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Seasonal Variation in the Species Composition, Abundance, and Size-Frequency Distribution of Zooplankton in Bear Lake, Utah-Idaho

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SEASONAL VARIATION IN THE SPECIES COMPOSITION, ABUNDANCE, AND SIZE FREQUENCY DISTRIBUTION OF ZOOPLANKTON IN BEAR LAKE, UTAH-IDAHO

by

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Edmundo G. Moreno

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ABSTRACT

Seasonal Variation in the Species Composition, Abundance, and Size-Frequency Distribution of Zooplankton in Bear Lake, Utah-Idaho

by

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Bear Lake, a large oligotrophic lake (282 km^2), was studied from October 1986 to December 1987 to determine the temporal changes in the zooplankton assemblage at one site in the pelagic zone and one in the littoral area. In this study, species composition, abundance, biomass, and size frequency distribution were determined. Additionally, chlorophyll a, water transparency, and temperature and oxygen profiles were measured to help interpret zooplankton changes during the study.

The zooplankton species assemblage comprised eight species of cladocera, seven species of copepods, and five species of rotifers. The abundance and biomass of the zooplankton assemblage, particularly that of crustaceans, were very low and comparable with those of oligotrophic systems. Mean densities of crustaceans in the pelagic zone, excluding

copepod nauplii, varied from 250 to 1,700 organisms/m^3 in winter and summer, respectively. Mean annual dry biomass of zooplankton in the pelagic zone was 6.4 mg/m^3. The analysis of the size structure of the zooplankton indicated the dominance of small organisms and the scarcity of large organisms, particularly cladocera. The zooplankton assemblage in the littoral zone was similar in species composition, abundance, and size structure to that in the pelagic zone. My results suggest that the littoral zooplankton assemblage is an extension of the pelagic assemblage.

Low zooplankton food resources and interference of calcium carbonate particles in the feeding behavior of crustaceans are suggested as the primary factors controlling the low abundance and biomass of zooplankton in Bear Lake. Size-selective fish predation probably causes the assemblage to be dominated by small species.

The analysis of Epischura nevadensis, the dominant species in the system, indicated that this species is bivoltine in Bear Lake. In the spring and summer, adult E. nevadensis were more abundant in the littoral zone, whereas copepodites were more abundant offshore.

The low density, biomass, and small size structure of the zooplankton in Bear Lake limits its importance as a source of food for fishes.

(121 pages)

INTRODUCTION

The abundance and species composition of zooplankton in most lakes varies markedly in time and space. Seasonal variations in densities of organisms can cover several orders of magnitude, vertical differences in abundances are often high, and species present in one region of a lake may be nearly completely different from those in another area (Hutchinson 1967, Margalef 1983).

Variation in zooplankton abundance, size structure, and distribution are particularly important in controlling the growth, abundance, and types of fish in lakes. Fish predation, in turn, may affect the zooplankton community. The interactions between these predators and prey have been intensively studied for decades (for reviews see Zaret 1980, Morgan 1980, Kerfoot and Sih 1987). In addition to the zooplankton-fish interaction, other factors that can affect the structure of the zooplankton community include predation by invertebrates (O'Brien 1979; Lewis 1980), competition (Lane 1975, Vanni 1987), food resources (Vanni 1987, Koenings et al., In press), and suspended inorganic materials that interfere with feeding in some zooplankton taxa (Vanderploeg et al. 1987, Koenings et al., In press).

Although there is a large number of studies on the temporal variation of zooplankton assemblages of lakes (Hutchinson 1967, Margalef 1983), there are few reports on the zooplankton of the Great Basin of the western United States

(Lake Tahoe--Byron et al. 1984, Lahontan Reservoir - Cooper and Vigg 1985, Pyramid Lake--Galat et al. 1981). In addition to these, the zooplankton community of Bear Lake has been studied several times over the last 65 years (Kemmerer et al. 1923, McConnell et al. 1957, Lentz 1986). Because of the tremendous diversity of lakes within the Great Basin (ranging from ultra-oligotrophic Lake Tahoe to the hypersaline and productive Great Salt Lake), few generalities emerge about their zooplankton communities except that they are relatively depauperate in species.

Although the zooplankton in Bear Lake have been studied previously, many aspects of their biology and ecology are not well understood. The information I collected over a 15-month period in 1986 and 1987 will provide additional information on (1) zooplankton taxonomy, (2) size-frequency distribution, (3) seasonal population dynamics, (4) biomass, and (5) differences between the littoral and pelagic zooplankton assemblages. Environmental variables measured during the study allowed me to speculate on causal factors shaping the structure of the zooplankton assemblage. This research was part of a larger project that examined trophic relations between fish and invertebrates in the Bear Lake. The information on the distribution and abundance of the zooplankton will help ecologists and managers better understand the role of these invertebrates in structuring the lake's fish assemblage.

STUDY SITE

Bear Lake is a large (282 km^2, 30 m mean depth) oligotrophic lake located on the border between Utah and Idaho. It is a tilt-block lake with a gentle slope on the western shore and an abruptly sloping eastern side (Fig. 1). It is normally dimictic, with summer surface temperatures near 20°C and deep hypolimnetic temperatures below 4.5°C. The water is hard (6.0 mEquiv $CaCO_3$ [Birdsey 1985]), and large amounts of calcium carbonate precipitate in the water column, giving it a characteristic milky-blue color. Oxygen is rarely depleted below 4 $\mu g/l$ (McConnell et al. 1957, Lamarra et al. 1987), and it probably does not limit zooplankton either spatially or temporally.

Primary productivity in this large lake is dominated by algal growth, because macrophytes are absent from the majority of the shoreline. The paucity of both emergent and submerged macrophytes may be due to the wave action on the unprotected shoreline and annual water level fluctuations of 1-2 m caused by irrigation use (Lamarra et al. 1987). No emergent or submerged macrophytes were present at my study sites. Although algal growth dominates production, it is also low, and the lake is oligotrophic. Summer chlorophyll a levels reach only 0.2 to 1.0 mg/m^3 in the surface water but are somewhat higher in the metalimnion, where a broad deep chlorophyll layer is present (Lamarra et al. 1987).

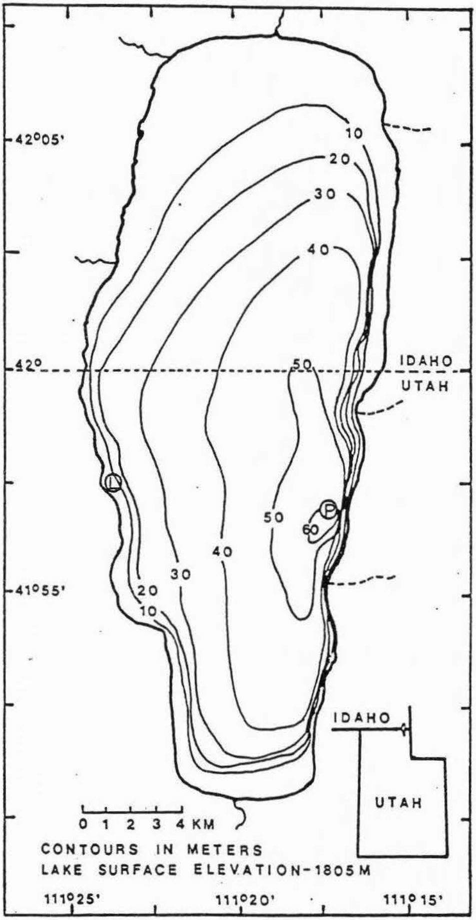

Figure 1. Morphometry of Bear Lake, Utah-Idaho. The locations of the littoral (L) and pelagic (P) stations sampled during the study are noted. The depths of the stations were 3 and 60 m, respectively.

The only abundant planktivorous fish in Bear Lake is the Bonneville cisco (Prosopium gemmiferum), which feeds nearly exclusively on calanoid copepods and cladocera (McConnell et al. 1957, Lentz 1986). Juvenile Bonneville and Bear Lake whitefish (P. spilonotus and P. abissycola) also feed on crustacean zooplankton, but they are rare in relation to the abundant cisco (Unpublished data of W. Wurtsbaugh, B. Nielsen and P. Birdsey). Cutthroat trout (Oncorhynchus clarki), the primary sport fish in the lake, only rarely feed on plankton.

METHODS

I collected samples every 3-4 weeks from October 1986 to December 1987 at two stations. A littoral station was located approximately 150 m from the western shore of the lake at a depth of 3 m (Fig. 1). A pelagic station was located approximately 700 m from the eastern shore at a depth of 55-60 m. A King echosounder and a Loran-C navigation device were used to locate the stations. At each station I took replicate samples at three sites, each separated by 500 m intervals.

At each sampling site, I made mid-day collections of zooplankton throughout the water column with vertical tows of an 80 μm mesh Wisconsin plankton net. From October 1986 to January 1987 a 30-cm diameter net was used, but I subsequently used a 50-cm diameter net to increase the sample sizes. Ratios between the length and mouth diameter of the small and large nets were 4:1 and 3:1. Because colonial and filamentous algae are rare in Bear Lake, net clogging was considered unimportant, and consequently no corrections were made for filtration efficiency. Nevertheless, the efficiency of 80 μm nets is less than 100% (UNESCO 1968), so that zooplankton densities were probably underestimated. The net was lowered to within 1 m and 0.2 m of the bottom at the pelagic and littoral stations, respectively. Zooplankton were preserved with a 4% solution of sucrose-formalin (Haney and Hall 1973).

Species identifications were made using keys by Edmondson

(1959), Ruttner-Kolisco (1974), and Pennak (1978). Instars of Epischura nevadensis, the dominant crustacean in the lake, were identified as adult males and females, copepodid I-V, and nauplii. In the present analysis E. nevadensis adult males and females were grouped as "adults." Nauplii of cyclopoid and harpacticoid copepods were also included in the nauplli taxa. For my analysis, however I assume that the nauplii were dominated by E. nevadensis because cyclopoid and harpacticoid copepodites were approximately two orders of magnitude less abundant than E. nevadensis. Cyclopoid and harpacticoid copepods were identified to species, but in some of my analyses they are grouped as "other copepods" because they were uncommon, and because many of them are associated with the benthic zone (Evans et al. 1980). The identification of Conochilus unicornis was confirmed by A. Litt (University of Washington). Because I did not check for subtle changes in the morphology of this species through the study, it is possible that there were successional changes in congeneric species that were not noted (Edmondson and Litt 1982).

Entire zooplankton samples or subsamples were counted under a dissecting microscope at 45X. Subsamples were taken by mixing 30 to 150 ml samples by blowing through a wide-bore pipette, then drawing up an aliquot of 1 to 10 ml (McCallum 1979). At least two subsamples were enumerated to obtain minimum counts of 40 organisms per taxa (when available). The length of 10 to 45 randomly chosen zooplankton of each taxa was measured to the nearest 33-μm with an ocular micrometer. Lengths were measured less setae and spines. Biomass estimates were made using length-weight regressions of McCauley (1984) (See Appendix A for the formulas used).

In addition to zooplankton, I took the following limnological parameters at each station. Penetration of photosynthetically active radiation (PAR) was measured with a Licor 188B radiometer equipped with a spherical sensor. Secchi transparency was measured with a 25-cm black and white disk. Temperature and oxygen were measured with a YSI-58 thermistor-oximeter. The oxygen meter was air-calibrated, giving an accuracy of approximately $\pm$ 1 mg/l. Samples for chlorophyll a determination were obtained with Van Dorn or Kemmerer bottles midway through each of the epilimnetic, metalimnetic and hypolimnetic strata. In the laboratory, aliquots of these samples were filtered on 0.45-μm membrane filters, extracted in boiling, buffered methanol, and analyzed fluorometrically before and after acidification with a Turner 111 fluorometer (Holm-Hansen and Riemann 1978). I initially fractionated the samples with a 30-μm Nitex net to determine proportions of the phytoplankton available to filter-feeding zooplankton. Because no differences were found between total and fractionated chlorophyll a samples, fractionalization was discontinued after 6 months.

RESULTS

Limnological Characteristics

The lake did not entirely freeze in the winter of 1987, but by February an ice layer about 1 cm thick covered much of the western part of the lake. Lake mixing during the winter allowed the entire water column to cool to 2°C or less (Fig. 2). Thermal stratification began in May and continued through December 1987. During summer stratification, a broad thermocline existed from approximately 12 to 28 m. Epilimnetic temperatures reached 19.5°C in August, while hypolimnetic temperatures were near 4°C. Temperatures at the littoral station were 1.2-1.6°C colder during the winter months, and 0.3-0.8°C warmer in the summer than the surface temperatures at the pelagic station.

Oxygen levels through the water column were generally high during the study period. Representative profiles are shown in Fig. 3. Epilimnetic concentrations varied from 11.3 mg/l in February to 7.4 mg/l in August. During stratification, oxygen concentration was maximal in the metalimnion. A minimum oxygen concentration of 4 mg/l was observed in the deep hypolimnion near the end of summer stratification (October).

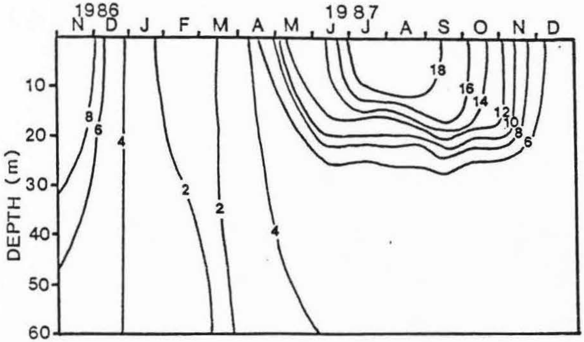

Figure 2. Temperature (^{0}C) isopleths of the pelagic zone of Bear Lake during 1986-1987.

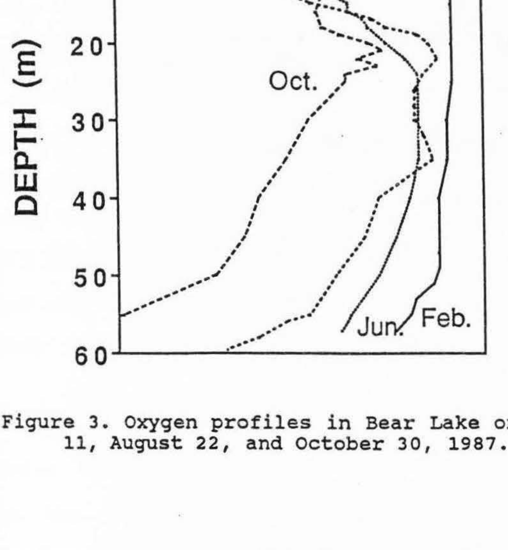

Figure 3. Oxygen profiles in Bear Lake on February 28, June 11, August 22, and October 30, 1987.

Epilimnetic chlorophyll a samples were highest in the winter and lowest during summer stratification (Fig. 4A; Appendix B). In the pelagic zone, winter concentrations ranged from 1.2 to 2.0 mg/m^3, whereas summer concentrations were near 0.5 mg/m^3. Annual mean chlorophyll a concentration in the epilimnion of the pelagic zone was 0.9 mg/m^3. Chlorophyll concentrations in the littoral zone were significantly different from those in the pelagic surface water in only May and September (t-test; $p<0.05$).

During stratified periods, concentrations of chlorophyll a were usually higher in the metalimnion, and often higher in the hypolimnion, than in the epilimnion (Fig. 4B). Annual mean chlorophyll a concentrations in the two lower strata were 1.2 and 0.8 mg/m^3, respectively. These means, however, are not directly comparable to that from the epilimnion, since they do not include values from the winter of 1986-1987.

Temporal variation in water transparency was inversely correlated with changes of chlorophyll a in the epilimnion (Fig. 4A, C; Fig. 5). Secchi transparencies ranged from 2 m in the winter to 7 m during the summer. Vertical light extinction coefficients were near $0.3 \cdot m^{-1}$ in the winter, and dropped to $0.14\text{-}0.19 \cdot m^{-1}$ during the summer (Fig. 4C; Appendix B). The photic zone, as estimated by the 1% light level, ranged to depths of 13-18 m in the winter and from 24 to 32 m during summer stratification.

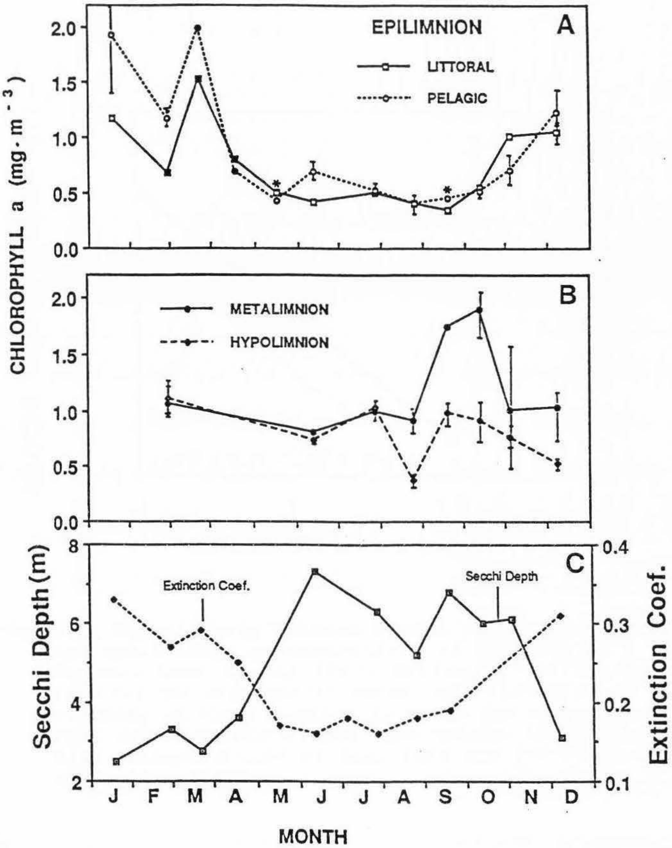

Figure 4. A. Mean concentration of chlorophyll a in the epilimnion of the pelagic and littoral zones of Bear Lake throughout 1987 (ranges of 2-3 replicates are shown when greater than the width of the points). Closed symbols denote dates when replicates where not taken. Dates when pelagic and littoral chlorophyll concentrations were significantly different (t-test; $p < 0.05$) are denoted by asterisks. B. Mean and ranges of chlorophyll a in the metalimnion and hypolimnion of Bear Lake. C. Secchi depth transparency and extinction coefficients for the pelagic zone of Bear Lake during 1987.

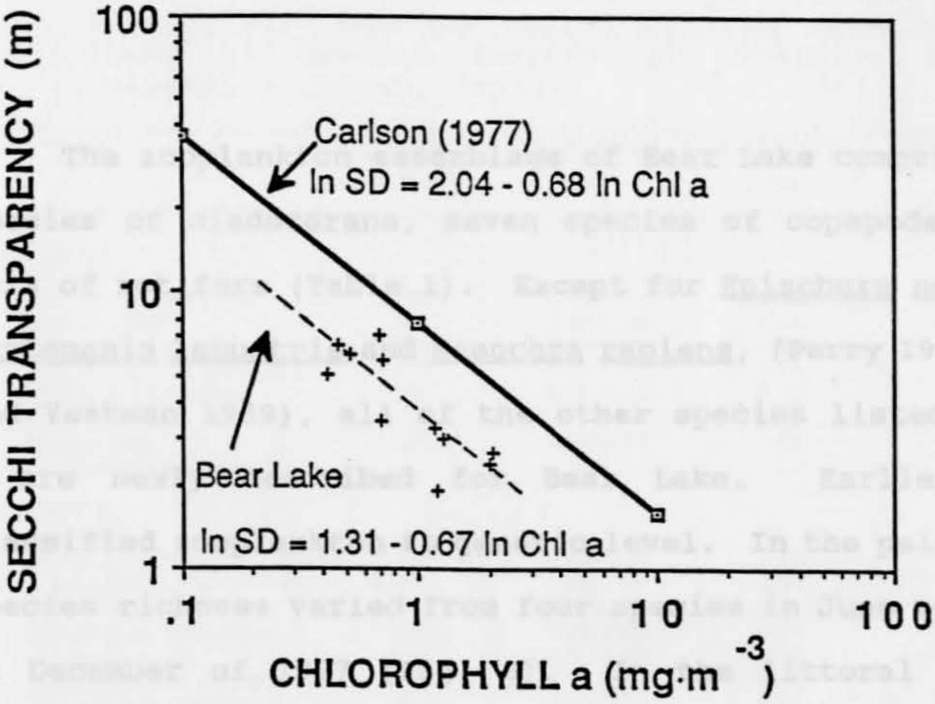

Figure 5. Relationship between Secchi disk transparency (SD) and epilimnetic concentrations of chlorophyll a (Chl a) in Bear Lake during 1987. Carlson's (1977) regression line for the chlorophyll-Secchi relationship in a variety of lakes in North America is shown for comparison. Note that although the slopes are nearly identical, Secchi disk transparencies of Bear lake are 50% of those found by Carlson (1977).

Species Richness and Composition of the Zooplankton Assemblage

The zooplankton assemblage of Bear Lake comprised eight species of cladocerans, seven species of copepods and five taxa of rotifers (Table 1). Except for Epischura nevadensis, Huntemania lacustris and Mesochra rapiens, (Perry 1943, Wilson and Yeatman 1959), all of the other species listed in Table 1 are newly described for Bear Lake. Earlier studies classified zooplankton to generic level. In the pelagic zone, species richness varied from four species in June to fourteen in December of 1987 (Fig. 6). In the littoral zone, the number of species was always less than or equal to that in the pelagic area.

Although species richness of the littoral and pelagic assemblages differed, there was no species that occurred exclusively in either zone. I found the harpacticoid copepod, Canthocaptus robertcokeri only in the pelagic zone, but benthic samples indicate that this species is most abundant in the littoral zone (C. Hawkins, Utah State University, pers. commun.). The reason for this discrepancy is not obvious. Diaphanosoma brachyurum, Daphnia pulex, Acanthocyclops vernalis, Paracyclops fimbriatus and Eucyclops agilis were found at least twice as often offshore as inshore, but this difference was statiscally different for only E. agilis (Chi

Table 1. Zooplankton taxa of Bear Lake with maximum abundances, length range, mean length and trophic groups (1986-1987). Alona sp. were counted at the generic level, but three species have subsequently been identified. Species marked with an asterisk are also found in benthic samples (C. Hawkins, Utah State University, unpub. data).

TAXA	MAX. ABUND. (Number/m^3)	LENGTH RANGE (mm)	MEAN LENGTH (mm)	TROPHIC GROUP
CRUSTACEA:				
I. CLADOCERA				
Bosmina longirostris	5,200	0.20-0.50	0.35	Grazer
Daphnia pulex	500	0.36-1.98	0.91	Grazer
Ceriodaphnia reticulata	2,500	0.20-0.99	0.58	Grazer
Diaphanosoma brachyurum	250	0.36-1.32	0.74	Grazer
Chydorus sphaericus	30	0.20-0.79	0.46	Grazer
Alona costata * Alona afinis * Alona quadrangularis *	65	0.42-0.42	0.42	Grazer
II. COPEPODA				
Calanoida:				
Epischura nevadensis (adults)	1,150	0.99-1.48	1.12	Graz.-Pred.
E. nevadensis (copepodites)	2,400	0.30-0.99	0.64	Grazer
Cyclopoida:				
Paracyclops fimbriatus *	120	0.46-0.85	0.64	Graz.-Pred.
Eucyclops agilis *	130	0.50-0.96	0.62	Graz.-Pred.
Acanthocyclops vernalis	60	0.82-1.16	0.84	Graz.-Pred.
Cyclopoida copepodites	200	0.30-0.63	0.38	Grazer
Harpacticoida:				
Canthocamptus robertcokeri *	15	0.53-0.59	0.53	?
Mesochra rapiens *	12	0.40-0.59	0.45	?
Huntemania lacustris *	35	0.46-0.59	0.49	?
Copepoda nauplii	6,000	0.07-0.36	0.20	Grazer
ROTIFERA:				
Keratella quadrata	106,000	0.10-0.17	0.13	Grazer
Keratella cochlearis	9,600	0.07-0.13	0.10	Grazer
Brachionus sp.	6,300	0.07-0.26	0.11	Grazer
Conochilus unicornis	200,000	0.07-0.10	0.10	Grazer
Polyarthra sp.	1,000	0.07-0.13	0.10	Grazer

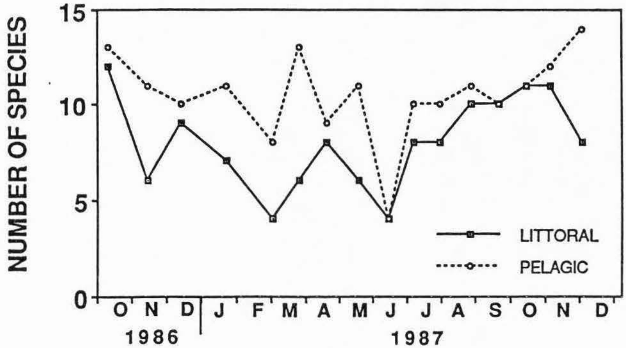

Figure 6. Temporal changes in number of different zooplankton species found in the pelagic and littoral zones of Bear lake.

square, $p<0.05$). Chydorus sphaericus was collected five times in the littoral zone and only once in the pelagic area, but these differences were also not significant ($p>0.05$).

Zooplankton Densities

CRUSTACEA.--The number of crustacea in Bear Lake was low throughout the study. In the pelagic zone, densities of crustaceans (less nauplii) varied from 200-500 organisms/m^3 during the winter to 1300-2100 organisms/m^3 during the summer and early fall (Fig. 7A; Appendix C). Stage 1-5 copepodites and adult E. nevadensis dominated the assemblage during the spring and summer; Bosmina longirostris and other cladocera were codominant in the fall and the winter. The larger species of cladocera in the lake, D. pulex and D. brachyurum, reached densities of only 470 and 150 individuals/m^3, respectively (Fig. 7A; Appendix C). Even when nauplii are included, crustacean densities reached a maximum of only 8,000/m^3.

In the littoral zone, the seasonal pattern of crustacean abundance was similar to that in the pelagic zone, but somewhat more variable (Fig. 7B; Appendix D). In March 1987, only 70 individuals/m^3 were found in the littoral zone, but total numbers increased rapidly in the spring and reached

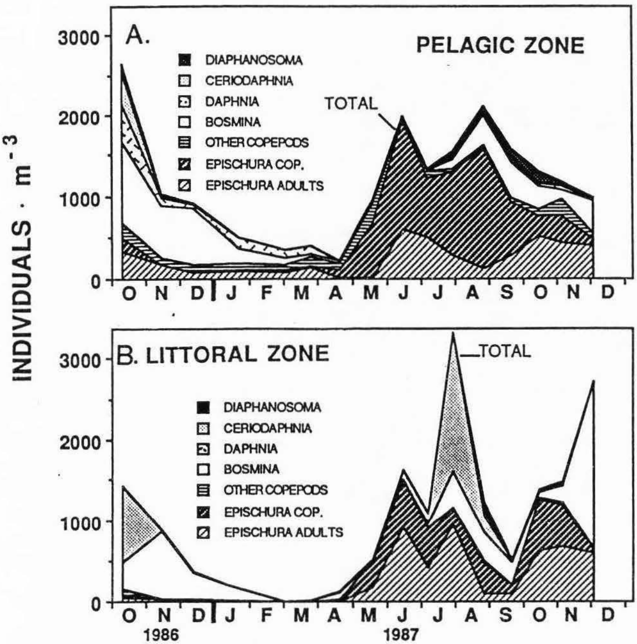

Figure 7. Temporal variation in the abundances of crustaceans (less nauplii) in the pelagic (A) and littoral (B) zones of Bear Lake during 1986-1987. Numbers represent the average of three replicated samples taken at each station.

densities of 3300 individuals/m^3 by July. During the early summer, E. nevadensis dominated the plankton in the littoral zone. Blooms of C. reticulata and B. longirostris in the late summer and fall contributed to the variability in total crustacean abundance, and made these species either dominant or co-dominant through the fall and winter (Appendix E). The larger species, D. pulex and D. brachyurum, were nearly absent from the littoral area.

Different life-stages of the dominant copepod, E. nevadensis, were concentrated in different areas during the year (Fig. 8). Adult E. nevadensis were nearly absent from the littoral zone during the fall of 1986 and winter of 1987, but small numbers of them overwintered in the pelagic zone (Fig. 8A). In the spring and summer this pattern reversed, and adults became more abundant in the littoral zone than in the pelagic environment. Copepodites, in contrast, were more abundant offshore than inshore during the spring and summer (Fig. 8B). Nauplii were almost always more abundant in the pelagic zone than in the littoral area (Fig. 8C).

A size-frequency analysis suggests that there were two overlapping generations of E. nevadensis produced during the year in Bear Lake (Fig. 9). The species over-wintered as nauplii and a small number of adults. By April and May, as surface water temperatures warmed to 12°C, the nauplii began to grow into copepodid stages, and by June, adults were abundant. A second generation of nauplii were produced by

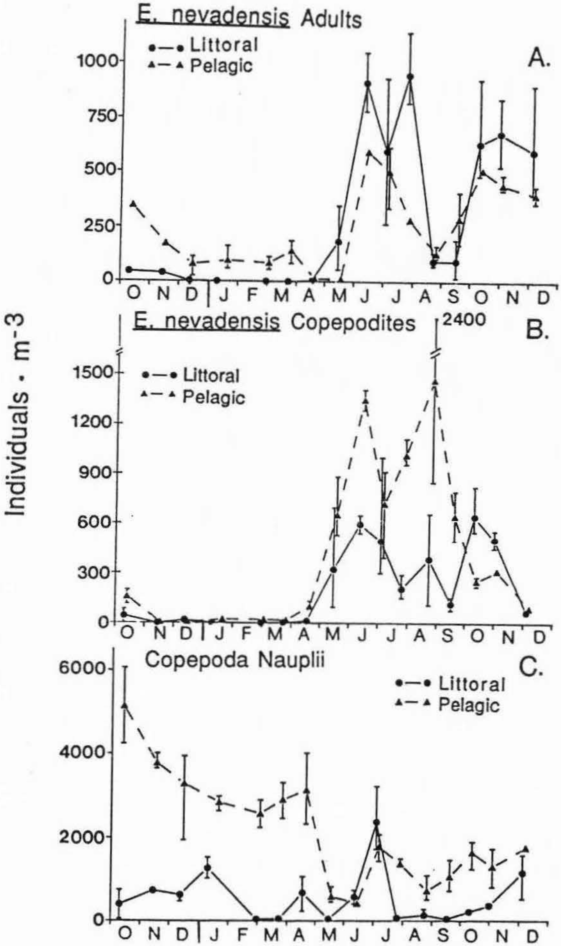

Figure 8. Seasonal variation in the abundance of (A) E. nevadensis adults (B) 1st through 5th instar copepodites, and, (C) copepod nauplii in the littoral and pelagic zones of Bear Lake during 1986-1987. Mean and ranges are shown.

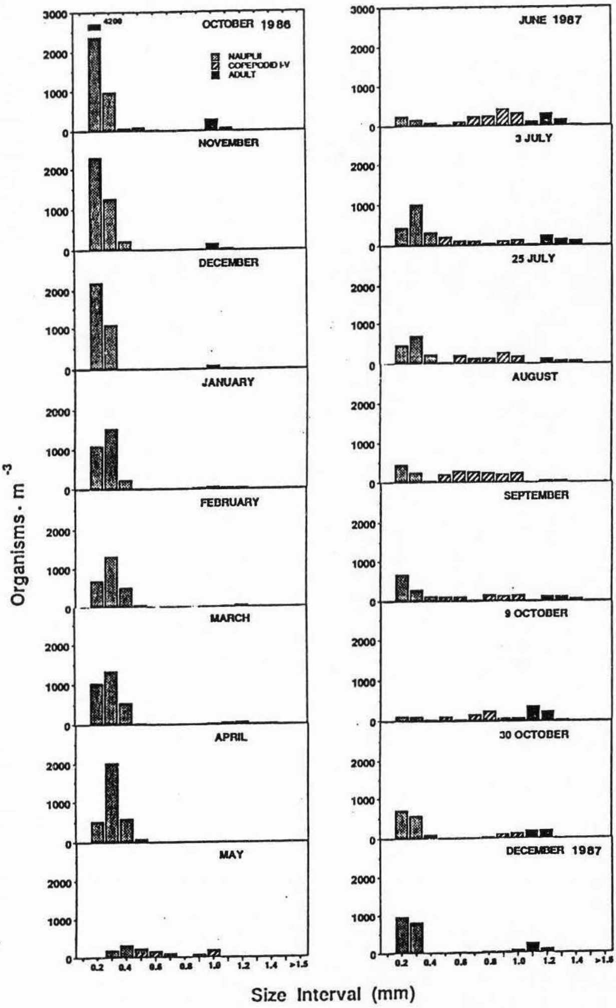

Figure 9. Temporal variation in the size-frequency distribution of nauplii, copepodids (I-V) and adults of E. nevadensis in the pelagic zone of Bear Lake. Nauplii are primarily from Epischura, but some cyclopoids are also included.

early July, and these grew to adults by fall. These, in turn, produced the over-wintering stock of nauplii.

ROTIFERA.--During the study, there were several seasonal pulses in the abundance of rotifers in the littoral and pelagic zones. In the pelagic zone, the principal pulse occurred during May and July of 1987, with numbers ranging from 93,500 to 5,000 organisms/m^3, respectively (Fig. 10A; Appendix C). Rotifer densities were low in the fall and winter, with densities ranging from 500 to 3,450 organisms/m^3. Among rotifers, *Keratella quadrata* and *Keratella cochlearis* dominated in the spring. *Brachionus* sp. and colonies of *C. unicornis* were numerically important only in the winter and summer, respectively.

Densities of rotifers were generally lower in the littoral zone than in the pelagic area, particularly in the spring when populations of both species of *Keratella* remained relatively low (Fig. 10B; Appendix D). Important pulses in the abundance of rotifers were those in winter and summer when densities reached 6,400 and 7,876 organisms/m^3, respectively.

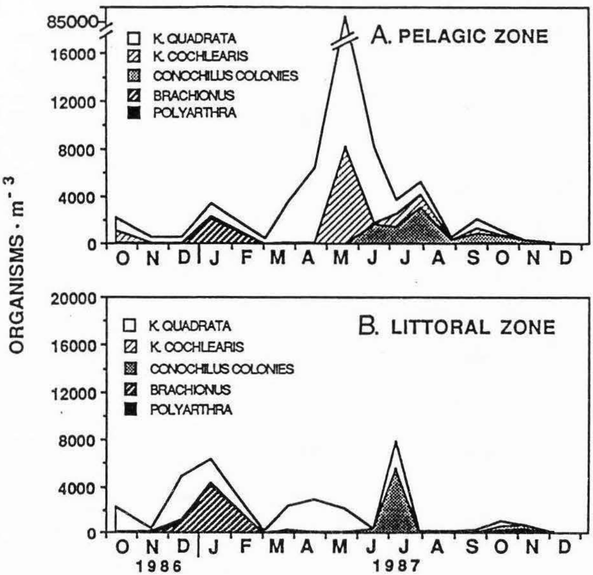

Figure 10. Temporal variation in the abundance of rotifers in the pelagic (A) and littoral (B) zones of Bear Lake during 1986-1987. Numbers represent the average of three replicate samples. Densities of Conochilus unicornis were estimated by dividing the number of individuals counted by 24.1, the mean number/colony found by Lentz (1986).

Zooplankton Biomass

Biomass of zooplankton in Bear Lake was low, with an annual mean of 6.4 mg of dry matter/m^3 in the pelagic zone (Fig. 11A; Appendix F). Biomass maxima were observed in October 1986 and during late spring and summer with values that reached 12 and 10 mg/m^3, respectively. Minimum values of 4 mg/m^3 were observed during the winter. In the fall of 1986 and winter 1987 copepoda nauplii and, to a lesser extent, cladocera, dominated the biomass of zooplankton. Copepods dominated during summer and fall of 1987. Rotifers were important in late spring and early summer.

On a percentage basis, *E. nevadensis* nauplii, copepodites, and adults dominated the zooplankton community in the pelagic zone, representing from 50 to 90% of the biomass on all sampling dates but one (Fig. 11B). From October 1986 to April 1987, nauplii comprised 35-80% of the zooplankton biomass, whereas *E. nevadensis* adults and copepodites dominated from June to December. The relative contribution of cladocera biomass was high in the fall of 1986 when it reached 45% of the total. Among cladocera, *B. longirostris* and *D. pulex* dominated in winter and autumn. The relative contribution of rotifers, primarily *K. quadrata* and *C. unicornis*, was highest in late spring and summer, when they represented 65 and 15% of the biomass, respectively.

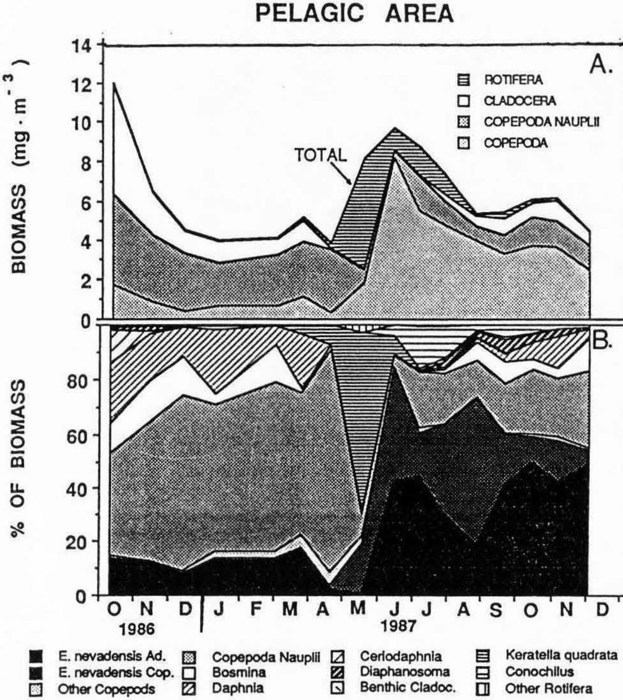

Figure 11. (A) Temporal variation in the dry biomass of rotifers, cladocera, copepod nauplii and adult copepods (primarily E. nevadensis) in the pelagic zone of Bear Lake. (B) Temporal variation in the percentage of the biomass of important zooplankton taxa in the pelagic zone.

The mean annual biomass of zooplankton in the littoral zone (4.4 mg/m^3) was 31% lower than in the pelagic zone (Fig. 12A; Appendix G). Seasonal changes in the littoral zone were greater than in the pelagic zone (cf. Fig. 11A, 12A). Zooplankton biomass ranged from a minimum of 0.2 mg/m^3 in February to 13 mg/m^3 in July. Cladocera contributed significantly to the biomass of plankton in the littoral zone in the fall of 1986, and in the summer and fall of 1987.

On a percentage basis, cladocera and rotifers represented a larger proportion of the biomass in the littoral zone than in the pelagic area (cf. Fig. 11B, 12B). C. reticulata, B. longirostris, and K. quadrata contributed up to 85% of the biomass in the littoral zone from October 1986 to April 1987. E. nevadensis adults subsequently dominated the biomass from May to December 1987.

Length-Frequency Distribution of the Zooplankton Assemblage

The zooplankton assemblage in Bear Lake was dominated by small species (Table 1). E. nevadensis adults were typically the largest organisms (1-1.5 mm length), but D. pulex also exceeded 1 mm on some occasions. Also, the size-frequency distribution fluctuated seasonally (Fig. 13; Appendix H, I).

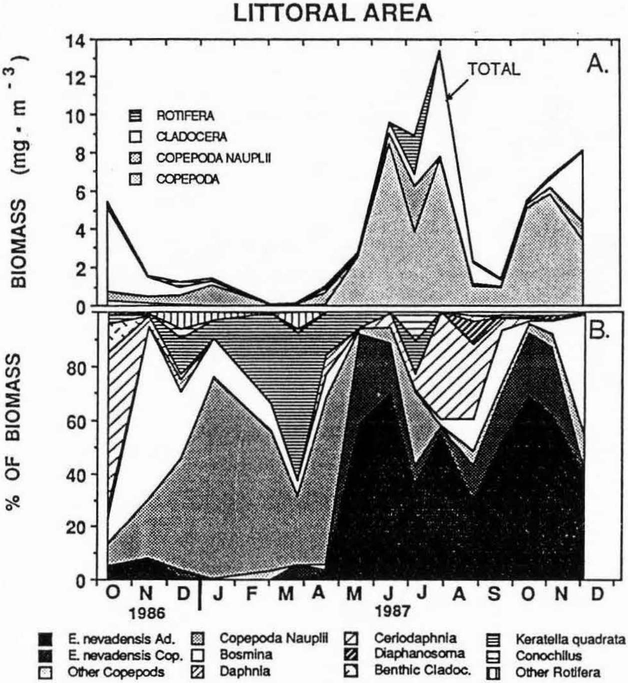

Figure 12. (A) Temporal variation in the dry biomass of zooplankton groups in the littoral zone of Bear Lake. (B) Temporal variation in the percentage of the biomass of important zooplankton taxa in the littoral zone.

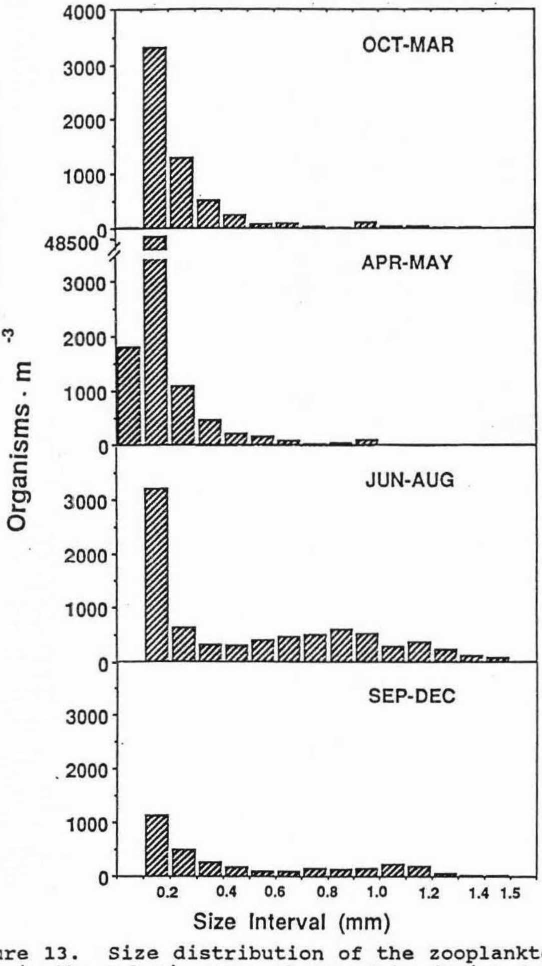

Figure 13. Size distribution of the zooplankton assemblage in the pelagic zone of Bear Lake during four periods in 1986-1987. The April-May size-frequency distribution was significantly different from all others because of the very high abundance of rotifers in the 0.1-0.2 mm size class at this time (Kolmogorov-Smirnov test; $p < 0.006$). The June-August distribution was also significantly different form the October-March distribution ($p < 0.025$).

From October to May, the length-frequency distribution of zooplankton was skewed toward small organisms, with K. quadrata and copepoda nauplii dominating the assemblage. In summer, increases in the number of adult E. nevadensis and C. unicornis colonies boosted the abundance of the organisms between 1 and 1.5 mm, but plankton less than 1 mm continued to dominate the assemblage. The summer size-frequency distribution was maintained into the fall, but the overall abundance of organisms decreased during that period.

DISCUSSION

The species richness of the zooplankton assemblage in Bear Lake was similar to that in other systems. Bear Lake had 20 taxa compared to a mean of 29 taxa (s.d. = 20) found in an analysis of 25 other lakes from throughout the world (Appendix J). Although Bear Lake appeared to have a higher number of crustaceans, and a lower number of rotifers than most other lakes, these differences were not large. The relatively high number of crustaceans in Bear Lake could have been due to the inclusion of some apparently benthic copepods and cladocerans in my analysis. Also, some rare rotifers could have been missed, as I routinely used only 45X magnification to count organisms.

The number of taxa in Bear lake does not appear to be a function of either lake size or productivity. Based on an analysis of 31 lakes, no statistically significant correlation existed between lake area and species richness (Appendix K).

Similarly, there was not a strong relationship between lake trophic state and species richness (Appendix L). Among the oligotrophic lakes analyzed, Bear Lake did have the lowest number of species. These comparisons of zooplankton species richness and habitat size and trophic state are, however, complicated by different sampling designs and the rigor of the taxonomy used by various investigators. A more detailed analysis than possible here would be necessary to correct for these complexities.

The zooplankton assemblage found in Bear Lake in 1986 and 1987 differs somewhat from previous reports (Kemmerer et al. 1923, Hazzard as cited by McConnell et al. 1957, McConnell et al. 1957, Nyquist 1968, Lentz 1986). The taxa found during my study were similar to those reported most recently by Nyquist (1968) and Lentz (1986). However, they classified zooplankton only to genera, and they also reported four rotifers not found during 1986-1987: Habrotrocha sp., Filina sp., Notholca sp., and Trichocerca sp. The absence of these species during my study could have been due to previous misidentifications or to inter-annual changes in species composition that are common in aquatic ecosystems (Margalef 1983). Lentz (1986) suggests that cladoceran abundance in Bear Lake may have increased from pristine levels due to the diversion of the Bear River into the system, doubling the nutrient loading and presumably increasing phytoplankton production (Lamarra et al. 1987). Early collections of zooplankton, although limited in scope, do suggest that cladocera were low or absent (Kemmerer et al. 1923, Hazzard, as cited by McConnell et al. 1957, Perry 1943). Unfortunately no systematic or long-term sampling was done during these early investigations, making it difficult to determine if changes have really occurred.

The low species richness of zooplankton in the littoral zone of Bear Lake (Figs. 6, 7B) contrasts with communities described in other temperate lakes. For example, Kelso and Ney (1985) found 24 species in the littoral zone and only 5 in the pelagic area. Littoral zones usually contain macrophytes which increase habitat complexity, thereby providing a variety of niches for different species. The absence of macrophytes at my study site may explain the low diversity of plankton.

The larger number of species observed in the pelagic zone than in the littoral area (Fig. 6) may be a consequence of vertical habitat segregation in the open water. Transect studies from the littoral to the pelagic zone show that zooplankton assemblages in Bear Lake are more strongly associated with depth gradients than with inshore-offshore gradients (E. Moreno, unpublished data). At times, the assemblage in the inshore region appears to be determined by advection of plankton from the surface pelagic waters into the inshore areas. The near absence of exclusively littoral or pelagic species in Bear Lake also suggests that there is considerable mixing between the two areas.

Abundance and Biomass of the Zooplankton

Zooplankton abundance and biomass in Bear Lake were very low and comparable to those in oligotrophic lakes. In comparison with lakes studied during the International Biological Program (IBP), zooplankton biomass in Bear Lake is among the lowest recorded for a temperate zone system (Fig. 14; Appendix M, Morgan 1980). Zooplankton biomass in the lake is, in fact, more comparable to levels in alpine and arctic lakes. The low abundance and biomass of zooplankton in Bear Lake may be explained primarily by low food resources (phytoplankton), presence of calcium carbonate precipitates in the system, and fish predation. Food resources for zooplankton may be a principal factor controlling population growth in Bear lake. Summer epilimnetic chlorophyll a concentrations of near 0.5 μg/L (Fig. 4) indicate that the lake is very oligotrophic (Wetzel 1983), and consequently able to support only a small zooplankton community. The low algal biomass may also partially explain the very low abundance of cladocerans in the system, as these fast-growing species, need moderately high food levels to survive. Koenings et al. (In press) and Carpenter (personal communication) have demonstrated that growth and reproduction of *Daphnia* is severely limited at chlorophyll a levels below 1 μg/L.

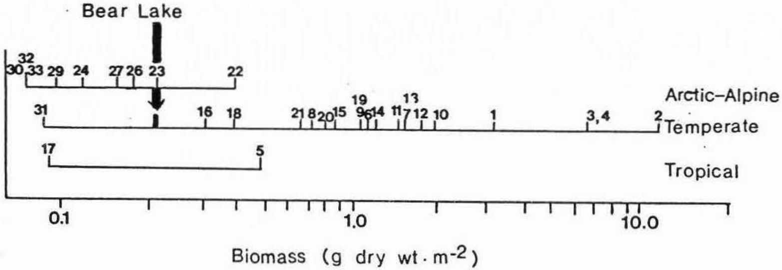

Figure 14. Mean biomass of zooplankton in Bear Lake in relation to that in 31 other temperate, tropical and arctic-alpine lakes. The numbers above the axes indicate different lakes studied during the International Biological Program [see Appendix 8 or Morgan (1980, p. 270) for names, locations and zooplankton production characteristics of the lakes]. The average areal biomass of zooplankton in Bear lake from May to October was calculated in order to make my data comparable to the growing-season data given by Morgan (1980). A value of 0.0478 g/J was used to convert the energy data of Morgan (1980) to biomass.

Similarly, Byron et al. (1984) found that another cladoceran (Bosmina longirostris) could not survive in ultra-oligotrophic Lake Tahoe, but could exist in a bay where chlorophyll levels were somewhat higher. In Bear Lake, D. pulex and B. longirostris were most abundant when chlorophyll levels were highest (fall and spring), giving additional support to the hypothesis that the cladocera in the system are food-limited.

Complementing the low levels of phytoplankton, precipitates of calcium carbonate in Bear lake may make it difficult for some zooplankton to use the already low levels of phytoplankton present. These precipitates are in the size range of most edible phytoplankton (1-50 μm), and consequently, large amounts of them are ingested by filter-feeding zooplankton (Vanderploeg et al. 1987). Calcium carbonate, as well as other inorganic particles such as glacial silt and clays, can inhibit filter feeding, digestion, growth and reproduction of cladocera (McCabe and O'Brien 1983, Vanderploeg et al. 1987, Koenings et al., In press). Copepods appear to be less affected by the inorganic materials due to their selective feeding behavior. Observations on the densities of copepods and rotifers also suggest that their survival rates are higher than that of cladocerans in environments with high concentrations of inorganic particles (Koenings et al., In press).

Although the size and abundance of calcite particles has not been determined in Bear Lake, the milky color of the water and the low Secchi transparency in relation to chlorophyll levels (Fig. 5) suggest that a large amount of this material is present. The precipitates may consequently contribute to the low abundance of zooplankton and the dominance of copepods and rotifers in the lake. The calcium carbonates may additionally reduce productivity in the system by coprecipitating phosphorus (Birdsey 1985), hastening the sedimentation of nutrients in the fecal pellets of zooplankton (Vanderploeg et al. 1987), and reducing light penetration into the lake (Vanderploeg et al. 1987, Koenings et al., In press).

A third factor, fish predation, may not only affect the abundance and biomass, but also species composition and size-structure of the zooplankton assemblage in Bear Lake. The only abundant zooplanktivore in the lake is the Bonneville cisco. Perry (1943) found that these fish preyed extensively on E. nevadensis, B. longirostris, and C. sphaericus. Lentz (1986) included Daphnia and Diaphanosoma in the list of preferred items of cisco, and demonstrated that cisco are size-selective predators. Predation by cisco may therefore contribute to the scarcity of large zooplankton in Bear Lake. Fish predation alone, however, cannot explain the near-absence of D. pulex and other large cladocera from the epilimnion, because ciscos (and other zooplanktivores) are absent from this zone during the summer (Lentz 1986; W. Wurtsbaugh, unpublished data). Food availability is probably therefore the principal factor limiting plankton in the lake.

The zooplankton assemblage in Bear Lake in turn provides a very limited food resource for fish. Maximum densities of crustacea (less nauplii) seldom reached 2,000 organisms/m^3 in the pelagic zone (Fig. 7). In contrast, productive lakes in Utah, such as East Canyon, Lost Creek and Causey Reservoirs, frequently have crustacean densities of 100,000-300,000 organisms/m^3 (W. Wurtsbaugh, unpublished data).

In addition to the low overall densities of prey, the dominant species in Bear Lake are not preferred prey of most fishes. E. nevadensis, the dominant crustacean in the lake, can often avoid fish attacks with rapid evasive movements (Lentz 1986). Although it is not a preferred prey, it is abundant and frequently found in fish stomachs (Lentz 1986; W. Wurtsbaugh, unpublished data). Another dominant in the lake is the colonial rotifer C. unicornis. The large size of its colonies (>1mm) and negligible evasive abilities of this organism should make it an easy prey for sight-feeding fishes. Nevertheless, it seldom makes up a large percentage of the diet of zooplanktivorous fishes (McConnell et al. 1957, Lentz 1986, W. Wurtsbaugh, unpublished data). Its importance as a food item may, however, have been underestimated because it would decompose more rapidly in fish stomachs than would crustacean prey. Preferred prey organisms such as the cladocerans Daphnia, Diaphanosoma, and Bosmina (Lentz 1986), are very scarce in Bear Lake (Fig. 7; Appendix E).

The size-structure of the plankton assemblage (Fig. 13) also indicates that prey availability is limited for zooplanktivorous fishes. Sight-feeding planktivores normally feed on the largest zooplankton available, often causing the assemblage to be dominated by small species (Brooks and Dodson 1965, O'Brien 1979, Vanni 1988). Small taxa such as K. quadrata, copepod nauplii and copepodites, and B. longirostris dominate the Bear Lake plankton assemblage for much of the year (Table 1; Fig. 13). Even the dominant large zooplankton E. nevadensis is relatively small, reaching only 1.5 mm in Bear Lake. In other systems it grows to 2 mm or more (Wilson and Yeatman 1959, Mesner 1984).

Because of the low availability, small size and dominance of non-preferred zooplankton, few fish in Bear Lake use this food resource. Only the specialized zooplanktivore, the Bonneville cisco, uses plankton extensively (Perry 1943, Lentz 1986, W. Wurtsbaugh, unpublished data). Species such as the cutthroat trout, which feed extensively on large zooplankton such as Daphnia in more productive systems, must feed on other invertebrates or fish in Bear Lake.

Differences in the Abundance of the Littoral and Pelagic Zooplankton Assemblage

Although mean annual densities of crustacea (less nauplii) did not differ markedly between the littoral and pelagic zones, the abundance and biomass of zooplankton in the inshore area was much more variable than in the offshore assemblage (Fig. 7, 11, 12; Appendix E). The higher variability observed in the littoral area may be due to several factors including differences in temperature and ice cover. In the winter of 1987, ice covered much of the littoral zone of the lake, and temperatures there dropped below 1°C. In contrast, ice did not cover the open water and temperatures there were somewhat warmer (Fig. 2). Winter chlorophyll levels were also lower in the littoral zone than in the pelagic zone (Fig. 4), and this could have affected the zooplankton populations.

The high temporal variation of zooplankton populations in the littoral zone may also be an artifact of the high spatial variation of cladocera in this area. _B_. _longirostris_ and _C_. _reticulata_, in particular, were very patchily distributed in the littoral zone. With only three replicate samples, estimates of mean abundances of these species were often imprecise (Appendix D). The high abundances of _C_.

reticulata and B. longirostris recorded in the littoral zone in late July and December 1987 (Fig. 7; Appendix E), may be due to this imprecision.

In summary, the zooplankton of Bear Lake, characterized by low densities, biomass, and dominance by small species, provide a limited food resource for fish. Low algal populations, the presence of calcium carbonate precipitates, and fish predation may be responsible for structuring the assemblage.

To determine the relative importance of these factors in controlling zooplankton, in situ bioassay experiments similar to those of Koenings et al. (In press) should be conducted to determine if chlorophyll levels and inorganic particles limit cladocera and other plankton in the lake. The species composition of the phytoplankton assemblage should be analyzed to determine what portion of the algae are available to the zooplankton grazers (Porter 1973). Finally, the impact of fish predation on the zooplankton assemblage in Bear Lake should be measured by determining the population size and distribution of planktivorous fishes, estimating their daily consumption rates, and then calculating the fraction of daily mortality of each zooplankton species caused by fish predation. Experimental and modeling approaches such as these will be necessary before we can begin to understand the ecological processes controlling the zooplankton in Bear Lake.

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APPENDICES

Appendix A. Values Used to Calculate the Biomass of Zooplankton

Values used to calculate the biomass of zooplankton in Bear Lake from the relation between length (L) and dry weight(W). The general equation is:

$$\ln W = \ln a * b \ln L.$$

TAXA	-ln a	b
Copepods	-5.36	2.47
Daphnia	-4.95	2.88
Ceriodaphnia	-4.37	2.81
Diaphanosoma	-5.50	2.73
Bosmina	-3.43	3.23
Chydorus	-2.29	3.88
Alona	-4.26	2.00
Keratella	-3.64	3.00
Conochilus	-4.37	3.00
Polyarthra	-4.37	3.00
Copepods Nauplii	-6.21	0.47

Source: McCauley (1984).

Appendix B. Chlorophyll a, Secchi Transparency and Extinction Coefficient Data

Temporal variation in the concentration of Chlorophyll a in the littoral zone, and in the epilimnion, metalimnion and hypolimnion of the pelagic zone. Chlorophyll a concentrations have been corrected for phaeophytin. Secchi transparencies and extinction coefficients are also shown.

JULIAN DATE	CHLOROPHYLL a (mg/m^3) LITTORAL	PELAGIC Epil.	PELAGIC Metal.	PELAGIC Hypol.	SECCHI (m)	EXT. COEFF.
345-86	1.52	1.18	-	-	2.00	-
019-87	1.17	1.93	-	-	2.50	0.33
059-87	0.68	1.16	1.06	1.11	3.30	0.27
082-87	1.52	1.99	-	-	2.75	0.29
107-87	0.80	0.69	-	-	3.60	0.25
135-87	0.50	0.43	-	-	-	0.17
162-87	0.42	0.69	0.81	0.74	7.30	0.18
206-87	0.50	0.52	0.99	1.03	6.30	0.16
234-87	0.41	0.40	0.91	0.38	5.20	0.18
258-87	0.34	0.45	1.74	0.98	6.80	0.19
282-87	0.55	0.51	1.89	0.91	6.00	-
303-87	1.01	0.70	1.01	0.76	6.10	-
337-87	1.05	1.23	1.03	0.53	3.10	0.31

Appendix C. Zooplankton Abundance

Data in the Pelagic Zone

Abundance of zooplankton (organisms/m^3) in the pelagic zone of Bear from October 1986 to December 1987. Values for each station represent abundances of zooplankton at three sampling sites (A, B, C).

Taxa abbreviations:

EPISC M	Epischura nevadensis Male
EPISC F	E. nevadensis Female
EPISC C	E. nevadensis copepodid
PARAC M	Paracyclops fimbriatus male
PARAC F	P. fimbriatus female
EUCYC M	Eucyclops agilis male
EUCYC F	E. agilis female
CYCLV M	Acanthocyclops vernalis male
CYCLV F	A. vernalis female
CYCLP C	Cyclopoida copepodid
CANTH M	Canthocamptus robertcokeri male
CANTH F	C. robertcokeri female
MESOC M	Mesochra rapiens male
MESOC F	M. rapiens female
HUNTE M	Huntemannia lacustris male
HUNTE F	H. lacustris female
HARPA C	Harpacticoida copepodid
COPEP N	Copepoda nauplii
BOSMI	Bosmina longirostris
DAPHN	Daphnia pulex
CERIO	Ceriodaphnia reticulata
DIAPH	Diaphanosoma brachyurum
CHYDO	Chydorus sphaericus
ALONA	Alona spp.
CLADO EM	Cladocera embryos
CLADO EG	Cladocera eggs
KERAT Q	Keratella quadrata
KERAT C	Keratella cochlearis
BRACH	Brachionus sp.
CONOC	Conochilus unicornis
POLYA	Polyarthra sp.
ROTIF EG	Rotifera eggs

	EPISC M			EPISC F			EPISC C			PARAC M		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	101	72	-	246	269	-	112	197	-	29	14	-
317-86	73	87	69	96	90	102	6	0	9	0	0	0
345-86	10	46	46	14	52	66	4	4	14	0	0	0
019-87	26	22	77	35	37	84	17	20	30	0	0	0
059-87	39	21	-	74	33	-	30	11	-	1	0	-
082-87	29	70	69	53	116	85	22	15	17	0	0	0
107-87	7	6	8	4	7	8	89	130	75	0	0	0
135-87	2	2	4	8	9	6	881	527	543	2	2	4
162-87	315	307	-	279	283	-	1406	1281	-	0	1	-
184-87	87	250	268	247	300	346	391	911	846	0	0	0
206-87	87	45	54	176	240	245	968	955	1111	0	0	0
234-87	91	63	68	73	43	45	2374	846	1167	0	0	0
258-87	65	87	37	219	319	133	782	493	650	0	0	0
282-87	143	146	243	360	342	281	252	275	216	0	0	0
303-87	279	248	192	205	169	224	330	300	300	0	0	0
337-87	184	165	206	210	193	227	64	87	112	0	0	0

	PARAC F			EUCYC M			EUCYC F			CYCLV M		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	95	14	-	0	0	-	0	0	-	0	0	-
317-86	5	2	15	0	0	0	0	0	0	0	0	0
345-86	0	0	0	0	0	0	6	18	17	0	0	0
019-87	0	0	0	0	0	0	9	5	6	0	0	0
059-87	16	10	-	0	0	-	0	0	-	0	0	-
082-87	0	0	0	8	14	14	21	29	32	0	0	0
107-87	0	0	0	3	1	1	5	9	6	0	0	0
135-87	26	20	19	8	20	17	49	109	94	0	0	0
162-87	0	2	-	0	0	-	0	0	-	0	0	-
184-87	0	0	0	4	0	8	0	0	0	0	0	0
206-87	0	0	0	0	0	0	0	0	0	0	0	0
234-87	0	0	0	0	0	0	7	0	0	0	0	0
258-87	0	0	0	0	0	0	0	0	0	0	0	0
282-87	0	0	0	0	0	0	3	3	0	0	0	0
303-87	0	0	0	0	0	0	29	16	4	0	0	0
337-87	0	0	0	0	1	0	0	4	0	1	4	0

	CYCLV F			CYCLP C			CANTH M			CANTH F		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	0	0	-	12	173	-	0	0	-	2	14	-
317-86	0	0	0	75	58	80	0	0	0	1	0	0
345-86	4	0	0	37	112	76	0	0	0	0	0	0
019-87	0	0	0	76	72	68	0	0	0	0	0	0
059-87	0	0	-	74	48	-	0	0	-	1	0	-
082-87	33	35	38	56	35	26	0	0	0	1	0	0
107-87	68	37	42	19	27	26	0	0	0	0	0	0
135-87	0	0	0	130	109	100	0	0	0	0	0	0
162-87	0	0	-	13	14	-	0	0	-	0	0	-
184-87	53	38	35	46	57	39	0	0	0	0	0	0
206-87	0	0	0	41	34	20	0	0	0	0	0	0
234-87	2	0	1	38	30	28	0	0	0	0	0	0
258-87	0	0	0	29	51	44	0	0	0	0	0	0
282-87	0	0	0	134	53	64	0	0	0	0	0	0
303-87	1	0	0	226	196	121	0	0	0	0	0	0
337-87	10	7	1	58	52	21	0	0	0	0	0	0

	MESOC M			MESOC F			HUNTE M			HUNTE F		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	0	5	-	0	0	-	0	0	-	0	0	-
317-86	0	0	0	0	0	0	0	0	0	0	0	0
345-86	0	0	0	0	0	0	0	0	0	0	0	0
019-87	0	0	0	0	0	0	0	0	0	0	0	0
059-87	0	0	-	0	0	-	0	0	-	0	0	-
082-87	0	0	0	0	2	2	0	2	0	4	4	2
107-87	0	0	0	0	0	0	0	0	0	0	0	0
135-87	0	0	0	0	0	0	0	0	0	0	0	0
162-87	0	0	-	0	0	-	0	0	-	0	0	-
184-87	0	0	0	0	0	0	0	0	0	0	0	0
206-87	0	0	0	0	0	0	0	0	0	0	0	0
234-87	0	0	0	0	0	0	0	0	0	0	0	0
258-87	0	0	0	0	0	0	0	0	0	0	0	0
282-87	0	0	0	0	0	0	0	0	0	0	0	0
303-87	0	0	0	0	1	0	0	0	0	0	0	0
337-87	0	0	0	0	0	0	0	0	0	0	0	0

	HARPA C			COPED N			COPEP E			BOSMI		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	0	0	-	6056	4245	-	0	0	-	1288	706	-
317-86	0	0	0	3637	3663	4011	0	0	0	612	697	552
345-86	0	0	0	1955	3909	3943	0	0	0	392	1190	420
019-87	0	0	0	2883	2963	2621	0	0	0	156	204	169
059-87	0	0	-	2877	2239	-	149	73	-	73	99	-
082-87	0	0	0	3296	2455	2907	0	0	0	72	36	57
107-87	0	0	0	2318	4009	3003	0	0	0	44	25	39
135-87	0	0	0	830	477	466	0	0	0	47	41	30
162-87	0	0	-	403	439	-	483	754	-	14	12	-
184-87	0	0	0	1442	2072	1834	3575	531	3704	4	8	28
206-87	0	0	0	1500	1296	1319	0	0	0	98	126	114
234-87	0	0	0	1092	568	516	0	0	0	451	424	257
258-87	0	0	0	722	1001	1469	0	0	0	264	500	576
282-87	0	0	0	1898	1243	1793	26	138	240	295	184	369
303-87	0	0	0	1737	1352	810	84	89	162	105	95	158
337-87	0	1	0	1828	1671	1788	17	24	11	310	384	523

	DAPHN			CERIO			DIAPH			CHYDO		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	499	442	-	557	245	-	54	134	-	0	0	-
317-86	98	94	91	15	15	18	39	38	46	0	0	0
345-86	36	88	57	0	1	0	1	8	2	0	0	0
019-87	95	84	178	0	1	7	1	0	0	0	0	0
059-87	132	44	-	0	0	-	0	0	-	0	0	-
082-87	53	106	124	0	0	0	0	0	0	0	0	0
107-87	1	0	1	0	0	0	0	0	0	0	0	0
135-87	13	7	2	0	0	0	0	0	0	0	11	0
162-87	0	1	-	0	1	-	0	1	-	0	0	-
184-87	0	8	0	0	0	0	0	0	0	0	0	0
206-87	6	6	6	31	25	17	70	42	80	0	0	0
234-87	9	4	11	11	10	7	122	80	73	0	2	0
258-87	36	51	37	12	7	7	120	87	118	0	0	0
282-87	26	32	61	0	15	0	126	108	149	0	0	0
303-87	34	47	72	0	0	2	52	41	35	0	0	0
337-87	17	21	11	0	0	0	13	12	13	0	0	0

	ALONA			CLADO EM			CLADO EG			KERAT Q		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	0	0	-	0	0	-	35	278	-	1082	1183	-
317-86	0	0	0	0	0	0	0	0	0	450	416	502
345-86	0	0	0	0	0	0	0	0	0	178	799	230
019-87	0	0	0	0	0	0	0	0	0	1288	1191	939
059-87	0	0	-	3	0	-	0	0	-	419	364	-
082-87	0	0	0	0	0	0	0	0	0	3944	3273	3482
107-87	0	0	0	0	0	0	0	0	0	5913	6818	6408
135-87	0	0	0	0	0	0	0	0	0	32976	106540	116622
162-87	0	0	-	0	0	-	0	0	-	7496	5386	-
184-87	0	0	0	0	0	0	0	0	0	683	1466	1625
206-87	0	0	0	0	0	0	68	55	97	1132	1009	1111
234-87	0	0	0	7	5	2	208	129	112	200	121	164
258-87	0	0	0	4	0	0	238	174	126	864	841	760
282-87	0	0	0	0	0	0	123	0	0	231	336	386
303-87	0	0	0	3	1	9	9	3	28	61	43	31
337-87	0	0	0	0	0	0	109	46	168	4	0	0

	KERAT C			BRACH			CONOC*			POLYA		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	719	1271	-	0	0	-	142	84	-	0	0	-
317-86	84	78	72	0	0	0	56	60	55	0	0	0
345-86	26	39	31	0	0	0	115	174	92	0	0	0
019-87	263	208	152	2590	2368	1288	13	19	15	0	0	0
059-87	1	0	-	0	0	-	0	0	-	0	0	-
082-87	56	91	93	0	0	0	0	0	0	0	0	0
107-87	119	136	161	0	0	0	0	0	0	0	0	0
135-87	9652	8033	7105	0	0	0	0	0	0	0	0	0
162-87	165	212	-	0	0	-	1760	1462	-	0	0	-
184-87	1518	783	996	0	0	0	672	1750	1774	0	0	0
206-87	668	1500	1347	0	0	0	3206	2001	3916	0	0	0
234-87	11	4	6	0	0	0	497	273	258	25	19	25
258-87	223	334	495	0	0	0	732	845	706	171	94	207
282-87	22	205	91	0	0	0	666	481	689	29	120	59
303-87	0	2	0	0	0	0	302	436	247	0	1	2
337-87	0	2	1	0	0	0	84	88	162	1	0	1

* The densities represent numbers of colonies assuming 24.1 individuals per colony (Lentz 1986).

	ROTIF EG		
REPLICATE	A	B	C
DATE			
282-86	0	0	-
317-86	0	0	0
345-86	0	0	0
019-87	14	36	28
059-87	114	167	-
082-87	29	73	56
107-87	92	82	80
135-87	402	263	268
162-87	0	0	-
184-87	0	0	0
206-87	0	0	0
234-87	0	0	0
258-87	0	0	0
282-87	0	0	0
303-87	62	0	0
337-87	0	0	0

Appendix D. Zooplankton Abundance

Data in the Littoral Zone

Abundance of zooplankton (organisms/m^3) in the littoral zone of Bear from October 1986 to December 1987. Values for each station represent abundances of zooplankton at three sampling sites (A, B, C).

Taxa abbreviations are shown in Appendix C.

	EPISC M			EPISC F			EPISC C			PARAC M		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	28	28	-	28	6	-	83	0	-	0	0	-
317-86	0	19	0	33	38	24	0	0	0	0	0	0
345-86	0	0	0	10	0	0	5	29	24	0	0	0
008-87	0	0	0	0	0	0	0	0	6	0	0	0
059-87	0	0	-	0	0	-	0	0	-	0	0	-
082-87	0	0	0	0	0	0	9	0	3	0	0	0
107-87	0	0	3	9	0	0	24	0	14	0	0	0
135-87	3	3	6	51	148	339	95	170	695	0	0	0
162-87	277	185	-	770	586	-	539	647	-	0	0	-
184-87	74	25	618	189	51	312	826	299	352	0	0	0
206-87	90	110	68	1047	768	750	289	150	171	0	0	0
234-87	27	67	29	53	65	42	0	657	107	0	0	0
258-87	9	66	2	63	126	16	114	152	75	0	0	0
282-87	489	197	156	435	283	334	820	553	547	0	0	0
303-87	-	200	391	-	323	446	-	553	446	-	0	0
337-87	231	397	162	259	499	236	83	46	65	0	0	0

	PARAC F			EUCYC M			EUCYC F			CYCLV M		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	28	11	-	0	0	-	0	0	-	0	0	-
317-86	0	0	0	0	0	0	0	0	0	0	0	0
345-86	0	0	0	0	0	0	0	0	0	0	0	0
008-87	0	0	0	0	0	0	0	0	0	0	0	0
059-87	0	2	-	0	0	-	0	0	-	0	0	-
082-87	0	0	0	0	0	0	0	0	0	0	0	0
107-87	0	0	0	2	0	0	7	0	9	0	0	0
135-87	0	0	0	0	0	0	0	2	0	0	0	0
162-87	0	0	-	0	0	-	0	0	-	0	0	-
184-87	0	0	0	0	0	0	0	0	0	0	0	0
206-87	0	0	0	0	0	0	0	0	0	0	0	0
234-87	0	0	0	0	0	0	0	4	2	0	0	0
258-87	0	0	0	0	0	0	0	0	0	0	0	0
282-87	0	0	0	0	0	0	0	0	0	0	0	0
303-87	-	0	0	-	3	3	-	3	0	-	0	0
337-87	0	0	0	0	0	0	0	0	0	0	0	0

	CYCLV F			CYCLP C			CANTH M			CANTH F		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	0	0	-	28	11	-	0	0	-	0	0	-
317-86	0	0	0	0	0	0	0	0	0	0	0	0
345-86	0	0	0	0	10	19	0	0	0	0	0	0
008-87	0	0	0	11	44	0	0	0	0	0	0	0
059-87	0	0	-	2	0	-	0	0	-	0	0	-
082-87	0	0	0	2	0	0	0	0	0	0	0	0
107-87	17	0	0	0	0	0	0	0	0	0	0	0
135-87	0	0	0	0	0	0	0	0	0	0	0	0
162-87	0	0	-	0	0	-	0	0	-	0	0	-
184-87	0	0	0	0	0	0	0	0	0	0	0	0
206-87	0	0	0	0	0	9	0	0	0	0	0	0
234-87	0	0	0	17	18	3	0	0	0	0	0	0
258-87	0	0	0	2	20	2	0	0	0	0	0	0
282-87	0	0	0	10	6	10	0	0	0	0	0	0
303-87	-	0	0	-	18	28	-	0	0	-	0	0
337-87	0	0	0	0	9	0	0	0	0	0	0	0

	MESOC M			MESOC F			HUNTE M			HUNTE F		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	0	0	-	0	0	-	0	6	-	28	28	-
317-86	0	0	0	0	0	0	0	0	0	0	0	0
345-86	0	0	0	0	0	5	0	0	0	0	0	0
008-87	0	0	0	0	6	0	0	0	0	0	0	0
059-87	0	0	-	0	0	-	0	0	-	0	0	-
082-87	0	0	0	0	0	0	0	0	0	0	0	0
107-87	0	0	0	0	0	0	0	0	0	0	0	0
135-87	0	0	0	0	0	0	0	0	0	0	0	0
162-87	0	0	-	0	0	-	0	0	-	0	0	-
184-87	0	0	0	0	0	0	0	0	0	0	0	0
206-87	0	0	0	0	0	0	0	0	0	0	0	0
234-87	0	0	0	0	6	0	0	0	0	0	0	0
258-87	0	0	0	0	0	0	0	0	0	0	0	0
282-87	0	0	0	0	0	0	0	0	0	0	3	0
303-87	-	3	0	-	12	3	-	0	0	-	0	3
337-87	0	0	0	0	0	0	0	0	0	0	0	0

	HARPA C			COPEP N			COPEP E			BOSMI		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	0	0	-	750	50	-	0	0	-	389	244	-
317-86	0	0	0	762	729	700	0	0	0	833	929	729
345-86	0	0	0	724	481	686	0	0	0	300	281	343
008-87	0	0	0	1539	1238	1029	0	0	0	165	311	83
059-87	0	0	-	48	34	-	0	0	-	7	3	-
082-87	0	0	0	92	24	56	0	0	0	5	9	10
107-87	0	0	0	1068	242	722	0	0	0	115	123	29
135-87	0	0	0	19	10	119	166	237	0	3	7	6
162-87	0	0	-	416	740	-	278	339	-	0	0	-
184-87	0	0	0	3202	1729	2148	0	0	0	34	19	81
206-87	0	0	0	30	70	128	1186	848	435	857	110	375
234-87	0	0	0	73	290	59	25	29	3	144	867	58
258-87	0	0	0	98	20	26	0	0	0	88	701	5
282-87	0	0	0	299	140	226	286	51	45	108	57	45
303-87	-	0	0	-	299	437	-	153	342	-	150	270
337-87	0	0	0	1586	1354	532	88	23	9	319	5186	615

	DAPHN			CERIO			DIAPH			CHYDO		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	28	0	-	944	944	-	0	0	-	28	0	-
317-86	0	5	0	10	33	10	0	0	0	0	0	0
345-86	0	52	10	5	5	5	0	0	0	0	0	0
008-87	0	0	0	0	0	0	0	0	0	0	6	0
059-87	0	0	-	0	0	-	0	0	-	0	0	-
082-87	2	0	0	0	0	0	0	0	0	0	0	0
107-87	10	8	3	0	0	0	0	0	0	0	0	0
135-87	0	0	0	0	3	0	0	0	0	2	0	0
162-87	0	0	-	170	77	-	0	0	-	0	0	-
184-87	0	0	0	162	13	237	0	0	12	0	19	12
206-87	0	0	0	2483	1107	1509	0	0	0	0	0	0
234-87	0	0	0	68	357	192	144	243	103	0	0	0
258-87	5	0	0	14	60	2	3	0	0	0	0	2
282-87	0	0	0	13	0	10	10	16	19	0	3	3
303-87	-	0	0	-	9	6	-	18	50	-	0	0
337-87	0	0	0	0	0	0	5	19	5	0	0	0

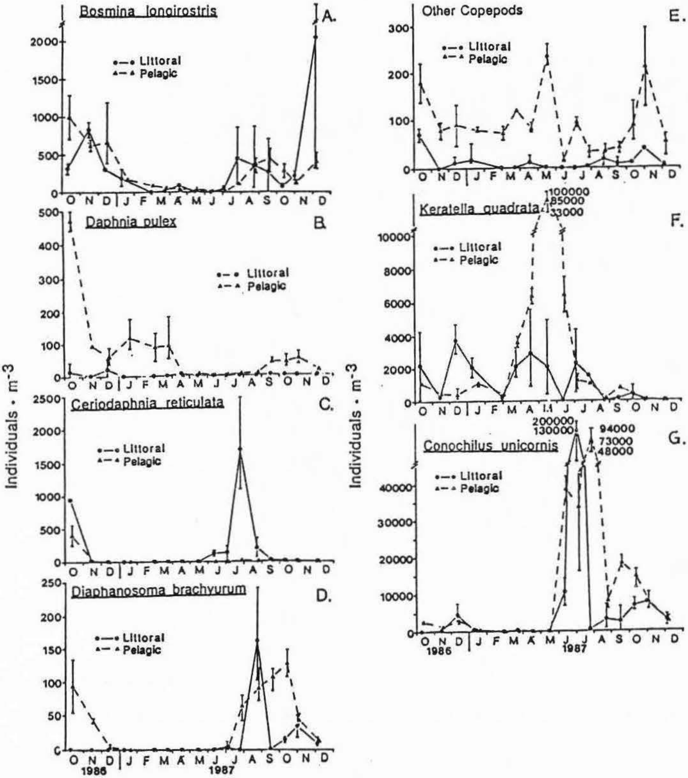
	ALONA			CLADO EM			CLADO EG			KERAT Q		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	0	0	-	0	0	-	0	0	-	4278	89	-
317-86	0	0	0	0	0	0	0	0	0	233	252	248
345-86	0	0	0	0	0	0	0	0	0	4698	2921	3492
008-87	0	0	0	0	0	0	0	0	0	2667	2019	1486
059-87	0	0	-	0	0	-	0	0	-	392	54	-
082-87	0	0	0	0	0	0	0	0	0	1556	1485	3254
107-87	0	0	0	0	0	0	0	0	0	5583	930	2156
135-87	0	0	0	0	0	0	0	0	0	4949	915	407
162-87	0	0	-	0	93	-	0	31	-	31	30	-
184-87	0	0	0	0	0	0	0	0	0	52242	119	4348
206-87	0	0	0	0	0	0	170	121	145	121	97	256
234-87	3	65	0	0	0	0	0	0	0	2	24	0
258-87	0	0	0	0	0	0	0	73	0	176	218	42
282-87	0	0	0	0	0	0	13	67	79	194	35	953
303-87	-	0	0	-	0	0	-	76	237	-	3	3
337-87	0	0	0	0	0	0	46	42	56	9	9	0

	KERAT C			BRACH			CONOC*			POLYA		
REPLICATE	A	B	C	A	B	C	A	B	C	A	B	C
DATE												
282-86	83	72	-	0	0	-	27	42	-	0	0	-
317-86	200	191	171	0	0	0	12	11	13	0	0	0
345-86	167	143	124	945	671	974	134	126	316	0	0	0
008-87	110	38	51	6334	3048	3429	16	36	12	0	0	0
059-87	0	0	-	0	0	-	0	0	-	0	0	-
082-87	5	10	51	305	153	254	26	8	13	0	0	0
107-87	81	60	71	0	0	0	0	0	0	0	0	0
135-87	102	68	136	0	0	0	0	0	0	0	0	0
162-87	0	0	-	0	0	-	591	288	-	0	0	-
184-87	0	17	0	0	0	0	4219	4800	8539	0	0	0
206-87	48	48	9	0	0	0	35	13	16	10	50	9
234-87	2	0	0	0	0	0	63	302	35	10	58	9
258-87	73	33	5	0	0	0	56	278	1	0	0	0
282-87	25	13	0	0	0	0	367	236	253	308	172	636
303-87	-	0	0	-	0	0	-	310	334	-	381	421
337-87	37	0	0	0	0	0	61	187	129	42	0	9

* The densities represent number of colonies assuming 24.1 individuals per colony (Lentz 1986).

	ROTIF EG		
REPLICATE	A	B	C
DATE			
282-86	500	0	-
317-86	0	0	0
345-86	0	0	0
008-87	143	127	159
059-87	0	0	-
082-87	31	41	31
107-87	0	0	0
135-87	0	0	0
162-87	0	0	-
184-87	0	0	0
206-87	0	0	0
234-87	0	0	0
258-87	0	0	0
282-87	0	0	0
303-87	-	0	0
337-87	0	0	0

Appendix E. Seasonal variation in the abundance of important zooplankton taxa



Seasonal variation in the abundance of important zooplankton taxa in Bear Lake during 1986-1987. Crustaceans: (A) Bosmina longirostris; (B) Daphnia pulex; (C) Ceriodaphnia reticulata; (D) Diaphanosoma brachyurum; (E) Other copepods. Principle rotifers: (F) K. quadrata, and (G) B. Conochilus unicornis. Mean and ranges of three replicate samples are shown.

Appendix F. Zooplankton Biomass

Data in the Pelagic

Dry biomass of zooplankton (mg/m^3) in the pelagic zone of Bear Lake from October 1986 to December 1987. Values for each station represent biomass of zooplankton at three sampling sites (A, B, C).

Taxa abbreviations:

EPISC AD	Epischura nevadensis Male
EPISC C	E. nevadensis copepodid
PARAC M	Paracyclops fimbriatus male
PARAC F	P. fimbriatus female
EUCYC M	Eucyclops agilis male
EUCYC F	E. agilis female
CYCLV M	Acanthocyclops vernalis male
CYCLV F	A. vernalis female
CYCLP C	Cyclopoida copepodid
CANTH M	Canthocamptus robertcokeri male
CANTH F	C. robertcokeri female
MESOC M	Mesochra rapiens male
MESOC F	M. rapiens female
HUNTE M	Huntemannia lacustris male
HUNTE F	H. lacustris female
HARPA C	Harpacticoida copepodid
COPEP N	Copepoda nauplii
BOSMI	Bosmina longirostris
DAPHN	Daphnia pulex
CERIO	Ceriodaphnia reticulata
DIAPH	Diaphanosoma brachyurum
CHYDO	Chydorus sphaericus
ALONA	Alona spp.
KERAT Q	Keratella quadrata
KERAT C	Keratella cochlearis
CONOC	Conochilus unicornis
BRACH	Brachionus sp.
POLYA	Polyarthra sp.

	EPISC AD			EPISC C			PARAC M		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	1.600	1.475	-	0.055	0.176	-	0.024	0.026	-
317-86	0.740	0.848	0.800	0.014	0.000	0.017	0.000	0.000	0.000
345-86	0.115	0.453	0.498	0.008	0.003	0.019	0.000	0.000	0.000
019-87	0.327	0.308	0.877	0.034	0.040	0.055	0.000	0.000	0.000
059-87	0.728	0.351	-	0.051	0.015	-	0.002	0.000	-
082-87	0.550	1.173	1.016	0.015	0.008	0.011	0.000	0.000	0.000
107-87	0.072	0.088	0.115	0.050	0.073	0.054	0.000	0.000	0.000
135-87	0.076	0.089	0.068	2.253	1.039	1.124	0.004	0.003	0.009
162-87	4.158	4.130	-	4.218	3.843	-	0.000	0.003	-
184-87	2.720	4.190	4.763	0.739	1.723	1.907	0.000	0.000	0.000
206-87	2.125	2.293	2.370	2.510	2.073	2.842	0.000	0.000	0.000
234-87	1.312	0.848	0.904	4.748	1.692	2.340	0.000	0.000	0.000
258-87	2.273	3.146	1.358	0.195	1.225	1.620	0.000	0.000	0.000
282-87	2.935	2.896	3.368	0.584	0.591	0.573	0.000	0.000	0.000
303-87	2.904	2.502	2.496	0.990	0.900	0.900	0.000	0.000	0.000
337-87	2.171	1.995	2.419	0.168	0.204	0.272	0.000	0.000	0.000

	PARAC F			EUCYC M			EUCYC F		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.108	0.014	-	0.000	0.000	-	0.000	0.000	-
317-86	0.006	0.002	0.014	0.000	0.000	0.000	0.000	0.000	0.000
345-86	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.016	0.016
019-87	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.008	0.010
059-87	0.032	0.020	-	0.000	0.000	-	0.000	0.000	-
082-87	0.000	0.000	0.000	0.019	0.034	0.022	0.053	0.091	0.040
107-87	0.000	0.000	0.000	0.003	0.001	0.001	0.008	0.011	0.008
135-87	0.056	0.041	0.045	0.010	0.026	0.021	0.070	0.137	0.132
162-87	0.000	0.004	-	0.000	0.000	-	0.000	0.000	-
184-87	0.000	0.000	0.000	0.009	0.000	0.017	0.000	0.000	0.000
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
234-87	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
282-87	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.006	0.000
303-87	0.000	0.000	0.000	0.000	0.000	0.000	0.058	0.016	0.008
337-87	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.006	0.000

	CYCLV M			CYCLV F			CYCLP C		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	0.000	0.000	-	0.004	0.054	-
317-86	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.027	0.034
345-86	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.039	0.026
019-87	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.240	0.026
059-87	0.000	0.000	-	0.000	0.000	-	0.074	0.048	-
082-87	0.000	0.000	0.000	0.122	0.122	0.093	0.048	0.017	0.013
107-87	0.000	0.000	0.000	0.237	0.111	0.125	0.011	0.012	0.013
135-87	0.000	0.000	0.000	0.000	0.000	0.000	0.059	0.052	0.044
162-87	0.000	0.000	-	0.000	0.000	-	0.013	0.006	-
184-87	0.000	0.000	0.000	0.152	0.135	0.108	0.016	0.023	0.015
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.013	0.008
234-87	0.000	0.000	0.000	0.000	0.003	0.005	0.015	0.012	0.028
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.022	0.017
282-87	0.000	0.000	0.000	0.000	0.000	0.011	0.067	0.022	0.026
303-87	0.000	0.000	0.000	0.003	0.000	0.000	0.090	0.059	0.048
337-87	0.003	0.012	0.000	0.048	0.024	0.003	0.025	0.026	0.009

	CANTH M			CANTH F			MESOC M		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	0.002	0.016	-	0.000	0.000	-
317-86	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
345-86	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
019-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
059-87	0.000	0.000	-	0.002	0.002	-	0.000	0.000	-
082-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
135-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
162-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
184-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
234-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
282-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
303-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
337-87	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000

	MESOC F			HUNTE M			HUNTE F		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
317-86	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
345-86	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
019-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
059-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
082-87	0.000	0.002	0.002	0.000	0.000	0.000	0.005	0.004	0.002
107-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
135-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
162-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
184-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
234-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
282-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
303-87	0.000	0.001	0.000	0.000	0.000	0.000	0.003	0.000	0.000
337-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	HARPA C			COPEP N			BOSMI		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	5.215	3.966	-	1.749	0.891	-
317-86	0.000	0.000	0.000	3.098	3.223	3.787	1.007	1.211	0.681
345-86	0.000	0.000	0.000	1.737	3.473	3.554	0.432	1.020	0.478
019-87	0.000	0.000	0.000	2.330	2.232	1.974	0.214	0.144	0.094
059-87	0.000	0.000	-	2.877	2.239	-	0.146	0.990	-
082-87	0.000	0.000	0.000	2.982	2.282	2.907	0.098	0.068	0.079
107-87	0.000	0.000	0.000	2.322	4.233	2.954	0.074	0.039	0.072
135-87	0.000	0.000	0.000	0.965	0.547	0.540	0.074	0.065	0.060
162-87	0.000	0.000	-	0.403	0.439	-	0.028	0.024	-
184-87	0.000	0.000	0.000	1.419	2.011	1.868	0.002	0.012	0.012
206-87	0.000	0.000	0.000	1.459	1.192	1.334	0.102	0.131	0.105
234-87	0.000	0.000	0.000	1.092	0.568	0.516	0.451	0.424	0.257
258-87	0.000	0.000	0.000	0.648	0.922	1.338	0.260	0.508	0.611
282-87	0.000	0.000	0.000	1.630	1.127	1.610	0.036	0.197	0.417
303-87	0.000	0.000	0.000	1.737	1.352	0.810	0.210	0.190	0.316
337-87	0.000	0.000	0.000	1.685	1.467	0.571	0.454	0.566	0.600

	DAPHN			CERIO			DIAPH		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	1.927	3.430	-	1.868	0.925	-	0.045	0.229	-
317-86	1.217	1.272	0.961	0.054	0.061	0.066	0.102	0.085	0.130
345-86	0.294	0.779	0.374	0.000	0.000	0.000	0.002	0.014	0.003
019-87	0.231	0.281	2.286	0.000	0.001	0.004	0.000	0.000	0.000
059-87	0.528	0.000	-	0.000	0.000	-	0.000	0.000	-
082-87	0.656	0.976	1.469	0.000	0.000	0.000	0.000	0.000	0.000
107-87	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000
135-87	0.044	0.032	0.006	0.000	0.000	0.000	0.000	0.000	0.000
162-87	0.000	0.002	-	0.003	0.003	-	0.000	0.002	-
184-87	0.000	0.092	0.000	0.000	0.000	0.000	0.000	0.004	0.018
206-87	0.016	0.045	0.011	0.061	0.070	0.048	0.119	0.072	0.244
234-87	0.056	0.030	0.084	0.055	0.030	0.014	0.146	0.128	0.073
258-87	0.243	0.125	0.039	0.064	0.010	0.017	0.337	0.177	0.268
282-87	0.263	0.324	0.559	0.000	0.035	0.000	0.179	0.144	0.244
303-87	0.374	0.470	1.297	0.000	0.000	0.010	0.208	0.164	0.140
337-87	0.246	0.060	0.147	0.000	0.000	0.000	0.034	0.031	0.027

	CHYDO			ALONA			KERAT Q		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	0.000	0.000	-	0.052	0.059	-
317-86	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.024	0.029
345-86	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.035	0.012
019-87	0.000	0.000	0.000	0.000	0.000	0.000	0.058	0.051	0.045
059-87	0.000	0.000	-	0.000	0.000	-	0.034	0.022	-
082-87	0.000	0.000	0.000	0.000	0.000	0.000	0.158	0.161	0.174
107-87	0.000	0.000	0.000	0.000	0.000	0.000	0.262	0.302	0.269
135-87	0.000	0.000	0.000	0.000	0.000	0.000	1.185	7.220	7.674
162-87	0.000	0.000	-	0.000	0.000	-	0.750	0.539	-
184-87	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.084	0.093
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.146	0.087	0.098
234-87	0.000	0.000	0.008	0.000	0.000	0.000	0.020	0.012	0.016
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.061	0.062
282-87	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.019	0.022
303-87	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.004	.0003
337-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	KERAT C			CONOC			BRACH		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.019	0.033	-	0.033	0.019	-	0.000	0.000	-
317-86	0.002	0.002	0.002	0.018	0.013	0.017	0.000	0.000	0.000
345-86	0.001	0.001	0.001	0.018	0.024	0.010	0.000	0.000	0.000
019-87	0.004	0.004	0.002	0.003	0.004	0.003	0.017	0.020	0.010
059-87	.0003	.0003	-	0.000	0.000	-	0.000	0.000	-
082-87	0.001	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000
107-87	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000
135-87	0.251	0.209	0.185	0.000	0.000	0.000	0.000	0.000	0.000
162-87	0.005	0.004	-	0.422	0.351	-	0.000	0.000	-
184-87	0.039	0.020	0.026	0.987	1.655	1.433	0.000	0.000	0.000
206-87	0.017	0.039	0.035	0.927	0.466	1.132	0.000	0.000	0.000
234-87	.0003	.0001	.0002	0.143	0.079	0.074	0.000	0.000	0.000
258-87	0.009	0.009	0.010	0.169	0.259	0.216	0.000	0.000	0.000
282-87	0.001	0.005	0.002	0.164	0.147	0.211	0.000	0.000	0.000
303-87	0.000	.0001	0.000	0.072	0.104	0.059	0.000	0.000	0.000
337-87	0.000	.0001	.0001	0.024	0.025	0.047	0.000	0.000	0.000

	POLYA		
REPLICATE	A	B	C
DATE			
282-86	0.000	0.000	-
317-86	0.000	0.000	0.000
345-86	0.000	0.000	0.000
019-87	0.000	0.000	0.000
059-87	0.000	0.000	-
082-87	0.000	0.000	0.000
107-87	0.000	0.000	0.000
135-87	0.000	0.000	0.000
162-87	0.000	0.000	-
184-87	0.000	0.000	0.000
206-87	0.000	0.000	0.000
234-87	0.001	0.001	0.001
258-87	0.002	0.001	0.002
282-87	0.000	0.002	0.001
303-87	.000	.00003	.0001
337-87	.00001	.000	.00001

Appendix G. Zooplankton Biomass

Data in the Littoral Zone

Dry biomass of zooplankton (mg/m^3) in the littoral zone of Bear Lake from October 1986 to December 1987. Values for each station represent biomass of zooplankton at three sampled sites (A, B, C).

Taxa abbreviations are shown in Appendix F.

	EPISC AD			EPISC C			PARAC M		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.302	0.153	-	0.025	0.000	-	0.000	0.000	-
345-86	0.000	0.000	-	0.045	0.038	-	0.000	0.000	-
008-87	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000
059-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
082-87	0.000	0.000	0.000	0.018	0.000	0.008	0.000	0.000	0.000
107-87	0.068	0.000	0.018	0.021	0.000	0.011	0.000	0.000	0.000
135-87	0.462	1.327	3.028	0.215	0.475	2.099	0.000	0.000	0.000
162-87	7.716	5.682	-	1.570	2.064	-	0.000	0.000	-
184-87	1.788	0.582	7.262	1.376	0.289	0.302	0.000	0.000	0.000
206-87	8.581	7.094	6.191	0.630	0.281	0.334	0.000	0.000	0.000
234-87	0.614	0.954	0.518	0.000	0.702	0.230	0.000	0.000	0.000
258-87	0.557	1.488	0.144	0.258	0.374	0.155	0.000	0.000	0.000
282-87	5.494	2.977	2.980	1.573	1.354	0.931	0.000	0.000	0.000
303-87	-	3.192	5.179	-	1.847	1.509	-	0.000	0.000
337-87	2.836	4.816	2.113	0.202	0.109	0.165	0.000	0.000	0.000

	PARAC F			EUCYC M			EUCYC F		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.021	0.018	-	0.000	0.000	-	0.000	0.000	-
345-86	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
008-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
059-87	0.000	0.005	-	0.000	0.000	-	0.000	0.000	-
082-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107-87	0.000	0.000	0.000	0.004	0.000	0.000	0.006	0.000	0.008
135-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000
162-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
184-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
234-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
282-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
303-87	-	0.000	0.000	-	0.004	0.000	-	0.003	0.004
337-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	CYCLV M			CYCLV F			CYCLP C		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	0.000	0.000	-	0.010	0.005	-
345-86	0.000	0.000	-	0.000	0.000	-	0.004	0.007	-
008-87	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.013	0.000
059-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
082-87	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
107-87	0.000	0.000	0.000	0.048	0.000	0.000	0.000	0.000	0.000
135-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
162-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
184-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
234-87	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.006	0.001
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001
282-87	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.002	0.005
303-87	-	0.000	0.000	-	0.000	0.000	-	0.007	0.013
337-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000

	CANTH M			CANTH F			MESOC M		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
345-86	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
008-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
059-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
082-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
135-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
162-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
184-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
234-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
282-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
303-87	-	0.000	0.000	-	0.000	0.000	-	0.001	0.000
337-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	MESOC F			HUNTE M			HUNTE F		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	0.000	0.004	-	0.019	0.021	-
345-86	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
008-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
059-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
082-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
135-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
162-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
184-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
234-87	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000
258-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
282-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000
303-87	-	0.006	0.001	-	0.000	0.000	-	0.000	0.000
337-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	HARPA C			COPEP N			BOSMI		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.000	0.000	-	0.752	0.137	-	0.651	0.361	-
345-86	0.000	0.000	-	0.375	0.574	-	0.340	0.379	-
008-87	0.000	0.000	0.000	1.367	1.150	0.770	0.162	0.385	0.081
059-87	0.000	0.000	-	0.049	0.034	-	0.007	0.009	-
082-87	0.000	0.000	0.000	0.067	0.018	0.041	0.005	0.011	0.012
107-87	0.000	0.000	0.000	1.023	0.222	0.678	0.097	0.086	0.089
135-87	0.000	0.000	0.000	0.022	0.012	0.141	0.005	0.010	0.013
162-87	0.000	0.000	-	0.380	0.677	-	0.000	0.000	-
184-87	0.000	0.000	0.000	3.334	1.735	2.206	0.031	0.021	0.100
206-87	0.000	0.000	0.000	0.028	0.061	0.123	0.502	0.057	0.297
234-87	0.000	0.000	0.000	0.064	0.257	0.050	0.092	0.722	0.048
258-87	0.000	0.000	0.000	0.081	0.021	0.023	0.106	0.772	0.005
282-87	0.000	0.000	0.000	0.264	0.121	0.190	0.108	0.068	0.036
303-87	-	0.000	0.000	-	0.275	0.373	-	0.156	0.450
337-87	0.000	0.000	0.000	1.415	1.214	0.445	0.495	9.458	0.900

	DAPHN			CERIO			DIAPH		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.442	0.000	-	2.410	3.883	-	0.000	0.000	-
345-86	0.096	0.056	-	0.038	0.017	-	0.000	0.000	-
008-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
059-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
082-87	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107-87	0.108	0.083	0.038	0.000	0.000	0.000	0.000	0.000	0.000
135-87	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000
162-87	0.000	0.000	-	0.624	0.453	-	0.000	0.000	-
184-87	0.000	0.000	0.000	0.728	0.035	0.740	0.000	0.000	0.053
206-87	0.000	0.000	0.000	7.543	3.231	5.054	0.000	0.000	0.000
234-87	0.000	0.000	0.000	0.197	1.184	0.538	0.199	0.301	0.124
258-87	0.000	0.000	0.000	0.053	0.122	0.006	0.006	0.000	0.000
282-87	0.000	0.000	0.000	0.066	0.000	0.059	0.006	0.024	0.019
303-87	-	0.000	0.000	-	0.062	0.052	-	0.039	0.124
337-87	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.061	0.014

	CHYDO			ALONA			KERAT Q		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	1.136	0.000	-	0.000	0.000	-	0.339	0.004	-
345-86	0.000	0.000	-	0.000	0.000	-	0.169	0.147	-
008-87	0.000	0.000	0.000	0.000	0.000	0.000	0.104	0.117	0.058
059-87	0.000	0.000	-	0.000	0.000	-	0.045	0.006	-
082-87	0.000	0.000	0.000	0.000	0.000	0.000	0.065	0.068	0.130
107-87	0.000	0.000	0.000	0.000	0.000	0.000	0.318	0.053	0.113
135-87	0.000	0.000	0.000	0.000	0.000	0.000	0.389	0.070	0.020
162-87	0.000	0.000	-	0.000	0.000	-	0.001	0.001	-
184-87	0.000	0.055	0.035	0.000	0.000	0.000	2.978	0.007	0.248
206-87	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.006	0.014
234-87	0.000	0.000	0.000	0.012	0.092	0.000	0.000	0.002	0.000
258-87	0.000	0.000	0.002	0.000	0.000	0.000	0.023	0.028	0.004
282-87	0.000	0.021	0.001	0.000	0.000	0.000	0.015	0.002	0.055
303-87	-	0.000	0.000	-	0.000	0.000	-	0.0002	0.0002
337-87	0.000	0.000	0.000	0.000	0.000	0.000	0.0002	0.0002	0.0002

	KERAT C			CONOC			BRACH		
REPLICATE	A	B	C	A	B	C	A	B	C
DATE									
282-86	0.002	0.002	-	0.000	0.000	-	0.000	0.000	-
345-86	0.003	0.003	-	0.020	0.060	-	0.044	0.131	-
008-87	0.002	0.002	0.001	0.002	0.008	0.001	0.056	0.028	0.029
059-87	0.000	0.000	-	0.000	0.000	-	0.000	0.000	-
082-87	0.001	0.000	0.001	0.002	0.001	0.002	0.010	0.008	0.013
107-87	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000
135-87	.0004	.0003	.0003	0.000	0.000	0.000	0.000	0.000	0.000
162-87	0.000	0.000	-	0.017	0.028	-	0.000	0.000	-
184-87	0.000	.0003	.0003	1.546	0.325	0.922	0.000	0.000	0.000
206-87	0.001	0.001	.0004	0.010	0.004	0.004	0.000	0.000	0.000
234-87	.0001	0.000	0.000	0.018	0.087	0.010	0.000	0.000	0.000
258-87	0.002	0.002	0.000	0.005	0.027	0.000	0.000	0.000	0.000
282-87	0.001	.0003	0.000	0.100	0.087	0.069	0.000	0.000	0.000
303-87	-	0.000	0.000	-	0.095	0.089	-	0.000	0.000
337-87	0.001	0.000	0.000	0.018	0.054	0.037	0.000	0.000	0.000

	POLYA		
REPLICATE	A	B	C
DATE			
282-86	0.110	0.012	-
345-86	0.000	0.000	-
008-87	0.000	0.000	0.000
059-87	0.000	0.000	-
082-87	0.000	0.000	0.000
107-87	0.000	0.000	0.000
135-87	0.000	0.000	0.000
162-87	0.000	0.000	-
184-87	0.000	0.000	0.000
206-87	.0003	0.001	.0002
234-87	.0001	0.001	.0001
258-87	0.000	0.000	0.000
282-87	.0002	.0001	.0001
303-87	-	0.011	0.010
337-87	.0004	0.000	.0001

Appendix H. Data of the Size-Frequency Distribution of Zooplankton in the Pelagic Zone

Size-frequency distribution of the zooplankton assemblage of the pelagic zone of Bear Lake from October 1986 to December 1987. Numbers in columns under taxa name represent organisms/m^3 in the respective size range.

Taxa abbreviation means:

EPI A	*Epischura nevadensis* adult
EPI C	*E.* nevadensis copepodid
PAR M	*Paracyclops fimbriatus* male
PAR F	*P. fimbriatus* female
EUC M	*Eucyclops agilis* male
EUC F	*E. agilis* female
CYV M	*Acanthocyclops vernalis* male
CYV F	*A. vernalis* female
CYC CO	Cyclopoida copepodid
CAN M	*Canthocamptus robertcokeri* male
CAN F	*C. robertcokeri* female
MES M	*Mesochra rapiens* male
MES F	M. *rapiens* female
HUN M	*Huntemannia lacustris* male
HUN F	*H. lacustris* female
HAR CO	Harpacticoida copepodid
COP-NA	Copepoda nauplii
BOSMI	*Bosmina longirostris*
DAPHN	*Daphnia pulex*
CERIO	*Ceriodaphnia reticulata*
DIAPH	*Diaphanosoma brachyurum*
CHYDO	*Chydorus sphaericus*
ALONA	*Alona* spp.
KER Q	*Keratella quadrata*
KER C	*Keratella cochlearis*
BRACH	*Brachionus* sp.
CONOC	*Conochilus unicornis*
POLYA	*Polyarthra* sp.

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	54	0	0	0	0	0	0	86	0
0.40-0.49	0	85	12	0	0	0	0	0	6	0
0.50-0.59	0	16	9	55	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	1	0	0	0	0	0	0	0
0.90-0.99	272	0	0	0	0	0	0	0	0	0
1.00-1.09	72	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	4185	0	0	0
0.20-0.29	0	0	0	0	0	0	966	0	0	0
0.30-0.39	0	0	0	0	0	0	0	598	0	0
0.40-0.49	0	0	0	0	0	0	0	399	0	77
0.50-0.59	8	3	0	0	0	0	0	0	126	46
0.60-0.69	0	0	0	0	0	0	0	0	144	231
0.70-0.79	0	0	0	0	0	0	0	0	54	46
0.80-0.89	0	0	0	0	0	0	0	0	18	0
0.90-0.99	0	0	0	0	0	0	0	0	54	0
1.00-1.09	0	0	0	0	0	0	0	0	18	0
1.10-1.19	0	0	0	0	0	0	0	0	18	0
1.20-1.29	0	0	0	0	0	0	0	0	18	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	18	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	1132	995	0	0	0
0.20-0.29	0	0	0	0	0	0	3	0
0.30-0.39	0	0	0	0	0	0	4	0
0.40-0.49	11	0	0	0	0	0	7	0
0.50-0.59	50	0	0	0	0	0	10	0
0.60-0.69	11	0	0	0	0	0	13	0
0.70-0.79	14	0	0	0	0	0	15	0
0.80-0.89	7	0	0	0	0	0	16	0
0.90-0.99	0	0	0	0	0	0	14	0
1.00-1.09	0	0	0	0	0	0	12	0
1.10-1.19	0	0	0	0	0	0	9	0
1.20-1.29	0	0	0	0	0	0	6	0
1.30-1.39	0	0	0	0	0	0	4	0
1.40-1.49	0	0	0	0	0	0	4	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	36	0
0.40-0.49	0	0	0	1	0	0	0	0	36	0
0.50-0.59	0	0	0	7	0	0	0	0	0	0
0.60-0.69	0	2	0	0	0	0	0	0	0	0
0.70-0.79	0	1	0	0	0	0	0	0	0	0
0.80-0.89	0	1	0	0	0	0	0	0	0	0
0.90-0.99	139	0	0	0	0	0	0	0	0	0
1.00-1.09	28	0	0	0	0	0	0	0	0	0
1.10-1.19	5	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	2304	0	0	0
0.20-0.29	0	0	0	0	0	0	1257	52	0	0
0.30-0.39	0	0	0	0	0	0	209	155	0	0
0.40-0.49	0	0	0	0	0	0	0	414	0	0
0.50-0.59	0	0	0	0	0	0	0	0	3	4
0.60-0.69	0	0	0	0	0	0	0	0	5	11
0.70-0.79	0	0	0	0	0	0	0	0	18	1
0.80-0.89	0	0	0	0	0	0	0	0	8	0
0.90-0.99	0	0	0	0	0	0	0	0	10	0
1.00-1.09	0	0	0	0	0	0	0	0	5	0
1.10-1.19	0	0	0	0	0	0	0	0	5	0
1.20-1.29	0	0	0	0	0	0	0	0	5	0
1.30-1.39	0	0	0	0	0	0	0	0	10	0
1.40-1.49	0	0	0	0	0	0	0	0	3	0
>1.5	0	0	0	0	0	0	0	4X0	21	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	456	78	0	0	0
0.20-0.29	0	0	0	0	0	0	2	0
0.30-0.39	0	0	0	0	0	0	2	0
0.40-0.49	0	0	0	0	0	0	3	0
0.50-0.59	1	0	0	0	0	0	5	0
0.60-0.69	6	0	0	0	0	0	6	0
0.70-0.79	3	0	0	0	0	0	7	0
0.80-0.89	19	0	0	0	0	0	8	0
0.90-0.99	11	0	0	0	0	0	7	0
1.00-1.09	0	0	0	0	0	0	6	0
1.10-1.19	0	0	0	0	0	0	4	0
1.20-1.29	0	0	0	0	0	0	3	0
1.30-1.39	0	0	0	0	0	0	2	0
1.40-1.49	0	0	0	0	0	0	2	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	56	0
0.40-0.49	0	1	0	0	0	4	0	0	19	0
0.50-0.59	0	2	0	0	0	10	0	1	0	0
0.60-0.69	0	2	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	1	0	0	0	0	0	0	0	0
0.90-0.99	66	0	0	0	0	0	0	0	0	0
1.00-1.09	12	0	0	0	0	0	0	0	0	0
1.10-1.19	1	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	2179	0	0	0
0.20-0.29	0	0	0	0	0	0	1090	148	0	0
0.30-0.39	0	0	0	0	0	0	0	389	0	0
0.40-0.49	0	0	0	0	0	0	0	130	0	0
0.50-0.59	0	0	0	0	0	0	0	0	3	0
0.60-0.69	0	0	0	0	0	0	0	0	12	0
0.70-0.79	0	0	0	0	0	0	0	0	5	0
0.80-0.89	0	0	0	0	0	0	0	0	10	0
0.90-0.99	0	0	0	0	0	0	0	0	13	1
1.00-1.09	0	0	0	0	0	0	0	0	3	2
1.10-1.19	0	0	0	0	0	0	0	0	3	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	25	0
>1.5	0	0	0	0	0	0	0	0	5	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	5	0	0	0
0.10-0.19	0	0	0	402	27	0	0	0
0.20-0.29	0	0	0	0	0	0	4	0
0.30-0.39	0	0	0	0	0	0	4	0
0.40-0.49	0	0	0	0	0	0	7	0
0.50-0.59	0	0	0	0	0	0	10	0
0.60-0.69	0	0	0	0	0	0	14	0
0.70-0.79	0	0	0	0	0	0	16	0
0.80-0.89	0	0	0	0	0	0	18	0
0.90-0.99	0	0	0	0	0	0	16	0
1.00-1.09	0	0	0	0	0	0	14	0
1.10-1.19	0	0	0	0	0	0	10	0
1.20-1.29	0	0	0	0	0	0	6	0
1.30-1.39	0	0	0	0	0	0	4	0
1.40-1.49	0	0	0	0	0	0	4	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	60	0
0.40-0.49	0	1	0	0	0	0	0	0	11	0
0.50-0.59	0	5	0	0	0	3	0	0	0	0
0.60-0.69	0	6	0	0	0	2	0	0	0	0
0.70-0.79	0	2	0	0	0	2	0	0	0	0
0.80-0.89	0	8	0	0	0	0	0	0	0	0
0.90-0.99	43	0	0	0	0	0	0	0	0	0
1.00-1.09	26	0	0	0	0	0	0	0	0	0
1.10-1.19	24	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	1086	0	0	0
0.20-0.29	0	0	0	0	0	0	1520	23	0	0
0.30-0.39	0	0	0	0	0	0	217	68	0	3
0.40-0.49	0	0	0	0	0	0	0	81	0	0
0.50-0.59	0	0	0	0	0	0	0	0	27	0
0.60-0.69	0	0	0	0	0	0	0	5	3	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	6	0
0.90-0.99	0	0	0	0	0	0	0	0	12	0
1.00-1.09	0	0	0	0	0	0	0	0	6	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	18	0
1.40-1.49	0	0	0	0	0	0	0	0	15	0
>1.5	0	0	0	0	0	0	0	0	90	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	98	0	0	0
0.10-0.19	0	0	0	1271	109	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	1	0
0.50-0.59	0	0	0	0	0	0	1	0
0.60-0.69	0	0	0	0	0	0	2	0
0.70-0.79	0	0	0	0	0	0	2	0
0.80-0.89	0	0	0	0	0	0	2	0
0.90-0.99	0	0	0	0	0	0	2	0
1.00-1.09	0	0	0	0	0	0	2	0
1.10-1.19	0	0	0	0	0	0	1	0
1.20-1.29	0	0	0	0	0	0	1	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	13	0
0.40-0.49	0	21	0	0	0	0	0	0	81	0
0.50-0.59	0	17	0	0	0	0	0	0	89	0
0.60-0.69	0	10	1	18	0	0	0	0	7	0
0.70-0.79	0	5	1	14	0	0	0	0	0	0
0.80-0.89	0	10	0	1	0	0	0	0	0	0
0.90-0.99	10	3	0	0	0	0	0	0	0	0
1.00-1.09	13	0	0	0	0	0	0	0	0	0
1.10-1.19	56	0	0	0	0	0	0	0	0	0
1.20-1.29	163	0	0	0	0	0	0	0	0	0
1.30-1.39	29	0	0	0	0	0	0	0	0	0
1.40-1.49	1	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	1810	0	0	0
0.20-0.29	0	0	0	0	0	0	3464	25	0	0
0.30-0.39	0	0	0	0	0	0	1373	93	0	0
0.40-0.49	0	0	0	0	0	0	151	121	16	0
0.50-0.59	2	0	0	0	0	0	0	0	61	0
0.60-0.69	2	0	0	0	0	0	0	0	110	0
0.70-0.79	0	0	0	0	0	0	0	0	80	0
0.80-0.89	0	0	0	0	0	0	0	0	40	0
0.90-0.99	0	0	0	0	0	0	0	0	24	0
1.00-1.09	0	0	0	0	0	0	0	0	11	0
1.10-1.19	0	0	0	0	0	0	0	0	3	0
1.20-1.29	0	0	0	0	0	0	0	0	3	0
1.30-1.39	0	0	0	0	0	0	0	0	11	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	11	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	1147	1	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	3	0	0	0	0	0	0	8	0
0.40-0.49	0	12	0	0	0	0	0	0	21	0
0.50-0.59	0	3	0	0	1	7	0	0	10	0
0.60-0.69	0	0	0	0	7	11	0	2	0	0
0.70-0.79	0	0	0	0	2	2	0	6	0	0
0.80-0.89	0	0	0	0	1	2	0	11	0	0
0.90-0.99	12	0	0	0	1	6	0	16	0	0
1.00-1.09	37	0	0	0	0	0	0	0	0	0
1.10-1.19	61	0	0	0	0	0	0	0	0	0
1.20-1.29	15	0	0	0	0	0	0	0	0	0
1.30-1.39	15	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	1022	0	0	0
0.20-0.29	0	0	0	0	0	0	1323	1	0	0
0.30-0.39	0	0	0	0	0	0	541	27	0	0
0.40-0.49	0	0	0	1	1	3	0	27	0	0
0.50-0.59	0	0	0	0	0	0	0	0	4	0
0.60-0.69	0	0	0	0	0	0	0	0	2	0
0.70-0.79	0	0	0	0	0	0	0	0	2	0
0.80-0.89	0	0	0	0	0	0	0	0	17	0
0.90-0.99	0	0	0	0	0	0	0	0	19	0
1.00-1.09	0	0	0	0	0	0	0	0	17	0
1.10-1.19	0	0	0	0	0	0	0	0	15	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	8	0
1.40-1.49	0	0	0	0	0	0	0	0	2	0
>1.5	0	0	0	0	0	0	0	0	8	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	3566	80	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	6	0	0	0	0	0	0	6	0
0.40-0.49	0	84	0	0	0	0	0	0	18	0
0.50-0.59	0	6	0	0	1	5	0	0	0	0
0.60-0.69	0	0	0	0	0	1	0	24	0	0
0.70-0.79	0	2	0	0	0	0	0	4	0	0
0.80-0.89	0	0	0	0	0	0	0	20	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	4	0	0	0	0	0	0	0	0	0
1.10-1.19	5	0	0	0	0	0	0	0	0	0
1.20-1.29	2	0	0	0	0	0	0	0	0	0
1.30-1.39	1	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	518	0	0	0
0.20-0.29	0	0	0	0	0	0	2022	1	0	0
0.30-0.39	0	0	0	0	0	0	583	10	0	0
0.40-0.49	0	0	0	0	0	0	0	25	0	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	1	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	54	0	0	0
0.10-0.19	0	0	0	6380	85	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	135	0	0	0	0	0	0	47	0
0.50-0.59	0	163	0	0	12	51	0	0	66	0
0.60-0.69	0	95	1	4	3	34	0	0	0	0
0.70-0.79	0	0	2	15	0	0	0	0	0	0
0.80-0.89	0	68	0	3	0	0	0	0	0	0
0.90-0.99	1	190	0	0	0	0	0	0	0	0
1.00-1.09	5	0	0	0	0	0	0	0	0	0
1.10-1.19	3	0	0	0	0	0	0	0	0	0
1.20-1.29	2	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	185	1	0	0
0.30-0.39	0	0	0	0	0	0	308	16	0	0
0.40-0.49	0	0	0	0	0	0	98	20	0	0
0.50-0.59	0	0	0	0	0	0	0	3	0	0
0.60-0.69	0	0	0	0	0	0	0	0	2	0
0.70-0.79	0	0	0	0	0	0	0	0	3	0
0.80-0.89	0	0	0	0	0	0	0	0	1	0
0.90-0.99	0	0	0	0	0	0	0	0	2	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	3557	0	0	0	0
0.10-0.19	0	0	0	81822	8263	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	4	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	167	0	0	0	0	0	0	17	0
0.40-0.49	0	83	0	0	0	0	0	0	48	0
0.50-0.59	0	313	0	0	0	0	0	0	4	0
0.60-0.69	0	727	0	1	0	0	0	0	0	0
0.70-0.79	0	748	1	1	0	0	0	0	0	0
0.80-0.89	40	1258	0	0	0	0	0	0	0	0
0.90-0.99	150	857	0	0	0	0	0	0	0	0
1.00-1.09	425	0	0	0	0	0	0	0	0	0
1.10-1.19	1256	0	0	0	0	0	0	0	0	0
1.20-1.29	609	0	0	0	0	0	0	0	0	0
1.30-1.39	87	0	0	0	0	0	0	0	0	0
1.40-1.49	79	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	963	0	0	0
0.20-0.29	0	0	0	0	0	0	614	3	0	0
0.30-0.39	0	0	0	0	0	0	106	16	0	0
0.40-0.49	0	0	0	0	0	0	0	10	0	0
0.50-0.59	0	0	0	0	0	0	0	3	0	1
0.60-0.69	0	0	0	0	0	0	0	0	1	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	104	0	0	0
0.10-0.19	0	0	0	16369	325	0	0	0
0.20-0.29	0	0	0	0	0	0	7	0
0.30-0.39	1	0	0	0	0	0	8	0
0.40-0.49	0	0	0	0	0	0	15	0
0.50-0.59	0	0	0	0	0	0	21	0
0.60-0.69	0	0	0	0	0	0	29	0
0.70-0.79	0	0	0	0	0	0	33	0
0.80-0.89	0	0	0	0	0	0	36	0
0.90-0.99	0	0	0	0	0	0	32	0
1.00-1.09	0	0	0	0	0	0	27	0
1.10-1.19	0	0	0	0	0	0	20	0
1.20-1.29	0	0	0	0	0	0	13	0
1.30-1.39	0	0	0	0	0	0	8	0
1.40-1.49	0	0	0	0	0	0	8	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	34	0
0.40-0.49	0	209	0	0	0	0	0	0	13	0
0.50-0.59	0	119	0	0	0	0	0	0	0	0
0.60-0.69	0	104	0	0	0	0	0	0	0	0
0.70-0.79	0	45	0	0	4	0	0	7	0	0
0.80-0.89	0	104	0	0	0	0	0	27	0	0
0.90-0.99	0	134	0	0	0	0	0	8	0	0
1.00-1.09	21	0	0	0	0	0	0	0	0	0
1.10-1.19	225	0	0	0	0	0	0	0	0	0
1.20-1.29	141	0	0	0	0	0	0	0	0	0
1.30-1.39	113	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	446	0	0	0
0.20-0.29	0	0	0	0	0	0	1003	6	0	0
0.30-0.39	0	0	0	0	0	0	334	3	0	0
0.40-0.49	0	0	0	0	0	0	0	3	0	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	1	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	1	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	1258	1009	0	0	0
0.20-0.29	0	0	0	0	0	0	132	0
0.30-0.39	0	0	0	0	0	0	155	0
0.40-0.49	1	0	0	0	0	0	266	0
0.50-0.59	1	0	0	0	0	0	390	0
0.60-0.69	1	0	0	0	0	0	527	0
0.70-0.79	0	0	0	0	0	0	605	0
0.80-0.89	0	0	0	0	0	0	652	0
0.90-0.99	1	0	0	0	0	0	590	0
1.00-1.09	0	0	0	0	0	0	503	0
1.10-1.19	0	0	0	0	0	0	360	0
1.20-1.29	0	0	0	0	0	0	237	0
1.30-1.39	0	0	0	0	0	0	142	0
1.40-1.49	0	0	0	0	0	0	141	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	26	0
0.40-0.49	0	42	0	0	0	0	0	0	6	0
0.50-0.59	0	211	0	0	0	1	0	0	0	0
0.60-0.69	0	147	0	0	0	0	0	0	0	0
0.70-0.79	0	147	0	0	0	0	0	0	0	0
0.80-0.89	0	274	0	0	0	0	0	0	0	0
0.90-0.99	0	190	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	124	0	0	0	0	0	0	0	0	0
1.20-1.29	87	0	0	0	0	0	0	0	0	0
1.30-1.39	70	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	457	0	0	0
0.20-0.29	0	0	0	0	0	0	686	0	0	1
0.30-0.39	0	0	0	0	0	0	229	25	0	3
0.40-0.49	0	0	0	0	0	0	0	65	0	5
0.50-0.59	0	0	0	0	0	0	0	20	0	8
0.60-0.69	0	0	0	0	0	0	0	2	2	5
0.70-0.79	0	0	0	0	0	0	0	0	2	2
0.80-0.89	0	0	0	0	0	0	0	0	1	1
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	1	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	1084	1172	0	0	0
0.20-0.29	0	0	0	0	0	85	0	0
0.30-0.39	0	0	0	0	0	100	0	0
0.40-0.49	8	0	0	0	0	172	0	0
0.50-0.59	16	0	0	0	0	250	0	0
0.60-0.69	10	0	0	0	0	341	0	0
0.70-0.79	21	0	0	0	0	391	0	0
0.80-0.89	14	0	0	0	0	422	0	0
0.90-0.99	0	0	0	0	0	382	0	0
1.00-1.09	1	0	0	0	0	325	0	0
1.10-1.19	1	0	0	0	0	233	0	0
1.20-1.29	1	0	0	0	0	153	0	0
1.30-1.39	4	0	0	0	0	92	0	0
1.40-1.49	0	0	0	0	0	91	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	47	0	0	0	0	0	0	57	0
0.40-0.49	0	665	0	0	0	2	0	0	25	0
0.50-0.59	0	950	0	0	0	2	0	0	2	0
0.60-0.69	0	855	0	0	0	0	0	0	0	0
0.70-0.79	0	760	0	0	0	0	0	0	0	0
0.80-0.89	0	712	0	0	0	0	0	0	0	0
0.90-0.99	0	76	0	0	0	0	0	0	0	0
1.00-1.09	13	0	0	0	0	0	0	0	0	0
1.10-1.19	199	0	0	0	0	0	0	0	0	0
1.20-1.29	318	0	0	0	0	0	0	0	0	0
1.30-1.39	26	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	1724	0	0	0
0.20-0.29	0	0	0	0	0	0	961	905	0	4
0.30-0.39	0	0	0	0	0	0	141	926	0	8
0.40-0.49	0	0	0	0	0	0	0	294	0	20
0.50-0.59	0	0	0	0	0	0	0	21	0	13
0.60-0.69	0	0	0	0	0	0	0	0	0	19
0.70-0.79	0	0	0	0	0	0	0	0	0	3
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	500	24	0	0	0
0.20-0.29	0	1	0	0	0	0	2	0
0.30-0.39	63	1	0	0	0	0	2	0
0.40-0.49	170	1	0	0	0	0	4	0
0.50-0.59	177	0	0	0	0	0	6	0
0.60-0.69	99	0	0	0	0	0	8	0
0.70-0.79	120	0	0	0	0	0	9	0
0.80-0.89	56	0	0	0	0	0	9	0
0.90-0.99	20	0	0	0	0	0	8	0
1.00-1.09	7	0	0	0	0	0	7	0
1.10-1.19	0	0	0	0	0	0	5	0
1.20-1.29	0	0	0	0	0	0	3	0
1.30-1.39	0	0	0	0	0	0	2	0
1.40-1.49	0	0	0	0	0	0	2	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	25	0
0.40-0.49	0	94	0	0	0	0	0	0	17	0
0.50-0.59	0	94	0	0	0	0	0	0	0	0
0.60-0.69	0	13	0	0	0	0	0	0	0	0
0.70-0.79	0	160	0	0	0	0	0	0	0	0
0.80-0.89	0	134	0	0	0	0	0	0	0	0
0.90-0.99	0	147	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	121	0	0	0	0	0	0	0	0	0
1.20-1.29	111	0	0	0	0	0	0	0	0	0
1.30-1.39	54	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	665	0	0	0
0.20-0.29	0	0	0	0	0	0	288	71	0	0
0.30-0.39	0	0	0	0	0	0	111	305	0	1
0.40-0.49	0	0	0	0	0	0	0	71	2	1
0.50-0.59	0	0	0	0	0	0	0	0	14	2
0.60-0.69	0	0	0	0	0	0	0	0	9	1
0.70-0.79	0	0	0	0	0	0	0	0	4	3
0.80-0.89	0	0	0	0	0	0	0	0	2	0
0.90-0.99	0	0	0	0	0	0	0	0	2	1
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	5	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	2	0
>1.5	0	0	0	0	0	0	0	0	2	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	26	0	0	0
0.10-0.19	0	0	0	822	325	0	0	157
0.20-0.29	0	0	0	0	0	0	21	0
0.30-0.39	0	0	0	0	0	0	25	0
0.40-0.49	6	0	0	0	0	0	43	0
0.50-0.59	26	0	0	0	0	0	63	0
0.60-0.69	15	0	0	0	0	0	86	0
0.70-0.79	0	0	0	0	0	0	98	0
0.80-0.89	29	0	0	0	0	0	106	0
0.90-0.99	12	0	0	0	0	0	96	0
1.00-1.09	18	0	0	0	0	0	82	0
1.10-1.19	3	0	0	0	0	0	59	0
1.20-1.29	0	0	0	0	0	0	39	0
1.30-1.39	0	0	0	0	0	0	23	0
1.40-1.49	0	0	0	0	0	0	23	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	13	0	0	0	0	0	0	6	0
0.40-0.49	0	93	0	0	0	0	0	0	2	0
0.50-0.59	0	27	0	0	0	0	0	0	0	0
0.60-0.69	0	160	0	0	0	0	0	0	0	0
0.70-0.79	0	240	0	0	0	0	0	0	0	0
0.80-0.89	0	67	0	0	0	0	0	0	0	0
0.90-0.99	7	67	0	0	0	0	0	0	0	0
1.00-1.09	360	0	0	0	0	0	0	0	0	0
1.10-1.19	231	0	0	0	0	0	0	0	0	0
1.20-1.29	34	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	115	0	0	0
0.20-0.29	0	0	0	0	0	0	97	21	0	0
0.30-0.39	0	0	0	0	0	0	9	27	0	0
0.40-0.49	0	0	0	0	0	0	0	21	0	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	3
0.70-0.79	0	0	0	0	0	0	0	0	0	4
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	2	0	0	0
0.10-0.19	0	0	0	394	10	0	0	372
0.20-0.29	0	1	0	0	0	0	8	0
0.30-0.39	0	0	0	0	0	0	9	0
0.40-0.49	1	0	0	0	0	0	16	0
0.50-0.59	8	1	0	0	0	0	23	0
0.60-0.69	5	0	0	0	0	0	32	0
0.70-0.79	0	0	0	0	0	0	37	0
0.80-0.89	1	0	0	0	0	0	40	0
0.90-0.99	0	0	0	0	0	0	36	0
1.00-1.09	0	0	0	0	0	0	31	0
1.10-1.19	0	0	0	0	0	0	22	0
1.20-1.29	0	0	0	0	0	0	14	0
1.30-1.39	0	0	0	0	0	0	9	0
1.40-1.49	0	0	0	0	0	0	9	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	50	0
0.30-0.39	0	0	0	0	0	0	0	0	345	0
0.40-0.49	0	51	0	0	0	1	0	0	148	0
0.50-0.59	0	51	0	0	0	23	0	0	22	0
0.60-0.69	0	84	0	0	0	26	0	0	0	0
0.70-0.79	0	219	0	0	0	0	0	2	0	0
0.80-0.89	0	606	0	0	0	0	0	0	0	0
0.90-0.99	43	685	0	0	0	1	0	0	0	0
1.00-1.09	899	0	0	0	0	1	0	0	0	0
1.10-1.19	976	0	0	0	0	0	0	0	0	0
1.20-1.29	59	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	2859	0	0	0
0.20-0.29	0	0	0	0	0	0	2300	69	0	0
0.30-0.39	0	0	0	0	0	0	105	174	0	0
0.40-0.49	0	0	1	0	0	0	0	258	0	0
0.50-0.59	0	0	0	0	0	0	0	54	9	0
0.60-0.69	0	0	0	0	0	0	0	0	9	3
0.70-0.79	0	0	0	0	0	0	0	0	8	3
0.80-0.89	0	0	0	0	0	0	0	0	5	0
0.90-0.99	0	0	0	0	0	0	0	0	6	0
1.00-1.09	0	0	0	0	0	0	0	0	4	0
1.10-1.19	0	0	0	0	0	0	0	0	14	0
1.20-1.29	0	0	0	0	0	0	0	0	15	0
1.30-1.39	0	0	0	0	0	0	0	0	19	0
1.40-1.49	0	0	0	0	0	0	0	0	13	0
>1.5	0	0	0	0	0	0	0	0	22	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	187	5	0	0	19
0.20-0.29	0	0	0	0	0	0	2	0
0.30-0.39	0	0	0	0	0	0	2	0
0.40-0.49	0	0	0	0	0	0	4	0
0.50-0.59	2	0	0	0	0	0	6	0
0.60-0.69	2	0	0	0	0	0	8	0
0.70-0.79	2	0	0	0	0	0	9	0
0.80-0.89	25	0	0	0	0	0	10	0
0.90-0.99	148	0	0	0	0	0	9	0
1.00-1.09	25	0	0	0	0	0	8	0
1.10-1.19	43	0	0	0	0	0	6	0
1.20-1.29	5	0	0	0	0	0	4	0
1.30-1.39	2	0	0	0	0	0	2	0
1.40-1.49	0	0	0	0	0	0	2	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	73	0
0.40-0.49	0	0	0	0	0	0	0	0	58	0
0.50-0.59	0	14	0	0	0	0	0	0	0	0
0.60-0.69	0	6	0	0	0	1	0	0	0	0
0.70-0.79	0	22	0	0	0	0	0	0	0	0
0.80-0.89	0	30	0	0	0	0	2	2	0	0
0.90-0.99	59	16	0	0	0	0	0	4	0	0
1.00-1.09	238	0	0	0	0	0	0	0	0	0
1.10-1.19	93	0	0	0	0	0	0	1	0	0
1.20-1.29	4	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	955	0	0	0
0.20-0.29	0	0	0	0	0	0	808	32	0	0
0.30-0.39	0	0	0	0	0	0	0	194	0	0
0.40-0.49	0	0	0	0	0	0	0	176	0	0
0.50-0.59	0	0	0	0	0	0	0	5	1	0
0.60-0.69	0	0	0	0	0	0	0	0	3	0
0.70-0.79	0	0	0	0	0	0	0	0	2	0
0.80-0.89	0	0	0	0	0	0	0	0	1	0
0.90-0.99	0	0	0	0	0	0	0	0	1	0
1.00-1.09	0	0	0	0	0	0	0	0	1	0
1.10-1.19	0	0	0	0	0	0	0	0	1	0
1.20-1.29	0	0	0	0	0	0	0	0	1	0
1.30-1.39	0	0	0	0	0	0	0	0	1	0
1.40-1.49	0	0	0	0	0	0	0	0	2	0
>1.5	0	0	0	0	0	0	0	0	3	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	1	1	0	0	1
0.20-0.29	0	0	0	0	0	0	3	0
0.30-0.39	0	0	0	0	0	0	4	0
0.40-0.49	0	0	0	0	0	0	6	0
0.50-0.59	0	0	0	0	0	0	9	0
0.60-0.69	0	0	0	0	0	0	12	0
0.70-0.79	4	0	0	0	0	0	14	0
0.80-0.89	6	0	0	0	0	0	15	0
0.90-0.99	2	0	0	0	0	0	14	0
1.00-1.09	0	0	0	0	0	0	12	0
1.10-1.19	0	0	0	0	0	0	9	0
1.20-1.29	0	0	0	0	0	0	6	0
1.30-1.39	0	0	0	0	0	0	3	0
1.40-1.49	0	0	0	0	0	0	3	0
>1.5	0	0	0	0	0	0	0	0

Appendix I. Data of the Size-Frequency Distribution of Zooplankton in the Littoral Zone

Size-frequency distribution of the zooplankton assemblage of the littoral zone of Bear Lake from October 1986 to December 1987. Numbers in columns under taxa name represent Organisms/m^3 in the respective size range.

Taxa abbreviation are shown in Appendix H.

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(mm)	EPI A	EPI C	PAR M	PAR F	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	42	0	0	0	0	0	0	10	0
0.40-0.49	0	0	0	10	0	0	0	0	10	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	10	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	22	0	0	0	0	0	0	0	0	0
1.00-1.09	17	0	0	0	0	0	0	0	0	0
1.10-1.19	6	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	253	0	0	0
0.20-0.29	0	0	0	0	0	0	148	164	0	109
0.30-0.39	0	0	0	0	0	0	0	153	0	73
0.40-0.49	0	0	0	3	28	0	0	0	0	218
0.50-0.59	0	0	0	0	0	0	0	0	0	472
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	73
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	14	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	14	0	0	0
0.10-0.19	0	0	0	2159	64	0	0	0
0.20-0.29	0	0	0	0	0	0	1	0
0.30-0.39	0	0	0	0	0	0	1	0
0.40-0.49	0	0	0	0	0	0	2	0
0.50-0.59	0	0	0	0	0	0	3	0
0.60-0.69	0	14	0	0	0	0	4	0
0.70-0.79	0	0	0	0	0	0	5	0
0.80-0.89	0	0	0	0	0	0	5	0
0.90-0.99	0	0	0	0	0	0	5	0
1.00-1.09	0	0	0	0	0	0	4	0
1.10-1.19	0	0	0	0	0	0	3	0
1.20-1.29	0	0	0	0	0	0	2	0
1.30-1.39	0	0	0	0	0	0	1	0
1.40-1.49	0	0	0	0	0	0	1	0
>1.5	0	0	0	0	0	0	0	0

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(MM)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	18	0	0	0	0	0	0	0	0
0.90-0.99	17	0	0	0	0	0	0	0	0	0
1.00-1.09	3	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	238	0	0	0
0.10-0.19	0	0	0	0	0	0	492	0	0	0
0.20-0.29	0	0	0	0	0	0	0	149	0	0
0.30-0.39	0	0	0	0	0	0	0	404	2	0
0.40-0.49	0	0	0	0	0	0	0	277	0	2
0.50-0.59	0	0	0	0	0	0	0	0	0	5
0.60-0.69	0	0	0	0	0	0	0	0	0	11
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	244	187	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	1	0
0.50-0.59	0	0	0	0	0	0	1	0
0.60-0.69	0	0	0	0	0	0	1	0
0.70-0.79	0	0	0	0	0	0	2	0
0.80-0.89	0	0	0	0	0	0	2	0
0.90-0.99	0	0	0	0	0	0	1	0
1.00-1.09	0	0	0	0	0	0	1	0
1.10-1.19	0	0	0	0	0	0	1	0
1.20-1.29	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	6	0
0.40-0.49	0	0	0	0	0	0	0	0	3	0
0.50-0.59	0	5	0	0	0	0	0	0	0	0
0.60-0.69	0	14	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	3	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	525	0	0	0
0.20-0.29	0	0	0	0	0	0	105	94	0	0
0.30-0.39	0	0	0	0	0	0	0	120	0	0
0.40-0.49	0	0	0	0	0	0	0	94	0	0
0.50-0.59	0	0	2	0	0	0	0	0	5	0
0.60-0.69	0	0	0	0	0	0	0	0	5	3
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	2
0.90-0.99	0	0	0	0	0	0	0	0	10	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	41	0	0	0
0.10-0.19	0	0	0	3704	103	528	0	0
0.20-0.29	0	0	0	0	0	335	5	0
0.30-0.39	0	0	0	0	0	0	6	0
0.40-0.49	0	0	0	0	0	0	11	0
0.50-0.59	0	0	0	0	0	0	16	0
0.60-0.69	0	0	0	0	0	0	22	0
0.70-0.79	0	0	0	0	0	0	25	0
0.80-0.89	0	0	0	0	0	0	27	0
0.90-0.99	0	0	0	0	0	0	24	0
1.00-1.09	0	0	0	0	0	0	21	0
1.10-1.19	0	0	0	0	0	0	15	0
1.20-1.29	0	0	0	0	0	0	10	0
1.30-1.39	0	0	0	0	0	0	6	0
1.40-1.49	0	0	0	0	0	0	6	0
>1.5	0	0	0	0	0	0	0	0

08 JANUARY 1987

(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	18	0
0.40-0.49	0	2	0	0	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	846	0	0	0
0.20-0.29	0	0	0	0	0	0	423	11	0	0
0.30-0.39	0	0	0	0	0	0	0	137	0	0
0.40-0.49	0	0	0	0	0	0	0	38	0	0
0.50-0.59	0	0	2	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	16	1952	0	0
0.10-0.19	0	0	0	2057	51	2318	0	0
0.20-0.29	0	0	0	0	0	0	1	0
0.30-0.39	0	0	0	0	0	0	1	0
0.40-0.49	0	2	0	0	0	0	1	0
0.50-0.59	0	0	0	0	0	0	2	0
0.60-0.69	0	0	0	0	0	0	2	0
0.70-0.79	0	0	0	0	0	0	3	0
0.80-0.89	0	0	0	0	0	0	3	0
0.90-0.99	0	0	0	0	0	0	3	0
1.00-1.09	0	0	0	0	0	0	2	0
1.10-1.19	0	0	0	0	0	0	2	0
1.20-1.29	0	0	0	0	0	0	1	0
1.30-1.39	0	0	0	0	0	0	1	0
1.40-1.49	0	0	0	0	0	0	1	0
>1.5	0	0	0	0	0	0	0	0

28 FEBRUARY 1987

(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0	2	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	2	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	12	0	0	0
0.20-0.29	0	0	0	0	0	0	58	2	0	0
0.30-0.39	0	0	0	0	0	0	12	2	0	0
0.40-0.49	0	0	0	0	0	0	0	4	0	0
0.50-0.59	0	0	0	0	0	0	0	2	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	446	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

23 MARCH 1987

(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0	1	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	1	0	0	0	0	0	0	0	0
0.70-0.79	0	1	0	0	0	0	0	0	0	0
0.80-0.89	0	1	0	0	0	0	0	0	0	0
0.90-0.99	0	1	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	1	0	0	0
0.10-0.19	0	0	0	0	0	0	55	0	0	0
0.20-0.29	0	0	0	0	0	0	1	0	0	0
0.30-0.39	0	0	0	0	0	0	0	6	0	0
0.40-0.49	0	0	0	0	0	0	0	1	0	0
0.50-0.59	0	0	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	1	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	2098	22	222	0	0
0.20-0.29	0	0	0	0	0	15	0	0
0.30-0.39	0	0	0	0	0	0	1	0
0.40-0.49	0	0	0	0	0	0	1	0
0.50-0.59	0	0	0	0	0	0	1	0
0.60-0.69	0	0	0	0	0	0	2	0
0.70-0.79	0	0	0	0	0	0	2	0
0.80-0.89	0	0	0	0	0	0	2	0
0.90-0.99	0	0	0	0	0	0	2	0
1.00-1.09	0	0	0	0	0	0	2	0
1.10-1.19	0	0	0	0	0	0	1	0
1.20-1.29	0	0	0	0	0	0	1	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

17 APRIL 1987

(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	8	0	0	0	0	0	0	0	0
0.50-0.59	0	4	0	0	0	4	0	0	0	0
0.60-0.69	0	1	0	0	0	0	0	3	0	0
0.70-0.79	0	0	0	0	1	0	0	3	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	2	0	0	0	0	0	0	0	0	0
1.20-1.29	1	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	288	0	0	0
0.20-0.29	0	0	0	0	0	0	346	0	0	0
0.30-0.39	0	0	0	0	0	0	43	2	0	0
0.40-0.49	0	0	0	0	0	0	0	41	0	0
0.50-0.59	0	0	0	0	0	0	0	47	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	2	0
1.00-1.09	0	0	0	0	0	0	0	0	1	0
1.10-1.19	0	0	0	0	0	0	0	0	2	0
1.20-1.29	0	0	0	0	0	0	0	0	1	0
1.30-1.39	0	0	0	0	0	0	0	0	2	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	2890	71	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

15 MAY 1987

(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	27	0	0	0	0	0	0	0	0
0.50-0.59	0	73	0	0	0	0	0	0	0	0
0.60-0.69	0	13	0	0	0	1	0	0	0	0
0.70-0.79	0	20	0	0	0	0	0	0	0	0
0.80-0.89	0	60	0	0	0	0	0	0	0	0
0.90-0.99	0	127	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	67	0	0	0	0	0	0	0	0	0
1.20-1.29	15	0	0	0	0	0	0	0	0	0
1.30-1.39	97	0	0	0	0	0	0	0	0	0
1.40-1.49	4	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	6	0	0	0
0.40-0.49	0	0	0	0	0	0	43	3	0	0
0.50-0.59	0	0	0	0	0	0	0	3	0	1
0.60-0.69	0	0	0	0	0	0	0	0	0	1
0.70-0.79	0	0	0	0	0	0	0	0	0	1
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	2090	102	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0
0.40-0.49	0	0	0	0	0	0	0	0
0.50-0.59	0	0	0	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	111	0	0	0	0	0	0	0	0
0.50-0.59	0	37	0	0	0	0	0	0	0	0
0.60-0.69	0	37	0	0	0	0	0	0	0	0
0.70-0.79	0	185	0	0	0	0	0	0	0	0
0.80-0.89	0	445	0	0	0	0	0	0	0	0
0.90-0.99	0	371	0	0	0	0	0	0	0	0
1.00-1.09	63	0	0	0	0	0	0	0	0	0
1.10-1.19	1128	0	0	0	0	0	0	0	0	0
1.20-1.29	596	0	0	0	0	0	0	0	0	0
1.30-1.39	31	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	434	0	0	0
0.20-0.29	0	0	0	0	0	0	650	0	0	15
0.30-0.39	0	0	0	0	0	0	72	0	0	15
0.40-0.49	0	0	0	0	0	0	0	0	0	15
0.50-0.59	0	0	0	0	0	0	0	0	0	15
0.60-0.69	0	0	0	0	0	0	0	0	0	62
0.70-0.79	0	0	0	0	0	0	0	0	0	108
0.80-0.89	0	0	0	0	0	0	0	0	0	15
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	61	0	0	0	0
0.20-0.29	0	0	0	0	0	0	25	0
0.30-0.39	0	0	0	0	0	0	29	0
0.40-0.49	0	0	0	0	0	0	50	0
0.50-0.59	0	0	0	0	0	0	72	0
0.60-0.69	0	0	0	0	0	0	99	0
0.70-0.79	0	0	0	0	0	0	113	0
0.80-0.89	0	0	0	0	0	0	122	0
0.90-0.99	0	0	0	0	0	0	110	0
1.00-1.09	0	0	0	0	0	0	94	0
1.10-1.19	0	0	0	0	0	0	67	0
1.20-1.29	0	0	0	0	0	0	44	0
1.30-1.39	0	0	0	0	0	0	27	0
1.40-1.49	0	0	0	0	0	0	26	0
>1.5	0	0	0	0	0	0	0	0

03 JULY 1987

(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	215	0	0	0	0	0	0	0	0
0.50-0.59	0	123	0	0	0	0	0	0	0	0
0.60-0.69	0	123	0	0	0	0	0	0	0	0
0.70-0.79	0	10	0	0	0	0	0	0	0	0
0.80-0.89	0	10	0	0	0	0	0	0	0	0
0.90-0.99	7	10	0	0	0	0	0	0	0	0
1.00-1.09	28	0	0	0	0	0	0	0	0	0
1.10-1.19	219	0	0	0	0	0	0	0	0	0
1.20-1.29	106	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	442	0	0	0
0.20-0.29	0	0	0	0	0	0	1229	9	0	0
0.30-0.39	0	0	0	0	0	0	688	27	0	17
0.40-0.49	0	0	0	0	0	0	0	9	0	13
0.50-0.59	0	0	0	0	0	0	0	0	0	26
0.60-0.69	0	0	0	0	0	0	0	0	0	36
0.70-0.79	0	0	0	0	0	0	0	0	0	43
0.80-0.89	0	0	0	0	0	0	0	0	0	4
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	18903	6	0	0	0
0.20-0.29	0	0	0	0	0	0	155	0
0.30-0.39	0	0	0	0	0	0	182	0
0.40-0.49	0	10	0	0	0	0	313	0
0.50-0.59	0	0	0	0	0	0	455	0
0.60-0.69	2	0	0	0	0	0	620	0
0.70-0.79	0	0	0	0	0	0	711	0
0.80-0.89	0	0	0	0	0	0	767	0
0.90-0.99	0	0	0	0	0	0	694	0
1.00-1.09	0	0	0	0	0	0	578	0
1.10-1.19	0	0	0	0	0	0	423	0
1.20-1.29	2	0	0	0	0	0	278	0
1.30-1.39	0	0	0	0	0	0	167	0
1.40-1.49	0	0	0	0	0	0	165	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	13	0	0	0	0	0	0	3	0
0.50-0.59	0	76	0	0	0	0	0	0	0	0
0.60-0.69	0	42	0	0	0	0	0	0	0	0
0.70-0.79	0	4	0	0	0	0	0	0	0	0
0.80-0.89	0	47	0	0	0	0	0	0	0	0
0.90-0.99	0	21	0	0	0	0	0	0	0	0
1.00-1.09	24	0	0	0	0	0	0	0	0	0
1.10-1.19	460	0	0	0	0	0	0	0	0	0
1.20-1.29	266	0	0	0	0	0	0	0	0	0
1.30-1.39	194	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	36	0	0	0
0.20-0.29	0	0	0	0	0	0	29	188	0	37
0.30-0.39	0	0	0	0	0	0	11	247	0	75
0.40-0.49	0	0	0	0	0	0	0	12	0	151
0.50-0.59	0	0	0	0	0	0	0	0	0	642
0.60-0.69	0	0	0	0	0	0	0	0	0	604
0.70-0.79	0	0	0	0	0	0	0	0	0	113
0.80-0.89	0	0	0	0	0	0	0	0	0	75
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	158	35	0	0	23
0.20-0.29	0	0	0	0	0	0	1	0
0.30-0.39	0	0	0	0	0	0	1	0
0.40-0.49	0	0	0	0	0	0	1	0
0.50-0.59	0	0	0	0	0	0	2	0
0.60-0.69	0	0	0	0	0	0	2	0
0.70-0.79	0	0	0	0	0	0	3	0
0.80-0.89	0	0	0	0	0	0	3	0
0.90-0.99	0	0	0	0	0	0	3	0
1.00-1.09	0	0	0	0	0	0	2	0
1.10-1.19	0	0	0	0	0	0	2	0
1.20-1.29	0	0	0	0	0	0	1	0
1.30-1.39	0	0	0	0	0	0	1	0
1.40-1.49	0	0	0	0	0	0	1	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	5	0
0.30-0.39	0	0	0	0	0	0	0	0	22	0
0.40-0.49	0	223	0	0	0	0	0	0	11	0
0.50-0.59	0	255	0	0	0	5	0	0	0	0
0.60-0.69	0	96	0	0	0	2	0	0	0	0
0.70-0.79	0	32	0	0	0	0	0	0	0	0
0.80-0.89	0	32	0	0	0	0	0	0	0	0
0.90-0.99	0	127	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	157	0	0	0	0	0	0	0	0	0
1.20-1.29	125	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	290	0	0	0
0.20-0.29	0	0	0	0	0	0	106	456	0	0
0.30-0.39	0	0	0	0	0	0	26	508	0	96
0.40-0.49	0	0	4	0	0	0	0	104	0	137
0.50-0.59	0	0	2	0	0	0	0	0	0	103
0.60-0.69	0	0	0	0	0	0	0	0	0	144
0.70-0.79	0	0	0	0	0	0	0	0	0	123
0.80-0.89	0	0	0	0	0	0	0	0	0	14
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	16
0.10-0.19	0	0	0	25	2	0	0	62
0.20-0.29	0	2	12	0	0	0	11	0
0.30-0.39	11	7	44	0	0	0	13	0
0.40-0.49	55	0	4	0	0	0	23	0
0.50-0.59	185	0	8	0	0	0	33	0
0.60-0.69	120	0	0	0	0	0	45	0
0.70-0.79	44	0	0	0	0	0	51	0
0.80-0.89	55	0	0	0	0	0	56	0
0.90-0.99	22	0	0	0	0	0	50	0
1.00-1.09	0	0	0	0	0	0	43	0
1.10-1.19	0	0	0	0	0	0	31	0
1.20-1.29	0	0	0	0	0	0	20	0
1.30-1.39	0	0	0	0	0	0	12	0
1.40-1.49	0	0	0	0	0	0	12	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	2	0	0	0	0	0	0	0	0
0.40-0.49	0	19	0	0	0	0	0	0	6	0
0.50-0.59	0	17	0	0	0	0	0	0	2	0
0.60-0.69	0	12	0	0	0	0	0	0	0	0
0.70-0.79	0	24	0	0	0	0	0	0	0	0
0.80-0.89	0	14	0	0	0	0	0	0	0	0
0.90-0.99	0	26	0	0	0	0	0	0	0	0
1.00-1.09	2	0	0	0	0	0	0	0	0	0
1.10-1.19	43	0	0	0	0	0	0	0	0	0
1.20-1.29	31	0	0	0	0	0	0	0	0	0
1.30-1.39	19	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	36	0	0	0
0.20-0.29	0	0	0	0	0	0	11	56	0	0
0.30-0.39	0	0	0	0	0	0	1	128	0	0
0.40-0.49	0	0	0	0	0	0	0	72	0	6
0.50-0.59	0	0	0	0	0	0	0	8	0	14
0.60-0.69	0	0	0	0	0	0	0	0	0	3
0.70-0.79	0	0	0	0	0	0	0	0	2	4
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	146	37	0	0	0
0.20-0.29	0	0	0	0	0	3	0	0
0.30-0.39	0	1	0	0	0	4	0	0
0.40-0.49	0	0	0	0	0	6	0	0
0.50-0.59	0	0	0	0	0	9	0	0
0.60-0.69	0	0	0	0	0	12	0	0
0.70-0.79	1	0	0	0	0	14	0	0
0.80-0.89	1	0	0	0	0	15	0	0
0.90-0.99	0	0	0	0	0	14	0	0
1.00-1.09	0	0	0	0	0	12	0	0
1.10-1.19	0	0	0	0	0	9	0	0
1.20-1.29	0	0	0	0	0	6	0	0
1.30-1.39	0	0	0	0	0	3	0	0
1.40-1.49	0	0	0	0	0	3	0	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	28	0
0.20-0.29	0	0	0	0	0	0	0	0	19	0
0.30-0.39	0	0	0	0	0	0	0	0	3	0
0.40-0.49	0	21	0	0	0	0	0	0	0	0
0.50-0.59	0	41	0	0	0	1	0	0	0	0
0.60-0.69	0	31	0	0	0	1	0	0	0	0
0.70-0.79	0	67	0	0	0	1	0	0	0	0
0.80-0.89	0	41	0	0	0	0	0	0	0	0
0.90-0.99	28	46	0	0	0	0	0	3	0	0
1.00-1.09	244	0	0	0	0	0	0	0	0	0
1.10-1.19	200	0	0	0	0	0	0	0	0	0
1.20-1.29	33	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	1131	0	0	0
0.20-0.29	0	0	0	0	0	0	411	19	0	0
0.30-0.39	0	0	0	0	0	0	103	201	0	0
0.40-0.49	0	0	0	0	0	0	0	63	3	0
0.50-0.59	0	0	0	0	0	0	0	0	4	5
0.60-0.69	0	0	0	0	0	0	0	0	10	0
0.70-0.79	0	0	0	0	0	0	0	0	6	0
0.80-0.89	0	0	0	0	0	0	0	0	2	0
0.90-0.99	0	0	0	0	0	0	0	0	2	0
1.00-1.09	0	0	0	0	0	0	0	0	1	0
1.10-1.19	0	0	0	0	0	0	0	0	1	0
1.20-1.29	0	0	0	0	0	0	0	0	3	0
1.30-1.39	0	0	0	0	0	0	0	0	1	0
1.40-1.49	0	0	0	0	0	0	0	0	1	0
>1.5	0	0	0	0	0	0	0	0	6	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	318	106	0	0	69
0.20-0.29	0	0	0	0	0	0	4	0
0.30-0.39	3	0	0	0	0	0	5	0
0.40-0.49	26	0	0	0	0	0	8	0
0.50-0.59	34	0	0	0	0	0	12	0
0.60-0.69	23	0	0	0	0	0	16	0
0.70-0.79	14	0	0	0	0	0	19	0
0.80-0.89	14	0	0	0	0	0	20	0
0.90-0.99	9	0	0	0	0	0	18	0
1.00-1.09	6	0	0	0	0	0	15	0
1.10-1.19	0	0	0	0	0	0	11	0
1.20-1.29	0	0	0	0	0	0	7	0
1.30-1.39	0	0	0	0	0	0	4	0
1.40-1.49	0	0	0	0	0	0	4	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	31	0
0.40-0.49	0	0	0	0	0	0	0	0	15	0
0.50-0.59	0	62	0	0	3	3	0	0	0	0
0.60-0.69	0	31	0	0	0	3	0	0	0	0
0.70-0.79	0	125	0	0	0	0	0	0	0	0
0.80-0.89	0	250	0	0	0	0	0	0	0	0
0.90-0.99	22	531	0	0	0	0	0	0	0	0
1.00-1.09	570	0	0	0	0	0	0	0	0	0
1.10-1.19	768	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	460	0	0	0
0.20-0.29	0	0	0	0	0	0	253	56	0	0
0.30-0.39	0	0	2	0	0	0	23	182	0	0
0.40-0.49	0	3	12	0	0	0	0	182	0	0
0.50-0.59	0	0	0	0	3	0	0	0	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	3
0.80-0.89	0	0	0	0	0	0	0	0	0	9
0.90-0.99	0	0	0	0	0	0	0	0	0	3
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	6	0	0	0	802
0.20-0.29	0	0	0	0	0	0	18	0
0.30-0.39	0	0	0	0	0	0	21	0
0.40-0.49	0	0	0	0	0	0	37	0
0.50-0.59	0	0	0	0	0	0	53	0
0.60-0.69	17	0	0	0	0	0	72	0
0.70-0.79	17	0	0	0	0	0	83	0
0.80-0.89	17	0	0	0	0	0	89	0
0.90-0.99	17	0	0	0	0	0	81	0
1.00-1.09	0	0	0	0	0	0	69	0
1.10-1.19	0	0	0	0	0	0	49	0
1.20-1.29	0	0	0	0	0	0	32	0
1.30-1.39	0	0	0	0	0	0	20	0
1.40-1.49	0	0	0	0	0	0	10	0
>1.5	0	0	0	0	0	0	0	0

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(mm)	EPI A	EPI C	PAR M	PARF	EUC M	EUC F	CYV M	CYV F	CYC CO	CAN M
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	0	0	0	0
0.20-0.29	0	0	0	0	0	0	0	0	0	0
0.30-0.39	0	0	0	0	0	0	0	0	0	0
0.40-0.49	0	2	0	0	0	0	0	0	2	0
0.50-0.59	0	5	0	0	0	0	0	0	0	0
0.60-0.69	0	2	0	0	0	0	0	0	2	0
0.70-0.79	0	14	0	0	0	0	0	0	0	0
0.80-0.89	0	25	0	0	0	0	0	0	0	0
0.90-0.99	173	16	0	0	0	0	0	0	0	0
1.00-1.09	243	0	0	0	0	0	0	0	0	0
1.10-1.19	173	0	0	0	0	0	0	0	0	0
1.20-1.29	6	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	CAN F	MES M	MES F	HUN M	HUN F	HAR CO	COP-NA	BOSMI	DAPHN	CERIO
0.01-0.09	0	0	0	0	0	0	0	0	0	0
0.10-0.19	0	0	0	0	0	0	699	0	0	0
0.20-0.29	0	0	0	0	0	0	458	68	0	0
0.30-0.39	0	0	0	0	0	0	0	725	0	0
0.40-0.49	0	0	0	0	0	0	0	1156	0	0
0.50-0.59	0	0	0	0	0	0	0	91	0	0
0.60-0.69	0	0	0	0	0	0	0	0	0	0
0.70-0.79	0	0	0	0	0	0	0	0	0	0
0.80-0.89	0	0	0	0	0	0	0	0	0	0
0.90-0.99	0	0	0	0	0	0	0	0	0	0
1.00-1.09	0	0	0	0	0	0	0	0	0	0
1.10-1.19	0	0	0	0	0	0	0	0	0	0
1.20-1.29	0	0	0	0	0	0	0	0	0	0
1.30-1.39	0	0	0	0	0	0	0	0	0	0
1.40-1.49	0	0	0	0	0	0	0	0	0	0
>1.5	0	0	0	0	0	0	0	0	0	0

	DIAPH	CHYDO	ALONA	KER Q	KER C	BRACH	CONOC	POLYA
0.01-0.09	0	0	0	0	0	0	0	5
0.10-0.19	0	0	0	6	12	0	0	12
0.20-0.29	0	0	0	0	0	0	4	0
0.30-0.39	0	0	0	0	0	0	4	0
0.40-0.49	0	0	0	0	0	0	7	0
0.50-0.59	0	0	0	0	0	0	10	0
0.60-0.69	0	0	0	0	0	0	14	0
0.70-0.79	0	0	0	0	0	0	16	0
0.80-0.89	5	0	0	0	0	0	17	0
0.90-0.99	5	0	0	0	0	0	16	0
1.00-1.09	0	0	0	0	0	0	13	0
1.10-1.19	0	0	0	0	0	0	10	0
1.20-1.29	0	0	0	0	0	0	6	0
1.30-1.39	0	0	0	0	0	0	4	0
1.40-1.49	0	0	0	0	0	0	4	0
>1.5	0	0	0	0	0	0	0	0

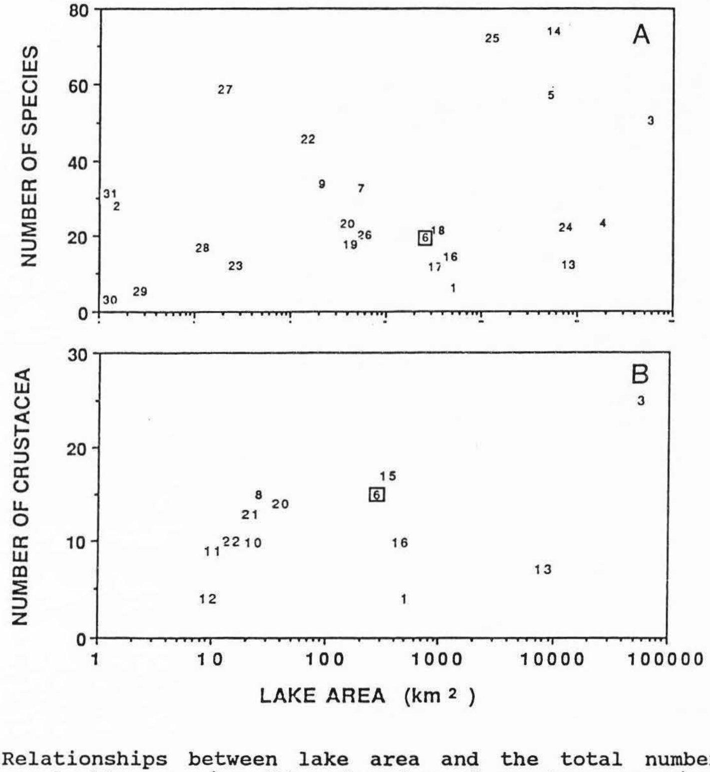
Appendix J. Zooplankton Species Richness in 31 Lakes Throughout the World

Zooplankton species richness in 31 lakes throughout the world. The number of crustacea species of some of the lakes is also indicated as well as the area of the lakes, primary productivity, chlorophyll a and trophic state.

	LAKE	AREA km^2	SPECIES CRUST.	TOT.	PRIM. PROD.	CHLOR. a mg/m^3	TROPHIC STATE	SOURCE
1	Tahoe	500	4	6	115 $gC/m^2/yr$	-	Ultraolig.	Byron 1984
2	Mirror Lake	0.15		29	29 $gC/m^2/yr$	-	Ultraolig.	Makarewicz 1985
3	Michigan	58,016	25	51	145 $gC/m^2/yr$	-	Oligotrop.	Evans et al. 1980
4	Ontario	18,760		23	180 $gC/m^2/yr$	-	Oligotrop.	Taylor et al. 1987
5	Kariba	5,344		58	-	-	Oligotrop.	Green 1985
6	BEAR LAKE	282	15	20	-	1	Oligotrop.	Moreno (unpub.data)
7	Kultspon	53		33	0.60 $gC/m^2/d$*	-	Oligotrop.	Axelson 1961
8	Kalamalka	26	15	-	-	1.05	Oligotrop.	Patalas & Salki 1973
9	Ramsarem	21		34	0.75 $gC/m^2/d$*	-	Oligotrop.	Axelson 1961
10	Skaja	20	10	-	-	1.25	Oligotrop.	Patalas & Salki 1973
11	Osoyoos	10	9	-	-	1.25	Oligotrop.	Patalas & Salki 1973
12	Wood	9	4	-	-	1.25	Oligotrop.	Patalas & Salki 1973
13	Titicaca	8,100	7	12	1.13 $gC/m^2/d$	-	Mesotroph.	Moreno 1983
14	Mobutu	5,600		74	-	1.75	Mesotroph.	Green 1985
15	Okanajan	344	17	-	-	7	Mesotroph.	Patalas & Salki 1973
16	Pyramid	446	10	14	2 $gC/m^2/d$	-	Eutrophic	Galat et al. 1981
17	Lanao	357		12	600 $gC/m^2/yr$	-	Eutrophic	Lewis 1979
18	Valencia	350		21	2 $gC/m^2/d$	-	Eutrophic	Saunders & Lewis 1988
19	Lahontan Res.	44.1		18	-		Eutrophic	Cooper and Vigg 1985
20	Mendota	39	14	23	(2g $AlgalC/m^2$)	-	Eutrophic	Brock 1985
21	Tjeukemeer	21	13	-	-	41	Eutrophic.	Vijverberg 1977
22	Myvatn	15	10	46	-	-	Eutrophic.	Adalsteinsson 1979
23	East Canyon	2.77		12	-	-	Eutrophic.	Tabor (pers. comm.)
24	Turkana	7,560		22	-	-	-	Green 1985
25	Kinjii	1,280		72	-	-	-	Green 1985
26	Biel	60		20	-	-	-	Berner-Fankhauser 1983
27	Skarshutsee	2		59	-	-	-	Berzins 1958
28	Gamelin	1.23		17	-	-	-	Lalancette et al. 1985
29	Lake 223	0.27		6	-	-	-	Kettle et al. 1987
30	Tory	0.13		3	-	-	-	Malone & McQueen 1983
31	St. George	0.11		30	-	-	-	Malone & McQueen 1983

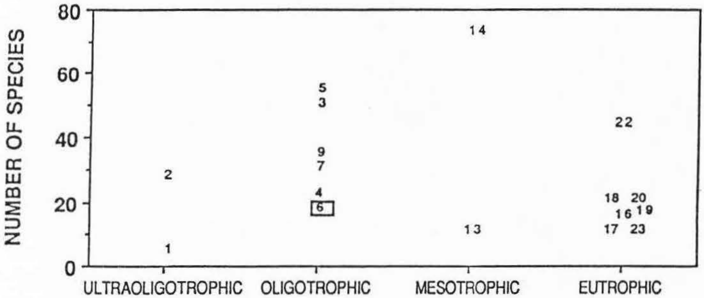
* Value represents summer mean.

Appendix K. Relationship Between Lake Area and the Total Number of Zooplankton Species, and Number of Crustacea Species in 31 Lakes Throughout the World



Relationships between lake area and the total number of zooplankton species (A) and number of crustacea species (B) in 31 temperate and tropical lakes listed in Appendix J. Neither relationship is statistically significant (Spearman correlation, $p > 0.05$). Bear Lake is denoted with a square.

Appendix L. Relationship Between Number of Zooplankton Species and the Trophic State of Several Temperate and Tropical Lakes



Relationships between number of zooplankton species and the trophic state of 17 temperate and tropical lakes listed in Appendix J. Bear Lake zooplankton species richness is denoted with a square. The correlation between trophic state and species richness was not significant (Spearman correlation, $p > 0.05$).

Appendix M. Zooplankton Biomass of Bear Lake and Other Lakes

Zooplankton biomass (dry weight) in Bear Lake in relation to that of 31 other lakes throughout the world described by Morgan (1980). Data represent biomasses during the growing season. The average biomass of zooplankton in Bear Lake from May to October was calculated in order to make my data comparable to that given by Morgan (1980). A value of 0.0478 g/J was used to convert the energy data of Morgan (1980) to biomass. HZB, herbivore zooplankton biomass; CZB, carnivore zooplankton biomass.

		HZB (J m-2)	CZB (J m-2)	TOTAL BIOMASS (J m-2)	BIOMASS (g m-2)	ALTITUDE (m)	LATITUDE (°)
1	Flosek	58.8	5.9	64.7	3.09	-	53 N
2	Dalnee	239.4	18.9	258.3	12.35	-	56 N
3	Mikolajskie	84.0	53.8	137.8	6.59	-	53 N
4	Taltowisko	133.4	7.1	140.5	6.72	-	53 N
5	George, Uganda	10.1	-	10.1	0.48	-	0 N/S
6	Drivyaty	25.5	-	25.5	1.22	-	55 N
7	Chedenjarvi	27.7	3.8	31.5	1.50	150	62 N
8	Warniak	12.6	2.5	15.1	0.72	-	53 N
9	Batorin	18.9	4.2	23.1	1.10	-	54 N
10	Myastro	35.3	5.9	41.2	1.97	-	54 N
11	Krasnoye	21.0	2.9	23.9	1.14	-	60 N
12	Sniardwy	33.6	5.0	38.6	1.85	-	53 N
13	Baykal	25.2	7.6	32.8	1.57	-	53 N
14	Kiev Reservoir	27.3	0.8	28.1	1.35	103	50 N
15	Kuarkhov	7.6	10.5	18.1	0.87	-	59 N
16	Rybinsk Reservoir	4.2	1.8	6.0	0.29	102	59 N
17	Sibaya	1.4	-	1.4	0.07	-	27 S
18	Karakul	7.6	0.4	8.0	0.38	480	43 N
19	Norach	16.8	6.7	23.5	1.12	-	54 N
20	Paajarvi	14.3	2.5	16.8	0.80	-	61 N
21	Bratsk Reservoir	8.0	5.5	13.5	0.64	-	56 N
22	Krivoye	5.5	2.1	7.6	0.37	-	65 N
23	Krugloye	3.7	0.8	4.5	0.21	-	65 N
	BEAR LAKE	-	-	3.8	0.21	1806	42 N
24	O. Heimdalsvatn	2.5	-	2.5	0.12	1090	61 N
26	Bolshoy Kharbey	2.9	0.8	3.7	0.18	200	67 N
27	V.Finstertaler See	2.3	0.8	3.1	0.15	2237	47 N
29	Char Lake	1.6	-	1.6	0.08	30	74 N
30	Zelenetskoye	0.4	0.0	0.4	0.02	-	-
31	Aleknagik	1.0	0.2	1.2	0.06	-	57 N
32	Tundra Pond	0.1	-	0.1	0.01	-	-
33	Latnjajaure	0.2	-	0.2	0.01	-	-