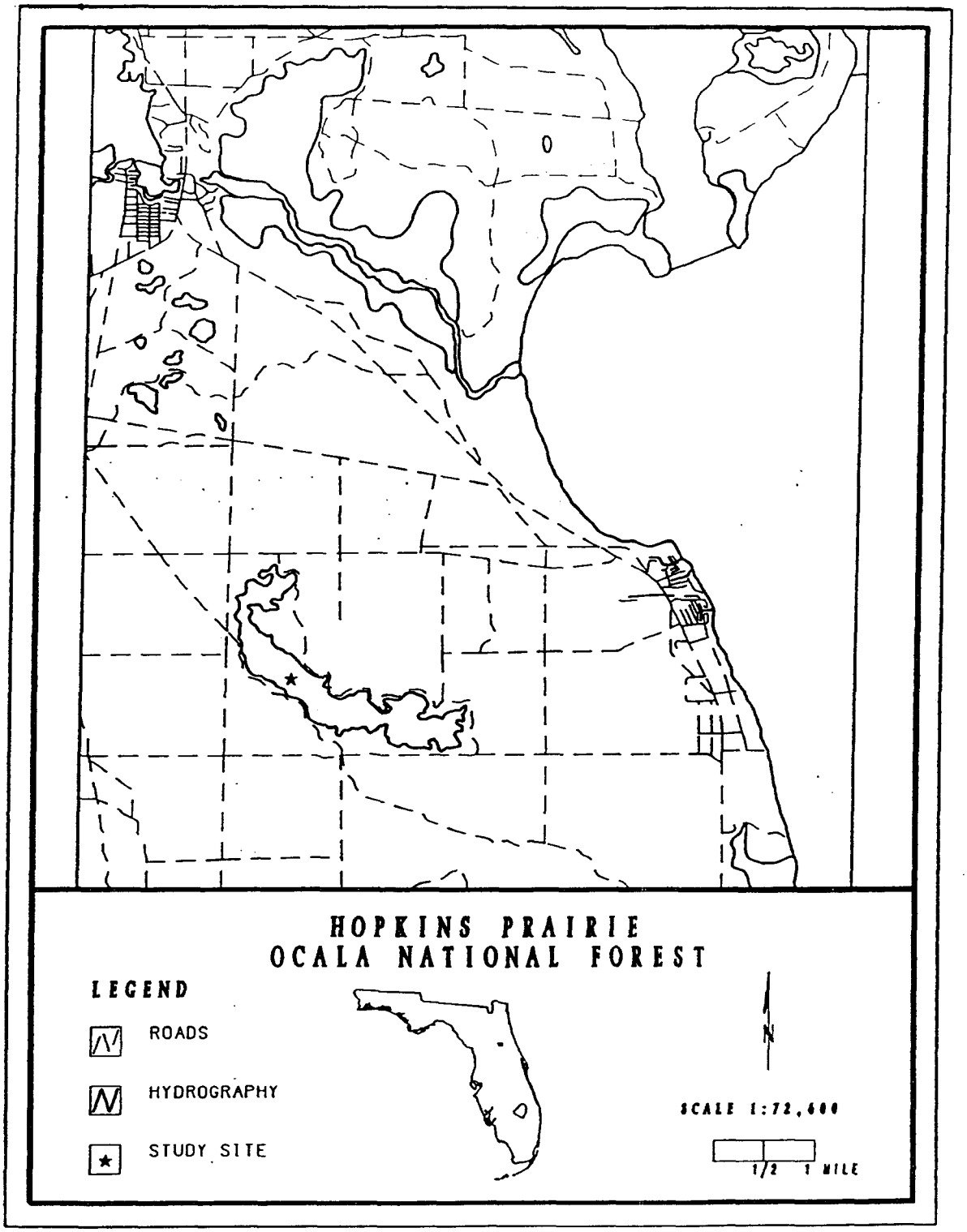


Figure 2-1. Location of St. Johns River Water Management District's research platform in Hopkins Prairie, Ocala National Forest, Florida. (Figure provided by St. Johns River Water Management District).

through November 1989 (the prairie was dry in May and June 1989) by District personnel from the area surrounding the research platform in Hopkins Prairie (Figure 2-1) using a pattern sampler (Brakke 1976). The sampler consisted of a series of inverted funnels inserted into distilled water filled bottles and placed on the bottom (effective collection area of each sampler = 271.7 cm^2). Samplers were placed among macrophytes in areas with a plant community judged to be representative of the prairie as a whole. Samplers were set out in the morning and left overnight; total deployment time each month was approximately 24 hours. The bottles from each pattern sampler were combined into one container. All samples were preserved in the field with buffered formaldehyde (5% final concentration) saturated with sucrose. To aid in the identification of soft-bodied organisms, starting in September 1988 carbonated water was added to each sample and the sample allowed to equilibrate before the addition of formaldehyde. Water quality samples were collected concurrently with microinvertebrates and analyzed by the District for a variety of physico-chemical parameters (Table 2-1).

2.3 LABORATORY PROCEDURES

2.3.1 Taxonomic Analysis and Enumeration

Microinvertebrate samples were shipped to NAI by the District for taxonomic analysis and enumeration. The volume of each microinvertebrate sample was determined by first pouring the contents of the storage vial into a beaker and

Table 2-1. Physico-chemical variables measured in Hopkins Prairie. June 1988 to November 1989.

air temperature (°C)
ammonia + ammonium-nitrogen (mg N/L)
ammonia-nitrogen (mg N/L)
biological oxygen demand (mg O_2/L)
cadmium (µg/L)
calcium (mg/L)
chloride (mg/L)
chlorophyll *a* (µg/L; corrected for pheophytin)
chlorophyll *a* (µg/L; uncorrected for pheophytin)
chlorophyll *c* (µg/L)
chromium (µg/L)
cloud cover (%)
color (Pt-Co units)
conductivity (µmhos/cm)
copper (µg/L)
dissolved oxygen (mg/L)
filtered total (i.e., ortho) phosphorus (mg P/L)
hardness (mg $CaCO_3$/L)
iron (µg/L)
Kjeldahl nitrogen (mg N/L)
nickel (µg/L)
pH
pheophytin *c* (µg/L)
potassium (mg/L)
sodium (mg/L)
sulfate (mg/L)
total alkalinity (mg $CaCO_3$/L)
total dissolved solids (mg/L)
total Kjeldahl nitrogen (mg N/L)
total phosphorus (mg P/L)
turbidity (NTU)
water depth (m)
water temperature (°C)
wind velocity (mph)
zinc (µg/L)

weighing the empty storage vial (which had been dried) to the nearest 1.0 mg. Next, the sample was transferred back to the storage vial and the vial+sample reweighed. It was assumed for this study that 1 g of sample liquid was equivalent to 1 mL sample volume and that the difference in weight between the empty and full storage vial was equivalent to the sample volume. Samples with low numbers of organisms (based on a preliminary visual examination by the taxonomist) were concentrated by allowing the sample to settle for at least 24 hours. To dislodge organisms caught in the water's surface film, a drop of detergent was added to the sample. After settling, some of the supernatant liquid was carefully removed using a pipette fitted with a large siphon bulb; the amount of liquid withdrawn from each sample was based on a judgement by the taxonomist. Each vial was reweighed after withdrawal of liquid to determine the new sample volume. A wide-bore calibrated pipette was used to mix each sample and extract 1-mL aliquots for taxonomic analysis and enumeration.

All microinvertebrate taxa were identified and enumerated in a Sedgewick-Rafter counting cell following established procedures (Lind 1974; Wetzel and Likens 1979). For this study, microinvertebrates included those aquatic invertebrates typically found in freshwater plankton habitats (e.g., Rotifera, Cladocera, Copepoda, Gastrotricha, and Ostracoda) and excluded those groups considered to be macroinvertebrates, such as Insecta, Mollusca, and Decapoda (Weber

1973). All organisms were identified to the lowest practical taxonomic level, usually genus or species. Some organisms were placed into more general groups (e.g., bdelloid rotifers, copepod copepodids, copepod nauplii). Principal taxonomic references are listed in Table 2-2. Previous NAI zooplankton studies have indicated that approximately 75 organisms per counting cell are required to reduce variability from subsampling to a satisfactory level (< 10%). The level of sample concentration employed in this project was adjusted for each sample in an attempt to attain a density of 75 organisms per cell, if possible. If a sample contained relatively few organisms, multiple 1-mL aliquots were examined so that the total cumulative count approached 75 organisms. All data were recorded onto preprinted laboratory bench sheets.

A reference collection specific to this project was maintained. It consisted of specimens placed on microscope slide mounts prepared with glycerin with cover slips sealed with nail polish and/or preserved in vials with 70% alcohol. After a sample was analyzed, the Sedgewick-Rafter cell was viewed under a dissection microscope and any organisms required for the reference collection or that needed dissection or greater magnification for identification were carefully removed. In some cases, it was necessary to pool replicates together and examine them for a needed organism. A supplemental photomicrographic record of taxa was also maintained by NAI.

Table 2-2. Taxonomic references used in the identification of Hopkins Prairie microinvertebrates.

Brooks, J. L. 1959. Cladocera. In: Edmondson, W. T. (ed.), Freshwater Biology. 2nd ed. John Wiley and Sons. New York, NY.

DeFlaudre, G. 1959. Rhizopoda and Actiniopoda. In: Edmondson, W. T. (ed.), Freshwater Biology. 2nd ed. John Wiley and Sons. New York, NY.

Edmondson, W. T. 1959. Rotifera. In: Edmondson, W. T. (ed.), Freshwater Biology. 2nd ed. John Wiley and Sons. New York, NY.

Jahn, T. L., E. C. Bovee, and F. F. Jahn. 1979. How to Know the Protozoa. 2nd ed. Wm. C. Brown Co., Dubuque, IA.

Kudo, R. R. 1966. Protozoology. 5th ed. Charles C. Thomas. Springfield, IL.

Noland, L. E. 1959. Ciliophora. In: Edmondson, W. T. (ed.), Freshwater Biology. 2nd ed. John Wiley and Sons. New York, NY.

Pennak, R. W. 1989. Freshwater Invertebrates of the United States. 3rd ed. John Wiley and Sons. New York, NY.

Ruttner-Kolisko, A. 1974. Das zooplankton der binnenge-wasser. 1. Teil. Rotatoria. Die Binnengewasser. Stuttgart, W. Germany. 26: 99-234.

Stemberger, R. S. 1979. A guide to rotifers of the Laurentian Great Lakes. EPA-6004-79-021. Env. Monitoring and Support Lab, US EPA. Cincinnati, OH.

2.3.2 Data Analysis

Hydrologic, water quality, and other physico-chemical data (collectively referred to as physico-chemical variables in this report) from Hopkins Prairie were supplied to NAI by the District. Values for all pertinent variables were plotted against time.

The density of microinvertebrates in each replicate sample was calculated on an areal basis as follows:

$$D = [N * (V/E)]/ A$$

where:
- D = density of microinvertebrate taxon (individuals/m^2),
- N = number of individuals observed in the counting cell,
- V = volume of entire sample (mL),
- E = volume of sample examined (mL),
- A = collection area of pattern sampler (m^2) = 0.02717 m^2.

Taxa diversity was calculated for each replicate sample using the Shannon-Wiener (H') function as given in Odum (1971):

$$H' = -\Sigma (p_i * \ln p_i)$$

where:
- H' = Shannon-Wiener diversity index,
- p_i = numerical importance (relative abundance) of each taxon in the sample.

Taxa richness was the sum of unique taxa identified from all replicate samples within a given date. For this study, copepod copepodids and nauplius larvae were enumerated but were not included in counts of taxa richness to avoid counting both immature and adult forms of individual species.

All statistics were calculated using PC SAS (SAS 1988a, 1988b), with reference made to Aldenderfer and Blashfield (1984), Digby and Kempton (1987), Gauch (1982), and Sokal and Rohlf (1981). Data have been summarized by standard statistical procedures (mean, number of observations [N], standard deviation [SD], coefficient of variation [CV], maximum value [Max], and minimum value [Min]). Spearman rank correlation coefficients, a non-parametric statistic, were computed between all pairs of physico-chemical variables and between microinvertebrate population parameters (density, taxa richness, and taxa diversity) and water depth, water temperature, dissolved oxygen concentration, and levels of chlorophyll a and c. The level of significance (α) was held at 0.05 in all cases. Cluster analysis (complete linkage method) was performed on the mean densities of taxa that were numerically abundant on at least one sampling date and used to detect temporal patterns in community structure that might not be obvious simply by examining the relative abundance data. Density data were $\log_e+1$ transformed prior to performing the cluster analysis. Taxa were considered to be numerically abundant if their relative abundance was at least 5.0% on one or more sampling dates.

3.0 RESULTS

3.1 PHYSICO-CHEMICAL VARIABLES

Physico-chemical data were collected from Hopkins Prairie monthly during the period June 1988 to November 1989 for the variables listed in Table 2-1. These data are presented in Appendix 1 and have been summarized in Figures 3-1 through 3-12.

Several physico-chemical variables monitored during this study exhibited distinct seasonal variation. The warmest water temperatures occurred during the summer months (exceeding 30 °C in 1989) and were coldest in winter (< 20 °C; Figure 3-1). Dissolved oxygen levels were below 5 mg/L during most of the summer (and measured less than 4 mg/L on several occasions) and were highest in fall/winter (Figure 3-2). Water depth usually varied between 0.6 and 1.2 m; the shallowest depths in each year were recorded in the summer (Figure 3-3). The prairie in the vicinity of the research platform was dry in May and June 1989; water quality samples were collected from an alternate location within the prairie during this time. In general, throughout most of this study water quality in Hopkins Prairie can be described as being acidic (pH < 6; Figure 3-4), moderately to highly colored (Figure 3-5), and soft watered (i.e., low hardness; Figure 3-6) with low to moderate conductivity (Figure 3-4), very low

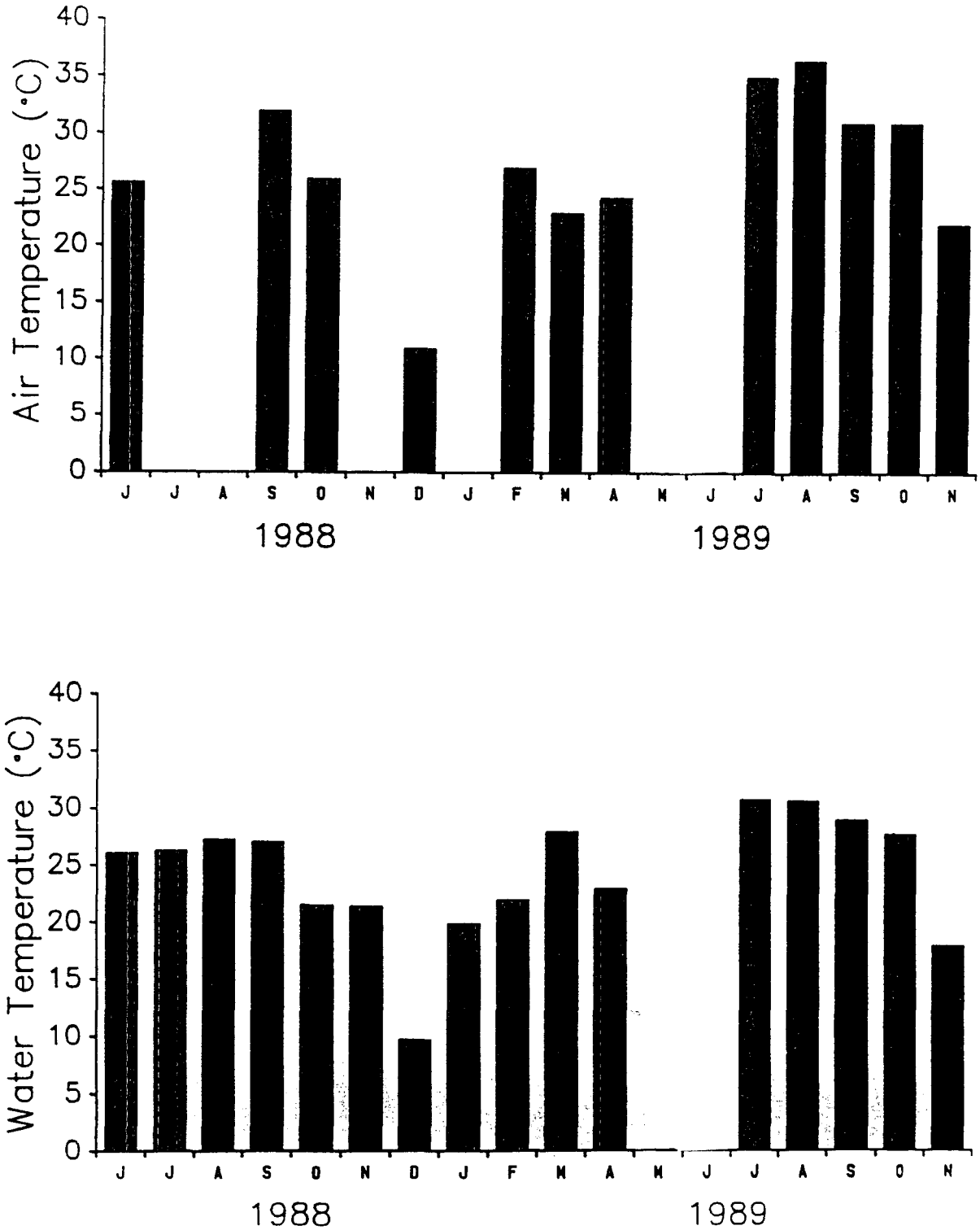


Figure 3-1. Air and water temperature (^{o}C) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

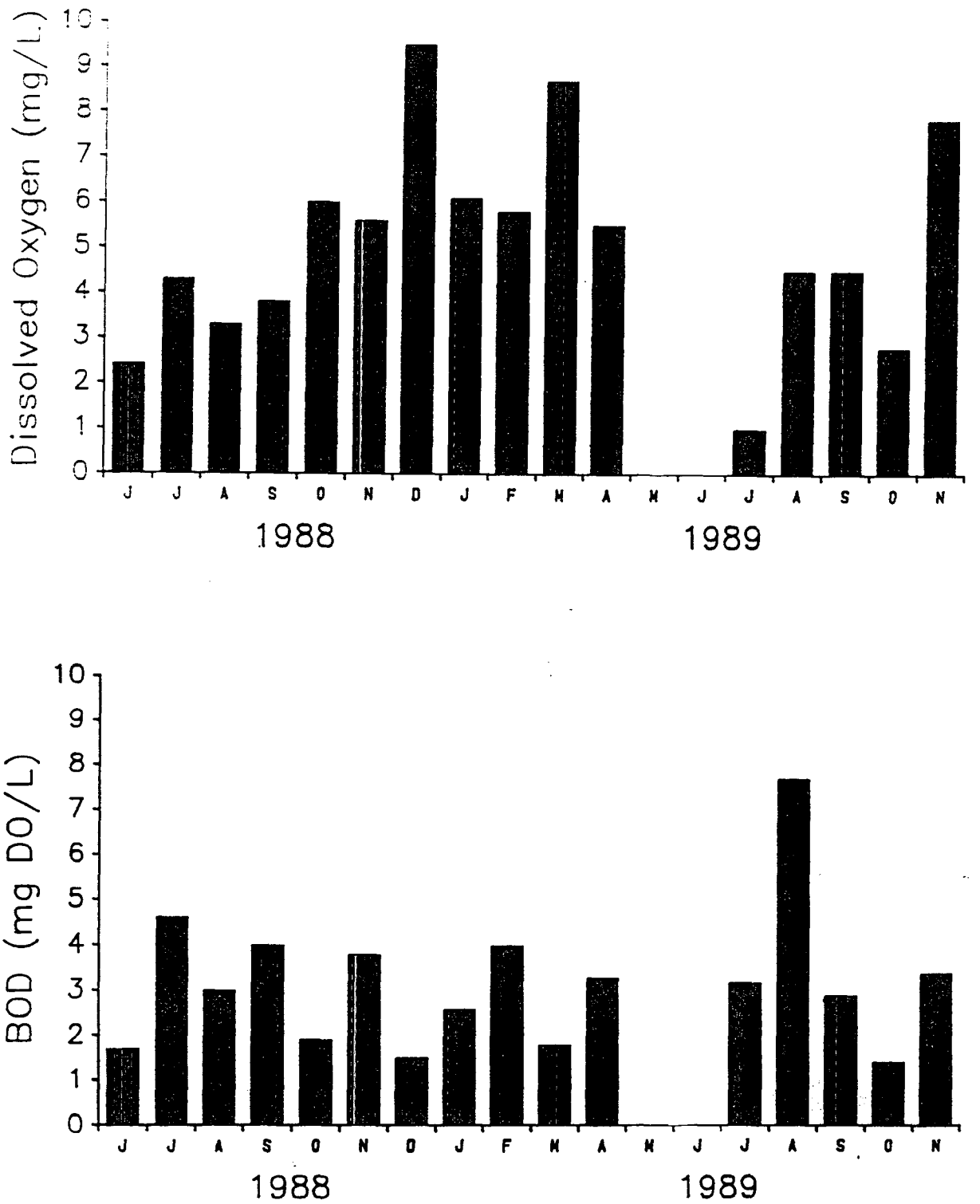


Figure 3-2. Dissolved oxygen (mg/L) and biological oxygen demand (mg O_2/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

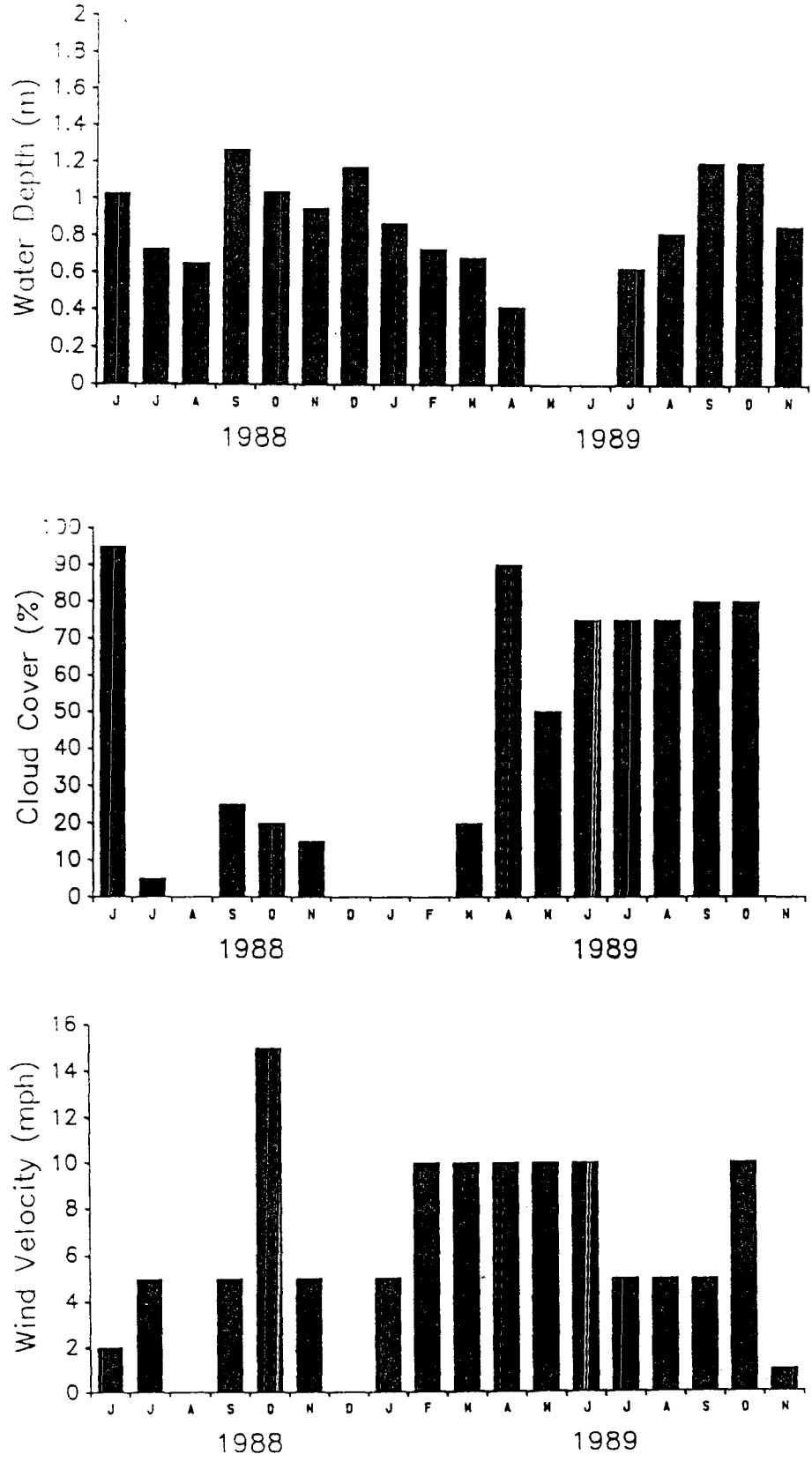


Figure 3-3. Water depth (m), cloud cover (%), and wind velocity (mph) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

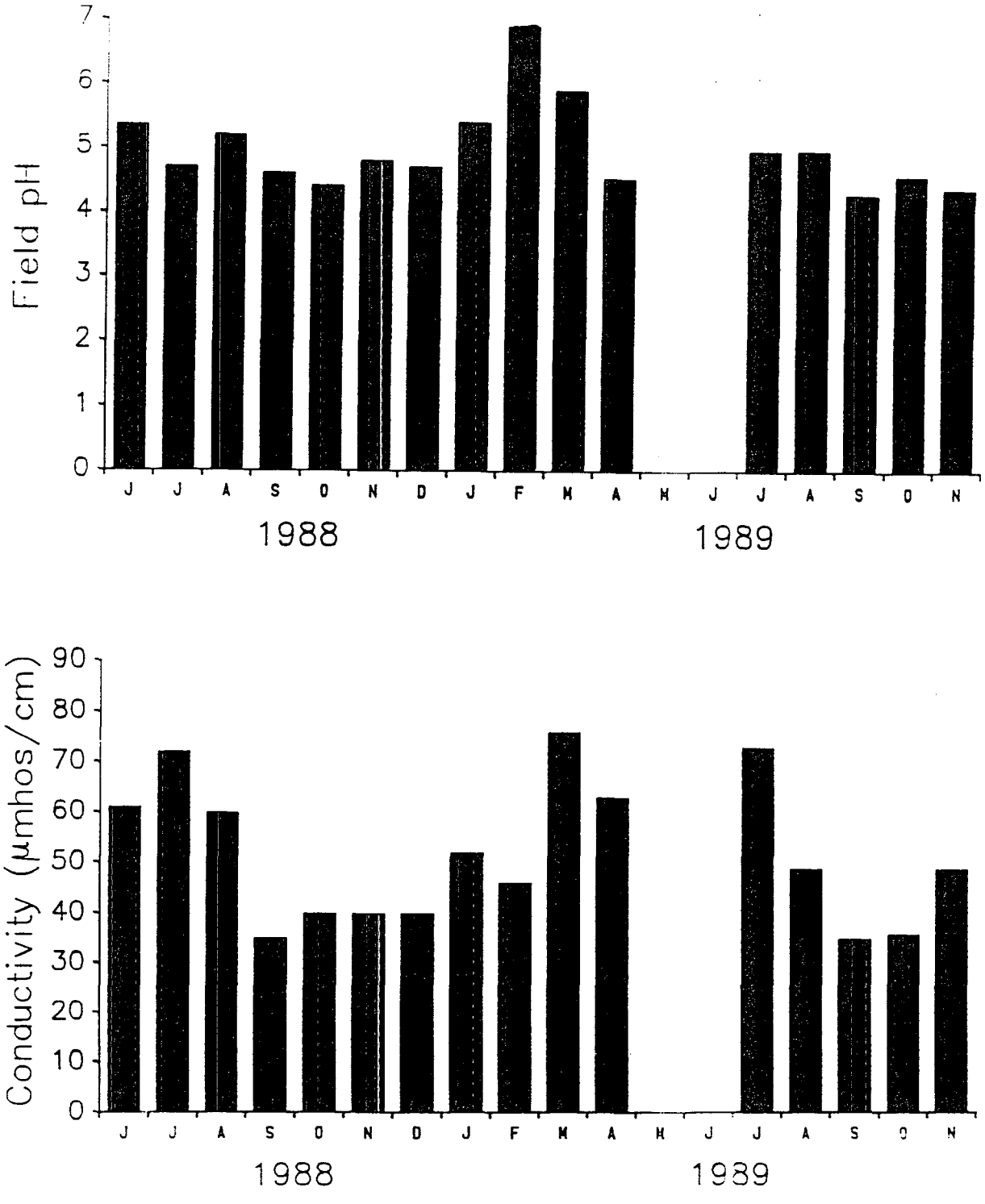


Figure 3-4. pH and conductivity (µmhos/cm) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

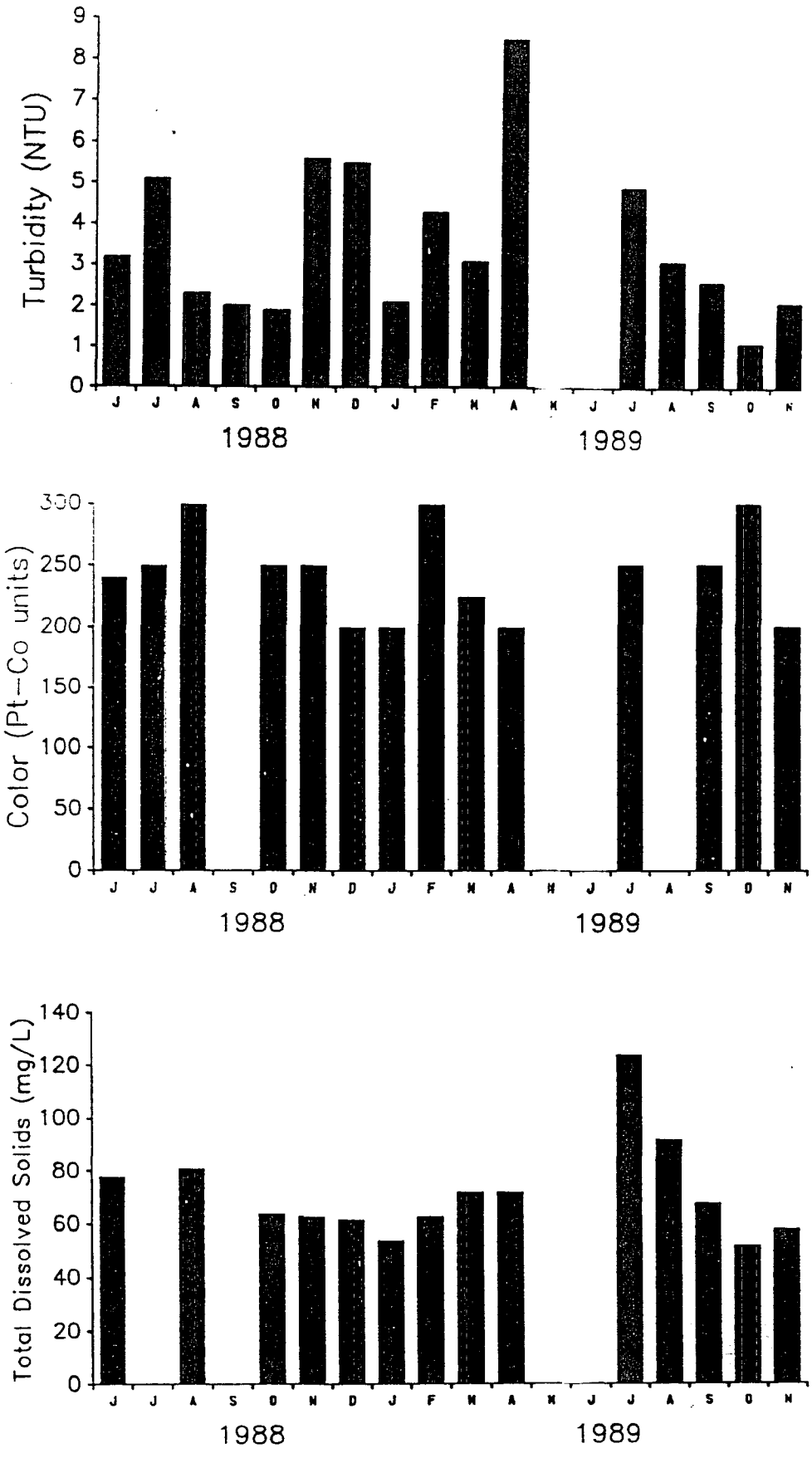


Figure 3-5. Turbidity (NTU), color (Pt-Co units), and total dissolved solids (mg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

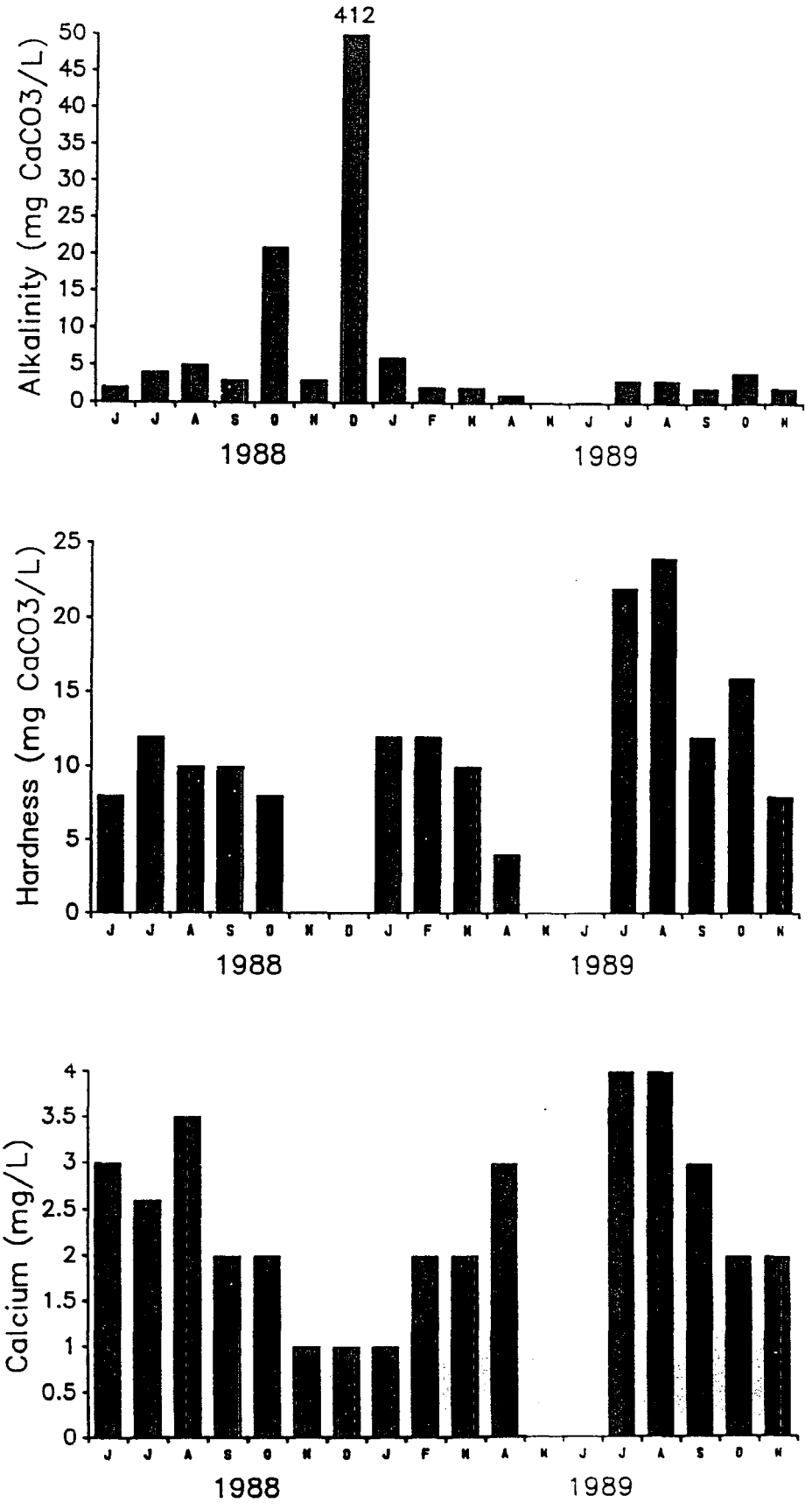


Figure 3-6. Alkalinity (mg $CaCO_3$/L), hardness (mg $CaCO_3$/L), and calcium (mg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

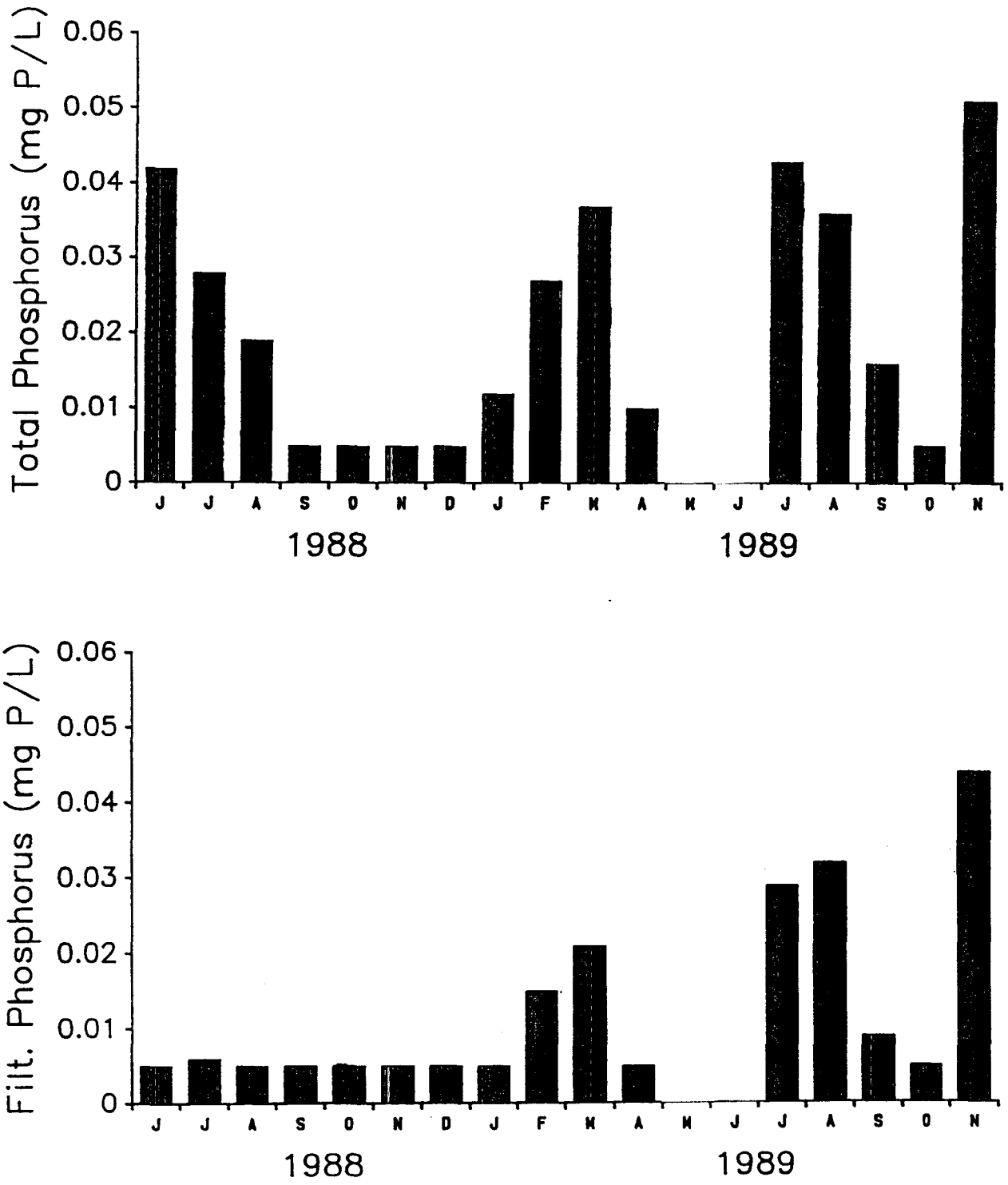


Figure 3-7. Total phosphorus (mg P/L) and filtered phosphorus (mg P/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

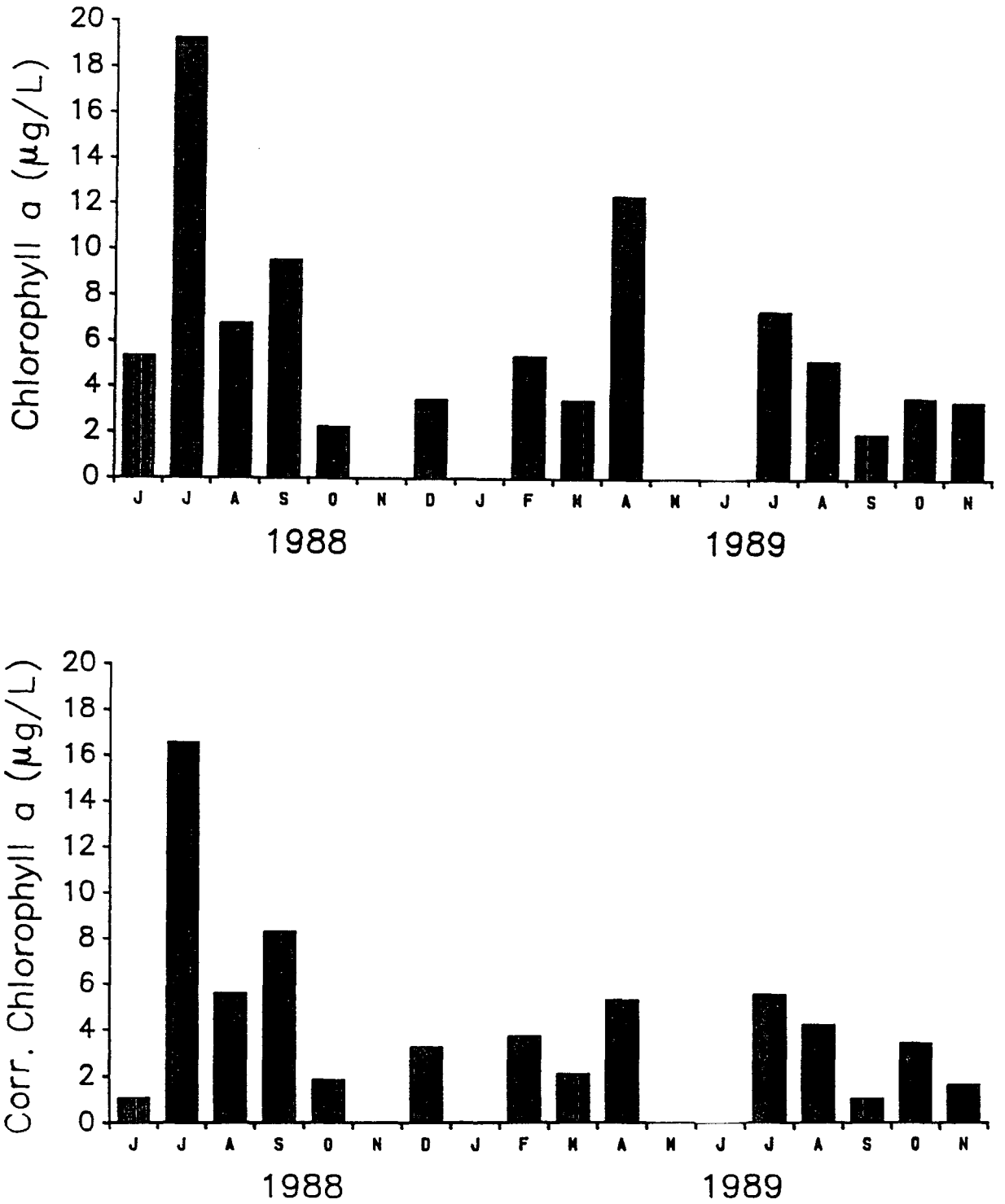


Figure 3-8. Chlorophyll a (µg/L), corrected chlorophyll a (µg/L), chlorophyll c (µg/L), and pheophytin (µg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

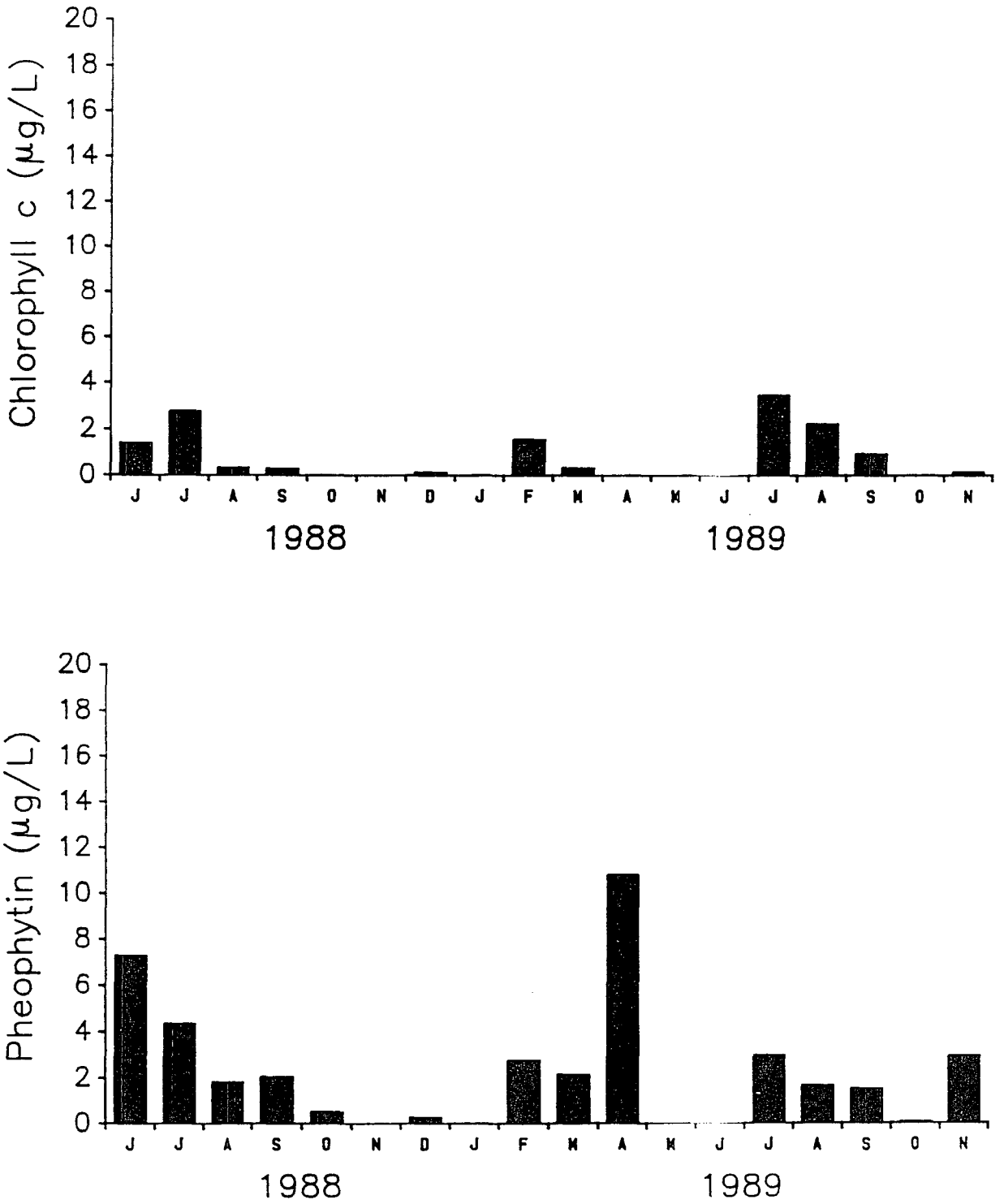


Figure 3-8 (continued). Chlorophyll a (µg/L), corrected chlorophyll a (µg/L), chlorophyll c (µg/L), and pheophytin (µg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

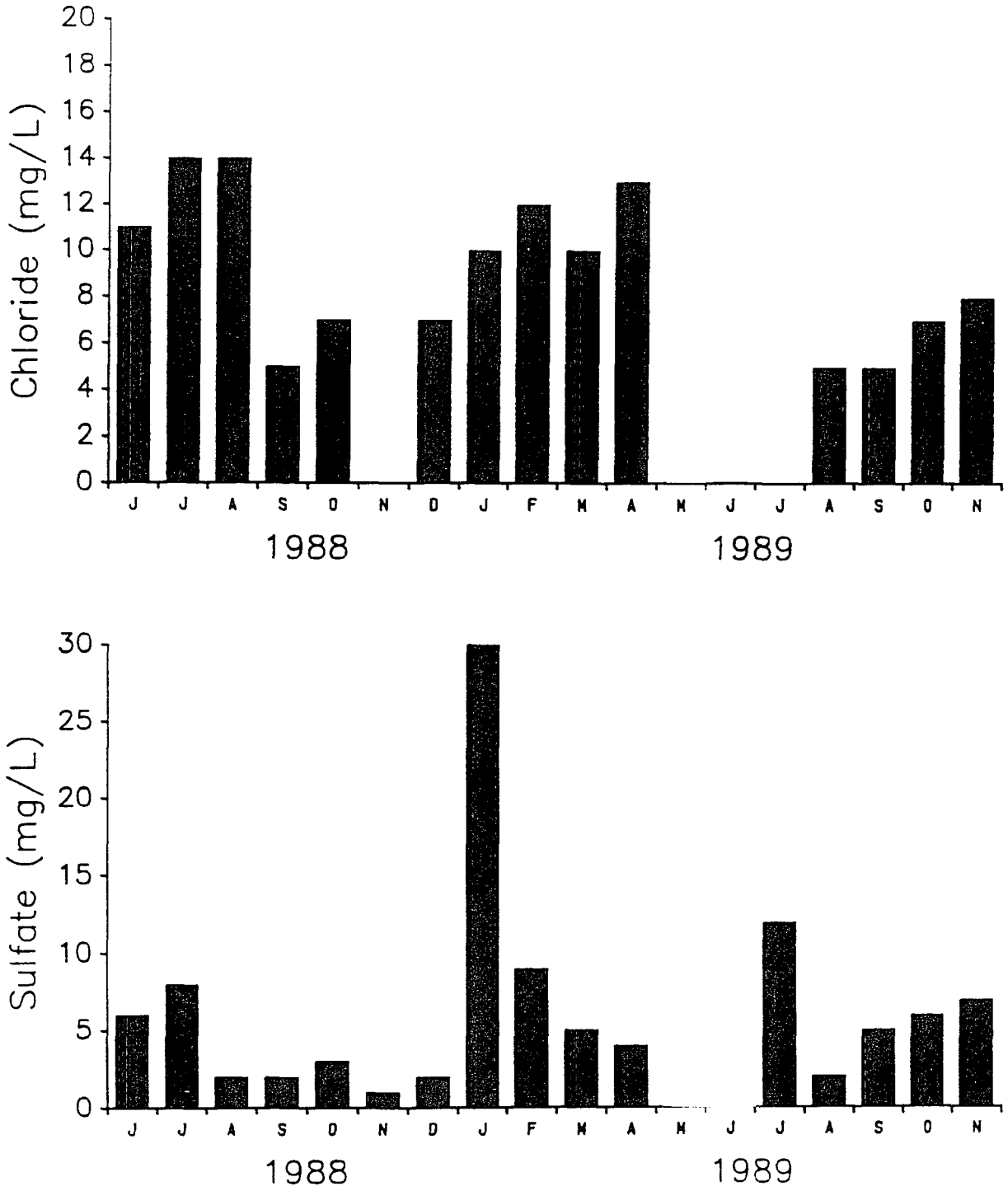


Figure 3-9. Chloride (mg/L), sulfate (mg/L), potassium (mg/L), and sodium (mg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

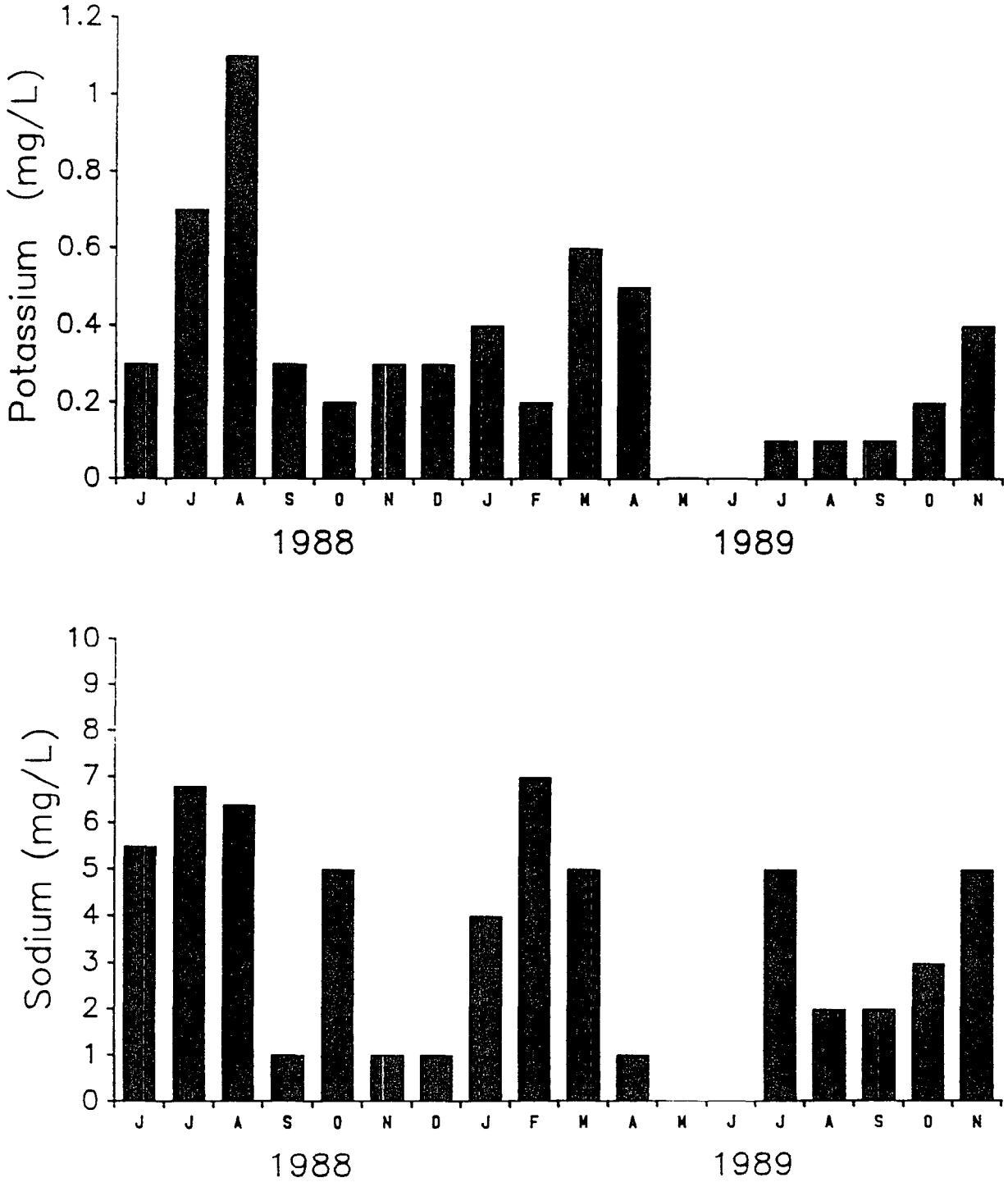
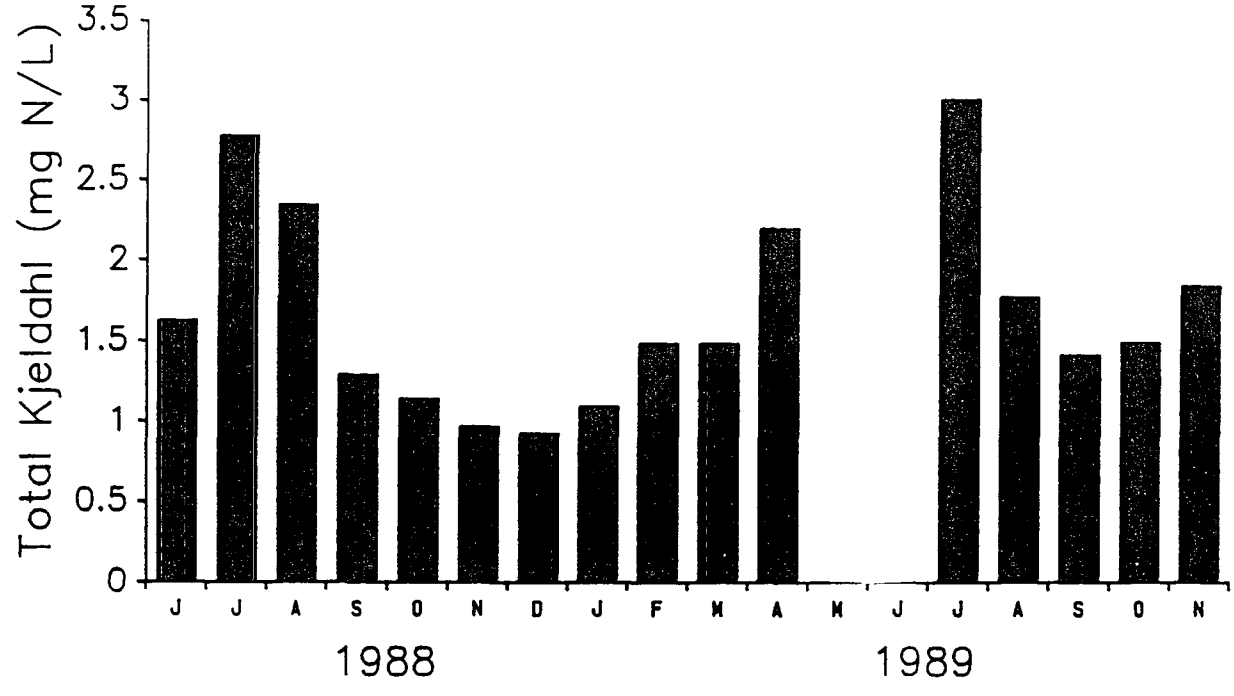


Figure 3-9 (continued). Chloride (mg/L), sulfate (mg/L), potassium (mg/L), and sodium (mg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.



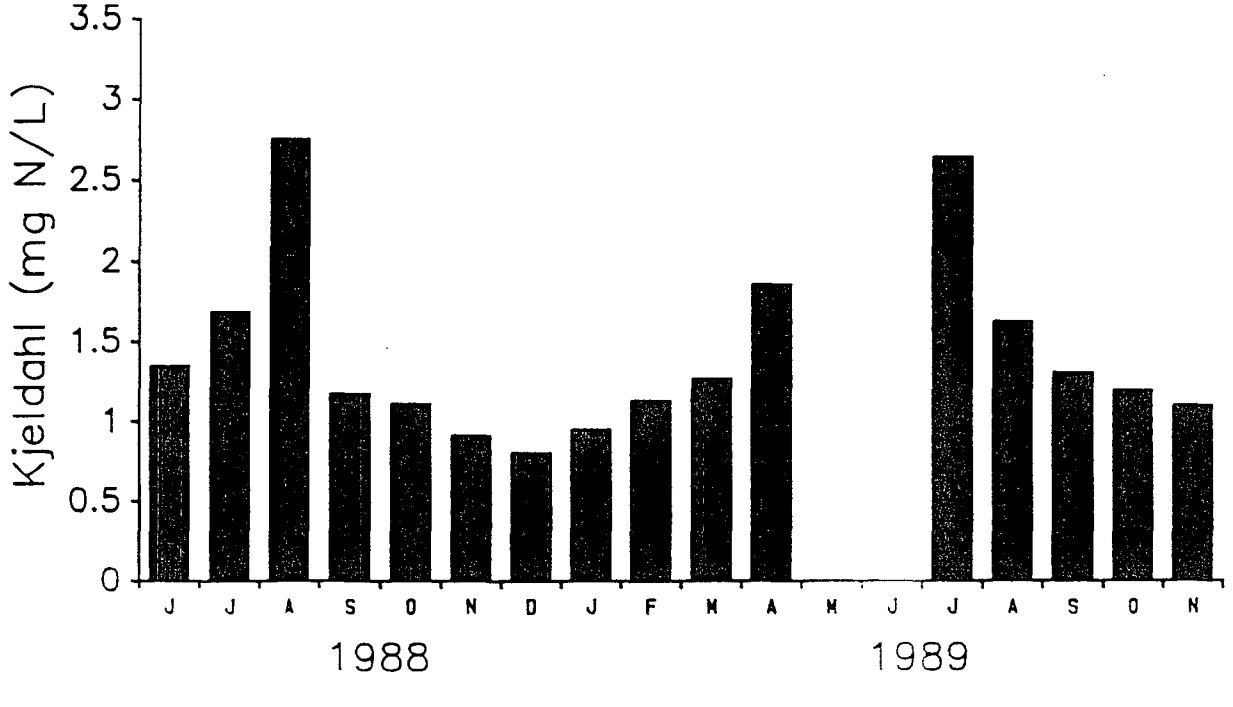


Figure 3-10. Total Kjeldahl nitrogen (mg N/L) and Kjeldahl nitrogen (mg N/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

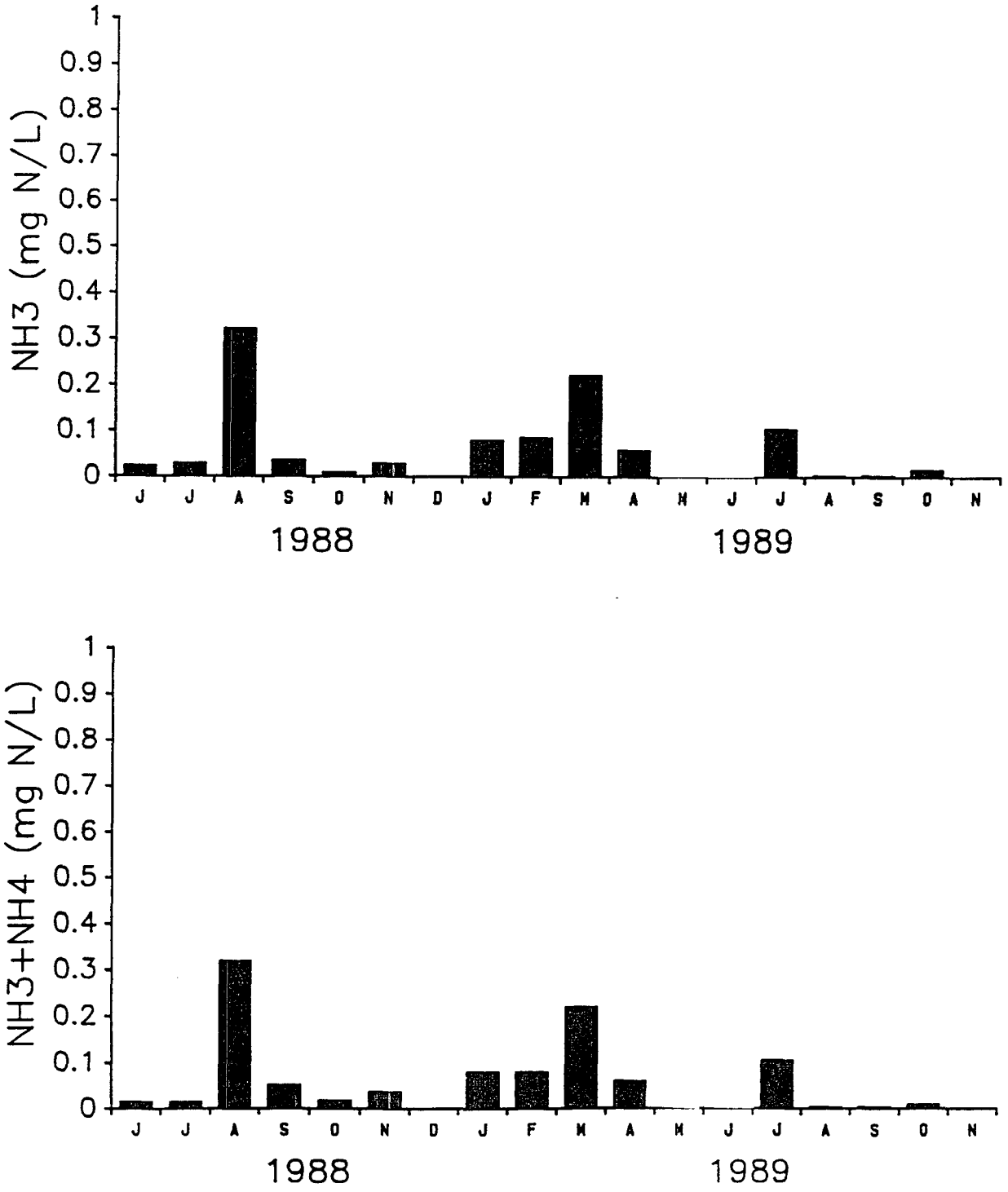


Figure 3-11. Ammonia-nitrogen (mg N/L) and ammonia + ammonium-nitrogen (mg N/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

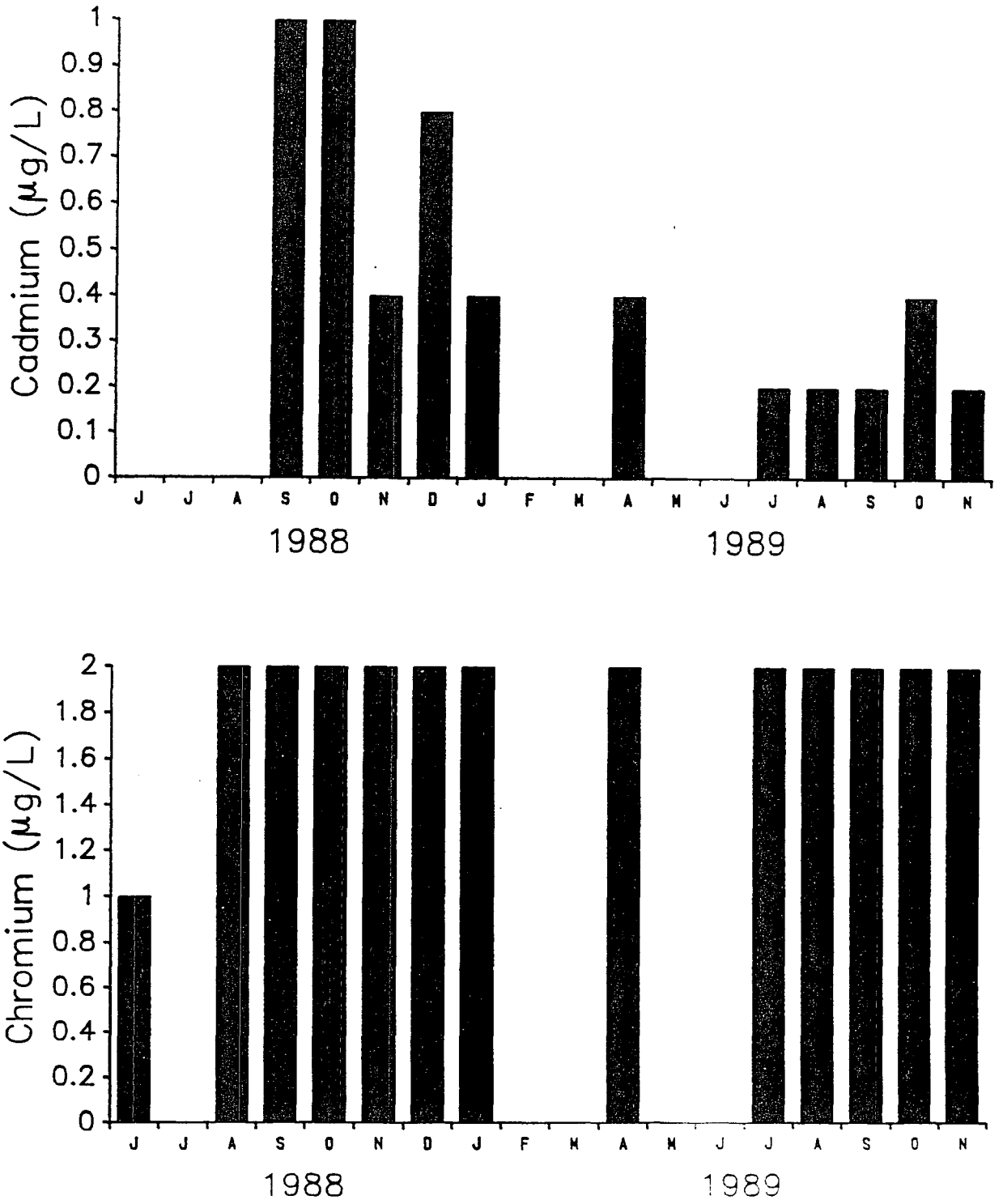


Figure 3-12. Dissolved cadmium (µg/L), dissolved chromium (µg/L), dissolved copper (µg/L), dissolved iron (µg/L), dissolved nickel (µg/L), and dissolved zinc (µg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

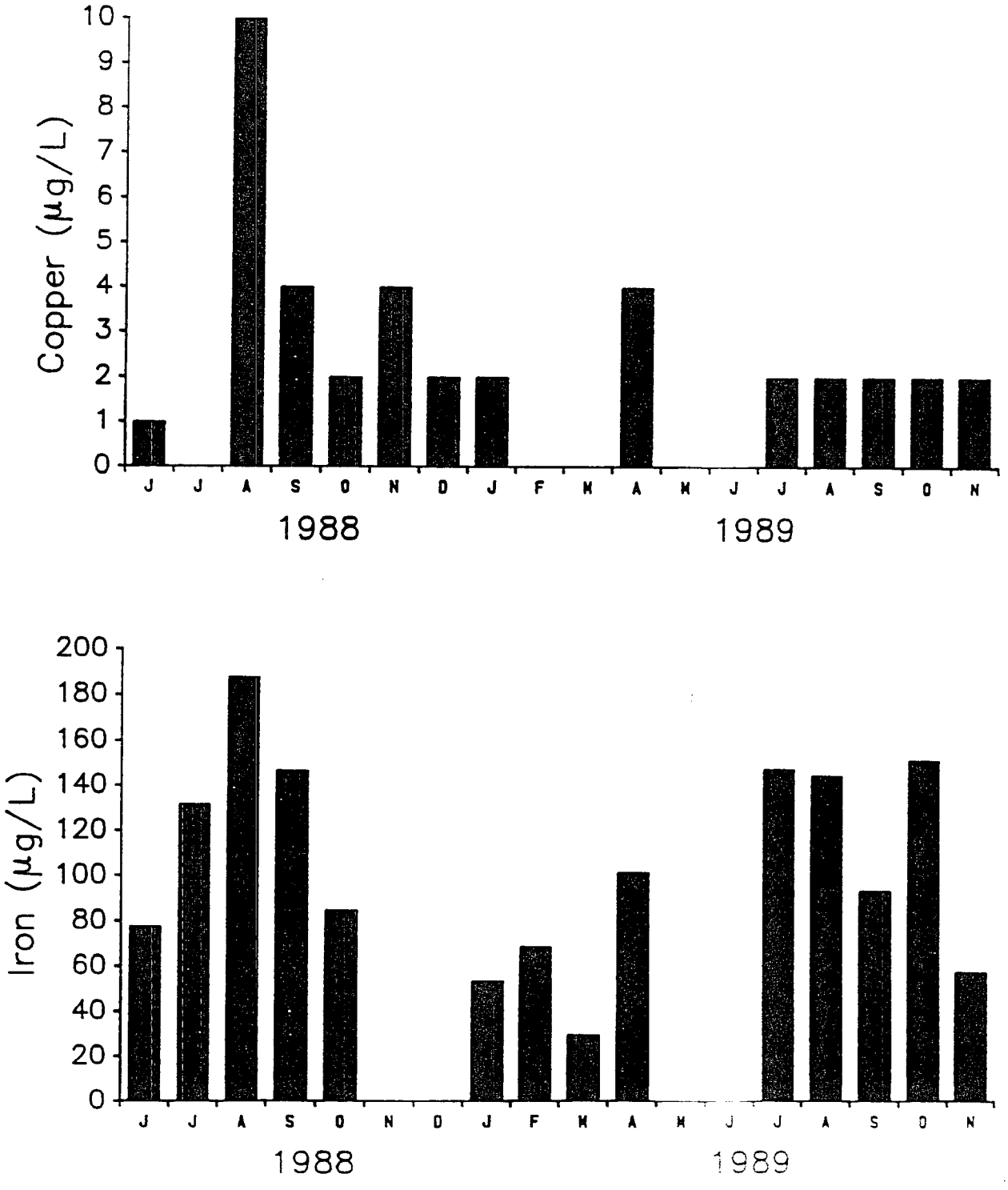


Figure 3-12 (continued). Dissolved cadmium (µg/L), dissolved chromium (µg/L), dissolved copper (µg/L), dissolved iron (µg/L), dissolved nickel (µg/L), and dissolved zinc (µg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

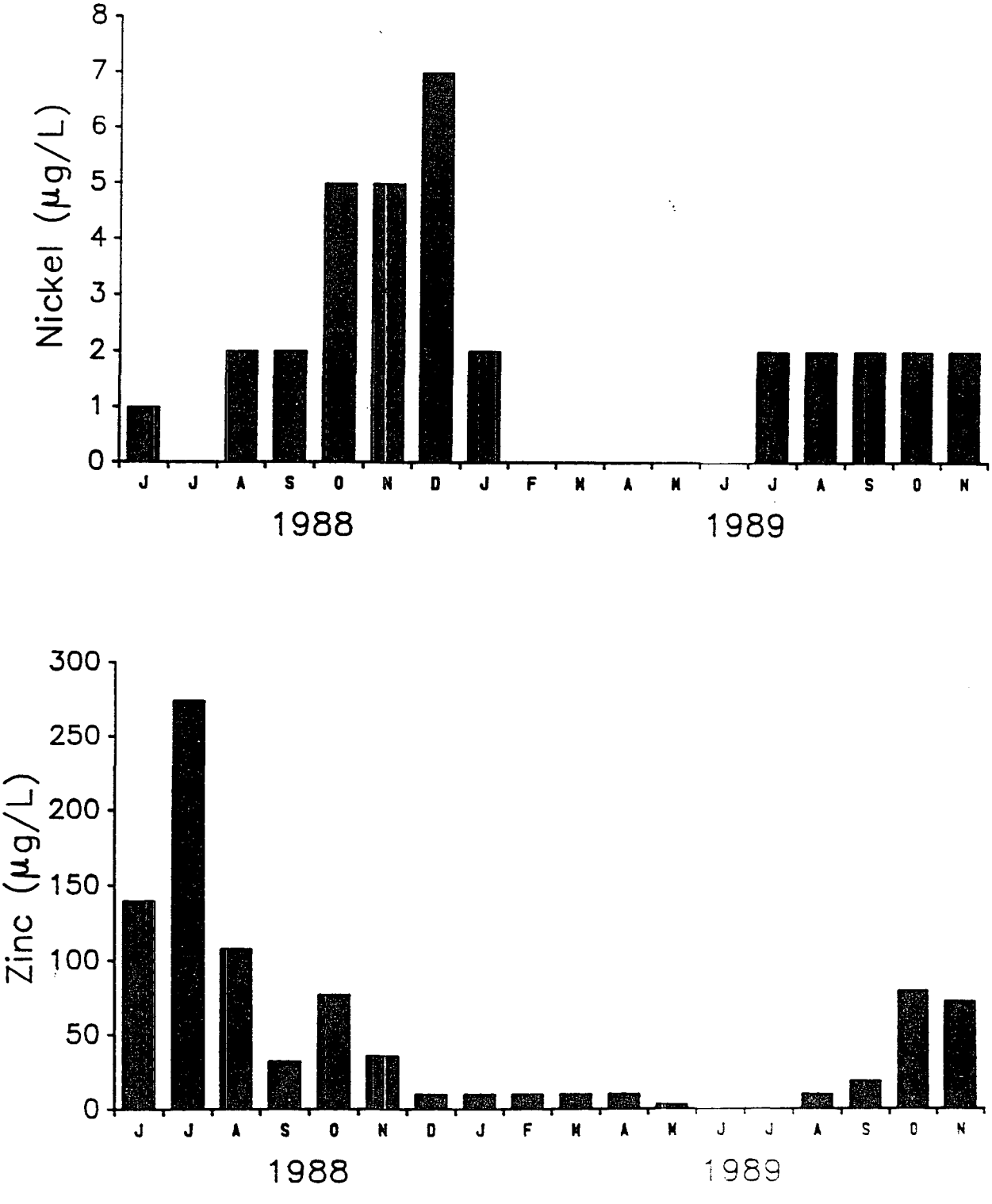


Figure 3-12 (continued). Dissolved cadmium (µg/L), dissolved chromium (µg/L), dissolved copper (µg/L), dissolved iron (µg/L), dissolved nickel (µg/L), and dissolved zinc (µg/L) at Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

alkalinity (Figure 3-6), low to moderate levels of total and filtered total phosphorus (Figure 3-7), and very low chlorophyll a concentrations (Figure 3-8).

Spearman rank correlation coefficients for all pairs of physico-chemical variables are presented in Appendix 2. In general, the majority of correlations were not statistically significant (i.e., probability greater than 0.05 that the correlation coefficient [R] was zero). Correlations for a number of variables that might be expected to vary together to some degree (i.e., dissolved oxygen and biological oxygen demand, color and turbidity, wind velocity with color and turbidity, color and total dissolved solids, chlorophyll a with phosphorus, ammonia and ammonia + ammonium with chlorophyll a and c) were not significant. Chlorophyll c was significantly correlated with both total phosphorus (0.62) and filtered total phosphorus (0.52). Water temperature was correlated with air temperature (0.79) and percent cloud cover (0.64). Many of the coefficients between water depth and dissolved/suspended materials were negative (regardless of the statistical significance), suggesting that an increase in water depth through precipitation and water inflow promoted decreased concentrations of dissolved/suspended materials in the water column. However, water depth was not significantly correlated with water temperature, dissolved oxygen content, or chlorophyll a and c concentrations, vari-

ables which might be expected to regulate microinvertebrate populations.

3.2 MICROINVERTEBRATE COMMUNITY STRUCTURE

Microinvertebrates were collected from Hopkins Prairie in all months except May and June 1989 when the prairie in the area of the research platform was dry. Raw counts of organisms identified in each replicate sample, the volume of each replicate sample, the number of aliquots examined from each replicate sample, the areal densities for taxa in each replicate sample, and the mean areal densities for taxa from all replicates are arranged by date in Appendix 3.

3.2.1 Taxa Richness

A total of 121 microinvertebrate taxa was identified from Hopkins Prairie during this study. This included 19 protozoans, 58 rotifers, 28 cladocerans, 10 copepods (discounting cyclopoid and calanoid copepodids and nauplius larvae), and 6 taxa which belonged collectively to the Ostracoda, Gastrotricha, Annelida, Nematoda, or Hydracarina and that are referred to as "other taxa" in this report (Table 3-1).

Microinvertebrate taxa richness (excluding months when no organisms were collected) varied between 26 and 47 taxa during this study (Appendix 4; Figure 3-13). Changes in taxa richness appeared to be influenced to some degree by water depth; there was a significant correlation (0.52) between

Table 3-1. Microinvertebrate taxa identified from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Phylum Protozoa
  Class Holotrichia
    Order Gymnostomatida
      Chilophrya sp.

  Class Pertrichia
    Order Mobilia
      Campanella sp.
      Epistylis spp.
      Pyxicola affinis
      Vaginicola sp.
      Vorticella sp.
      Zoothamniun sp.
      unidentified sp.

  Class Rhizopoda
    Order Actinopoda
      Acanthocystis spp.
    Order Amoebida
      unidentified sp.
    Order Testicida
      Arcella sp.
      Arcella vulgaris
      Centropyxis aculeata
    * Difflugia sp.
      Euglypha spp.
    * Lesquereusia sp.
      unidentified sp.

  Class Suctoria
      unidentified sp.

  Uncertain affiliation
      unidentified sp.

Phylum Rotifera
  Class Digononta
    Order Bdelloidea
      Family Habrotrochidae
        Habrotrocha sp.
      Family Philodinidae
        Dissotrocha sp.
      Uncertain affiliation
      * unidentified sp.

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* numerically dominant taxa

Table 3-1 (continued). Microinvertebrate taxa identified from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Phylum Rotifera (continued)
Class Monogononta
Order Collothecacea
Family Collothecidae
unidentified sp.

Order Flosculariacea
Family Conochilidae
Conochilius sp.
Family Flosculariidae
Octotrocha speciosa
Ptygura sp.
Family Testudinellidae
Testudinella parva

Order Ploima
Family Brachionidae
* Anuraeopsis sp.
Keratella cochlearis
Keratella spp.
Family Colurellidae
Colurella spp.
Lepadella cristata
Lepadella ovalis
Lepadella patella
Lepadella spp.
Paracolurella sp.
Squatinella sp.
Family Dicranophoridae
Dicranophorus forcipatus
* Dicranophorus sp.
Family Euchlanidae
Euchlanis dilatata
Euchlanis meneta
Euchlanis triquetra
Family Gastropodidae
Ascomorpha sp.
Chromogaster sp.
Family Lecanidae
* Lecane inopinata
Lecane leontina
* Lecane signifera
* Lecane sp. 1
Lecane stichaea
Lecane stokesi
* Monostyla bulla

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* numerically dominant taxa

Table 3-1 (continued). Microinvertebrate taxa identified from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Family Lecanidae (continued)
Monostyla crenata
* Monostyla lunaris
Monostyla quadridentata
Monostyla sp. 1
Monostyla sp. 3
Family Notommatidae
* Cephalodella mucronata
Cephalodella spp.
* Monommata spp.
* Notommata sp.
Rousseletia corniculata
Scaridium longicaudum
Family Proalidae
* Proales sp.
Family Trichocercidae
Trichocerca porcellus
Trichocerca pusilla
Trichocerca spp.
Family Trichotriidae
* Macrochaetus longipes
Trichotria sp.
Trichotria tetractis
Family Synchaetidae
Ploesoma triacanthum
Ploesoma truncatum
Polyarthra sp.

Uncertain affiliation
rotifera unidentified sp. 1
rotifera unidentified sp. 3
rotifera unidentified sp. 4
rotifera unidentified sp. 7
* rotifer - unidentified spp.

Phylum Arthropoda
Class Crustacea
Subclass Branchiopoda
Order Cladocera
Family Bosminidae
Eubosmina tubicen
Family Chydoridae
Acroperus harpae
Alona monocantha
Alona quadrangularis
* Alona rustica

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* numericaly dominant taxa

Table 3-1 (continued). Microinvertebrate taxa identified from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Family Chydoridae (continued)
Alona sp.
* Biapertura affinis (= Alona affinis)
Camptocercus rectirostris
* Chydorus faviformis
* Chydorus piger
Chydorus sp.
Ephemeroporus hybridus
Eurycercus sp.
Graptoleberis testudinaria
Family Daphnidae
* Ceriodaphnia spp.
Simocephalus serrulatus
Family Macrothricidae
* Acantholeberis curvirostris
Drepanothrix dentata
* Echinisco rosea (= Macrothrix rosea)
Grimaldina brazzai
Ilyocryptus sordidus
Ilyocryptus spinifer
Macrothrix sp.
* Streblocercus pygmaeus
* Streblocercus serricaudatus
Family Polyphemidae
Polyphemus pediculus
Family Sididae
Diaphanosoma brachyurum
Latonopsis occidentalis

Subclass Copepoda
Order Eucopepoda
Suborder Calanoida
Family Diaptomidae
calanoid copepodid
calanoid nauplius larvae
Diaptomus sp.

Suborder Cyclopoida
Family Cyclopidae
* cyclopoid copepodid
cyclopoid nauplius larvae
cyclopoid sp.
Eucyclops agilis
Eucyclops speratus
Macrocyclops albidus
Mesocyclops leukarti

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* numercially dominant taxa

Table 3-1 (continued). Microinvertebrate taxa identified from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Family Cyclopidae (continued)
* Microcyclops varicans rubellus
* Paracyclops affinis
* Tropocyclops prasinus
Suborder Harpacticoida
* unidentified sp.
Subclass Ostracoda
unidentified sp.
Phylum Gastrotricha
Order Chaetonotoidea
Family Chaetonotidae
Chaetonotus sp.
* unidentified sp.
Phylum Annelida
* unidentified sp.
Phylum Nematoda
unidentifed sp.
Phylum Arthropoda
Class Arachnoidea
Order Hydracarina
unidentified sp.

* numerically dominant taxa

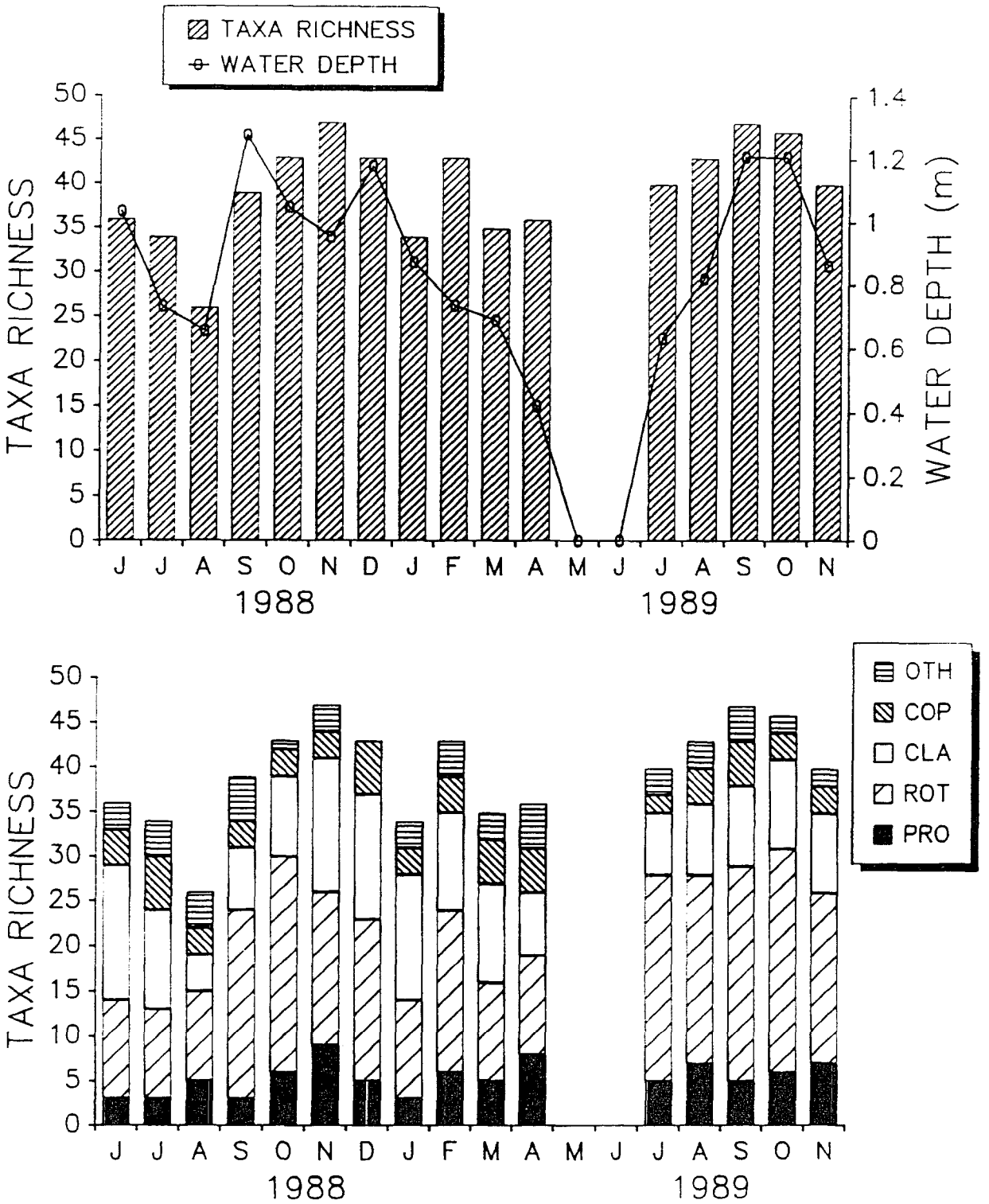

Figure 3-13. Microinvertebrate taxa richness in Hopkins Prairie, Ocala National Forest, Florida. Top panel: overall taxa richness versus water depth (m); bottom panel: taxa richness of major taxonomic groups. PRO = Protozoa, COP = Copepoda, CLA = Cladocera, ROT = Rotifera, OTH = Other Taxa. June 1988 to November 1989.

these variables (Table 3-2). Taxa richness was negatively correlated with chlorophyll a (-0.59) but not with dissolved oxygen, water temperature, or chlorophyll c.

On most dates, rotifers were the most common taxa identified from the samples with cladocerans being the next most abundant group (Figure 3-13). Rotifer taxa richness was significantly correlated with water depth (0.54), cladocera taxa richness was negatively correlated with water temperature (-0.50), and other taxa richness was correlated with chlorophyll a (0.63; Table 3-2). No other correlations were statistically significant.

Cumulative taxa richness increased rapidly from June (36 taxa) to November 1988 (88 taxa) and then slowed markedly from December 1988 (93 taxa) through April 1989 (102 taxa; Figure 3-14). These data suggested that cumulative taxa richness was approaching an asymptote prior to the drying of the prairie. There was a small increase in new taxa in the last half of 1989 (July to November: 102 to 121 taxa) following the reflooding of the prairie.

3.2.2 Taxa Abundance

Mean total densities ranged from 5,459 to 88,686 organisms/m^2, although most total densities ranged between ca. 15,000 - 30,000 organisms/m^2 (Appendix 5). The microinvertebrate community, relative to major taxonomic groups, was nu-

Table 3-2. Spearman rank correlations between water depth, water temperature, dissolved oxygen, chlorophyll a and chlorophyll c and microinvertebrate population parameters in Hopkins Prairie, Ocala National Forest. June 1988 to November 1989. Boldface coefficients are significantly different from zero.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	DEPTH	DO	WATTEMP	CHLA	CORRCHLA	CHLC
PRODEN	-0.41532	0.03679	0.25000	-0.07489	-0.21586	0.07735
	0.1097	0.8924	0.3504	0.7992	0.4586	0.7927
	16	16	16	14	14	14
ROTDEN	0.22533	-0.40029	**0.56765**	-0.15198	0.00881	0.27183
	0.4014	0.1244	0.0218	0.6040	0.9762	0.3472
	16	16	16	14	14	14
CLADEN	-0.08984	0.00294	0.24118	-0.23348	-0.34802	**0.54365**
	0.7407	0.9914	0.3682	0.4218	0.2227	0.0445
	16	16	16	14	14	14
COPDEN	0.07806	-0.21928	**0.54706**	-0.23568	-0.33260	0.48620
	0.7739	0.4145	0.0283	0.4173	0.2453	0.0779
	16	16	16	14	14	14
OTHDEN	-0.19588	-0.46799	**0.58824**	0.30397	0.15639	**0.56133**
	0.4672	0.0675	0.0165	0.2907	0.5934	0.0367
	16	16	16	14	14	14
TOTDEN	0.05891	-0.32524	**0.56176**	-0.17401	-0.26872	**0.62100**
	0.8284	0.2190	0.0235	0.5519	0.3529	0.0178
	16	16	16	14	14	14
PRORICH	-0.20339	0.25613	-0.13439	-0.26065	-0.17073	-0.40655
	0.4499	0.3383	0.6198	0.3681	0.5595	0.1492
	16	16	16	14	14	14
ROTRICH	**0.54541**	-0.11450	0.24964	-0.50112	-0.29334	-0.20290
	0.0289	0.6728	0.3511	0.0679	0.3087	0.4866
	16	16	16	14	14	14
CLARICH	0.29317	0.36136	**-0.49928**	-0.29020	-0.48664	0.09183
	0.2705	0.1691	0.0490	0.3142	0.0776	0.7549
	16	16	16	14	14	14
COPRICH	-0.05033	0.32652	-0.05567	-0.00683	-0.10244	0.07765
	0.8531	0.2171	0.8378	0.9815	0.7275	0.7919
	16	16	16	14	14	14

Table 3-2 (continued). Spearman rank correlations between water depth, water temperature, dissolved oxygen, chlorophyll a and chlorophyll c and microinvertebrate population parameters in Hopkins Prairie, Ocala National, Forest. June 1988 to November 1989. Boldface coefficients are significantly different from zero.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	DEPTH	DO	WATTEMP	CHLA	CORRCHLA	CHLC
OTHRICH	-0.29918	-0.36455	0.33533	**0.62770**	0.51932	0.27412
	0.2603	0.1651	0.2042	0.0162	0.0570	0.3429
	16	16	16	14	14	14
TOTRICH	**0.52457**	0.07881	0.00000	**-0.59490**	-0.44199	-0.17470
	0.0370	0.7717	1.0000	0.0248	0.1136	0.5503
	16	16	16	14	14	14
DIVERS	0.24300	-0.09860	0.38235	-0.43172	-0.27974	0.16133
	0.3645	0.7164	0.1439	0.1232	0.3327	0.5816
	16	16	16	14	14	14

DEPTH = water depth
DO = dissolved oxygen
WATTEMP = water temperature
CHLA = chlorophyll a uncorrected for pheophytin
CORRCHLA = chlorophyll a corrected for pheophytin
CHLC = chlorophyll c
PRODEN = protozoa density
ROTDEN = rotifer density
CLADEN = cladocera density
COPDEN = copepod density
OTHDEN = other taxa density
TOTDEN = total microinvertebrate density
PRORICH = protozoa taxa richness
ROTRICH = rotifer taxa richness
CLARICH = cladocera taxa richness
COPRICH = copepod taxa richness
OTHRICH = other taxa taxa richness
TOTRICH = total microinvertebrate taxa richness
DIVERS = taxa diversity

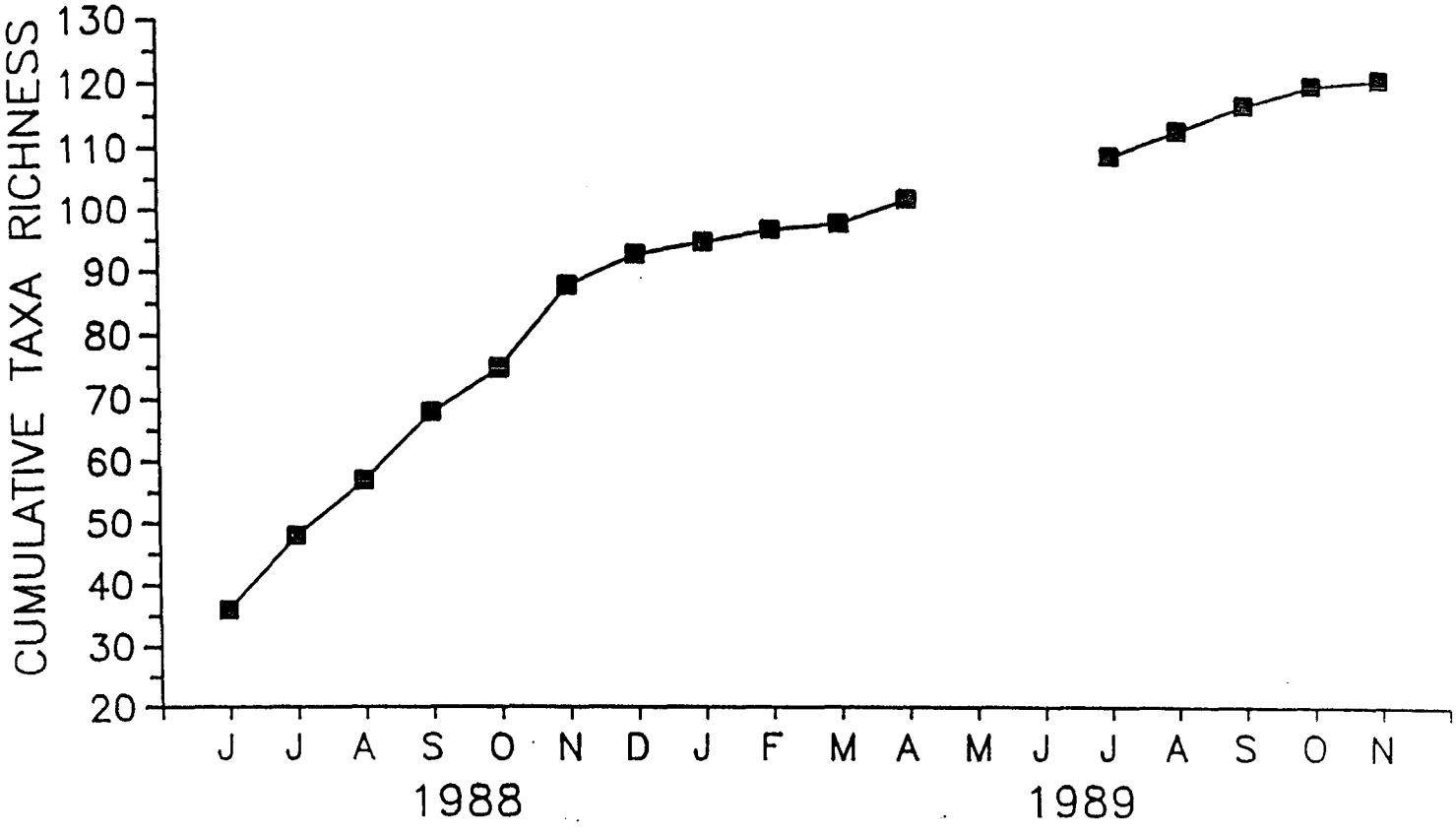

Figure 3-14. Microinvertebrate cumulative taxa richness in Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

merically dominated during the course of this study by rotifers, cladocerans, or copepods, with no one group being mostimportant for more than three consecutive months (Appendix 6; Figure 3-15).

The individual taxa that were numerically dominant in Hopkins Prairie were mostly cladocerans and copepods with cyclopoid copepodids and copepod nauplius larvae most frequently encountered in the samples (Appendix 7). The community was never overwhelmingly dominated by any single taxon. The highest relative abundance was 24% for nauplius larvae in December 1988. The number of dominant taxa on any given date ranged from two to seven taxa.

Microinvertebrate densities (both total and for major taxonomic groups) were not significantly correlated with water depth (Table 3-2), although decreases in water depth from June to August 1988, September to November 1988, March to May 1989, and October to November 1989 coincided with declines in total microinvertebrate abundance (Figure 3-15). The reflooding of the prairie in 1989 coincided with a dramatic increase in densities in July and August 1989. Water temperature was significantly correlated with rotifer density (0.57), copepod density (0.55), other taxa density (0.59), and total density (0.56); chlorophyll $\underline{c}$ levels were correlated with cladocera density (0.54), other taxa density

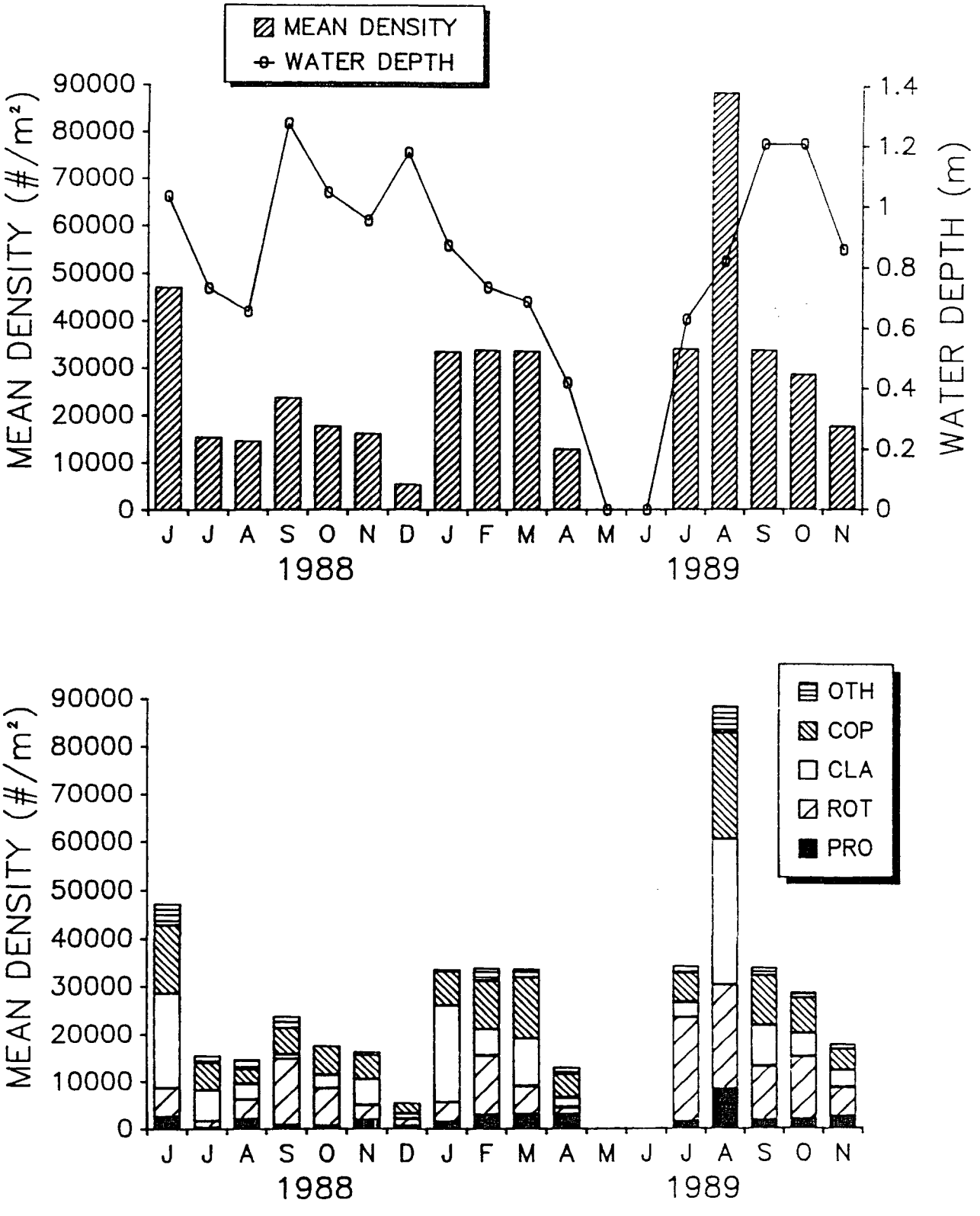

Figure 3-15. Microinvertebrate density (organisms/m^2) in Hopkins Prairie, Ocala National Forest, Florida. Top panel: total microinvertebrate density versus water depth (m); bottom panel: densities of major taxonomic groups. PRO = Protozoa, COP = Copepoda, CLA = Cladocera, ROT, Rotifera, OTH = Other Taxa. June 1988 to November 1989.

(0.56), and total density (0.62; Table 3-2). No other correlations were statistically significant.

3.2.3 Taxa Diversity

Taxa diversity varied little throughout this study (Appendix 8; Figure 3-16) and was not significantly correlated with water depth, dissolved oxygen, water temperature, or chlorophyll a and c (Table 3-2). Diversity values from Hopkins Prairie were relatively high compared to those for pelagic zooplankton communities from other southeastern lakes and ponds (M. Chimney, unpub. data) and for Montandon Marsh (H' = 0.89± 0.27; Seelbach and McDiffett 1983), the only published data from a wetland community. This may reflect both actual diffrences between studies in community structure and degree of taxomomic resolution.

3.2.4 Cluster Analysis

Cluster analysis of mean densities of numerically dominant taxa detected differences in community structure that may have reflected some degree of "seasonality" (Figure 3-17). Groups of consecutive sampling dates tended to cluster together (except for April 1989 which clustered with September and August 1988). This was an indication of similarity in the microinvertebrate community over relatively short periods of time; date groupings seemed to conform to "winter", "spring", "summer", and "fall" communities. The largest differences detected in community structure, indicated by the

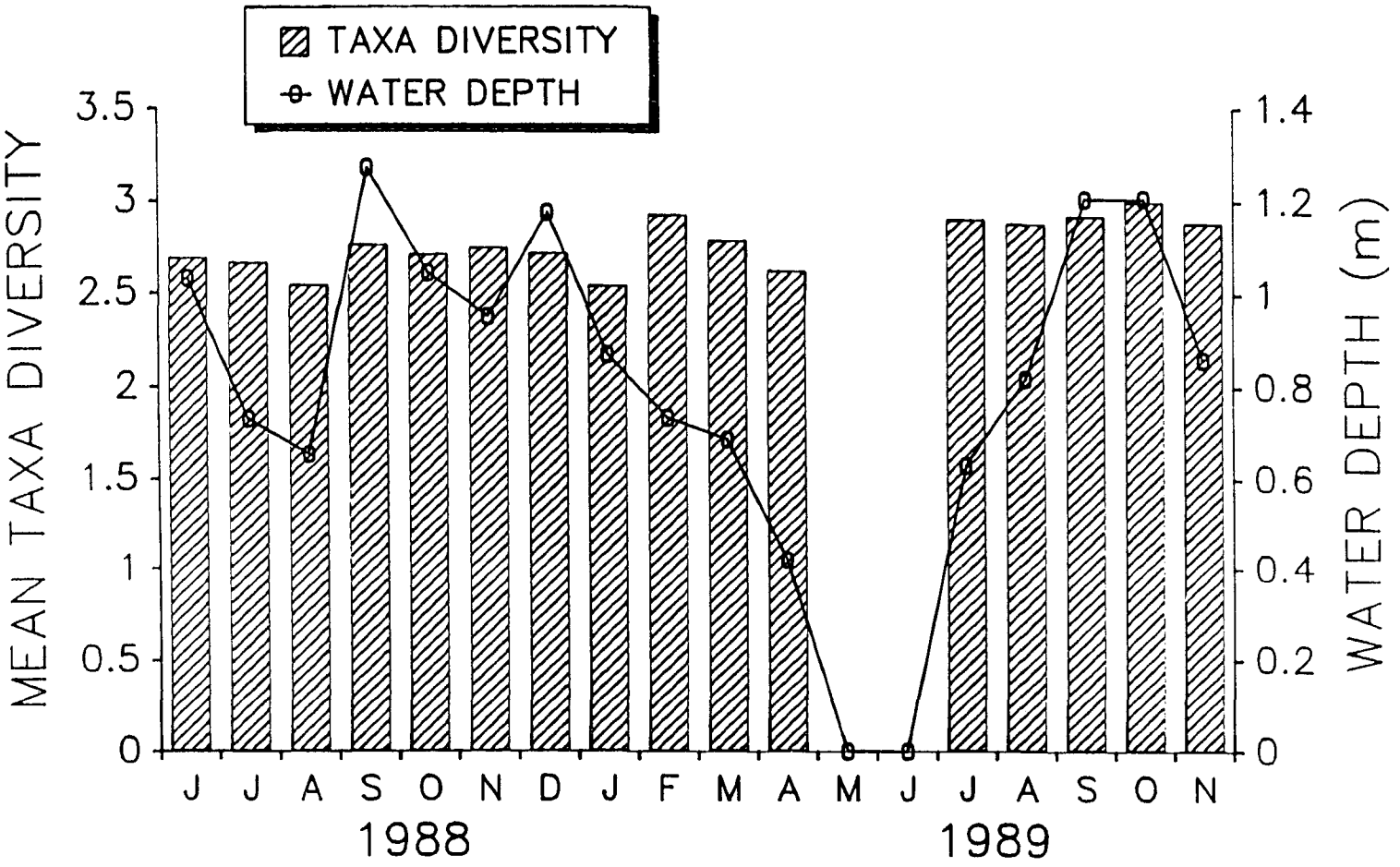

Figure 3-16. Microinvertebrate Shannon-Wiener taxa diversity versus water depth (m) in Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

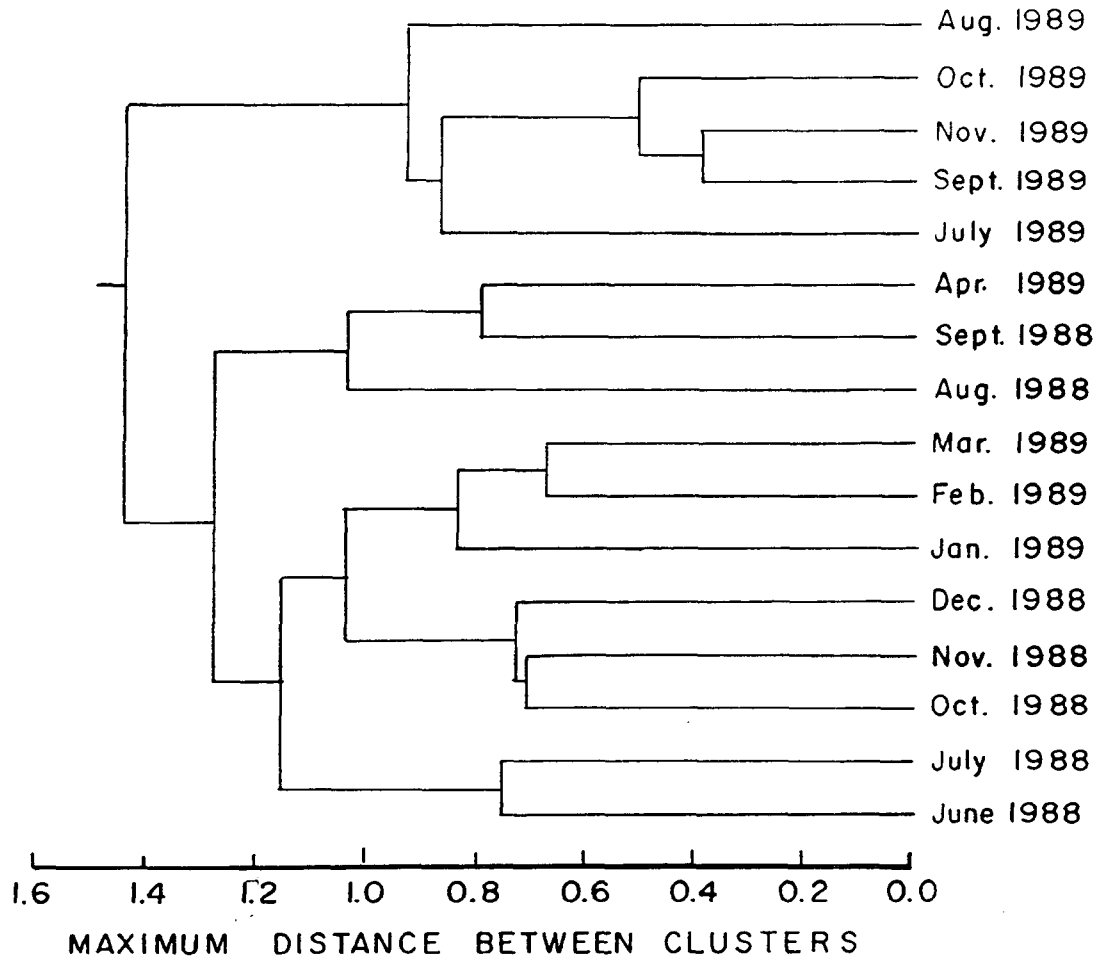

Figure 3-17. Dendrogram for cluster analysis (complete linkage method) of mean densities (log_e+1 transformed) of numerically important taxa from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

farthest separation of cluster groups, were between the dates before and after the drying of the prairie in May and June 1989.

4.0 DISCUSSION AND SUMMARY

All microinvertebrate sampling procedures introduce some amount of bias into the data through the very act of collecting organisms. The pattern sampler used in this study is most efficient at collecting taxa that are strong swimmers and able to make their way up into the bottle atop the funnel (e.g., copepods and cladocera) and as a result may underestimate densities of protozoa and rotifers. However, the difficulties of sampling microinvertebrates in areas with abundant macrophyte growth generally preclude the use of more traditional methods (i.e., nets or water bottles). Even with the limitations noted above, a large number of rotifer and protozoa taxa was collected during this study.

Microinvertebrate populations are influenced, to a large degree, by variation in water quality, food availability, competition, and predation pressure (Odum 1971; Wetzel 1983). A growing body of evidence indicates that predation is the major determinant of zooplankton community structure (e.g., Kerfoot and Sih 1987; Lane 1975; Lynch 1979; Threlkeld 1979) while all four parameters can regulate the size of populations. Fluctuation in water levels, in turn, can impact all of these controlling factors. Possible influence of changing water levels on the microinvertebrates in Hopkins Prairie (i.e., taxa richness and total density) was documented in

this study. Decreasing water depth would concentrate organisms into a smaller volume of water and thus increase the probability of prey-predator encounters. In the short term, this would be expected to lead to decreased prey densities (Loftus et al. 1986; Seelbach and McDiffett 1983), which is what was observed on several occasions in Hopkins Prairie (June to August 1988, September to November 1988, March to May 1989, and October to November 1989). Correlations between water depth and other physico-chemical variables and between microinvertebrate population parameters and water depth, water temperature, dissolved oxygen, and food availability were either nonsignificant or, if significant, only moderate correlations at best. This was attributed to the relatively small data set being analyzed and/or the fact that environmental data of this type are, under the best of conditions, usually quite variable. Schoenberg (1983) reported correlations of a similar magnitude between zooplankton biomass and environmental variables in the Okefenokee Swamp.

The microinvertebrate community in Hopkins Prairie, as might be expected, was composed mainly of organisms that have a preference for shallow, weedy habitats and was similar in composition to that found in other marshes and swamps (see Anderson et al. 1977; Loftus et al. 1986; Schoenberg 1988; Seelbach and McDiffett 1983). Cluster analysis detected differences in Hopkins Prairie community structure that may re-

flect some degree of "seasonality". Dates prior to the prairie's drying in 1989 were grouped together in what was interpreted as "winter", "spring", "summer", and "fall" communities, although inspection of the numerically important taxa did not reveal any abrupt month-to-month changes in community composition. The major environmental event in the prairie during this study was the drought in May and June 1989 and the subsequent drying of the prairie in the vicinity of the research platform. The most pronounced differences in community structure detected by cluster analysis were for sampling dates before versus those after this event. However, taxa richness, taxa diversity, and mean density (except for August 1989) were not substantially different after the drought compared to the months prior to the event. This would indicate that changes in the community detected by cluster analysis were of a more subtle nature. Loftus et al. (1986) hypothesized that aside from desiccation and predation, aquatic organisms in short hydroperiod marshes could be impacted by more subtle alterations to the food web which may account for the some of the changes that were observed in the Hopkins Prairie microinvertebrate community.

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APPENDICES

Appendix 1.

Hydrologic and physico-chemical parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

STA	DATE YYMMDD	TIME HHMM	TEMP WATER °C	TEMP AIR °C	CLOUD COVER %	WIND VEL mph	WEATHER PAST 24 h	COLOR Pt-Co units	COND µmhos/cm	DO mg/L
HOP-	880621	1035	26.1	25.7	95	2	66	240	61	2.42
HOP-	880719	918	26.3		5	5	80	250	72	4.30
HOP-	880816	1025	27.3					300	60	3.30
HOP-	880919	1000	27.1	32.0	25	5	64		35	3.80
HOP-	881017	1105	21.5	26.0	20	15	20	250	40	6.00
HOP-	881117	915	21.4		15	5	20	250	40	5.60
HOP-	881213	1103	9.8	11.0	0		66	200	40	9.50
HOP-	890118	1205	19.9		0	5	20	200	52	6.10
HOP-	890216	1100	22.0	27.0	0	10	20	300	46	5.80
HOP-	890316	1120	28.0	23.0	20	10	20	225	76	8.70
HP2-	890421	1334	23.0	24.4	90	10	64	200	63	5.50
HP2-	890523	1055	28.9		50	10	20	150	65	8.25
HP2-	890620	1040	28.9	32.0	75	10	54	100	85	8.60
HOP-	890712	1140	30.8	35.0	75	5	20	250	73	1.00
HOP-	890814	1100	30.7	36.5	75	5	64		49	4.50
HOP-	890913	1050	29.0	31.0	80	5	20	250	35	4.50
HOP-	891018	1100	27.7	31.0	80	10	20	300	36	2.80
HOP-	891120	1130	18.0	22.0	0	1	20	200	49	7.84

STA	DATE YYMMDD	TIME HHMM	BOD mg/L	pH STD units	TOTAL ALK mg/L	NH3+NH4 mg/L	NH3 mg/L	KN mg/L	TKN mg/L	TP mg/L	TP/F mg/L
HOP-	880621	1035	1.7	5.36	2	0.0160	0.024	1.35	1.63	0.042	0.005
HOP-	880719	918	4.6	4.70	4	0.0160	0.030	1.69	2.78	0.028	0.006
HOP-	880816	1025	3.0	5.20	5	0.3210	0.323	2.76	2.35	0.019	0.005
HOP-	880919	1000	4.0	4.60	3	0.0520	0.037	1.18	1.29	0.005	0.005
HOP-	881017	1105	1.9	4.40	21	0.0190	0.011	1.12	1.14	0.005	0.005
HOP-	881117	915	3.8	4.80	3	0.0380	0.030	0.92	0.97	0.005	0.005
HOP-	881213	1103	1.5	4.70	412			0.81	0.93	0.005	0.005
HOP-	890118	1205	2.6	5.40	6	0.0810	0.081	0.96	1.10	0.012	0.005
HOP-	890216	1100	4.0	6.90	2	0.0810	0.087	1.14	1.49	0.027	0.015
HOP-	890316	1120	1.8	5.90	2	0.2240	0.224	1.28	1.49	0.037	0.021
HP2-	890421	1334	3.3	4.53	1	0.0620	0.060	1.87	2.21	0.010	0.005
HP2-	890523	1055	2.9	4.74	3	0.3270	0.350	0.05	2.72	0.020	0.014
HP2-	890620	1040	2.8	4.70	2	0.6640	0.696	3.11	3.37	0.031	0.016
HOP-	890712	1140	3.2	4.96	3	0.1080	0.106	2.66	3.02	0.043	0.029
HOP-	890814	1100	7.7	4.96	3	0.0050	0.005	1.64	1.78	0.036	0.032
HOP-	890913	1050	2.9	4.28	2	0.0050	0.005	1.32	1.42	0.016	0.009
HOP-	891018	1100	1.4	4.57	4	0.0110	0.017	1.21	1.50	0.005	0.005
HOP-	891120	1130	3.4	4.37	2			1.12	1.85	0.051	0.044

Appendix 1 (continued).

Hydrologic and physico-chemical parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

STA	DATE YYMMDD	TIME HHMM	HARD CaCO3 mg/L	Ca mg/L	Na mg/L	K mg/L	Cl mg/L	SO4 mg/L	Cd µg/L	Cr µg/L	Cu µg/L	Fe µg/L
HOP-	880621	1035	8	3.0	5.5	0.3	11	6		1	1	78
HOP-	880719	918	12	2.6	6.8	0.7	14	8				132
HOP-	880816	1025	10	3.5	6.4	1.1	14	2		2	10	188
HOP-	880919	1000	10	2.0	1.0	0.3	5	2	1.0	2	4	147
HOP-	881017	1105	8	2.0	5.0	0.2	7	3	1.0	2	2	85
HOP-	881117	915		1.0	1.0	0.3		1	0.4	2	4	
HOP-	881213	1103		1.0	1.0	0.3	7	2	0.8	2	2	
HOP-	890118	1205	12	1.0	4.0	0.4	10	30	0.4	2	2	54
HOP-	890216	1100	12	2.0	7.0	0.2	12	9				69
HOP-	890316	1120	10	2.0	5.0	0.6	10	5				30
HP2-	890421	1334	4	3.0	1.0	0.5	13	4	0.4	2	4	102
HP2-	890523	1055	20	2.0	10.0	0.4	14	3	0.2	0.2	2	107
HP2-	890620	1040	12	2.0	3.0	0.4	20	3	0.2	2	2	94
HOP-	890712	1140	22	4.0	5.0	0.1		12	0.2	2	2	148
HOP-	890814	1100	24	4.0	2.0	0.1	5	2	0.2	2	2	145
HOP-	890913	1050	12	3.0	2.0	0.1	5	5	0.2	2	2	94
HOP-	891018	1100	16	2.0	3.0	0.2	7	6	0.4	2	2	152
HOP-	891120	1130	8	2.0	5.0	0.4	8	7	0.2	2	2	58

STA	DATE YYMMDD	TIME HHMM	Ni µg/L	Zn µg/L	CHL a µg/l	CHL a CORR µg/l	CHL c µg/l	PHEO µg/l	TDS mg/L	TURBID NTU	WATER DEPTH m
HOP-	880621	1035	1	140	5.4	1.1	1.4	7.4	78	3.2	1.03
HOP-	880719	918		274	19.3	16.6	2.8	4.4		5.1	0.73
HOP-	880816	1025	2	108	6.8	5.6	0.3	1.8	81	2.3	0.65
HOP-	880919	1000	2	32	9.5	8.3	0.3	2.1		2.0	1.27
HOP-	881017	1105	5	77	2.2	1.9	0.0	0.6	64	1.9	1.04
HOP-	881117	915	5	36					63	5.6	0.95
HOP-	881213	1103	7	10	3.5	3.3	0.1	0.3	62	5.5	1.18
HOP-	890118	1205	2	10					54	2.1	0.87
HOP-	890216	1100		10	5.4	3.7	1.6	2.8	63	4.3	0.73
HOP-	890316	1120		10	3.4	2.1	0.4	2.2	72	3.1	0.69
HP2-	890421	1334		10	12.4	5.3	0.0	10.9	72	8.5	0.42
HP2-	890523	1055	2	3	4.6	2.7	0.0	3.1	80	3.1	
HP2-	890620	1040	2	3	4.9	4.5	1.9	0.5	94	4.0	
HOP-	890712	1140	2	3	7.4	5.6	3.5	3.0	124	4.9	0.63
HOP-	890814	1100	2	10	5.2	4.3	2.3	1.7	92	3.1	0.82
HOP-	890913	1050	2	19	2.0	1.1	1.0	1.6	68	2.6	1.21
HOP-	891018	1100	2	80	3.6	3.5	0.0	0.1	52	1.1	1.21
HOP-	891120	1130	2	73	3.4	1.7	0.2	3.0	58	2.1	0.86

Appendix 1 (continued).

Hydrologic and physico-chemical parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

TEMP WATER = water temperature
TEMP AIR = air temperature
CLOUD COVER = cloud cover
WIND VEL = wind velocity
WEATHER PAST = weather conditions within past 24 hours
COLOR = water color
COND = conductivity
DO = dissolved oxygen
BOD = biological oxygen demand
pH = pH
TOTAL ALK = total alkalinity
NH3+NH4 = ammonia + ammonium-nitrogen
NH3 = ammonia-nitrogen
KN = Kjeldahl nitrogen
TKN = total Kjeldahl nitrogen
TP = total phosphorus
TP/F = filtered total phosphorus
HARD = hardness
Ca = calcium
Na = sodium
K = potassium
Cl = chloride
SO4 = sulfate
Cd = cadmium
Cr = chromium
Cu = copper
Fe = iron
Ni = nickel
Zn = zinc
CHL a = chlorophyll a uncorrected for pheophytin
CHL a CORR = chlorophyll a corrected for pheophytin
CHL c = chlorophyll c
PHEO = pheophytin
TDS = total dissolved solids
TURBID = turbidity
WATER DEPTH = water depth

Appendix 2.

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	WATTEMP	AIRTEMP	CLOUD	WIND	COLOR	COND	DO	BOD	PH	ALK	NH3NH4	NH3
WATTEMP	1.00000	0.78788	0.63780	0.11860	0.10569	0.31072	-0.36054	0.10388	0.06625	-0.24519	0.05310	0.10759
	0.0	0.0014	0.0059	0.6618	0.6969	0.2095	0.1416	0.6817	0.7939	0.3268	0.8452	0.6917
	18	13	17	16	16	18	18	18	18	18	16	16
AIRTEMP	0.78788	1.00000	0.34639	-0.04450	0.43496	-0.04149	-0.58897	0.41517	0.11464	0.15743	-0.18078	-0.16705
	0.0014	0.0	0.2463	0.8908	0.1812	0.8929	0.0342	0.1583	0.7092	0.6075	0.5948	0.6235
	13	13	13	12	11	13	13	13	13	13	11	11
CLOUD	0.63780	0.34639	1.00000	0.06845	0.04369	0.07578	-0.54430	-0.19084	-0.20981	-0.39949	-0.28739	-0.26013
	0.0059	0.2463	0.0	0.8011	0.8771	0.7725	0.0239	0.4631	0.4190	0.1121	0.2990	0.3491
	17	13	17	16	15	17	17	17	17	17	15	15
WIND	0.11860	-0.04450	0.06845	1.00000	0.05064	0.11719	0.39848	-0.30541	-0.01503	0.08742	0.39620	0.30885
	0.6618	0.8908	0.8011	0.0	0.8635	0.6656	0.1263	0.2500	0.9559	0.7475	0.1438	0.2627
	16	12	16	16	14	16	16	16	16	16	15	15
COLOR	0.10569	0.43496	0.04369	0.05064	1.00000	-0.43884	-0.65783	0.17515	0.14073	0.21073	-0.43163	-0.39834
	0.6969	0.1812	0.8771	0.8635	0.0	0.0890	0.0056	0.5165	0.6032	0.4334	0.1233	0.1583
	16	11	15	14	16	16	16	16	16	16	14	14
COND	0.31072	-0.04149	0.07578	0.11719	-0.43884	1.00000	0.14707	-0.00518	0.41360	-0.27835	0.62214	0.67257
	0.2095	0.8929	0.7725	0.6656	0.0890	0.0	0.5603	0.9837	0.0880	0.2634	0.0101	0.0043
	18	13	17	16	16	18	18	18	18	18	16	16
DO	-0.36054	-0.58897	-0.54430	0.39848	-0.65783	0.14707	1.00000	-0.21550	-0.00983	-0.01968	0.44985	0.37288
	0.1416	0.0342	0.0239	0.1263	0.0056	0.5603	0.0	0.3904	0.9691	0.9382	0.0804	0.1549
	18	13	17	16	16	18	18	18	18	18	16	16
BOD	0.10388	0.41517	-0.19084	-0.30541	0.17515	-0.00518	-0.21550	1.00000	0.01761	-0.21924	-0.11365	-0.05973
	0.6817	0.1583	0.4631	0.2500	0.5165	0.9837	0.3904	0.0	0.9447	0.3821	0.6751	0.8261
	18	13	17	16	16	18	18	18	18	18	16	16
PH	0.06625	0.11464	-0.20981	-0.01503	0.14073	0.41360	-0.00983	0.01761	1.00000	0.02238	0.38672	0.42773
	0.7939	0.7092	0.4190	0.9559	0.6032	0.0880	0.9691	0.9447	0.0	0.9297	0.1390	0.0984
	18	13	17	16	16	18	18	18	18	18	16	16
ALK	-0.24519	0.15743	-0.39949	0.08742	0.21073	-0.27835	-0.01968	-0.21924	0.02238	1.00000	-0.09198	-0.14813
	0.3268	0.6075	0.1121	0.7475	0.4334	0.2634	0.9382	0.3821	0.9297	0.0	0.7348	0.5840
	18	13	17	16	16	18	18	18	18	18	16	16
NH3NH4	0.05310	-0.18078	-0.28739	0.39620	-0.43163	0.62214	0.44985	-0.11365	0.38672	-0.09198	1.00000	0.97786
	0.8452	0.5948	0.2990	0.1438	0.1233	0.0101	0.0804	0.6751	0.1390	0.7348	0.0	0.0001
	16	11	15	15	14	16	16	16	16	16	16	16
NH3	0.10759	-0.16705	-0.26013	0.30885	-0.39834	0.67257	0.37288	-0.05973	0.42773	-0.14813	0.97786	1.00000
	0.6917	0.6235	0.3491	0.2627	0.1583	0.0043	0.1549	0.8261	0.0984	0.5840	0.0001	0.0
	16	11	15	15	14	16	16	16	16	16	16	16

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	WATTEMP	AIRTEMP	CLOUD	WIND	COLOR	COND	DO	BOD	PH	ALK	NH3NH4	NH3
KN	0.56715	0.57379	0.59817	-0.03321	0.18949	0.47592	-0.49483	0.18191	0.04658	-0.32922	0.10022	0.17084
	0.0141	0.0403	0.0112	0.9028	0.4821	0.0459	0.0368	0.4700	0.8544	0.1822	0.7119	0.5270
	18	13	17	16	16	18	18	18	18	18	16	16
TKN	0.56715	0.31724	0.40497	0.00633	-0.14042	0.72191	-0.25413	0.24755	0.00621	-0.33082	0.36209	0.45984
	0.0141	0.2909	0.1068	0.9815	0.6040	0.0007	0.3089	0.3220	0.9805	0.1800	0.1681	0.0731
	18	13	17	16	16	18	18	18	18	18	16	16
TP	0.35891	0.02235	0.08897	-0.43219	-0.19684	0.65901	-0.05738	0.19103	0.33665	-0.49311	0.22866	0.30342
	0.1436	0.9422	0.7342	0.0946	0.4650	0.0029	0.8211	0.4477	0.1719	0.0376	0.3943	0.2533
	18	13	17	16	16	18	18	18	18	18	16	16
FILTTP	0.46219	0.22892	-0.08886	-0.14845	-0.21354	0.41805	0.21069	0.35096	0.10169	-0.44297	0.19993	0.23990
	0.0535	0.4519	0.7345	0.5832	0.4271	0.0843	0.4014	0.1533	0.6880	0.0656	0.4578	0.3708
	18	13	17	16	16	18	18	18	18	18	16	16
HARD	0.68233	0.80755	0.03226	0.00586	0.14072	0.07671	-0.13226	0.16845	0.23012	0.27374	-0.04122	0.02926
	0.0036	0.0015	0.9091	0.9835	0.6313	0.7777	0.6254	0.5329	0.3912	0.3049	0.8840	0.9176
	16	12	15	15	14	16	16	16	16	16	15	15
CA	0.65048	0.53746	0.67651	-0.21629	0.31705	0.27491	-0.65429	0.30694	0.00109	-0.29240	-0.21799	-0.16994
	0.0035	0.0582	0.0029	0.4211	0.2315	0.2696	0.0032	0.2154	0.9966	0.2390	0.4173	0.5292
	18	13	17	16	16	18	18	18	18	18	16	16
NA	0.12272	-0.09157	-0.16060	0.08875	0.20673	0.45656	-0.06371	0.00836	0.40713	0.01344	0.35487	0.39318
	0.6276	0.7661	0.5380	0.7438	0.4424	0.0568	0.8017	0.9737	0.0936	0.9578	0.1774	0.1319
	18	13	17	16	16	18	18	18	18	18	16	16
K	-0.25775	-0.62981	-0.25630	0.07550	-0.32749	0.53260	0.29547	-0.00943	0.14174	-0.03291	0.52053	0.57082
	0.3018	0.0211	0.3207	0.7811	0.2156	0.0229	0.2339	0.9704	0.5748	0.8969	0.0387	0.0209
	18	13	17	16	16	18	18	18	18	18	16	16
CL	-0.00149	-0.31674	-0.01641	0.25631	-0.26162	0.81996	0.13671	0.06097	0.36486	-0.19055	0.70348	0.76533
	0.9956	0.3158	0.9537	0.3764	0.3663	0.0001	0.6137	0.8225	0.1647	0.4796	0.0050	0.0014
	16	12	15	14	14	16	16	16	16	16	14	14
SO4	-0.01978	-0.07372	-0.12391	-0.21283	0.13270	0.28654	-0.16450	-0.08021	0.18101	-0.18118	-0.02079	0.04970
	0.9379	0.8109	0.6356	0.4287	0.6242	0.2490	0.5142	0.7517	0.4723	0.4718	0.9391	0.8550
	18	13	17	16	16	18	18	18	18	18	16	16
CD	-0.57688	-0.36680	-0.30953	0.31601	0.30523	-0.51866	-0.01177	-0.25607	-0.12526	0.57783	-0.19170	-0.22119
	0.0390	0.2971	0.3034	0.3170	0.3614	0.0694	0.9696	0.3984	0.6835	0.0386	0.5723	0.5134
	13	10	13	12	11	13	13	13	13	13	11	11
CR	-0.12689	0.20092	-0.28047	0.05132	0.31497	-0.37023	0.01208	0.23565	-0.30238	0.19547	-0.14871	-0.20120
	0.6523	0.5536	0.3314	0.8678	0.2945	0.1743	0.9659	0.3978	0.2733	0.4851	0.6278	0.5098
	15	11	14	13	13	15	15	15	15	15	13	13

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	WATTEMP	AIRTEMP	CLOUD	WIND	COLOR	COND	DO	BOD	PH	ALK	NH3NH4	NH3
CU	-0.10695	0.07578	-0.18200	0.20239	0.26671	-0.15148	-0.05989	0.54330	-0.07065	0.05821	0.27486	0.24643
	0.7044	0.8247	0.5335	0.5073	0.3784	0.5900	0.8321	0.0363	0.8024	0.8367	0.3634	0.4170
	15	11	14	13	13	15	15	15	15	15	13	13
FE	0.51178	0.73462	0.46440	0.01911	0.38952	-0.10538	-0.66937	0.25866	-0.20560	0.36427	-0.10663	-0.04741
	0.0427	0.0065	0.0812	0.9461	0.1686	0.6977	0.0046	0.3334	0.4449	0.1654	0.7053	0.8668
	16	12	15	15	14	16	16	16	16	16	15	15
NI	-0.42239	-0.27758	-0.62988	0.46810	0.05142	-0.37754	0.50245	-0.05798	-0.30816	0.60634	0.01383	-0.13373
	0.1324	0.4374	0.0210	0.1248	0.8739	0.1832	0.0671	0.8439	0.2838	0.0215	0.9660	0.6786
	14	10	13	12	12	14	14	14	14	14	12	12
ZN	-0.33094	-0.27102	-0.00381	-0.30888	0.54226	-0.35557	-0.46110	-0.00685	-0.20859	0.23658	-0.55821	-0.52481
	0.1798	0.3704	0.9884	0.2444	0.0300	0.1476	0.0541	0.9785	0.4062	0.3446	0.0246	0.0369
	18	13	17	16	16	18	18	18	18	18	16	16
CHLA	0.05011	0.32320	0.16697	-0.21143	0.12586	0.31070	-0.51732	0.54056	0.32668	-0.03966	0.11577	0.21806
	0.8538	0.2814	0.5520	0.4681	0.6681	0.2415	0.0402	0.0306	0.2168	0.8841	0.6935	0.4539
	16	13	15	14	14	16	16	16	16	16	14	14
CORRCHLA	0.18276	0.53103	-0.06222	0.07275	0.20902	0.24280	-0.31614	0.53466	0.17517	0.24175	0.24062	0.32304
	0.4981	0.0619	0.8256	0.8048	0.4733	0.3649	0.2329	0.0329	0.5164	0.3670	0.4073	0.2599
	16	13	15	14	14	16	16	16	16	16	14	14
CHLC	0.44883	0.60111	-0.01636	-0.43494	0.15307	0.38782	-0.30120	0.44247	0.45685	-0.17735	-0.08027	0.00445
	0.0812	0.0298	0.9538	0.1201	0.6014	0.1377	0.2570	0.0861	0.0752	0.5111	0.7850	0.9879
	16	13	15	14	14	16	16	16	16	16	14	14
PHEO	-0.09131	-0.17103	0.12985	-0.35669	-0.19195	0.45944	-0.21502	0.42447	0.23708	-0.47553	0.14317	0.21562
	0.7366	0.5764	0.6446	0.2106	0.5109	0.0734	0.4239	0.1013	0.3767	0.0627	0.6253	0.4591
	16	13	15	14	14	16	16	16	16	16	14	14
TDS	0.74134	0.54035	0.49913	0.02467	-0.14080	0.66815	-0.24024	0.26087	0.18732	-0.25375	0.39845	0.40132
	0.0010	0.0697	0.0582	0.9333	0.6167	0.0047	0.3701	0.3291	0.4873	0.3430	0.1582	0.1550
	16	12	15	14	15	16	16	16	16	16	14	14
TURBID	-0.07143	-0.16552	-0.02855	-0.05868	-0.17226	0.40529	0.10766	0.26100	0.22614	-0.28194	0.16260	0.23486
	0.7782	0.5889	0.9134	0.8291	0.5235	0.0952	0.6707	0.2955	0.3669	0.2570	0.5474	0.3813
	18	13	17	16	16	18	18	18	18	18	16	16
DEPTH	-0.32575	-0.04138	-0.03286	-0.30089	0.39164	-0.86625	-0.20631	-0.21262	-0.33990	0.32317	-0.74815	-0.77786
	0.1871	0.8932	0.9004	0.2575	0.1336	0.0001	0.4114	0.3970	0.1676	0.1908	0.0009	0.0004
	18	13	17	16	16	18	18	18	18	18	16	16

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	KN	TKN	TP	FILTTP	HARD	CA	NA	K	CL	SO4	CD	CR
WATTEMP	0.56715	0.56715	0.35891	0.46219	0.68233	0.65048	0.12272	-0.25775	-0.00149	-0.01978	-0.57688	-0.12689
	0.0141	0.0141	0.1436	0.0535	0.0036	0.0035	0.6276	0.3018	0.9956	0.9379	0.0390	0.6523
	18	18	18	18	16	18	18	18	16	18	13	15
AIRTEMP	0.57379	0.31724	0.02235	0.22892	0.80755	0.53746	-0.09157	-0.62981	-0.31674	-0.07372	-0.36680	0.20092
	0.0403	0.2909	0.9422	0.4519	0.0015	0.0582	0.7661	0.0211	0.3158	0.8109	0.2971	0.5536
	13	13	13	13	12	13	13	13	12	13	10	11
CLOUD	0.59817	0.40497	0.08897	-0.08886	0.03226	0.67651	-0.16060	-0.25630	-0.01641	-0.12391	-0.30953	-0.28047
	0.0112	0.1068	0.7342	0.7345	0.9091	0.0029	0.5380	0.3207	0.9537	0.6356	0.3034	0.3314
	17	17	17	17	15	17	17	17	15	17	13	14
WIND	-0.03321	0.00633	-0.43219	-0.14845	0.00586	-0.21629	0.08875	0.07550	0.25631	-0.21283	0.31601	0.05132
	0.9028	0.9815	0.0946	0.5832	0.9835	0.4211	0.7438	0.7811	0.3764	0.4287	0.3170	0.8678
	16	16	16	16	15	16	16	16	14	16	12	13
COLOR	0.18949	-0.14042	-0.19684	-0.21354	0.14072	0.31705	0.20673	-0.32749	-0.26162	0.13270	0.30523	0.31497
	0.4821	0.6040	0.4650	0.4271	0.6313	0.2315	0.4424	0.2156	0.3663	0.6242	0.3614	0.2945
	16	16	16	16	14	16	16	16	14	16	11	13
COND	0.47592	0.72191	0.65901	0.41805	0.07671	0.27491	0.45656	0.53260	0.81996	0.28654	-0.51866	-0.37023
	0.0459	0.0007	0.0029	0.0843	0.7777	0.2696	0.0568	0.0229	0.0001	0.2490	0.0694	0.1743
	18	18	18	18	16	18	18	18	16	18	13	15
DO	-0.49483	-0.25413	-0.05738	0.21069	-0.13226	-0.65429	-0.06371	0.29547	0.13671	-0.16450	-0.01177	0.01208
	0.0368	0.3089	0.8211	0.4014	0.6254	0.0032	0.8017	0.2339	0.6137	0.5142	0.9696	0.9659
	18	18	18	18	16	18	18	18	16	18	13	15
BOD	0.18191	0.24755	0.19103	0.35096	0.16845	0.30694	0.00836	-0.00943	0.06097	-0.08021	-0.25607	0.23565
	0.4700	0.3220	0.4477	0.1533	0.5329	0.2154	0.9737	0.9704	0.8225	0.7517	0.3984	0.3978
	18	18	18	18	16	18	18	18	16	18	13	15
PH	0.04658	0.00621	0.33665	0.10169	0.23012	0.00109	0.40713	0.14174	0.36486	0.18101	-0.12526	-0.30238
	0.8544	0.9805	0.1719	0.6880	0.3912	0.9966	0.0936	0.5748	0.1647	0.4723	0.6835	0.2733
	18	18	18	18	16	18	18	18	16	18	13	15
ALK	-0.32922	-0.33082	-0.49311	-0.44297	0.27374	-0.29240	0.01344	-0.03291	-0.19055	-0.18118	0.57783	0.19547
	0.1822	0.1800	0.0376	0.0656	0.3049	0.2390	0.9578	0.8969	0.4796	0.4718	0.0386	0.4851
	18	18	18	18	16	18	18	18	16	18	13	15
NH3NH4	0.10022	0.36209	0.22866	0.19993	-0.04122	-0.21799	0.35487	0.52053	0.70348	-0.02079	-0.19170	-0.14871
	0.7119	0.1681	0.3943	0.4578	0.8840	0.4173	0.1774	0.0387	0.0050	0.9391	0.5723	0.6278
	16	16	16	16	15	16	16	16	14	16	11	13
NH3	0.17084	0.45984	0.30342	0.23990	0.02926	-0.16994	0.39318	0.57082	0.76533	0.04970	-0.22119	-0.20120
	0.5270	0.0731	0.2533	0.3708	0.9176	0.5292	0.1319	0.0209	0.0014	0.8550	0.5134	0.5098
	16	16	16	16	15	16	16	16	14	16	11	13

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	KN	TKN	TP	FILTTP	HARD	CA	NA	K	CL	SO4	CD	CR
KN	1.00000	0.67975	0.41943	0.20959	0.03908	0.76668	0.05327	0.12730	0.33880	0.10620	-0.35908	0.25377
	0.0	0.0019	0.0832	0.4039	0.8858	0.0002	0.8337	0.6147	0.1993	0.6749	0.2282	0.3614
	18	18	18	18	16	18	18	18	16	18	13	15
TKN	0.67975	1.00000	0.62914	0.49308	0.25550	0.61791	0.46008	0.28919	0.71548	0.23374	-0.70542	-0.24147
	0.0019	0.0	0.0052	0.0376	0.3395	0.0063	0.0547	0.2445	0.0018	0.3506	0.0071	0.3859
	18	18	18	18	16	18	18	18	16	18	13	15
TP	0.41943	0.62914	1.00000	0.78542	0.12351	0.48697	0.51582	0.09947	0.33658	0.45847	-0.88890	-0.31353
	0.0832	0.0052	0.0	0.0001	0.6486	0.0404	0.0284	0.6945	0.2024	0.0557	0.0001	0.2551
	18	18	18	18	16	18	18	18	16	18	13	15
FILTTP	0.20959	0.49308	0.78542	1.00000	0.40135	0.30033	0.28996	-0.14321	0.06899	0.27682	-0.87232	-0.02043
	0.4039	0.0376	0.0001	0.0	0.1234	0.2259	0.2431	0.5708	0.7996	0.2661	0.0001	0.9424
	18	18	18	18	16	18	18	18	16	18	13	15
HARD	0.03908	0.25550	0.12351	0.40135	1.00000	0.14176	0.08037	-0.44175	-0.03697	0.11196	-0.52866	-0.03538
	0.8858	0.3395	0.6486	0.1234	0.0	0.6005	0.7673	0.0867	0.8959	0.6797	0.0945	0.9086
	16	16	16	16	16	16	16	16	15	16	11	13
CA	0.76668	0.61791	0.48697	0.30033	0.14176	1.00000	0.20531	-0.15200	0.05575	0.09741	-0.50860	-0.05660
	0.0002	0.0063	0.0404	0.2259	0.6005	0.0	0.4138	0.5471	0.8375	0.7006	0.0759	0.8412
	18	18	18	18	16	18	18	18	16	18	13	15
NA	0.05327	0.46008	0.51582	0.28996	0.08037	0.20531	1.00000	0.25795	0.58788	0.47684	-0.42536	-0.55737
	0.8337	0.0547	0.0284	0.2431	0.7673	0.4138	0.0	0.3014	0.0166	0.0454	0.1473	0.0309
	18	18	18	18	16	18	18	18	16	18	13	15
K	0.12730	0.28919	0.09947	-0.14321	-0.44175	-0.15200	0.25795	1.00000	0.72215	-0.03115	0.07548	-0.15132
	0.6147	0.2445	0.6945	0.5708	0.0867	0.5471	0.3014	0.0	0.0016	0.9023	0.8064	0.5904
	18	18	18	18	16	18	18	18	16	18	13	15
CL	0.33880	0.71548	0.33658	0.06899	-0.03697	0.05575	0.58788	0.72215	1.00000	0.20361	-0.27051	-0.38479
	0.1993	0.0018	0.2024	0.7996	0.8959	0.8375	0.0166	0.0016	0.0	0.4494	0.4211	0.1942
	16	16	16	16	15	16	16	16	16	16	11	13
SO4	0.10620	0.23374	0.45847	0.27682	0.11196	0.09741	0.47684	-0.03115	0.20361	1.00000	-0.32693	-0.10097
	0.6749	0.3506	0.0557	0.2661	0.6797	0.7006	0.0454	0.9023	0.4494	0.0	0.2756	0.7203
	18	18	18	18	16	18	18	18	16	18	13	15
CD	-0.35908	-0.70542	-0.88890	-0.87232	-0.52866	-0.50860	-0.42536	0.07548	-0.27051	-0.32693	1.00000	0.28890
	0.2282	0.0071	0.0001	0.0001	0.0945	0.0759	0.1473	0.8064	0.4211	0.2756	0.0	0.3384
	13	13	13	13	11	13	13	13	11	13	13	13
CR	0.25377	-0.24147	-0.31353	-0.02043	-0.03538	-0.05660	-0.55737	-0.15132	-0.38479	-0.10097	0.28890	1.00000
	0.3614	0.3859	0.2551	0.9424	0.9086	0.8412	0.0309	0.5904	0.1942	0.7203	0.3384	0.0
	15	15	15	15	13	15	15	15	13	15	13	15

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	KN	TKN	TP	FILTTP	HARD	CA	NA	K	CL	SO4	CD	CR
CU	0.11550	-0.02137	-0.42220	-0.32548	-0.21620	-0.01447	-0.36318	0.41433	0.07150	-0.54482	0.44374	0.44070
	0.6819	0.9397	0.1170	0.2365	0.4781	0.9592	0.1833	0.1247	0.8164	0.0357	0.1288	0.1001
	15	15	15	15	13	15	15	15	13	15	13	15
FE	0.45655	0.41973	-0.27011	-0.20125	0.39678	0.53120	-0.13968	-0.12165	0.00000	-0.39808	0.00000	0.14871
	0.0755	0.1055	0.3116	0.4548	0.1281	0.0342	0.6059	0.6536	1.0000	0.1267	1.0000	0.6278
	16	16	16	16	16	16	16	16	15	16	11	13
NI	-0.51902	-0.58187	-0.63458	-0.25653	0.00000	-0.55941	-0.46847	-0.10212	-0.27048	-0.49636	0.59811	0.45023
	0.0572	0.0290	0.0148	0.3760	1.0000	0.0375	0.0911	0.7283	0.3952	0.0710	0.0400	0.1062
	14	14	14	14	12	14	14	14	12	14	12	14
ZN	0.04743	-0.16231	-0.16712	-0.45353	-0.43731	0.08919	0.13426	0.15928	-0.12969	-0.01646	0.49008	-0.00611
	0.8518	0.5199	0.5075	0.0587	0.0903	0.7249	0.5953	0.5279	0.6321	0.9483	0.0891	0.9827
	18	18	18	18	16	18	18	18	16	18	13	15
CHLA	0.52100	0.48637	0.07864	-0.18757	-0.00455	0.42891	0.09688	0.29212	0.43040	0.09986	0.04984	-0.04368
	0.0385	0.0561	0.7722	0.4867	0.9872	0.0974	0.7212	0.2723	0.1093	0.7129	0.8843	0.8873
	16	16	16	16	15	16	16	16	15	16	11	13
CORRCHLA	0.51142	0.44068	-0.12166	-0.08456	0.23730	0.25197	-0.06558	0.26529	0.32341	-0.10507	0.20434	0.41171
	0.0429	0.0876	0.6535	0.7555	0.3944	0.3465	0.8093	0.3207	0.2397	0.6986	0.5467	0.1622
	16	16	16	16	15	16	16	16	15	16	11	13
CHLC	0.56901	0.39022	0.62360	0.52004	0.46014	0.48824	0.18155	-0.18905	0.12215	0.35034	-0.52031	0.11976
	0.0214	0.1351	0.0098	0.0389	0.0844	0.0550	0.5010	0.4832	0.6645	0.1834	0.1008	0.6968
	16	16	16	16	15	16	16	16	15	16	11	13
PHEO	0.12739	0.42415	0.48333	0.12598	-0.29250	0.36150	0.41254	0.36488	0.41158	0.43487	-0.28972	-0.50737
	0.6382	0.1016	0.0579	0.6420	0.2901	0.1689	0.1123	0.1647	0.1274	0.0923	0.3875	0.0768
	16	16	16	16	15	16	16	16	15	16	11	13
TDS	0.66912	0.71186	0.50075	0.37912	0.29646	0.70308	0.21834	0.00898	0.44458	-0.25297	-0.55611	-0.20555
	0.0046	0.0020	0.0482	0.1476	0.3034	0.0024	0.4166	0.9737	0.1112	0.3445	0.0604	0.4808
	16	16	16	16	14	16	16	16	14	16	12	14
TURBID	0.17236	0.18220	0.14010	0.07295	0.08592	0.07454	-0.11984	0.14069	0.48063	-0.06782	-0.22695	-0.10886
	0.4940	0.4693	0.5793	0.7736	0.7517	0.7688	0.6358	0.5776	0.0595	0.7892	0.4559	0.6994
	18	18	18	18	16	18	18	18	16	18	13	15
DEPTH	-0.40434	-0.74922	-0.51595	-0.45715	-0.15804	-0.29025	-0.43442	-0.46989	-0.83782	-0.12194	0.60126	0.22981
	0.0961	0.0003	0.0284	0.0565	0.5588	0.2427	0.0716	0.0491	0.0001	0.6298	0.0297	0.4100
	18	18	18	18	16	18	18	18	16	18	13	15

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	CU	FE	NI	ZN	CHLA	CORRCHLA	CHLC	PHEO	TDS	TURBID	DEPTH
WATTEMP	-0.10695	0.51178	-0.42239	-0.33094	0.05011	0.18276	0.44883	-0.09131	0.74134	-0.07143	-0.32575
	0.7044	0.0427	0.1324	0.1798	0.8538	0.4981	0.0812	0.7366	0.0010	0.7782	0.1871
	15	16	14	18	16	16	16	16	16	18	18
AIRTEMP	0.07578	0.73462	-0.27758	-0.27102	0.32320	0.53103	0.60111	-0.17103	0.54035	-0.16552	-0.04138
	0.8247	0.0065	0.4374	0.3704	0.2814	0.0619	0.0298	0.5764	0.0697	0.5889	0.8932
	11	12	10	13	13	13	13	13	12	13	13
CLOUD	-0.18200	0.46440	-0.62988	-0.00381	0.16697	-0.06222	-0.01636	0.12985	0.49913	-0.02855	-0.03286
	0.5335	0.0812	0.0210	0.9884	0.5520	0.8256	0.9538	0.6446	0.0582	0.9134	0.9004
	14	15	13	17	15	15	15	15	15	17	17
WIND	0.20239	0.01911	0.46810	-0.30888	-0.21143	0.07275	-0.43494	-0.35669	0.02467	-0.05868	-0.30089
	0.5073	0.9461	0.1248	0.2444	0.4681	0.8048	0.1201	0.2106	0.9333	0.8291	0.2575
	13	15	12	16	14	14	14	14	14	16	16
COLOR	0.26671	0.38952	0.05142	0.54226	0.12586	0.20902	0.15307	-0.19195	-0.14080	-0.17226	0.39164
	0.3784	0.1686	0.8739	0.0300	0.6681	0.4733	0.6014	0.5109	0.6167	0.5235	0.1336
	13	14	12	16	14	14	14	14	15	16	16
COND	-0.15148	-0.10538	-0.37754	-0.35557	0.31070	0.24280	0.38782	0.45944	0.66815	0.40529	-0.86625
	0.5900	0.6977	0.1832	0.1476	0.2415	0.3649	0.1377	0.0734	0.0047	0.0952	0.0001
	15	16	14	18	16	16	16	16	16	18	18
DO	-0.05989	-0.66937	0.50245	-0.46110	-0.51732	-0.31614	-0.30120	-0.21502	-0.24024	0.10766	-0.20631
	0.8321	0.0046	0.0671	0.0541	0.0402	0.2329	0.2570	0.4239	0.3701	0.6707	0.4114
	15	16	14	18	16	16	16	16	16	18	18
BOD	0.54330	0.25866	-0.05798	-0.00685	0.54056	0.53466	0.44247	0.42447	0.26087	0.26100	-0.21262
	0.0363	0.3334	0.8439	0.9785	0.0306	0.0329	0.0861	0.1013	0.3291	0.2955	0.3970
	15	16	14	18	16	16	16	16	16	18	18
PH	-0.07065	-0.20560	-0.30816	-0.20859	0.32668	0.17517	0.45685	0.23708	0.18732	0.22614	-0.33990
	0.8024	0.4449	0.2838	0.4062	0.2168	0.5164	0.0752	0.3767	0.4873	0.3669	0.1676
	15	16	14	18	16	16	16	16	16	18	18
ALK	0.05821	0.36427	0.60634	0.23658	-0.03966	0.24175	-0.17735	-0.47553	-0.25375	-0.28194	0.32317
	0.8367	0.1654	0.0215	0.3446	0.8841	0.3670	0.5111	0.0627	0.3430	0.2570	0.1908
	15	16	14	18	16	16	16	16	16	18	18
NH3NH4	0.27486	-0.10663	0.01383	-0.55821	0.11577	0.24062	-0.08027	0.14317	0.39845	0.16260	-0.74815
	0.3634	0.7053	0.9660	0.0246	0.6935	0.4073	0.7850	0.6253	0.1582	0.5474	0.0009
	13	15	12	16	14	14	14	14	14	16	16

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	CU	FE	NI	ZN	CHLA	CORRCHLA	CHLC	PHEO	TDS	TURBID	DEPTH
NH3	0.24643	-0.04741	-0.13373	-0.52481	0.21806	0.32304	0.00445	0.21562	0.40132	0.23486	-0.77786
	0.4170	0.8668	0.6786	0.0369	0.4539	0.2599	0.9879	0.4591	0.1550	0.3813	0.0004
	13	15	12	16	14	14	14	14	14	16	16
KN	0.11550	0.45655	-0.51902	0.04743	0.52100	0.51142	0.56901	0.12739	0.66912	0.17236	-0.40434
	0.6819	0.0755	0.0572	0.8518	0.0385	0.0429	0.0214	0.6382	0.0046	0.4940	0.0961
	15	16	14	18	16	16	16	16	16	18	18
TKN	-0.02137	0.41973	-0.58187	-0.16231	0.48637	0.44068	0.39022	0.42415	0.71186	0.18220	-0.74922
	0.9397	0.1055	0.0290	0.5199	0.0561	0.0876	0.1351	0.1016	0.0020	0.4693	0.0003
	15	16	14	18	16	16	16	16	16	18	18
TP	-0.42220	-0.27011	-0.63458	-0.16712	0.07864	-0.12166	0.62360	0.48333	0.50075	0.14010	-0.51595
	0.1170	0.3116	0.0148	0.5075	0.7722	0.6535	0.0098	0.0579	0.0482	0.5793	0.0284
	15	16	14	18	16	16	16	16	16	18	18
FILTTP	-0.32548	-0.20125	-0.25653	-0.45353	-0.18757	-0.08456	0.52004	0.12598	0.37912	0.07295	-0.45715
	0.2365	0.4548	0.3760	0.0587	0.4867	0.7555	0.0389	0.6420	0.1476	0.7736	0.0565
	15	16	14	18	16	16	16	16	16	18	18
HARD	-0.21620	0.39678	0.00000	-0.43731	-0.00455	0.23730	0.46014	-0.29250	0.29646	0.08592	-0.15804
	0.4781	0.1281	1.0000	0.0903	0.9872	0.3944	0.0844	0.2901	0.3034	0.7517	0.5588
	13	16	12	16	15	15	15	15	14	16	16
CA	-0.01447	0.53120	-0.55941	0.08919	0.42891	0.25197	0.48824	0.36150	0.70308	0.07454	-0.29025
	0.9592	0.0342	0.0375	0.7249	0.0974	0.3465	0.0550	0.1689	0.0024	0.7688	0.2427
	15	16	14	18	16	16	16	16	16	18	18
NA	-0.36318	-0.13968	-0.46847	0.13426	0.09688	-0.06558	0.18155	0.41254	0.21834	-0.11984	-0.43442
	0.1833	0.6059	0.0911	0.5953	0.7212	0.8093	0.5010	0.1123	0.4166	0.6358	0.0716
	15	16	14	18	16	16	16	16	16	18	18
K	0.41433	-0.12165	-0.10212	0.15928	0.29212	0.26529	-0.18905	0.36488	0.00898	0.14069	-0.46989
	0.1247	0.6536	0.7283	0.5279	0.2723	0.3207	0.4832	0.1647	0.9737	0.5776	0.0491
	15	16	14	18	16	16	16	16	16	18	18
CL	0.07150	0.00000	-0.27048	-0.12969	0.43040	0.32341	0.12215	0.41158	0.44458	0.48063	-0.83782
	0.8164	1.0000	0.3952	0.6321	0.1093	0.2397	0.6645	0.1274	0.1112	0.0595	0.0001
	13	15	12	16	15	15	15	15	14	16	16
SO4	-0.54482	-0.39808	-0.49636	-0.01646	0.09986	-0.10507	0.35034	0.43487	-0.25297	-0.06782	-0.12194
	0.0357	0.1267	0.0710	0.9483	0.7129	0.6986	0.1834	0.0923	0.3445	0.7892	0.6298
	15	16	14	18	16	16	16	16	16	18	18
CD	0.44374	0.00000	0.59811	0.49008	0.04984	0.20434	-0.52031	-0.28972	-0.55611	-0.22695	0.60126
	0.1288	1.0000	0.0400	0.0891	0.8843	0.5467	0.1008	0.3875	0.0604	0.4559	0.0297
	13	11	12	13	11	11	11	11	12	13	13

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	CU	FE	NI	ZN	CHLA	CORRCHLA	CHLC	PHEO	TDS	TURBID	DEPTH
CR	0.44070	0.14871	0.45023	-0.00611	-0.04368	0.41171	0.11976	-0.50737	-0.20555	-0.10886	0.22981
	0.1001	0.6278	0.1062	0.9827	0.8873	0.1622	0.6968	0.0768	0.4808	0.6994	0.4100
	15	13	14	15	13	13	13	13	14	15	15
CU	1.00000	0.52862	0.36159	0.06818	0.48082	0.73165	-0.22876	0.09091	0.03309	0.10276	-0.07279
	0.0	0.0633	0.2040	0.8092	0.0963	0.0045	0.4522	0.7677	0.9106	0.7155	0.7966
	15	13	14	15	13	13	13	13	14	15	15
FE	0.52862	1.00000	0.05923	0.14234	0.46553	0.65443	0.03971	-0.20215	0.44493	-0.02954	-0.04720
	0.0633	0.0	0.8549	0.5990	0.0803	0.0081	0.8883	0.4700	0.1109	0.9135	0.8622
	13	16	12	16	15	15	15	15	14	16	16
NI	0.36159	0.05923	1.00000	-0.13633	-0.45895	0.08751	-0.46301	-0.61607	-0.28580	0.18517	0.19899
	0.2040	0.8549	0.0	0.6421	0.1334	0.7868	0.1296	0.0329	0.3438	0.5262	0.4952
	14	12	14	14	12	12	12	12	13	14	14
ZN	0.06818	0.14234	-0.13633	1.00000	0.08697	-0.06298	-0.10416	0.04945	-0.38908	-0.29836	0.50800
	0.8092	0.5990	0.6421	0.0	0.7488	0.8168	0.7011	0.8557	0.1363	0.2291	0.0314
	15	16	14	18	16	16	16	16	16	18	18
CHLA	0.48082	0.46553	-0.45895	0.08697	1.00000	0.82080	0.35933	0.54753	0.53032	0.46972	-0.32694
	0.0963	0.0803	0.1334	0.7488	0.0	0.0001	0.1717	0.0281	0.0511	0.0664	0.2165
	13	15	12	16	16	16	16	16	14	16	16
CORRCHLA	0.73165	0.65443	0.08751	-0.06298	0.82080	1.00000	0.32443	0.11275	0.50276	0.30133	-0.30185
	0.0045	0.0081	0.7868	0.8168	0.0001	0.0	0.2202	0.6776	0.0669	0.2567	0.2559
	13	15	12	16	16	16	16	16	14	16	16
CHLC	-0.22876	0.03971	-0.46301	-0.10416	0.35933	0.32443	1.00000	0.15876	0.58401	0.38514	-0.19020
	0.4522	0.8883	0.1296	0.7011	0.1717	0.2202	0.0	0.5570	0.0283	0.1407	0.4805
	13	15	12	16	16	16	16	16	14	16	16
PHEO	0.09091	-0.20215	-0.61607	0.04945	0.54753	0.11275	0.15876	1.00000	0.27974	0.43247	-0.43068
	0.7677	0.4700	0.0329	0.8557	0.0281	0.6776	0.5570	0.0	0.3327	0.0943	0.0958
	13	15	12	16	16	16	16	16	14	16	16
TDS	0.03309	0.44493	-0.28580	-0.38908	0.53032	0.50276	0.58401	0.27974	1.00000	0.33407	-0.66224
	0.9106	0.1109	0.3438	0.1363	0.0511	0.0669	0.0283	0.3327	0.0	0.2060	0.0052
	14	14	13	16	14	14	14	14	16	16	16
TURBID	0.10276	-0.02954	0.18517	-0.29836	0.46972	0.30133	0.38514	0.43247	0.33407	1.00000	-0.44041
	0.7155	0.9135	0.5262	0.2291	0.0664	0.2567	0.1407	0.0943	0.2060	0.0	0.0674
	15	16	14	18	16	16	16	16	16	18	18
DEPTH	-0.07279	-0.04720	0.19899	0.50800	-0.32694	-0.30185	-0.19020	-0.43068	-0.66224	-0.44041	1.00000
	0.7966	0.8622	0.4952	0.0314	0.2165	0.2559	0.4805	0.0958	0.0052	0.0674	0.0
	15	16	14	18	16	16	16	16	16	18	18

Appendix 2 (continued).

Spearman rank correlations of hydrologic and water quality parameters from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

WATTEMP = water temperature
AIRTEMP = air temperature
CLOUD = cloud cover
WIND = wind velocity
COLOR = water color
COND = conductivity
DO = dissolved oxygen
BOD = biological oxygen demand
PH = pH
ALK = total alkalinity
NH3NH4 = ammonia + ammonium-nitrogen
NH3 = ammonia-nitrogen
KN = Kjeldahl nitrogen
TKN = total Kjeldahl nitrogen
TP = total phosphorus
FILTTP = filtered total phosphorus
HARD = hardness
CA = calcium
NA = sodium
K = potassium
CL = chloride
SO4 = sulfate
CD = cadmium
CR = chromium
CU = copper
FE = iron
NI = nickel
ZN = zinc
CHLA = chlorophyll a uncorrected for pheophytin
CORRCHLA = chlorophyll a corrected for pheophytin
CHLC = chlorophyll c
PHEO = pheophytin
TDS = total dissolved solids
TURBID = turbidity
DEPTH = water depth

Appendix 3.

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C	
88 6 22	ciliate - unidentified spp.	PROT	646.7	1487.7	452.3	0.0	2	1	0	
88 6 22	Vorticella sp.	PROT	1152.6	743.8	2714.0	0.0	1	6	0	VOL CONC 20.2 12.3 6.2
88 6 22	Ascomorpha sp.	ROTI	301.6	0.0	904.7	0.0	0	2	0	VOL EXAM 1 1 1
88 6 22	bdelloidea - unidentified spp.	ROTI	1519.6	2975.3	1357.0	226.4	4	3	1	
88 6 22	Conochilius sp.	ROTI	495.9	1487.7	0.0	0.0	2	0	0	
88 6 22	Dicranophorus forcipatus	ROTI	247.9	743.8	0.0	0.0	1	0	0	
88 6 22	Dicranophorus sp.	ROTI	323.4	743.8	0.0	226.4	1	0	1	
88 6 22	Euchlanis triquetra	ROTI	474.2	743.8	452.3	226.4	1	1	1	
88 6 22	Keratella cochlearis	ROTI	247.9	743.8	0.0	0.0	1	0	0	
88 6 22	Monostyla lunaris	ROTI	150.8	0.0	452.3	0.0	0	1	0	
88 6 22	Monostyla sp. 1	ROTI	549.5	743.8	904.7	0.0	1	2	0	
88 6 22	rotifer - unidentified spp.	ROTI	1551.5	1487.7	2714.0	452.7	2	6	2	
88 6 22	Trichocerca spp.	ROTI	301.7	0.0	452.3	452.7	0	1	2	
88 6 22	Acantholeberis curvirostris	CLAD	4871.8	6694.5	1809.3	6111.5	9	4	27	
88 6 22	Alona quadrangularis	CLAD	1045.4	2231.5	904.7	0.0	3	2	0	
88 6 22	Alona rustica	CLAD	603.4	0.0	904.7	905.4	0	2	4	
88 6 22	Alona sp.	CLAD	743.8	2231.5	0.0	0.0	3	0	0	
88 6 22	Ceriodaphnia spp.	CLAD	75.5	0.0	0.0	226.4	0	0	1	
88 6 22	Chydorus faviformis	CLAD	5937.1	4463.0	8142.1	5206.1	6	18	23	
88 6 22	Chydorus piger	CLAD	3147.0	4463.0	2261.7	2716.2	6	5	12	
88 6 22	Chydorus sp.	CLAD	549.6	743.8	452.3	452.7	1	1	2	
88 6 22	Diaphanosoma brachyurum	CLAD	75.5	0.0	0.0	226.4	0	0	1	
88 6 22	Drepanothrix dentata	CLAD	873.1	1487.7	0.0	1131.8	2	0	5	
88 6 22	Eubosmina tubicen	CLAD	678.7	0.0	1357.0	679.1	0	3	3	
88 6 22	Graptoleberis testudinaria	CLAD	150.8	0.0	452.3	0.0	0	1	0	
88 6 22	Ilyocryptus spinifer	CLAD	398.7	743.8	452.3	0.0	1	1	0	
88 6 22	Simocephalus serrulatus	CLAD	150.8	0.0	452.3	0.0	0	1	0	
88 6 22	Streblocercus pygmaeus	CLAD	603.1	0.0	1809.3	0.0	0	4	0	
88 6 22	Eucyclops agilis	COPE	75.5	0.0	0.0	226.4	0	0	1	
88 6 22	Macrocyclops albidus	COPE	549.5	743.8	904.7	0.0	1	2	0	
88 6 22	Microcyclops varicans rubellus	COPE	4115.9	1487.7	5880.4	4979.8	2	13	22	
88 6 22	Tropocyclops prasinus	COPE	452.5	0.0	904.7	452.7	0	2	2	
88 6 22	copepod nauplius larvae	COPE	1422.4	2231.5	1809.3	226.4	3	4	1	
88 6 22	cyclopoid copepodid	COPE	7520.7	4463.0	11308.4	6790.6	6	25	30	
88 6 22	Annelida	ANNE	3717.9	5950.7	3618.7	1584.5	8	8	7	
88 6 22	*Hydracarina*	HYDR	150.8	0.0	452.3	0.0	0	1	0	
88 6 22	Nematoda	NEMA	549.5	743.8	904.7	0.0	1	2	0	
			47219.5				70	124	148	<=== COUNT TOTALS

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date					Mean	Calculated Densities			Raw Counts			
YY	MM	DD	Taxa Name and Taxonomic Group		Density	REP A	REP B	REP C	REP A	REP B	REP C	
					#/m²	#/m²	#/m²	#/m²				
88	7	21	Arcella sp.	PROT	63.6	0.0	190.7	0.0	0	1	0	
88	7	21	ciliate - unidentified spp.	PROT	92.4	277.1	0.0	0.0	1	0	0	
88	7	21	Difflugia sp.	PROT	113.9	0.0	190.7	150.9	0	1	1	
88	7	21	Dicranophorus sp.	ROTI	219.5	277.1	381.3	0.0	1	2	0	
88	7	21	Lecane inopinata	ROTI	92.4	277.1	0.0	0.0	1	0	0	
88	7	21	Lecane signifera	ROTI	92.4	277.1	0.0	0.0	1	0	0	
88	7	21	Lepadella cristata	ROTI	63.6	0.0	190.7	0.0	0	1	0	
88	7	21	Lepadella ovalis	ROTI	50.3	0.0	0.0	150.9	0	0	1	
88	7	21	Monostyla sp. 1	ROTI	248.3	554.3	190.7	0.0	2	1	0	
88	7	21	rotifer - unidentified spp.	ROTI	357.1	277.1	190.7	603.6	1	1	4	
88	7	21	rotifera unidentified sp. 1	ROTI	142.7	277.1	0.0	150.9	1	0	1	
88	7	21	Trichocerca porcellus	ROTI	63.6	0.0	190.7	0.0	0	1	0	
88	7	21	Trichocerca spp.	ROTI	100.6	0.0	0.0	301.8	0	0	2	
88	7	21	Acantholeberis curvirostris	CLAD	556.0	0.0	762.6	905.4	0	4	6	
88	7	21	Alona sp.	CLAD	50.3	0.0	0.0	150.9	0	0	1	
88	7	21	Ceriodaphnia spp.	CLAD	1299.6	277.1	0.0	3621.6	1	0	24	
88	7	21	Chydorus faviformis	CLAD	744.0	0.0	572.0	1659.9	0	3	11	
88	7	21	Chydorus piger	CLAD	1750.2	0.0	4194.3	1056.3	0	22	7	
88	7	21	Diaphanosoma brachyurum	CLAD	714.3	554.3	381.3	1207.2	2	2	8	
88	7	21	Eubosmina tubicen	CLAD	92.4	277.1	0.0	0.0	1	0	0	
88	7	21	Grimaldina brazzai	CLAD	714.3	554.3	381.3	1207.2	2	2	8	
88	7	21	Ilyocryptus spinifer	CLAD	63.6	0.0	190.7	0.0	0	1	0	
88	7	21	Latonopsis occidentalis	CLAD	177.4	0.0	381.3	150.9	0	2	1	
88	7	21	Streblocercus pygmaeus	CLAD	362.2	554.3	381.3	150.9	2	2	1	
88	7	21	Diaptomus sp.	COPE	92.4	277.1	0.0	0.0	1	0	0	
88	7	21	Eucyclops agilis	COPE	100.6	0.0	0.0	301.8	0	0	2	
88	7	21	Macrocyclops albidus	COPE	100.6	0.0	0.0	301.8	0	0	2	
88	7	21	Mesocyclops leukarti	COPE	264.8	0.0	190.7	603.6	0	1	4	
88	7	21	Microcyclops varicans rubellus	COPE	883.4	831.4	762.6	1056.3	3	4	7	
88	7	21	Tropocyclops prasinus	COPE	1771.6	2217.2	381.3	2716.2	8	2	18	
88	7	21	copepod nauplius larvae	COPE	749.0	277.1	762.6	1207.2	1	4	8	
88	7	21	cyclopoid copepodid	COPE	1759.5	1108.6	1906.5	2263.5	4	10	15	
88	7	21	cyclopoid unidentified male	COPE	63.6	0.0	190.7	0.0	0	1	0	
88	7	21	Annelida	ANNE	214.5	0.0	190.7	452.7	0	1	3	
88	7	21	Hydracarina	HYDR	214.5	0.0	190.7	452.7	0	1	3	
88	7	21	Nematoda	NEMA	235.1	554.3	0.0	150.9	2	0	1	
88	7	21	Ostracoda - unidentified spp.	OSTR	818.1	0.0	190.7	2263.5	0	1	15	
					15491.7				35	71	154	<=== COUNT TOTALS

	A	B	C
VOL CONC	7.5	10.4	12.3
VOL EXAM	1	2	3

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date					Mean	Calculated Densities			Raw Counts			
YY	MM	DD	Taxa Name and Taxonomic Group		Density	REP A	REP B	REP C	REP A	REP B	REP C	
					#/m²	#/m²	#/m²	#/m²				
88	8	23	Acanthocystis spp.	PROT	606.7	1036.1	784.0	0.0	1	1	0	
88	8	23	Chilophrya sp.	PROT	264.8	0.0	0.0	794.3	0	0	1	
88	8	23	Difflugia sp.	PROT	606.7	1036.1	784.0	0.0	1	1	0	
88	8	23	Lesquereusia sp.	PROT	345.4	1036.1	0.0	0.0	1	0	0	
88	8	23	Vorticella sp.	PROT	261.3	0.0	784.0	0.0	0	1	0	
88	8	23	bdelloidea - unidentified spp.	ROTI	345.4	1036.1	0.0	0.0	1	0	0	
88	8	23	Habrotrocha sp.	ROTI	345.4	1036.1	0.0	0.0	1	0	0	
88	8	23	Lecane inopinata	ROTI	1136.2	1036.1	784.0	1588.5	1	1	2	
88	8	23	Lecane sp. 1	ROTI	526.1	0.0	784.0	794.3	0	1	1	
88	8	23	Lepadella spp.	ROTI	345.4	1036.1	0.0	0.0	1	0	0	
88	8	23	Macrochaetus longipes	ROTI	264.8	0.0	0.0	794.3	0	0	1	
88	8	23	Monostyla sp. 1	ROTI	264.8	0.0	0.0	794.3	0	0	1	
88	8	23	rotifera unidentified sp. 1	ROTI	345.4	1036.1	0.0	0.0	1	0	0	
88	8	23	Trichocerca porcellus	ROTI	345.4	1036.1	0.0	0.0	1	0	0	
88	8	23	Trichocerca spp.	ROTI	261.3	0.0	784.0	0.0	0	1	0	
88	8	23	Acantholeberis curvirostris	CLAD	345.4	1036.1	0.0	0.0	1	0	0	
88	8	23	Chydorus piger	CLAD	1739.4	2072.1	2351.9	794.3	2	3	1	
88	8	23	Grimaldina brazzai	CLAD	345.4	1036.1	0.0	0.0	1	0	0	
88	8	23	Streblocercus pygmaeus	CLAD	868.0	1036.1	1567.9	0.0	1	2	0	
88	8	23	Macrocyclops albidus	COPE	264.8	0.0	0.0	794.3	0	0	1	
88	8	23	Paracyclops affinis	COPE	871.4	1036.1	784.0	794.3	1	1	1	
88	8	23	Tropocyclops prasinus	COPE	1297.4	3108.2	784.0	0.0	3	1	0	
88	8	23	copepod nauplius larvae	COPE	606.7	1036.1	784.0	0.0	1	1	0	
88	8	23	Annelida	ANNE	610.1	1036.1	0.0	794.3	1	0	1	
88	8	23	Hydracarina	HYDR	264.8	0.0	0.0	794.3	0	0	1	
88	8	23	Gastrotricha	GAST	871.4	1036.1	784.0	794.3	1	1	1	
88	8	23	Ostracoda - unidentified spp.	OSTR	345.4	1036.1	0.0	0.0	1	0	0	
					14694.6				22	15	12	<=== COUNT TOTALS

	A	B	C
VOL CONC	28.2	21.3	21.6
VOL EXAM	1	1	1

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
88 9 23	ciliate - unidentified spp.	PROT	572.5	1601.8	115.8	0.0	4	1	0
88 9 23	Difflugia sp.	PROT	231.4	400.4	0.0	293.9	1	0	1
88 9 23	suctorian ciliate - unidentified spp.	PROT	38.6	0.0	115.8	0.0	0	1	0
88 9 23	bdelloidea - unidentified spp.	ROTI	1175.1	2002.2	347.5	1175.6	5	3	4
88 9 23	Cephalodella mucronata	ROTI	462.9	800.9	0.0	587.8	2	0	2
88 9 23	Cephalodella spp.	ROTI	133.5	400.4	0.0	0.0	1	0	0
88 9 23	Dicranophorus forcipatus	ROTI	364.9	800.9	0.0	293.9	2	0	1
88 9 23	Dicranophorus sp.	ROTI	1083.3	1201.3	579.2	1469.5	3	5	5
88 9 23	Euchlanis triquetra	ROTI	98.0	0.0	0.0	293.9	0	0	1
88 9 23	Lecane inopinata	ROTI	3512.2	10011.0	231.7	293.9	25	2	1
88 9 23	Lecane leontina	ROTI	133.5	400.4	0.0	0.0	1	0	0
88 9 23	Lecane signifera	ROTI	533.9	1601.8	0.0	0.0	4	0	0
88 9 23	Lecane sp. 1	ROTI	706.0	2002.2	115.8	0.0	5	1	0
88 9 23	Lepadella cristata	ROTI	98.0	0.0	0.0	293.9	0	0	1
88 9 23	Macrochaetus longipes	ROTI	231.4	400.4	0.0	293.9	1	0	1
88 9 23	Monommata spp.	ROTI	1097.9	2002.2	115.8	1175.6	5	1	4
88 9 23	Monostyla crenata	ROTI	133.5	400.4	0.0	0.0	1	0	0
88 9 23	Monostyla lunaris	ROTI	1495.9	1201.3	347.5	2938.9	3	3	10
88 9 23	Monostyla sp. 1	ROTI	800.9	2402.6	0.0	0.0	6	0	0
88 9 23	Notommata sp.	ROTI	77.2	0.0	231.7	0.0	0	2	0
88 9 23	Octotrocha speciosa	ROTI	98.0	0.0	0.0	293.9	0	0	1
88 9 23	rotifer - unidentified spp.	ROTI	1495.2	3604.0	0.0	881.7	9	0	3
88 9 23	Scaridium longicaudum	ROTI	133.5	400.4	0.0	0.0	1	0	0
88 9 23	Trichotria tetractis	ROTI	98.0	0.0	0.0	293.9	0	0	1
88 9 23	Acantholeberis curvirostris	CLAD	234.5	0.0	115.8	587.8	0	1	2
88 9 23	Alona rustica	CLAD	38.6	0.0	115.8	0.0	0	1	0
88 9 23	Chydorus piger	CLAD	38.6	0.0	115.8	0.0	0	1	0
88 9 23	Ilyocryptus sordidus	CLAD	98.0	0.0	0.0	293.9	0	0	1
88 9 23	Ilyocryptus spinifer	CLAD	133.5	400.4	0.0	0.0	1	0	0
88 9 23	Simocephalus serrulatus	CLAD	305.6	800.9	115.8	0.0	2	1	0
88 9 23	Streblocercus pygmaeus	CLAD	115.8	0.0	347.5	0.0	0	3	0
88 9 23	Microcyclops varicans rubellus	COPE	38.6	0.0	115.8	0.0	0	1	0
88 9 23	Paracyclops affinis	COPE	115.8	0.0	347.5	0.0	0	3	0
88 9 23	Tropocyclops prasinus	COPE	1540.3	2402.6	1042.6	1175.6	6	9	4
88 9 23	copepod nauplius larvae	COPE	1094.8	2402.6	0.0	881.7	6	0	3
88 9 23	cyclopoid copepodid	COPE	2789.5	4805.3	1506.0	2057.2	12	13	7
88 9 23	Annelida	ANNE	961.3	2002.2	0.0	881.7	5	0	3
88 9 23	Hydracarina	HYDR	136.6	0.0	115.8	293.9	0	1	1
88 9 23	Nematoda	NEMA	994.0	2402.6	579.2	0.0	6	5	0
88 9 23	Gastrotricha	GAST	231.4	400.4	0.0	293.9	1	0	1
88 9 23	Ostracoda - unidentified spp.	OSTR	136.6	0.0	115.8	293.9	0	1	1
			23808.8				118	59	59 <=== COUNT TOTALS

	A	B	C
VOL CONC	10.9	12.6	16.0
VOL EXAM	1	4	2

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
88 10 21	Arcella sp.	PROT	76.7	0.0	230.0	0.0	0	1	0
88 10 21	Difflugia sp.	PROT	54.1	0.0	0.0	162.2	0	0	1
88 10 21	Lesquereusia sp.	PROT	294.4	491.0	230.0	162.2	2	1	1
88 10 21	suctorian ciliate - unidentified spp.	PROT	76.7	0.0	230.0	0.0	0	1	0
88 10 21	Vaginicola sp.	PROT	54.1	0.0	0.0	162.2	0	0	1
88 10 21	Vorticella sp.	PROT	76.7	0.0	230.0	0.0	0	1	0
88 10 21	bdelloidea - unidentified spp.	ROTI	675.8	1472.9	230.0	324.4	6	1	2
88 10 21	Cephalodella mucronata	ROTI	315.5	0.0	460.1	486.6	0	2	3
88 10 21	Cephalodella spp.	ROTI	726.7	245.5	1610.2	324.4	1	7	2
88 10 21	Colurella spp.	ROTI	163.7	491.0	0.0	0.0	2	0	0
88 10 21	Dicranophorus forcipatus	ROTI	327.3	982.0	0.0	0.0	4	0	0
88 10 21	Dicranophorus sp.	ROTI	135.9	245.5	0.0	162.2	1	0	1
88 10 21	Euchlanis triquetra	ROTI	212.6	245.5	230.0	162.2	1	1	1
88 10 21	Lecane inopinata	ROTI	678.0	736.5	0.0	1297.5	3	0	8
88 10 21	Lecane signifera	ROTI	190.0	245.5	0.0	324.4	1	0	2
88 10 21	Lecane sp. 1	ROTI	463.2	1227.5	0.0	162.2	5	0	1
88 10 21	Lepadella cristata	ROTI	163.7	491.0	0.0	0.0	2	0	0
88 10 21	Lepadella spp.	ROTI	76.7	0.0	230.0	0.0	0	1	0
88 10 21	Monommata spp.	ROTI	682.9	736.5	1150.2	162.2	3	5	1
88 10 21	Monostyla crenata	ROTI	163.7	491.0	0.0	0.0	2	0	0
88 10 21	Monostyla lunaris	ROTI	54.1	0.0	0.0	162.2	0	0	1
88 10 21	Monostyla sp. 3	ROTI	217.7	491.0	0.0	162.2	2	0	1
88 10 21	Polyarthra sp.	ROTI	327.3	982.0	0.0	0.0	4	0	0
88 10 21	rotifer - unidentified spp.	ROTI	322.2	736.5	230.0	0.0	3	1	0
88 10 21	rotifera unidentified sp. 1	ROTI	81.8	245.5	0.0	0.0	1	0	0
88 10 21	rotifera unidentified sp. 3	ROTI	536.7	0.0	1610.2	0.0	0	7	0
88 10 21	Testudinella parva	ROTI	81.8	245.5	0.0	0.0	1	0	0
88 10 21	Trichocerca porcellus	ROTI	299.6	736.5	0.0	162.2	3	0	1
88 10 21	Trichocerca spp.	ROTI	881.7	982.0	690.1	973.1	4	3	6
88 10 21	Trichotria tetractis	ROTI	217.7	491.0	0.0	162.2	2	0	1
88 10 21	Acantholeberis curvirostris	CLAD	158.5	245.5	230.0	0.0	1	1	0
88 10 21	Alona rustica	CLAD	690.1	0.0	2070.3	0.0	0	9	0
88 10 21	Ceriodaphnia spp.	CLAD	212.6	245.5	230.0	162.2	1	1	1
88 10 21	Chydorus piger	CLAD	184.8	0.0	230.0	324.4	0	1	2
88 10 21	Eubosmina tubicen	CLAD	698.9	0.0	1610.2	486.6	0	7	3
88 10 21	Ilyocryptus spinifer	CLAD	153.4	0.0	460.1	0.0	0	2	0
88 10 21	Polyphemus pediculus	CLAD	54.1	0.0	0.0	162.2	0	0	1
88 10 21	Simocephalus serrulatus	CLAD	245.5	736.5	0.0	0.0	3	0	0
88 10 21	Streblocercus pygmaeus	CLAD	388.5	245.5	920.1	0.0	1	4	0
88 10 21	Microcyclops varicans rubellus	COPE	76.7	0.0	230.0	0.0	0	1	0
88 10 21	Paracyclops affinis	COPE	153.4	0.0	460.1	0.0	0	2	0

	A	B	C
VOL CONC	13.3	18.8	13.2
VOL EXAM	2	3	3

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date			Mean	Calculated Densities			Raw Counts			
YY MM DD	Taxa Name and Taxonomic Group		Density #/m²	REP A #/m²	REP B #/m²	REP C #/m²	REP A	REP B	REP C	
88 10 21	Tropocyclops prasinus	COPE	848.6	245.5	2300.3	0.0	1	10	0	
88 10 21	copepod nauplius larvae	COPE	3863.5	8346.7	0.0	3243.8	34	0	20	
88 10 21	cyclopoid copepodid	COPE	1090.1	2945.9	0.0	324.4	12	0	2	
88 10 21	cyclopoid unidentified male	COPE	158.5	245.5	230.0	0.0	1	1	0	
88 10 21	Nematoda	NEMA	238.9	0.0	230.0	486.6	0	1	3	
			17844.8				107	72	66	<=== COUNT TOTALS

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
88 11 30	Amoebida	PROT	99.7	0.0	0.0	299.2	0	0	1
88 11 30	Arcella sp.	PROT	45.7	0.0	137.1	0.0	0	1	0
88 11 30	ciliate - unidentified spp.	PROT	122.9	231.5	137.1	0.0	1	1	0
88 11 30	Difflugia sp.	PROT	390.6	0.0	274.2	897.7	0	2	3
88 11 30	Epistylis spp.	PROT	99.7	0.0	0.0	299.2	0	0	1
88 11 30	Lesquereusia sp.	PROT	887.4	231.5	1233.9	1196.9	1	9	4
88 11 30	Testacida	PROT	99.7	0.0	0.0	299.2	0	0	1
88 11 30	Vorticella sp.	PROT	45.7	0.0	137.1	0.0	0	1	0
88 11 30	Zoothamniun sp.	PROT	145.4	0.0	137.1	299.2	0	1	1
88 11 30	bdelloidea - unidentified spp.	ROTI	222.6	231.5	137.1	299.2	1	1	1
88 11 30	Cephalodella mucronata	ROTI	99.7	0.0	0.0	299.2	0	0	1
88 11 30	Cephalodella spp.	ROTI	314.0	231.5	411.3	299.2	1	3	1
88 11 30	Keratella spp.	ROTI	299.2	0.0	0.0	897.7	0	0	3
88 11 30	Lecane inopinata	ROTI	328.2	0.0	685.5	299.2	0	5	1
88 11 30	Lecane signifera	ROTI	282.5	0.0	548.4	299.2	0	4	1
88 11 30	Lecane sp. 1	ROTI	344.9	0.0	137.1	897.7	0	1	3
88 11 30	Lepadella cristata	ROTI	45.7	0.0	137.1	0.0	0	1	0
88 11 30	Monommata spp.	ROTI	91.4	0.0	274.2	0.0	0	2	0
88 11 30	Monostyla crenata	ROTI	45.7	0.0	137.1	0.0	0	1	0
88 11 30	rotifer - unidentified spp.	ROTI	145.4	0.0	137.1	299.2	0	1	1
88 11 30	rotifera unidentified sp. 1	ROTI	236.8	0.0	411.3	299.2	0	3	1
88 11 30	rotifera unidentified sp. 3	ROTI	77.2	231.5	0.0	0.0	1	0	0
88 11 30	rotifera unidentified sp. 4	ROTI	122.9	231.5	137.1	0.0	1	1	0
88 11 30	Squatinella sp.	ROTI	45.7	0.0	137.1	0.0	0	1	0
88 11 30	Trichocerca spp.	ROTI	245.2	0.0	137.1	598.5	0	1	2
88 11 30	Trichotria sp.	ROTI	145.4	0.0	137.1	299.2	0	1	1
88 11 30	Acantholeberis curvirostris	CLAD	145.4	0.0	137.1	299.2	0	1	1
88 11 30	Alona rustica	CLAD	397.1	231.5	959.7	0.0	1	7	0
88 11 30	Biapertura affinis	CLAD	91.4	0.0	274.2	0.0	0	2	0
88 11 30	Camptocercus rectirostris	CLAD	77.2	231.5	0.0	0.0	1	0	0
88 11 30	Ceriodaphnia spp.	CLAD	322.4	231.5	137.1	598.5	1	1	2
88 11 30	Chydorus piger	CLAD	182.8	0.0	548.4	0.0	0	4	0
88 11 30	Diaphanosoma brachyurum	CLAD	45.7	0.0	137.1	0.0	0	1	0
88 11 30	Echinisco rosea	CLAD	99.7	0.0	0.0	299.2	0	0	1
88 11 30	Ephemeroporus hybridus	CLAD	368.1	231.5	274.2	598.5	1	2	2
88 11 30	Eubosmina tubicen	CLAD	45.7	0.0	137.1	0.0	0	1	0
88 11 30	Ilyocryptus spinifer	CLAD	236.8	0.0	411.3	299.2	0	3	1
88 11 30	Latonopsis occidentalis	CLAD	45.7	0.0	137.1	0.0	0	1	0
88 11 30	Simocephalus serrulatus	CLAD	45.7	0.0	137.1	0.0	0	1	0
88 11 30	Streblocercus pygmaeus	CLAD	2975.2	0.0	3838.8	5086.9	0	28	17
88 11 30	Streblocercus serricaudatus	CLAD	428.0	0.0	685.5	598.5	0	5	2
88 11 30	Macrocyclops albidus	COPE	236.8	0.0	411.3	299.2	0	3	1

	A	B	C
VOL CONC	12.6	7.5	8.1
VOL EXAM	2	2	1

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C	
88 11 30	Microcyclops varicans rubellus	COPE	91.4	0.0	274.2	0.0	0	2	0	
88 11 30	Tropocyclops prasinus	COPE	91.4	0.0	274.2	0.0	0	2	0	
88 11 30	copepod nauplius larvae	COPE	3224.8	0.0	2193.6	7480.7	0	16	25	
88 11 30	cyclopoid copepodid	COPE	1386.1	231.5	1233.9	2693.0	1	9	9	
88 11 30	cyclopoid unidentified male	COPE	77.2	231.5	0.0	0.0	1	0	0	
88 11 30	Annelida	ANNE	419.6	0.0	959.7	299.2	0	7	1	
88 11 30	Nematoda	NEMA	77.2	231.5	0.0	0.0	1	0	0	
88 11 30	Ostracoda - unidentified spp.	OSTR	99.7	0.0	0.0	299.2	0	0	1	
			16240.9				13	137	90	<=== COUNT TOTALS

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
88 12 14	Acanthocystis spp.	PROT	13.9	0.0	0.0	41.7	0	0	1
88 12 14	Difflugia sp.	PROT	177.1	0.0	114.7	416.5	0	1	10
88 12 14	Epistylis spp.	PROT	45.0	93.5	0.0	41.7	1	0	1
88 12 14	Lesquereusia sp.	PROT	274.2	187.0	344.1	291.6	2	3	7
88 12 14	Testacida	PROT	31.2	93.5	0.0	0.0	1	0	0
88 12 14	bdelloidea - unidentified spp.	ROTI	162.9	373.9	114.7	0.0	4	1	0
88 12 14	Cephalodella mucronata	ROTI	38.2	0.0	114.7	0.0	0	1	0
88 12 14	Cephalodella spp.	ROTI	13.9	0.0	0.0	41.7	0	0	1
88 12 14	Dicranophorus forcipatus	ROTI	38.2	0.0	114.7	0.0	0	1	0
88 12 14	Dicranophorus sp.	ROTI	107.7	0.0	114.7	208.3	0	1	5
88 12 14	Dissotrocha sp.	ROTI	205.1	0.0	573.5	41.7	0	5	1
88 12 14	Lecane signifera	ROTI	453.8	1121.8	114.7	125.0	12	1	3
88 12 14	Lecane sp. 1	ROTI	27.8	0.0	0.0	83.3	0	0	2
88 12 14	Lepadella cristata	ROTI	58.9	93.5	0.0	83.3	1	0	2
88 12 14	Macrochaetus longipes	ROTI	13.9	0.0	0.0	41.7	0	0	1
88 12 14	Monommata spp.	ROTI	114.4	187.0	114.7	41.7	2	1	1
88 12 14	Monostyla sp. 1	ROTI	27.8	0.0	0.0	83.3	0	0	2
88 12 14	Proales sp.	ROTI	100.6	187.0	114.7	0.0	2	1	0
88 12 14	rotifer - unidentified spp.	ROTI	27.8	0.0	0.0	83.3	0	0	2
88 12 14	rotifera unidentified sp. 3	ROTI	31.2	93.5	0.0	0.0	1	0	0
88 12 14	Rousseletia corniculata	ROTI	38.2	0.0	114.7	0.0	0	1	0
88 12 14	Trichocerca porcellus	ROTI	38.2	0.0	114.7	0.0	0	1	0
88 12 14	Trichocerca spp.	ROTI	111.0	93.5	114.7	125.0	1	1	3
88 12 14	Acantholeberis curvirostris	CLAD	13.9	0.0	0.0	41.7	0	0	1
88 12 14	Alona rustica	CLAD	38.2	0.0	114.7	0.0	0	1	0
88 12 14	Camptocercus rectirostris	CLAD	13.9	0.0	0.0	41.7	0	0	1
88 12 14	Ceriodaphnia spp.	CLAD	97.2	93.5	114.7	83.3	1	1	2
88 12 14	Chydorus faviformis	CLAD	45.0	93.5	0.0	41.7	1	0	1
88 12 14	Chydorus piger	CLAD	13.9	0.0	0.0	41.7	0	0	1
88 12 14	Echinisco rosea	CLAD	52.1	0.0	114.7	41.7	0	1	1
88 12 14	Ephemeroporus hybridus	CLAD	159.8	93.5	344.1	41.7	1	3	1
88 12 14	Graptoleberis testudinaria	CLAD	31.2	93.5	0.0	0.0	1	0	0
88 12 14	Ilyocryptus sordidus	CLAD	13.9	0.0	0.0	41.7	0	0	1
88 12 14	Latonopsis occidentalis	CLAD	58.9	93.5	0.0	83.3	1	0	2
88 12 14	Simocephalus serrulatus	CLAD	38.2	0.0	114.7	0.0	0	1	0
88 12 14	Streblocercus pygmaeus	CLAD	263.7	280.5	344.1	166.6	3	3	4
88 12 14	Streblocercus serricaudatus	CLAD	201.1	373.9	229.4	0.0	4	2	0
88 12 14	Diaptomus sp.	COPE	52.1	0.0	114.7	41.7	0	1	1
88 12 14	Eucyclops agilis	COPE	58.9	93.5	0.0	83.3	1	0	2
88 12 14	Eucyclops speratus	COPE	38.2	0.0	114.7	0.0	0	1	0

	A	B	C
VOL CONC	7.6	9.4	6.8
VOL EXAM	3	3	6

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C	
88 12 14	Harpacticoida	COPE	31.2	93.5	0.0	0.0	1	0	0	
88 12 14	Macrocyclops albidus	COPE	72.8	93.5	0.0	125.0	1	0	3	
88 12 14	Tropocyclops prasinus	COPE	97.2	0.0	0.0	291.6	0	0	7	
88 12 14	copepod nauplius larvae	COPE	1322.9	841.4	2294.2	833.0	9	20	20	
88 12 14	cyclopoid copepodid	COPE	555.5	280.5	803.0	583.1	3	7	14	
88 12 14	cyclopoid unidentified male	COPE	38.2	0.0	114.7	0.0	0	1	0	
			5459.08				54	61	104	<=== COUNT TOTALS

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date			Taxa Name and Taxonomic Group		Mean Density	Calculated Densities			Raw Counts			
YY	MM	DD			#/m²	REP A #/m²	REP B #/m²	REP C #/m²	REP A	REP B	REP C	
89	1	19	Acanthocystis spp.	PROT	37.6	112.9	0.0	0.0	1	0	0	
89	1	19	Centropyxis aculeata	PROT	142.8	0.0	0.0	428.4	0	0	1	
89	1	19	Lesquereusia sp.	PROT	1386.6	677.4	912.0	2570.5	6	7	6	
89	1	19	bdelloidea - unidentified spp.	ROTI	142.8	0.0	0.0	428.4	0	0	1	
89	1	19	Colurella spp.	ROTI	142.8	0.0	0.0	428.4	0	0	1	
89	1	19	Dicranophorus sp.	ROTI	571.2	0.0	0.0	1713.7	0	0	4	
89	1	19	Dissotrocha sp.	ROTI	86.9	0.0	260.6	0.0	0	2	0	
89	1	19	Lecane inopinata	ROTI	249.0	225.8	521.2	0.0	2	4	0	
89	1	19	Lecane signifera	ROTI	820.2	225.8	521.2	1713.7	2	4	4	
89	1	19	Lecane sp. 1	ROTI	142.8	0.0	0.0	428.4	0	0	1	
89	1	19	Monostyla lunaris	ROTI	86.9	0.0	260.6	0.0	0	2	0	
89	1	19	Monostyla sp. 1	ROTI	37.6	112.9	0.0	0.0	1	0	0	
89	1	19	Proales sp.	ROTI	1712.8	1693.5	1302.9	2142.1	15	10	5	
89	1	19	rotifer - unidentified spp.	ROTI	142.8	0.0	0.0	428.4	0	0	1	
89	1	19	Acantholeberis curvirostris	CLAD	5407.4	1806.4	1563.5	12852.4	16	12	30	
89	1	19	Acroperus harpae	CLAD	186.2	0.0	130.3	428.4	0	1	1	
89	1	19	Alona rustica	CLAD	584.7	338.7	130.3	1285.2	3	1	3	
89	1	19	Biapertura affinis	CLAD	4269.8	1354.8	1172.6	10281.9	12	9	24	
89	1	19	Ceriodaphnia spp.	CLAD	37.6	112.9	0.0	0.0	1	0	0	
89	1	19	Chydorus faviformis	CLAD	453.5	112.9	390.9	856.8	1	3	2	
89	1	19	Chydorus piger	CLAD	261.5	225.8	130.3	428.4	2	1	1	
89	1	19	Diaphanosoma brachyurum	CLAD	142.8	0.0	0.0	428.4	0	0	1	
89	1	19	Eubosmina tubicen	CLAD	150.5	451.6	0.0	0.0	4	0	0	
89	1	19	Graptoleberis testudinaria	CLAD	43.4	0.0	130.3	0.0	0	1	0	
89	1	19	Ilyocryptus spinifer	CLAD	43.4	0.0	130.3	0.0	0	1	0	
89	1	19	Polyphemus pediculus	CLAD	43.4	0.0	130.3	0.0	0	1	0	
89	1	19	Streblocercus pygmaeus	CLAD	4129.8	338.7	912.0	11138.8	3	7	26	
89	1	19	Streblocercus serricaudatus	CLAD	4657.6	338.7	781.7	12852.4	3	6	30	
89	1	19	Eucyclops agilis	COPE	37.6	112.9	0.0	0.0	1	0	0	
89	1	19	Macrocyclops albidus	COPE	37.6	112.9	0.0	0.0	1	0	0	
89	1	19	Microcyclops varicans rubellus	COPE	435.2	225.8	651.5	428.4	2	5	1	
89	1	19	copepod nauplius larvae	COPE	4907.7	2822.5	2475.5	9425.1	25	19	22	
89	1	19	cyclopoid copepodid	COPE	1374.1	677.4	1302.9	2142.1	6	10	5	
89	1	19	cyclopoid unidentified male	COPE	441.9	338.7	130.3	856.8	3	1	2	
89	1	19	Annelida	ANNE	142.8	0.0	0.0	428.4	0	0	1	
89	1	19	Nematoda	NEMA	37.6	112.9	0.0	0.0	1	0	0	
89	1	19	Ostracoda - unidentified spp.	OSTR	86.9	0.0	260.6	0.0	0	2	0	
					33616.4				111	109	173	<=== COUNT TOTALS

	A	B	C
VOL CONC	12.3	10.6	11.6
VOL EXAM	4	3	1

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
89 2 17	Acanthocystis spp.	PROT	163.2	0.0	489.7	0.0	0	1	0
89 2 17	Arcella sp.	PROT	163.2	0.0	489.7	0.0	0	1	0
89 2 17	ciliate - unidentified spp.	PROT	128.6	0.0	0.0	385.9	0	0	1
89 2 17	Difflugia sp.	PROT	1041.8	1092.0	489.7	1543.6	3	1	4
89 2 17	Lesquereusia sp.	PROT	1316.1	728.0	2448.5	771.8	2	5	2
89 2 17	Vorticella sp.	PROT	121.3	364.0	0.0	0.0	1	0	0
89 2 17	bdelloidea - unidentified spp.	ROTI	1729.3	1092.0	2938.2	1157.7	3	6	3
89 2 17	Cephalodella mucronata	ROTI	1885.2	1456.0	3427.9	771.8	4	7	2
89 2 17	Cephalodella spp.	ROTI	576.4	364.0	979.4	385.9	1	2	1
89 2 17	Colurella spp.	ROTI	413.2	364.0	489.7	385.9	1	1	1
89 2 17	Dicranophorus sp.	ROTI	1141.2	2548.0	489.7	385.9	7	1	1
89 2 17	Habrotrocha sp.	ROTI	163.2	0.0	489.7	0.0	0	1	0
89 2 17	Lecane inopinata	ROTI	655.9	1092.0	489.7	385.9	3	1	1
89 2 17	Lecane signifera	ROTI	747.0	0.0	1469.1	771.8	0	3	2
89 2 17	Lecane sp. 1	ROTI	371.3	728.0	0.0	385.9	2	0	1
89 2 17	Monommata spp.	ROTI	728.0	2184.0	0.0	0.0	6	0	0
89 2 17	Monostyla crenata	ROTI	128.6	0.0	0.0	385.9	0	0	1
89 2 17	Monostyla lunaris	ROTI	284.6	364.0	489.7	0.0	1	1	0
89 2 17	Monostyla sp. 1	ROTI	507.2	364.0	0.0	1157.7	1	0	3
89 2 17	Polyarthra sp.	ROTI	163.2	0.0	489.7	0.0	0	1	0
89 2 17	Proales sp.	ROTI	1618.2	1456.0	1469.1	1929.5	4	3	5
89 2 17	rotifer - unidentified spp.	ROTI	1083.7	728.0	979.4	1543.6	2	2	4
89 2 17	Trichocerca pusilla	ROTI	163.2	0.0	489.7	0.0	0	1	0
89 2 17	Trichocerca spp.	ROTI	250.0	364.0	0.0	385.9	1	0	1
89 2 17	Acantholeberis curvirostris	CLAD	2014.4	2184.0	0.0	3859.0	6	0	10
89 2 17	Alona rustica	CLAD	257.3	0.0	0.0	771.8	0	0	2
89 2 17	Biapertura affinis	CLAD	677.8	0.0	489.7	1543.6	0	1	4
89 2 17	Ceriodaphnia spp.	CLAD	291.9	0.0	489.7	385.9	0	1	1
89 2 17	Chydorus piger	CLAD	569.1	728.0	979.4	0.0	2	2	0
89 2 17	Echinisco rosea	CLAD	420.5	0.0	489.7	771.8	0	1	2
89 2 17	Grimaldina brazzai	CLAD	128.6	0.0	0.0	385.9	0	0	1
89 2 17	Ilyocryptus spinifer	CLAD	326.5	0.0	979.4	0.0	0	2	0
89 2 17	Macrothrix sp.	CLAD	364.0	1092.0	0.0	0.0	3	0	0
89 2 17	Streblocercus pygmaeus	CLAD	405.9	728.0	489.7	0.0	2	1	0
89 2 17	Streblocercus serricaudatus	CLAD	121.3	364.0	0.0	0.0	1	0	0
89 2 17	Diaptomus sp.	COPE	128.6	0.0	0.0	385.9	0	0	1
89 2 17	Macrocyclops albidus	COPE	250.0	364.0	0.0	385.9	1	0	1
89 2 17	Microcyclops varicans rubellus	COPE	670.5	364.0	489.7	1157.7	1	1	3
89 2 17	Tropocyclops prasinus	COPE	128.6	0.0	0.0	385.9	0	0	1
89 2 17	copepod nauplius larvae	COPE	7111.6	7280.1	4407.3	9647.6	20	9	25
89 2 17	cyclopoid copepodid	COPE	1878.4	2548.0	0.0	3087.2	7	0	8

	A	B	C
VOL CONC	19.8	26.6	21.0
VOL EXAM	2	2	2

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date				Mean	Calculated Densities			Raw Counts			
YY	MM	DD	Taxa Name and Taxonomic Group	Density #/m²	REP A #/m²	REP B #/m²	REP C #/m²	REP A	REP B	REP C	
89	2	17	Annelida ANNE	1069.1	1456.0	979.4	771.8	4	2	2	
89	2	17	Nematoda NEMA	1319.0	1820.0	979.4	1157.7	5	2	3	
89	2	17	Gastrotricha GAST	128.6	0.0	0.0	385.9	0	0	1	
89	2	17	Ostracoda - unidentified spp. OSTR	128.6	0.0	0.0	385.9	0	0	1	
				33934.2				94	60	99	<=== COUNT TOTALS

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
89 3 17	Acanthocystis spp.	PROT	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Arcella sp.	PROT	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Difflugia sp.	PROT	2471.6	2467.8	1708.1	3238.9	9	7	11
89 3 17	Euglypha spp.	PROT	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Lesquereusia sp.	PROT	270.9	274.2	244.0	294.4	1	1	1
89 3 17	bdelloidea - unidentified spp.	ROTI	81.3	0.0	244.0	0.0	0	1	0
89 3 17	Cephalodella mucronata	ROTI	460.4	548.4	244.0	588.9	2	1	2
89 3 17	Cephalodella spp.	ROTI	98.1	0.0	0.0	294.4	0	0	1
89 3 17	Dicranophorus sp.	ROTI	2843.5	1371.0	976.1	6183.3	5	4	21
89 3 17	Lecane inopinata	ROTI	98.1	0.0	0.0	294.4	0	0	1
89 3 17	Lecane signifera	ROTI	771.7	548.4	0.0	1766.7	2	0	6
89 3 17	Monommata spp.	ROTI	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Monostyla lunaris	ROTI	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Proales sp.	ROTI	1063.4	548.4	1464.1	1177.8	2	6	4
89 3 17	rotifer - unidentified spp.	ROTI	277.6	0.0	244.0	588.9	0	1	2
89 3 17	Trichocerca spp.	ROTI	172.7	274.2	244.0	0.0	1	1	0
89 3 17	Acantholeberis curvirostris	CLAD	3400.0	2467.8	3904.3	3827.8	9	16	13
89 3 17	Alona rustica	CLAD	81.3	0.0	244.0	0.0	0	1	0
89 3 17	Biapertura affinis	CLAD	260.8	0.0	488.0	294.4	0	2	1
89 3 17	Ceriodaphnia spp.	CLAD	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Chydorus faviformis	CLAD	352.2	274.2	488.0	294.4	1	2	1
89 3 17	Chydorus piger	CLAD	3000.0	2193.6	2684.2	4122.2	8	11	14
89 3 17	Diaphanosoma brachyurum	CLAD	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Ilyocryptus spinifer	CLAD	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Macrothrix sp.	CLAD	636.6	0.0	732.1	1177.8	0	3	4
89 3 17	Streblocercus pygmaeus	CLAD	1238.9	822.6	244.0	2650.0	3	1	9
89 3 17	Streblocercus serricaudatus	CLAD	829.5	822.6	488.0	1177.8	3	2	4
89 3 17	Macrocyclops albidus	COPE	551.8	822.6	244.0	588.9	3	1	2
89 3 17	Mesocyclops leukarti	COPE	91.4	274.2	0.0	0.0	1	0	0
89 3 17	Microcyclops varicans rubellus	COPE	2627.5	2742.0	2196.2	2944.4	10	9	10
89 3 17	Paracyclops affinis	COPE	98.1	0.0	0.0	294.4	0	0	1
89 3 17	Tropocyclops prasinus	COPE	1249.5	1645.2	1220.1	883.3	6	5	3
89 3 17	copepod nauplius larvae	COPE	5536.0	6032.4	4392.3	6183.3	22	18	21
89 3 17	cyclopoid copepodid	COPE	2492.5	2193.6	2928.2	2355.5	8	12	8
89 3 17	cyclopoid unidentified male	COPE	189.5	274.2	0.0	294.4	1	0	1
89 3 17	Annelida	ANNE	565.3	274.2	244.0	1177.8	1	1	4
89 3 17	Hydracarina	HYDR	744.8	274.2	488.0	1472.2	1	2	5
89 3 17	Ostracoda - unidentified spp.	OSTR	450.4	274.2	488.0	588.9	1	2	2
			33737				108	110	152

<===== COUNT TOTALS

	A	B	C
VOL CONC	7.5	6.6	8.0
VOL EXAM	1	1	1

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
89 4 25	Acanthocystis spp.	PROT	140.5	0.0	261.7	159.7	0	1	2
89 4 25	Arcella sp.	PROT	90.2	190.7	0.0	79.9	2	0	1
89 4 25	ciliate - unidentified spp.	PROT	87.2	0.0	261.7	0.0	0	1	0
89 4 25	Difflugia sp.	PROT	1806.6	572.0	4448.7	399.3	6	17	5
89 4 25	Epistylis spp.	PROT	26.6	0.0	0.0	79.9	0	0	1
89 4 25	Lesquereusia sp.	PROT	325.2	190.7	785.1	0.0	2	3	0
89 4 25	Peritrichia sp.	PROT	348.9	0.0	1046.7	0.0	0	4	0
89 4 25	Vorticella sp.	PROT	174.5	0.0	523.4	0.0	0	2	0
89 4 25	bdelloidea - unidentified spp.	ROTI	119.0	95.3	261.7	0.0	1	1	0
89 4 25	Cephalodella mucronata	ROTI	26.6	0.0	0.0	79.9	0	0	1
89 4 25	Dicranophorus sp.	ROTI	158.9	476.6	0.0	0.0	5	0	0
89 4 25	Lecane signifera	ROTI	331.1	572.0	261.7	159.7	6	1	2
89 4 25	Lecane sp. 1	ROTI	182.6	286.0	261.7	0.0	3	1	0
89 4 25	Lepadella cristata	ROTI	119.0	95.3	261.7	0.0	1	1	0
89 4 25	Monommata spp.	ROTI	326.0	476.6	261.7	239.6	5	1	3
89 4 25	Monostyla lunaris	ROTI	119.0	95.3	261.7	0.0	1	1	0
89 4 25	Monostyla quadridentata	ROTI	87.2	0.0	261.7	0.0	0	1	0
89 4 25	rotifer - unidentified spp.	ROTI	53.2	0.0	0.0	159.7	0	0	2
89 4 25	Trichocerca spp.	ROTI	31.8	95.3	0.0	0.0	1	0	0
89 4 25	Acantholeberis curvirostris	CLAD	1335.1	0.0	3925.3	79.9	0	15	1
89 4 25	Alona monocantha	CLAD	145.6	95.3	261.7	79.9	1	1	1
89 4 25	Alona rustica	CLAD	87.2	0.0	261.7	0.0	0	1	0
89 4 25	Chydorus faviformis	CLAD	58.4	95.3	0.0	79.9	1	0	1
89 4 25	Chydorus piger	CLAD	58.4	95.3	0.0	79.9	1	0	1
89 4 25	Ilyocryptus spinifer	CLAD	174.5	0.0	523.4	0.0	0	2	0
89 4 25	Macrothrix sp.	CLAD	206.2	95.3	523.4	0.0	1	2	0
89 4 25	Eucyclops agilis	COPE	119.0	95.3	261.7	0.0	1	1	0
89 4 25	Eucyclops speratus	COPE	26.6	0.0	0.0	79.9	0	0	1
89 4 25	Microcyclops varicans rubellus	COPE	547.7	857.9	785.1	0.0	9	3	0
89 4 25	Paracyclops affinis	COPE	436.1	0.0	1308.4	0.0	0	5	0
89 4 25	Tropocyclops prasinus	COPE	87.2	0.0	261.7	0.0	0	1	0
89 4 25	copepod nauplius larvae	COPE	2133.0	3622.4	2616.9	159.7	38	10	2
89 4 25	cyclopoid copepodid	COPE	1542.6	1429.9	2878.5	319.5	15	11	4
89 4 25	cyclopoid unidentified male	COPE	87.2	0.0	261.7	0.0	0	1	0
89 4 25	Annelida	ANNE	232.9	95.3	523.4	79.9	1	2	1
89 4 25	Hydracarina	HYDR	116.8	190.7	0.0	159.7	2	0	2
89 4 25	Nematoda	NEMA	174.5	0.0	523.4	0.0	0	2	0
89 4 25	Chaetonotus sp.	GAST	87.2	0.0	261.7	0.0	0	1	0
89 4 25	Gastropoda	GAST	113.9	0.0	261.7	79.9	0	1	1
89 4 25	Ostracoda - unidentified spp.	OSTR	820.5	572.0	1570.1	319.5	6	6	4
			13144.8				109	100	36 <=== COUNT TOTALS

	A	B	C
VOL CONC	5.2	14.2	10.9
VOL EXAM	2	2	5

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
89 7 13	ciliate - unidentified spp.	PROT	86.9	0.0	260.6	0.0	0	1	0
89 7 13	Difflugia sp.	PROT	804.4	1279.0	521.2	613.2	5	2	7
89 7 13	Euglypha spp.	PROT	85.3	255.8	0.0	0.0	1	0	0
89 7 13	Lesquereusia sp.	PROT	429.5	767.4	521.2	0.0	3	2	0
89 7 13	Pyxicola affinis	PROT	86.9	0.0	260.6	0.0	0	1	0
89 7 13	Anuraeopsis sp.	ROTI	1767.1	0.0	4951.0	350.4	0	19	4
89 7 13	bdelloidea - unidentified spp.	ROTI	486.3	1023.2	260.6	175.2	4	1	2
89 7 13	Cephalodella spp.	ROTI	201.3	255.8	260.6	87.6	1	1	1
89 7 13	Dicranophorus forcipatus	ROTI	427.9	1023.2	260.6	0.0	4	1	0
89 7 13	Dissotrocha sp.	ROTI	85.3	255.8	0.0	0.0	1	0	0
89 7 13	Euchlanis dilatata	ROTI	232.1	0.0	521.2	175.2	0	2	2
89 7 13	Euchlanis meneta	ROTI	85.3	255.8	0.0	0.0	1	0	0
89 7 13	Euchlanis triquetra	ROTI	170.5	511.6	0.0	0.0	2	0	0
89 7 13	Lecane inopinata	ROTI	1095.9	767.4	2345.2	175.2	3	9	2
89 7 13	Lecane leontina	ROTI	1377.0	2046.4	2084.7	0.0	8	8	0
89 7 13	Lecane signifera	ROTI	514.8	1023.2	521.2	0.0	4	2	0
89 7 13	Lecane stichaea	ROTI	58.4	0.0	0.0	175.2	0	0	2
89 7 13	Lepadella cristata	ROTI	86.9	0.0	260.6	0.0	0	1	0
89 7 13	Macrochaetus longipes	ROTI	3965.3	767.4	9902.1	1226.4	3	38	14
89 7 13	Monommata spp.	ROTI	5260.3	1790.6	13289.7	700.8	7	51	8
89 7 13	Monostyla bulla	ROTI	2675.9	2813.8	4951.0	262.8	11	19	3
89 7 13	Monostyla lunaris	ROTI	29.2	0.0	0.0	87.6	0	0	1
89 7 13	Monostyla quadridentata	ROTI	405.0	255.8	521.2	438.0	1	2	5
89 7 13	Notommata sp.	ROTI	1754.3	2302.2	2084.7	876.0	9	8	10
89 7 13	Polyarthra sp.	ROTI	838.5	255.8	2084.7	175.2	1	8	2
89 7 13	rotifer - unidentified spp.	ROTI	404.2	255.8	781.7	175.2	1	3	2
89 7 13	rotifera unidentified sp. 7	ROTI	86.9	0.0	260.6	0.0	0	1	0
89 7 13	Trichocerca spp.	ROTI	86.9	0.0	260.6	0.0	0	1	0
89 7 13	Alona rustica	CLAD	370.3	1023.2	0.0	87.6	4	0	1
89 7 13	Echinisco rosea	CLAD	631.6	1023.2	521.2	350.4	4	2	4
89 7 13	Ephemeroporus hybridus	CLAD	1028.0	2302.2	781.7	0.0	9	3	0
89 7 13	Grimaldina brazzai	CLAD	85.3	255.8	0.0	0.0	1	0	0
89 7 13	Latonopsis occidentalis	CLAD	285.0	767.4	0.0	87.6	3	0	1
89 7 13	Macrothrix sp.	CLAD	575.5	767.4	521.2	438.0	3	2	5
89 7 13	Streblocercus pygmaeus	CLAD	174.5	0.0	260.6	262.8	0	1	3
89 7 13	Microcyclops varicans rubellus	COPE	1919.4	3325.4	2345.2	87.6	13	9	1
89 7 13	Paracyclops affinis	COPE	973.5	1790.6	1042.3	87.6	7	4	1
89 7 13	copepod nauplius larvae	COPE	1962.7	1534.8	3127.0	1226.4	6	12	14
89 7 13	cyclopoid copepodid	COPE	1204.8	2046.4	1042.3	525.6	8	4	6
89 7 13	cyclopoid unidentified male	COPE	170.5	511.6	0.0	0.0	2	0	0
89 7 13	Annelida	ANNE	199.7	511.6	0.0	87.6	2	0	1
89 7 13	Nematoda	NEMA	1068.0	1279.0	260.6	1664.3	5	1	19
89 7 13	Ostracoda - unidentified spp.	OSTR	85.3	255.8	0.0	0.0	1	0	0
			34322.2				138	219	121 <=== COUNT TOTALS

	A	B	C
VOL CONC	7.0	7.1	4.8
VOL EXAM	1	1	2

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
89 8 16	Arcella sp.	PROT	1309.8	492.1	1880.4	1556.9	1	3	3
89 8 16	Campanella sp.	PROT	492.1	1476.3	0.0	0.0	3	0	0
89 8 16	Centropyxis aculeata	PROT	683.0	492.1	0.0	1556.9	1	0	3
89 8 16	Difflugia sp.	PROT	2422.0	3936.7	1253.6	2075.8	8	2	4
89 8 16	Euglypha spp.	PROT	173.0	0.0	0.0	519.0	0	0	1
89 8 16	Lesquereusia sp.	PROT	3140.8	2460.4	1253.6	5708.5	5	2	11
89 8 16	suctorian ciliate - unidentified spp.	PROT	164.0	492.1	0.0	0.0	1	0	0
89 8 16	bdelloidea - unidentified spp.	ROTI	1885.0	2952.5	626.8	2075.8	6	1	4
89 8 16	Cephalodella mucronata	ROTI	164.0	492.1	0.0	0.0	1	0	0
89 8 16	Cephalodella spp.	ROTI	208.9	0.0	626.8	0.0	0	1	0
89 8 16	Dicranophorus sp.	ROTI	208.9	0.0	626.8	0.0	0	1	0
89 8 16	Lecane inopinata	ROTI	2129.9	2952.5	1880.4	1556.9	6	3	3
89 8 16	Lecane leontina	ROTI	1929.9	2460.4	1253.6	2075.8	5	2	4
89 8 16	Lecane signifera	ROTI	927.9	492.1	1253.6	1037.9	1	2	2
89 8 16	Lecane sp. 1	ROTI	656.1	1968.3	0.0	0.0	4	0	0
89 8 16	Lepadella patella	ROTI	337.0	492.1	0.0	519.0	1	0	1
89 8 16	Macrochaetus longipes	ROTI	4203.5	3444.6	5014.4	4151.6	7	8	8
89 8 16	Monommata spp.	ROTI	1437.9	984.2	1253.6	2075.8	2	2	4
89 8 16	Monostyla bulla	ROTI	173.0	0.0	0.0	519.0	0	0	1
89 8 16	Monostyla crenata	ROTI	2875.8	3936.7	3134.0	1556.9	8	5	3
89 8 16	Monostyla quadridentata	ROTI	1282.9	1968.3	1880.4	0.0	4	3	0
89 8 16	Monostyla sp. 1	ROTI	173.0	0.0	0.0	519.0	0	0	1
89 8 16	Monostyla sp. 3	ROTI	208.9	0.0	626.8	0.0	0	1	0
89 8 16	Notommata sp.	ROTI	501.0	984.2	0.0	519.0	2	0	1
89 8 16	Ploesoma truncatum	ROTI	1721.0	2460.4	626.8	2075.8	5	1	4
89 8 16	Ptygura sp.	ROTI	328.1	984.2	0.0	0.0	2	0	0
89 8 16	rotifer - unidentified spp.	ROTI	381.9	0.0	626.8	519.0	0	1	1
89 8 16	rotifera unidentified sp. 3	ROTI	346.0	0.0	0.0	1037.9	0	0	2
89 8 16	Acantholeberis curvirostris	CLAD	173.0	0.0	0.0	519.0	0	0	1
89 8 16	Alona rustica	CLAD	12693.7	9349.7	13162.7	15568.6	19	21	30
89 8 16	Chydorus piger	CLAD	1765.9	1968.3	1253.6	2075.8	4	2	4
89 8 16	Echinisco rosea	CLAD	13290.8	1476.3	15043.1	23353.0	3	24	45
89 8 16	Ephemeroporus hybridus	CLAD	1539.0	984.2	0.0	3632.7	2	0	7
89 8 16	Latonopsis occidentalis	CLAD	173.0	0.0	0.0	519.0	0	0	1
89 8 16	Macrothrix sp.	CLAD	519.0	0.0	0.0	1556.9	0	0	3
89 8 16	Streblocercus serricaudatus	CLAD	173.0	0.0	0.0	519.0	0	0	1
89 8 16	Eucyclops agilis	COPE	710.0	984.2	626.8	519.0	2	1	1
89 8 16	Mesocyclops leukarti	COPE	173.0	0.0	0.0	519.0	0	0	1
89 8 16	Microcyclops varicans rubellus	COPE	1345.7	492.1	2507.2	1037.9	1	4	2
89 8 16	Paracyclops affinis	COPE	2804.0	3936.7	1880.4	2594.8	8	3	5
89 8 16	copepod nauplius larvae	COPE	11074.0	10825.9	12535.9	9860.1	22	20	19

	A	B	C
VOL CONC	13.4	17.0	14.1
VOL EXAM	1	1	1

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date					Mean	Calculated Densities			Raw Counts			
YY	MM	DD	Taxa Name and Taxonomic Group		Density #/m²	REP A #/m²	REP B #/m²	REP C #/m²	REP A	REP B	REP C	
89	8	16	cyclopoid copepodid	COPE	6079.6	6889.2	5641.1	5708.5	14	9	11	
89	8	16	cyclopoid unidentified male	COPE	208.9	0.0	626.8	0.0	0	1	0	
89	8	16	Annelida	ANNE	2538.7	1476.3	2507.2	3632.7	3	4	7	
89	8	16	Hydracarina	HYDR	208.9	0.0	626.8	0.0	0	1	0	
89	8	16	Nematoda	NEMA	2750.1	4920.9	1253.6	2075.8	10	2	4	
					88685.7				161	130	203	<=== COUNT TOTALS

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
89 9 27	Arcella sp.	PROT	536.9	329.8	0.0	1280.8	1	0	5
89 9 27	Campanella sp.	PROT	219.9	659.6	0.0	0.0	2	0	0
89 9 27	Difflugia sp.	PROT	507.1	989.3	275.7	256.2	3	1	1
89 9 27	Euglypha spp.	PROT	109.9	329.8	0.0	0.0	1	0	0
89 9 27	Lesquereusia sp.	PROT	361.1	0.0	827.0	256.2	0	3	1
89 9 27	bdelloidea - unidentified spp.	ROTI	965.0	1319.1	551.3	1024.7	4	2	4
89 9 27	Cephalodella spp.	ROTI	464.5	329.8	551.3	512.3	1	2	2
89 9 27	Chromogaster sp.	ROTI	311.7	659.6	275.7	0.0	2	1	0
89 9 27	Collothecacea sp.	ROTI	91.9	0.0	275.7	0.0	0	1	0
89 9 27	Dicranophorus sp.	ROTI	728.6	0.0	1929.7	256.2	0	7	1
89 9 27	Lecane inopinata	ROTI	433.4	0.0	275.7	1024.7	0	1	4
89 9 27	Lecane leontina	ROTI	183.8	0.0	551.3	0.0	0	2	0
89 9 27	Lecane signifera	ROTI	1289.8	1978.7	1378.4	512.3	6	5	2
89 9 27	Lecane sp. 1	ROTI	1687.2	1319.1	2205.4	1537.0	4	8	6
89 9 27	Lecane stokesi	ROTI	91.9	0.0	275.7	0.0	0	1	0
89 9 27	Lepadella cristata	ROTI	372.6	329.8	275.7	512.3	1	1	2
89 9 27	Lepadella spp.	ROTI	219.9	659.6	0.0	0.0	2	0	0
89 9 27	Macrochaetus longipes	ROTI	500.6	989.3	0.0	512.3	3	0	2
89 9 27	Monommata spp.	ROTI	916.0	659.6	551.3	1537.0	2	2	6
89 9 27	Monostyla bulla	ROTI	177.3	0.0	275.7	256.2	0	1	1
89 9 27	Monostyla crenata	ROTI	489.0	659.6	551.3	256.2	2	2	1
89 9 27	Monostyla lunaris	ROTI	109.9	329.8	0.0	0.0	1	0	0
89 9 27	Monostyla sp. 1	ROTI	91.9	0.0	275.7	0.0	0	1	0
89 9 27	Notommata sp.	ROTI	109.9	329.8	0.0	0.0	1	0	0
89 9 27	Ploesoma triacanthum	ROTI	390.6	659.6	0.0	512.3	2	0	2
89 9 27	Proales sp.	ROTI	1050.4	1319.1	551.3	1280.8	4	2	5
89 9 27	rotifer - unidentified spp.	ROTI	195.3	329.8	0.0	256.2	1	0	1
89 9 27	Scaridium longicaudum	ROTI	305.2	659.6	0.0	256.2	2	0	1
89 9 27	Testudinella parva	ROTI	311.7	659.6	275.7	0.0	2	1	0
89 9 27	Alona monocantha	CLAD	109.9	329.8	0.0	0.0	1	0	0
89 9 27	Alona rustica	CLAD	4128.5	5276.4	6340.4	768.5	16	23	3
89 9 27	Chydorus piger	CLAD	2574.5	3627.5	3583.7	512.3	11	13	2
89 9 27	Echinisco rosea	CLAD	293.7	329.8	551.3	0.0	1	2	0
89 9 27	Ephemeroporus hybridus	CLAD	91.9	0.0	275.7	0.0	0	1	0
89 9 27	Ilyocryptus spinifer	CLAD	1014.1	1978.7	551.3	512.3	6	2	2
89 9 27	Latonopsis occidentalis	CLAD	219.9	659.6	0.0	0.0	2	0	0
89 9 27	Simocephalus serrulatus	CLAD	91.9	0.0	275.7	0.0	0	1	0
89 9 27	Streblocercus pygmaeus	CLAD	177.3	0.0	275.7	256.2	0	1	1
89 9 27	Macrocyclops albidus	COPE	91.9	0.0	275.7	0.0	0	1	0
89 9 27	Mesocyclops leukarti	COPE	85.4	0.0	0.0	256.2	0	0	1
89 9 27	Microcyclops varicans rubellus	COPE	507.1	989.3	275.7	256.2	3	1	1

	A	B	C
VOL CONC	9.0	7.5	7.0
VOL EXAM	1	1	1

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date				Mean	Calculated Densities			Raw Counts			
YY	MM	DD	Taxa Name and Taxonomic Group	Density #/m²	REP A #/m²	REP B #/m²	REP C #/m²	REP A	REP B	REP C	
89	9	27	Paracyclops affinis	COPE	91.9	0.0	275.7	0.0	0	1	0	
89	9	27	Tropocyclops prasinus	COPE	109.9	329.8	0.0	0.0	1	0	0	
89	9	27	copepod nauplius larvae	COPE	7094.2	10882.6	5789.1	4611.0	33	21	18	
89	9	27	cyclopoid copepodid	COPE	2346.7	3297.8	2205.4	1537.0	10	8	6	
89	9	27	cyclopoid unidentified male	COPE	109.9	329.8	0.0	0.0	1	0	0	
89	9	27	Annelida	ANNE	641.8	329.8	827.0	768.5	1	3	3	
89	9	27	Hydracarina	HYDR	85.4	0.0	0.0	256.2	0	0	1	
89	9	27	Nematoda	NEMA	868.1	989.3	1102.7	512.3	3	4	2	
89	9	27	Chaetonotus sp.	GAST	85.4	0.0	0.0	256.2	0	0	1	
					34042.2				136	126	88	<=== COUNT TOTALS

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
89 10 20	Acanthocystis spp.	PROT	134.0	401.9	0.0	0.0	1	0	0
89 10 20	Arcella vulgaris	PROT	240.5	401.9	0.0	319.5	1	0	1
89 10 20	Difflugia sp.	PROT	283.8	0.0	531.8	319.5	0	1	1
89 10 20	Epistylis spp.	PROT	347.0	401.9	0.0	638.9	1	0	2
89 10 20	Euglypha spp.	PROT	134.0	401.9	0.0	0.0	1	0	0
89 10 20	Lesquereusia sp.	PROT	843.1	401.9	2127.3	0.0	1	4	0
89 10 20	Anuraeopsis sp.	ROTI	134.0	401.9	0.0	0.0	1	0	0
89 10 20	bdelloidea - unidentified spp.	ROTI	949.6	401.9	2127.3	319.5	1	4	1
89 10 20	Cephalodella spp.	ROTI	401.9	1205.7	0.0	0.0	3	0	0
89 10 20	Colurella spp.	ROTI	417.7	401.9	531.8	319.5	1	1	1
89 10 20	Dicranophorus sp.	ROTI	551.7	803.8	531.8	319.5	2	1	1
89 10 20	Euchlanis triquetra	ROTI	347.0	401.9	0.0	638.9	1	0	2
89 10 20	Lecane inopinata	ROTI	461.0	0.0	1063.7	319.5	0	2	1
89 10 20	Lecane signifera	ROTI	1620.0	2411.5	531.8	1916.8	6	1	6
89 10 20	Lecane sp. 1	ROTI	374.4	803.8	0.0	319.5	2	0	1
89 10 20	Lepadella cristata	ROTI	311.3	401.9	531.8	0.0	1	1	0
89 10 20	Lepadella spp.	ROTI	311.3	401.9	531.8	0.0	1	1	0
89 10 20	Macrochaetus longipes	ROTI	2002.7	2813.4	0.0	3194.7	7	0	10
89 10 20	Monommata spp.	ROTI	1284.8	3215.3	0.0	638.9	8	0	2
89 10 20	Monostyla crenata	ROTI	347.0	401.9	0.0	638.9	1	0	2
89 10 20	Monostyla lunaris	ROTI	267.9	803.8	0.0	0.0	2	0	0
89 10 20	Monostyla sp. 1	ROTI	283.8	0.0	531.8	319.5	0	1	1
89 10 20	Paracolurella sp.	ROTI	267.9	803.8	0.0	0.0	2	0	0
89 10 20	Ploesoma triacanthum	ROTI	240.5	401.9	0.0	319.5	1	0	1
89 10 20	Proales sp.	ROTI	1060.1	2009.6	531.8	638.9	5	1	2
89 10 20	rotifer - unidentified spp.	ROTI	772.3	401.9	1595.5	319.5	1	3	1
89 10 20	Squatinella sp.	ROTI	106.5	0.0	0.0	319.5	0	0	1
89 10 20	Testudinella parva	ROTI	106.5	0.0	0.0	319.5	0	0	1
89 10 20	Trichocerca porcellus	ROTI	267.9	803.8	0.0	0.0	2	0	0
89 10 20	Trichocerca spp.	ROTI	240.5	401.9	0.0	319.5	1	0	1
89 10 20	Trichotria sp.	ROTI	134.0	401.9	0.0	0.0	1	0	0
89 10 20	Alona rustica	CLAD	1355.5	3215.3	531.8	319.5	8	1	1
89 10 20	Chydorus piger	CLAD	134.0	401.9	0.0	0.0	1	0	0
89 10 20	Diaphanosoma brachyurum	CLAD	603.2	0.0	531.8	1277.9	0	1	4
89 10 20	Echinisco rosea	CLAD	106.5	0.0	0.0	319.5	0	0	1
89 10 20	Ephemeroporus hybridus	CLAD	603.2	0.0	531.8	1277.9	0	1	4
89 10 20	Eubosmina tubicen	CLAD	213.0	0.0	0.0	638.9	0	0	2
89 10 20	Ilyocryptus spinifer	CLAD	240.5	401.9	0.0	319.5	1	0	1
89 10 20	Polyphemus pediculus	CLAD	106.5	0.0	0.0	319.5	0	0	1
89 10 20	Simocephalus serrulatus	CLAD	1016.8	2411.5	0.0	638.9	6	0	2
89 10 20	Streblocercus pygmaeus	CLAD	587.4	803.8	0.0	958.4	2	0	3

	A	B	C
VOL CONC	10.9	14.5	8.7
VOL EXAM	1	1	1

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C	
89 10 20	calanoid copepodid	COPE	106.5	0.0	0.0	319.5	0	0	1	
89 10 20	Microcyclops varicans rubellus	COPE	134.0	401.9	0.0	0.0	1	0	0	
89 10 20	Paracyclops affinis	COPE	374.4	803.8	0.0	319.5	2	0	1	
89 10 20	Tropocyclops prasinus	COPE	461.0	0.0	1063.7	319.5	0	2	1	
89 10 20	copepod nauplius larvae	COPE	3859.2	4019.1	2127.3	5431.0	10	4	17	
89 10 20	cyclopoid copepodid	COPE	2478.8	5626.8	531.8	1277.9	14	1	4	
89 10 20	Annelida	ANNE	267.9	803.8	0.0	0.0	2	0	0	
89 10 20	Nematoda	NEMA	906.3	803.8	1595.5	319.5	2	3	1	
			28799.2				104	34	83	<=== COUNT TOTALS

Appendix 3 (continued).

Raw sample counts, calculated densities (organisms/m²), volume of entire sample (mL), and volume of sample examined (mL) for microinvertebrate samples collected from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Sample Date YY MM DD	Taxa Name and Taxonomic Group		Mean Density #/m²	Calculated Densities REP A #/m²	REP B #/m²	REP C #/m²	Raw Counts REP A	REP B	REP C
89 11 22	Acanthocystis spp.	PROT	143.8	431.4	0.0	0.0	1	0	0
89 11 22	Arcella vulgaris	PROT	143.8	431.4	0.0	0.0	1	0	0
89 11 22	ciliate - unidentified spp.	PROT	174.0	431.4	0.0	90.7	1	0	1
89 11 22	Difflugia sp.	PROT	384.6	431.4	541.0	181.4	1	3	2
89 11 22	Epistylis spp.	PROT	143.8	431.4	0.0	0.0	1	0	0
89 11 22	Euglypha spp.	PROT	264.0	431.4	360.7	0.0	1	2	0
89 11 22	Lesquereusia sp.	PROT	1261.0	2156.8	1082.1	544.1	5	6	6
89 11 22	bdelloidea - unidentified spp.	ROTI	648.6	862.7	901.7	181.4	2	5	2
89 11 22	Cephalodella spp.	ROTI	203.9	431.4	180.3	0.0	1	1	0
89 11 22	Colurella spp.	ROTI	60.1	0.0	180.3	0.0	0	1	0
89 11 22	Dicranophorus sp.	ROTI	90.3	0.0	180.3	90.7	0	1	1
89 11 22	Dissotrocha sp.	ROTI	60.1	0.0	180.3	0.0	0	1	0
89 11 22	Lecane inopinata	ROTI	150.5	0.0	360.7	90.7	0	2	1
89 11 22	Lecane signifera	ROTI	1245.5	1294.1	1082.1	1360.3	3	6	15
89 11 22	Lecane sp. 1	ROTI	1524.7	2588.1	1623.1	362.8	6	9	4
89 11 22	Macrochaetus longipes	ROTI	438.0	862.7	360.7	90.7	2	2	1
89 11 22	Monommata spp.	ROTI	181.0	0.0	180.3	362.8	0	1	4
89 11 22	Monostyla bulla	ROTI	60.1	0.0	180.3	0.0	0	1	0
89 11 22	Monostyla crenata	ROTI	90.3	0.0	180.3	90.7	0	1	1
89 11 22	Monostyla lunaris	ROTI	264.0	431.4	360.7	0.0	1	2	0
89 11 22	Monostyla sp. 1	ROTI	287.6	862.7	0.0	0.0	2	0	0
89 11 22	Notommata sp.	ROTI	180.3	0.0	541.0	0.0	0	3	0
89 11 22	Ploesoma triacanthum	ROTI	60.1	0.0	180.3	0.0	0	1	0
89 11 22	Proales sp.	ROTI	60.5	0.0	0.0	181.4	0	0	2
89 11 22	rotifer - unidentified spp.	ROTI	347.7	862.7	180.3	0.0	2	1	0
89 11 22	Trichocerca porcellus	ROTI	287.6	862.7	0.0	0.0	2	0	0
89 11 22	Alona rustica	CLAD	1829.5	4313.6	721.4	453.4	10	4	5
89 11 22	Chydorus piger	CLAD	407.8	862.7	360.7	0.0	2	2	0
89 11 22	Diaphanosoma brachyurum	CLAD	234.1	431.4	180.3	90.7	1	1	1
89 11 22	Echinisco rosea	CLAD	203.9	431.4	180.3	0.0	1	1	0
89 11 22	Ephemeroporus hybridus	CLAD	595.5	431.4	901.7	453.4	1	5	5
89 11 22	Eubosmina tubicen	CLAD	30.2	0.0	0.0	90.7	0	0	1
89 11 22	Eurycercus (bullatifrons) sp.	CLAD	60.1	0.0	180.3	0.0	0	1	0
89 11 22	Graptoleberis testudinaria	CLAD	143.8	431.4	0.0	0.0	1	0	0
89 11 22	Streblocercus pygmaeus	CLAD	90.3	0.0	180.3	90.7	0	1	1
89 11 22	calanoid copepodid	COPE	30.2	0.0	0.0	90.7	0	0	1
89 11 22	Macrocyclops albidus	COPE	60.1	0.0	180.3	0.0	0	1	0
89 11 22	Paracyclops affinis	COPE	461.6	1294.1	0.0	90.7	3	0	1
89 11 22	Tropocyclops prasinus	COPE	151.1	0.0	0.0	453.4	0	0	5
89 11 22	copepod nauplius larvae	COPE	3056.7	4744.9	3246.2	1178.9	11	18	13
89 11 22	cyclopoid copepodid	COPE	740.0	862.7	541.0	816.2	2	3	9
89 11 22	Annelida	ANNE	421.5	0.0	901.7	362.8	0	5	4
89 11 22	Nematoda	NEMA	612.0	1294.1	360.7	181.4	3	2	2
			17884.6				67	93	88

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Appendix 4.

Microinvertebrate taxa richness for all taxa, within major taxonomic groups, and cumulative over time in Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Month	All Taxa	Pro	Rot	Cla	Cop	Oth	Cumulative
			1988				
June	36	3	11	15	4	3	36
July	34	3	10	11	6	4	48
August	26	5	10	4	3	4	57
September	39	3	21	7	3	5	68
October	43	6	24	9	3	1	75
November	47	9	17	15	3	3	88
December	43	5	18	14	6	0	93
			1989				
January	34	3	11	14	3	3	95
February	43	6	18	11	4	4	97
March	35	5	11	11	5	3	98
April	36	8	11	7	5	5	102
May	-	-	-	-	-	-	102
June	-	-	-	-	-	-	102
July	40	5	23	7	2	3	109
August	43	7	21	8	4	3	113
September	47	5	24	9	5	4	117
October	46	6	25	10	3	2	120
November	40	7	19	9	3	2	121

Pro = Protozoa
Rot = Rotifera
Cla = Cladocera
Cop = Copepoda
Oth = other taxa

Appendix 5.

Descriptive statistics for total microinvertebrate density (organisms/m^2) from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Month	Mean	N	Std	CV	Min	Max
			1988			
June	47219	3	12050	25.5	33501	56090
July	15492	3	6978	45.0	9700	23239
August	14695	3	7102	48.3	9532	22794
September	23809	3	20971	88.1	6834	47252
October	17845	3	7861	44.0	10705	26268
November	16241	3	12161	74.9	3010	26930
December	5459	3	1379	25.3	4333	6997
			1989			
January	33616	3	35083	104.4	12532	74116
February	33934	3	4418	13.0	29382	38204
March	33737	3	9642	28.6	26842	44755
April	13031	3	11780	90.4	2796	25907
May	-	-	-	-	-	-
June	-	-	-	-	-	-
July	34323	3	23250	67.7	10600	57068
August	88686	3	14474	16.3	79226	105348
September	34043	3	11170	32.8	22543	44850
October	28799	3	12022	41.7	18082	41799
November	17885	3	10505	58.7	7981	28901

Appendix 6.

Descriptive statistics for densities of major taxonomic groups of microinvertebrates (organisms/m^2) from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Taxon	Mean	% Comp	N	Std	CV	Min	Max
			June 1988				
Protozoa	2596.7	5.50	3	2255.7	86.9	0.0	4071.0
Rotifera	6163.8	13.05	3	4148.0	67.3	1584.6	9669.7
Cladocera	19904.1	42.15	3	2813.2	14.1	17655.6	23058.8
Copepoda	14136.4	29.94	3	6073.9	43.0	8926.0	20807.5
Other Taxa	4418.2	9.36	3	2600.2	58.9	1584.5	6694.5
TOTAL	47219.4	100.00					
			July 1988				
Protozoa	269.8	1.74	3	115.4	42.8	150.9	381.4
Rotifera	1430.3	9.23	3	442.3	30.9	1144.1	1939.8
Cladocera	6524.0	42.11	3	3995.6	61.2	2217.1	10110.3
Copepoda	5785.4	37.35	3	2322.3	40.1	4194.4	8450.4
Other Taxa	1482.0	9.57	3	1591.5	107.4	554.3	3319.8
TOTAL	15491.7	100.00					
			August 1988				
Protozoa	2084.8	14.19	3	1179.9	56.6	794.3	3108.3
Rotifera	4180.0	28.44	3	1940.7	46.4	2352.0	6216.6
Cladocera	3298.1	22.44	3	2258.1	68.5	794.3	5180.4
Copepoda	3040.3	20.69	3	1892.2	62.2	1588.6	5180.4
Other Taxa	2091.7	14.23	3	1189.1	56.9	784.0	3108.3
TOTAL	14695.1	100.00					
			September 1988				
Protozoa	842.5	3.54	3	1004.7	119.2	231.6	2002.2
Rotifera	13962.6	58.65	3	14193.2	101.7	1969.2	29632.4
Cladocera	964.5	4.05	3	208.0	21.6	810.7	1201.3
Copepoda	5578.9	23.43	3	3534.6	63.4	3011.9	9610.5
Other Taxa	2459.8	10.33	3	2086.2	84.8	810.8	4805.2
TOTAL	23808.5	100.00					
			October 1988				
Protozoa	632.5	3.54	3	248.9	39.4	486.6	920.0
Rotifera	7996.4	44.81	3	3981.0	49.8	5028.0	12520.4
Cladocera	2786.3	15.61	3	2572.7	92.3	1135.4	5750.7
Copepoda	6190.7	34.69	3	4846.6	78.3	3220.4	11783.6
Other Taxa	238.8	1.34	3	243.4	101.9	0.0	486.6
TOTAL	17844.9	100.00					

Appendix 6 (continued).

Descriptive statistics for densities of major taxonomic groups of microinvertebrates (organisms/m^2) from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Taxon	Mean	% Comp	N	Std	CV	Min	Max
			November 1988				
Protozoa	1936.9	11.93	3	1417.9	73.2	463.0	3291.4
Rotifera	3092.7	19.04	3	1973.5	63.8	926.0	4787.5
Cladocera	5506.9	33.91	3	3967.2	72.0	926.0	7814.7
Copepoda	5107.7	31.45	3	5043.6	98.7	463.0	10472.9
Other Taxa	596.5	3.67	3	364.1	61.0	231.5	959.7
TOTAL	16240.8	100.00					
			December 1988				
Protozoa	541.4	9.92	3	220.6	40.8	374.0	791.5
Rotifera	1609.6	29.48	3	603.6	37.5	958.3	2150.2
Cladocera	1041.1	19.07	3	382.1	36.7	625.1	1376.4
Copepoda	2267.1	41.53	3	1054.0	46.5	1402.4	3441.3
Other Taxa	0.0	0.00	3	0.0	.	0.0	0.0
TOTAL	5459.3	100.00					
			January 1989				
Protozoa	1567.0	4.66	3	1241.4	79.2	790.3	2998.9
Rotifera	4135.8	12.30	3	2742.5	66.3	2258.0	7283.1
Cladocera	20411.9	60.72	3	26104.0	127.9	5080.5	50552.7
Copepoda	7234.2	21.52	3	4867.3	67.3	4290.2	12852.4
Other Taxa	267.3	0.80	3	157.8	59.1	112.9	428.4
TOTAL	33616.4	100.00					
			February 1989				
Protozoa	2934.3	8.65	3	889.9	30.3	2184.0	3917.6
Rotifera	12609.4	37.16	3	2367.8	18.8	10033.4	14691.0
Cladocera	5577.2	16.44	3	1945.3	34.9	3917.6	7718.0
Copepoda	10167.7	29.96	3	5087.7	50.0	4897.0	15050.2
Other Taxa	2645.3	7.80	3	660.3	25.0	1958.8	3276.0
TOTAL	33934.1	100.00					
			March 1989				
Protozoa	3016.6	8.94	3	922.0	30.6	1952.1	3564.6
Rotifera	6049.8	17.93	3	4200.8	69.4	3416.2	10894.4
Cladocera	10073.4	29.86	3	3147.8	31.2	7403.4	13544.4
Copepoda	12836.4	38.05	3	1621.9	12.6	10980.8	13984.2
Other Taxa	1760.5	5.22	3	1295.6	73.6	822.6	3238.9
TOTAL	33736.8	100.00					

Appendix 6 (continued).

Descriptive statistics for densities of major taxonomic groups of microinvertebrates (organisms/m^2) from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Taxon	Mean	% Comp	N	Std	CV	Min	Max
			April 1989				
Protozoa	2999.8	23.02	3	3749.5	125.0	718.8	7327.3
Rotifera	1554.4	11.93	3	813.0	52.3	638.9	2192.4
Cladocera	2065.4	15.85	3	2970.6	143.8	319.6	5495.5
Copepoda	4979.5	38.21	3	4007.1	80.5	559.1	8374.0
Other Taxa	1431.9	10.99	3	1261.7	88.1	559.1	2878.6
TOTAL	13031.1	100.00					
			July 1989				
Protozoa	1493.0	4.35	3	846.7	56.7	613.2	2302.2
Rotifera	22095.5	64.38	3	21026.1	95.2	5080.8	45602.0
Cladocera	3150.1	9.18	3	2623.9	83.3	1226.4	6139.2
Copepoda	6230.9	18.15	3	3817.5	61.3	1927.2	9208.8
Other Taxa	1352.9	3.94	3	957.4	70.8	260.6	2046.4
TOTAL	34322.5	100.00					
			August 1989				
Protozoa	8384.8	9.45	3	3612.7	43.1	4387.6	11417.1
Rotifera	22080.9	24.90	3	3910.8	17.7	19430.8	26572.6
Cladocera	30327.3	34.20	3	16999.3	56.1	13778.5	47744.0
Copepoda	22395.2	25.25	3	1898.6	8.5	20239.3	23818.2
Other Taxa	5497.7	6.20	3	1021.2	18.6	4387.6	6397.2
TOTAL	88686.0	100.00					
			September 1989				
Protozoa	1734.8	5.10	3	605.0	34.9	1102.7	2308.5
Rotifera	11488.3	33.75	3	1525.6	13.3	10246.7	13191.5
Cladocera	8701.6	25.56	3	5763.7	66.2	2049.3	12201.8
Copepoda	10437.1	30.66	3	4793.1	45.9	6660.4	15829.3
Other Taxa	1680.6	4.94	3	320.4	19.1	1319.1	1929.7
TOTAL	34042.5	100.00					
			October 1989				
Protozoa	1982.1	6.88	3	691.0	34.9	1277.9	2659.1
Rotifera	13262.0	46.05	3	6066.8	45.7	8509.1	20095.4
Cladocera	4966.6	17.25	3	2977.0	59.9	1595.4	7234.4
Copepoda	7413.9	25.74	3	3571.1	48.2	3722.8	10851.6
Other Taxa	1174.2	4.08	3	740.2	63.0	319.5	1607.6
TOTAL	28798.9	100.00					

Appendix 6 (continued).

Descriptive statistics for densities of major taxonomic groups of microinvertebrates (organisms/m^2) from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Taxon	Mean	% Comp	N	Std	CV	Min	Max
			November 1989				
Protozoa	2515.0	14.06	3	2017.6	80.2	816.2	4745.2
Rotifera	6240.9	34.90	3	3168.1	50.8	2811.5	9058.5
Cladocera	3595.2	20.10	3	2963.5	82.4	1178.9	6901.9
Copepoda	4499.7	25.16	3	2185.0	48.6	2629.9	6901.7
Other Taxa	1033.5	5.78	3	424.1	41.0	544.2	1294.1
TOTAL	17884.5	100.00					

Appendix 7.

Descriptive statistics for densities of numerically dominant (>5%) micro-invertebrate taxa (organisms/m²) from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Order	Taxon	Mean	% Comp
	June 1988		
Copepoda	cyclopoid copepodid	7520.6	15.93
Cladocera	Chydorus faviformis	5937.0	12.57
Cladocera	Acantholeberis curvirostris	4871.7	10.32
Copepoda	Microcyclops varicans rubellus	4115.9	8.72
Other Taxa	Annelida	3717.9	7.87
Cladocera	Chydorus piger	3146.9	6.66
TOTAL			62.07
	July 1988		
Copepoda	Tropocyclops prasinus	1771.5	11.44
Copepoda	cyclopoid copepodid	1759.5	11.36
Cladocera	Chydorus piger	1750.2	11.30
Cladocera	Ceriodaphnia spp.	1299.5	8.39
Copepoda	Microcyclops varicans rubellus	883.4	5.70
Other Taxa	Ostracoda - unidentified spp.	818.0	5.28
TOTAL			53.46
	August 1988		
Cladocera	Chydorus piger	1739.4	11.84
Copepoda	Tropocyclops prasinus	1297.4	8.83
Rotifera	Lecane inopinata	1136.2	7.73
Other Taxa	Gastrotricha	871.4	5.93
Copepoda	Paracyclops affinis	871.4	5.93
Cladocera	Streblocercus pygmaeus	868.0	5.91
TOTAL			46.16
	September 1988		
Rotifera	Lecane inopinata	3512.2	14.75
Copepoda	cyclopoid copepodid	2789.5	11.72
Copepoda	Tropocyclops prasinus	1540.2	6.47
Rotifera	Monostyla lunaris	1495.9	6.28
Rotifera	rotifer - unidentified spp.	1495.2	6.28
TOTAL			45.50
	October 1988		
Copepoda	nauplius larvae - unidentified spp.	3863.5	21.65
Copepoda	cyclopoid copepodid	1090.1	6.11
TOTAL			27.76
	November 1988		
Copepoda	nauplius larvae - unidentified spp.	3224.7	19.86
Cladocera	Streblocercus pygmaeus	2975.2	18.32
Copepoda	cyclopoid copepodid	1386.1	8.53
Protozoa	Lesquereusia sp.	887.4	5.46
TOTAL			52.17
	December 1988		
Copepoda	nauplius larvae - unidentified spp.	1322.8	24.23
Copepoda	cyclopoid copepodid	555.5	10.18
Rotifera	Lecane signifera	453.8	8.31
Protozoa	Lesquereusia sp.	274.2	5.02
TOTAL			47.74

Appendix 7 (continued).

Descriptive statistics for densities of numerically dominant (>5%) micro-invertebrate taxa (organisms/m²) from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Order	Taxon	Mean	% Comp
	January 1989		
Cladocera	Acantholeberis curvirostris	5407.4	16.09
Copepoda	nauplius larvae - unidentified spp.	4907.7	14.60
Cladocera	Streblocercus serricaudatus	4657.6	13.86
Cladocera	Biapertura affinis	4269.7	12.70
Cladocera	Streblocercus pygmaeus	4129.8	12.29
Rotifera	Proales sp.	1712.8	5.10
TOTAL			74.62
	February 1989		
Copepoda	nauplius larvae - unidentified spp.	7111.6	20.96
Cladocera	Acantholeberis curvirostris	2014.3	5.94
Rotifera	Cephalodella mucronata	1885.2	5.56
Copepoda	cyclopoid copepodid	1878.4	5.54
Rotifera	Bdelloidea - unidentified spp.	1729.3	5.10
TOTAL			43.08
	March 1989		
Copepoda	nauplius larvae - unidentified spp.	5536.0	16.41
Cladocera	Acantholeberis curvirostris	3399.9	10.08
Cladocera	Chydorus piger	3000.0	8.89
Rotifera	Dicranophorus sp.	2843.4	8.43
Copepoda	Microcyclops varicans rubellus	2627.5	7.79
Copepoda	cyclopoid copepodid	2492.4	7.39
Protozoa	Difflugia sp.	471.6	7.33
TOTAL			66.31
	April 1989		
Copepoda	nauplius larvae - unidentified spp.	2133.0	16.37
Protozoa	Difflugia sp.	1806.6	13.86
Copepoda	cyclopoid copepodid	1542.6	11.84
Cladocera	Acantholeberis curvirostris	1335.0	10.25
Other Taxa	Ostracoda - unidentified spp.	820.5	6.30
TOTAL			58.61
	July 1989		
Rotifera	Monommata spp.	5260.3	15.33
Rotifera	Macrochaetus longipes	3965.3	11.55
Rotifera	Monostyla bulla	2675.8	7.80
Copepoda	nauplius larvae - unidentified spp.	1962.7	5.72
Copepoda	Microcyclops varicans rubellus	1919.4	5.59
Rotifera	Anuraeopsis sp.	1767.1	5.15
Rotifera	Notommata sp.	1754.3	5.11
TOTAL			56.25
	August 1989		
Cladocera	Echinisco rosea	13290.8	14.99
Cladocera	Alona rustica	12693.6	14.31
Copepoda	nauplius larvae - unidentified spp.	11073.9	12.49
Copepoda	cyclopoid copepodid	6079.6	6.86
TOTAL			48.64

Appendix 7 (continued).

Descriptive statistics for densities of numerically dominant (>5%) micro-invertebrate taxa (organisms/m^2) from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Order	Taxon	Mean	% Comp
	September 1989		
Copepoda	nauplius larvae - unidentified spp.	7094.2	20.84
Cladocera	Alona rustica	4128.4	12.13
Cladocera	Chydorus piger	2574.5	7.56
Copepoda	cyclopoid copepodid	2346.7	6.89
TOTAL			47.42
	October 1989		
Copepoda	nauplius larvae - unidentified spp.	3859.1	13.40
Copepoda	cyclopoid copepodid	2478.8	8.61
Rotifera	Macrochaetus longipes	2002.7	6.95
Rotifera	Lecane signifera	1620.0	5.63
TOTAL			34.59
	November 1989		
Copepoda	nauplius larvae - unidentified spp.	3056.6	17.09
Cladocera	Alona rustica	1829.4	10.23
Rotifera	Lecane sp. 1	1524.6	8.53
Protozoa	Lesquereusia sp.	1261.0	7.05
Rotifera	Lecane signifera	1245.5	6.96
TOTAL			49.86

Appendix 8.

Descriptive statistics for Shannon-Wiener taxa diversity for micro-invertebrates from Hopkins Prairie, Ocala National Forest, Florida. June 1988 to November 1989.

Month	Mean	N	Std	CV	Min	Max
			1988			
June	2.692	3	0.330	12.3	2.315	2.928
July	2.668	3	0.110	4.1	2.583	2.792
August	2.548	3	0.286	11.2	2.369	2.878
September	2.768	3	0.117	4.2	2.634	2.846
October	2.715	3	0.105	3.9	2.612	2.822
November	2.752	3	0.279	10.1	2.565	3.072
December	2.722	3	0.168	6.2	2.589	2.911
			1989			
January	2.547	3	0.156	6.1	2.396	2.708
February	2.934	3	0.036	1.2	2.911	2.976
March	2.795	3	0.088	3.1	2.695	2.861
April	2.630	3	0.242	9.2	2.357	2.817
May	-	-	-	-	-	-
June	-	-	-	-	-	-
July	2.911	3	0.287	9.9	2.662	3.224
August	2.887	3	0.164	5.7	2.725	3.053
September	2.929	3	0.072	2.5	2.872	3.010
October	3.006	3	0.218	7.3	2.762	3.181
November	2.891	3	0.125	4.3	2.764	3.014

Reference Collection Log
Taxa List

Group	Taxon	Vial Code	Mount
CLADOCERA			
Bosminidae	Eubosmina tubicen	B1	X
Chydoridae	Acroperus harpae	C12	X
	Alona monacantha	C13	X
	Alona quadrangularis	C5	X
	Alona rustica	C7	X
	Alona sp.	No vial	X
	Biapertura affinis	C1	X
	Camptocercus cf. rectirostris	C10	X
	Chydorus faviformis	C3	X
	Chydorus piger	C2	X
	Chydorus sp.	C4	X
	Ephemeroporus hybridus	C11	X
	Eurycercus sp.	C14	X
	Graptoleberis testudinaria	C8	X
Daphnidae	Ceriodaphnia sp.	D1	X
	Simocephalus serrulatus	D2	X
Macrothricidae	Acantholeberis curvirostris	M4	X
	Drepanothrix dentata	M3	X
	Echiniscus rosea	M7	X
	Grimaldina brazzai	M5	X
	Ilyocryptus sordidus	M1	X
	Ilyocryptus spinifer	M1	X
	Macrothrix sp.	M8	X
	Streblocercus pygmaeus	M2	X
	Streblocercus serricaudatus	M9	X
Polyphemidae	Polyphemus pediculus	P1	X
Sididae	Diaphanosoma brachyurum	S1	X
	Latonopsis occidentalis	S2	X
COPEPODA			
Calanoida	Calanoid copepodid	CO3	X
	Diaptomus	CO9	X
Cyclopoida	Cyclopoida copepodid	CO2	X
	Cyclopoida-unidentified male	CO11	X
	Eucyclops agilis	CO7	X
	Eucyclops speratus	CO13	X
	Macrocyclops albidus	CO5	X
	Mesocyclops leuckarti	CO8	X
	Microcyclops varicans rubellus	CO4	X
	Paracyclops affinis	CO10	X
	Tropocyclops prasinus	CO6	X
Harpacticoida	Harpacticoida	No vial	X
Copepoda	Copepoda-nauplii	CO1	X

Reference Collection Log
Taxa List (continued).

Group	Taxon	Vial Code	Mount
OTHER			
	Annelida	A-1	X
	Gastropoda	G-1	X
	Gastrotricha	---	---
	Hydracarina	HY-1	X
	Nematoda	N-1	X
	Ostracoda	O-1	X