

Aurora Trout Lakes Ecosystem Data Report:

1976 - 2006



Aurora trout - Whirligig Lake (*E. Snucins*)

Cooperative Freshwater Ecology Unit

- 2008 -



Whirligig Lake research cabin (*E. Snucins*)

Aurora Trout Lakes Ecosystem Data Report: 1976 - 2006



Aurora Whitepine Lake (B.Keller)

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Aurora trout - Aurora Whitepine Lake, 1953 (*Ontario Ministry of Natural Resources*)



First naturally reproduced aurora trout captured after re-introduction efforts
- Whirligig Lake, 1992 (*E. Snucins*)

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Summary

Aurora Whitepine, Little Whitepine and Whirligig lakes, located approximately 100 km northeast of Sudbury, Ontario, have been monitored since 1976 as part of the Ontario Ministry of the Environment's Sudbury Environmental Study (SES). Aurora Whitepine and Whirligig lakes are the only known native habitat of the aurora trout, a rare colour variant of the brook trout (*Salvelinus fontinalis*). The native populations were extirpated by acidification from atmospheric sulphur deposition during 1958-1967, but were successfully reintroduced during the early 1990's following whole-lake liming efforts to improve water quality in Whirligig Lake. Since the final liming of Whirligig in 1995, the pH of the Aurora Trout Lakes has remained slightly above 5.0, the threshold necessary for brook trout survival. Overall the invertebrate communities are abundant in all study lakes, although species composition reflects the generally low pH of these lakes. Both phytoplankton and zooplankton communities have experienced a shift from dominance by acid-tolerant taxa to include more acid-sensitive species in recent years. However, although significant improvements in water quality have occurred, and the biota exhibit some signs of recovery from acidification, the aurora trout populations remain at risk. Continued monitoring of the chemistry and biology of the native Aurora Trout Lakes is necessary to determine if the habitat continues to be suitable for aurora trout survival. As well, regional reference lakes need to be monitored to determine regional patterns in recovery from acidification.

Introduction

The Ontario Ministry of the Environment (MOE) and the Ontario Ministry of Natural Resources (MNR) have conducted field studies in three Temagami-area lakes, Aurora Whitepine, Little Whitepine and Whirligig, since the mid 1970's as part of the MNR's Comparative Lakes Study (CLS) and the MOE's Acid Precipitation in Ontario Study (APIOS) and Sudbury Environmental Study (SES). The lakes are located within the zone historically affected by atmospheric deposition from Sudbury-area metal smelters (Neary et al. 1990).

This report describes all historical water quality, phytoplankton, zooplankton, benthic invertebrate and fish data presently catalogued with the Cooperative Freshwater Ecology Unit, a partnership of the MOE, the MNR, and Laurentian University. Sampling protocols are detailed, and basic trends are displayed in graphical form. The water quality data and biological data are summarized in tabular form in appendices. A list of key references cited within the text and a list of additional references is included.

Program History

Aurora Whitepine and Whirligig lakes are the only known natural habitat of the rare colour variant of the brook trout (*Salvelinus fontinalis*) commonly known as the aurora trout (see Sale 1967), first discovered in Gamble Township in 1923 (Henn and Rinkenbach 1925). By the late 1960's no fish were being captured in these lakes. Fortunately, in 1958 some of the last surviving aurora trout had been removed and transferred to the MNR Hill's Lake Fish Culture Station. In 1976, in response to concerns that populations of this rare fish had disappeared, the MOE and the MNR initiated an extensive sampling program to assess the chemical and biological status of this group of northern lakes. In 1987 the aurora trout was designated as "endangered" on Canada's list of Species At Risk. Low pH and alkalinity values and elevated metal concentrations in the lakes indicated that

atmospheric acid inputs were responsible for the decline in fish populations (Keller 1978).

As acidity declined in response to decreased smelter emissions, and after liming in 1989, chemistry improved to a point where re-introduction of hatchery-maintained fish was attempted in Whirligig Lake. Whirligig Lake was stocked with adult aurora trout in 1990, resulting in recruitment to establish a self-sustaining, naturally reproducing population (Malette et al. 2004). Little Whitepine Lake, the headwater of Whirligig, was also limed in 1989 to help the recovery process and maintain $\text{pH} > 5.0$, the threshold necessary for brook trout population survival. Subsequent whole-lake limestone additions to Whirligig Lake in 1993 and 1995, and the Whirligig wetland liming in 1992 (Table 1) were successful in maintaining $\text{pH} > 5.0$. Aurora trout were reintroduced to Aurora Whitepine Lake in 1994, when pH reached 5.2.

Table 1: Stocking and liming history of the Aurora Trout Lakes

Year	Aurora Whitepine	Little Whitepine	Whirligig
1989	-	Lake limed	Lake limed
1990	-	-	Re-introduction
1992	-	-	Wetland limed
1993	-	-	Lake limed
1994	Re-introduction	-	-
1995	-	-	Lake limed

The water chemistry and invertebrate biology of Aurora Whitepine Lake had been studied sporadically by the MOE from 1976 to 1986 as part of the APIOS and SES. Whirligig Lake chemistry was also sampled in June and August of 1976. More intensive sampling programs involving monthly ice-free season chemistry, phytoplankton and zooplankton collections were initiated in 1987 for Aurora Whitepine, Little Whitepine and Whirligig lakes, and have continued through to 2007 (except during 1989 when liming occurred). Nearby Wilderness Lake was also sampled, but only in 1987 and 1988 (Table 2). Biological sampling for a number of different organisms (phytoplankton, zooplankton, *Chaoborus*, benthic invertebrates and fish) was also conducted using a number of sampling gear types, protocols and various sampling schedules (Table 2). In addition to monitoring of the Aurora Trout Lakes, regional reference lakes, both recovering and unperturbed, were studied as part of the SES (Table 3).

Table 2a: Sampling history of the Aurora Trout Lakes, 1974 - 2006. AWP = Aurora Whitepine Lake, LWP = Little Whitepine Lake, WG = Whirligig Lake, and WLD = Wilderness Lake. (*) = Sample collected as part of the early SES surveys. Chemistry data from 1974 - 1976 were collected at the surface and 1m off bottom. Mark-recapture methods include: trap nets, fyke nets, short-duration gillnets, and angling. Spawning assessments occurred in 1994 and 1995, and genetic samples were collected in 2003 and 2004.

Year	Phytoplankton (Pooled sample)	Water Chemistry (Tube Composite)	Dissolved Oxygen/Temperature Profile; Secchi Depth	Fish		
				Gut Contents	Hoop Net	Mark/Recapture
1974	-	AWP*, LWP*, WG*, WLD*	AWP*, LWP*, WG*, WLD*	-	-	-
1975	-	AWP*, LWP*, WG*, WLD*	AWP*, LWP*, WG*, WLD*	-	-	-
1976	AWP*, LWP*, WG*, WLD*	AWP*, LWP*, WG*, WLD*	AWP*, LWP*, WG*, WLD*	-	-	-
1979	-	AWP*	-	-	-	-
1980	-	AWP*	-	-	-	-
1981	-	AWP*	-	-	-	-
1982	-	AWP*	-	AWP	-	-
1983	-	AWP*	-	AWP	-	-
1984	-	AWP*	-	-	-	-
1985	-	AWP*	-	-	-	-
1986	-	AWP*	-	-	-	-
1987	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD	-	-	-
1988	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD	-	-	-
1989	WG	AWP, LWP, WG	LWP, WG	-	-	-
1990	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	WG	-	-
1991	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-
1992	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, WG	-	AWP, WG
1993	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, WG	-	AWP, WG
1994	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, WG	-	AWP, WG
1995	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, WG	-	AWP, WG
1996	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-
1997	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-
1998	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-
1999	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-
2000	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-
2001	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-
2002	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	WG	-
2003	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	WG	AWP, WG
2004	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	AWP, WG
2005	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-
2006	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	-	-

Table 2b: Sampling history for the Aurora Trout lakes, 1974 - 2005. AWP = Aurora Whitepine Lake, LWP = Little Whitepine Lake, WG = Whirligig Lake, and WLD = Wilderness Lake. (*) = Sample collected as part of the early SES surveys. (^) = Sample collected but not yet processed.

Year	Macroinvertebrates					Zooplankton (Metered Flow Net)
	Substrate Cages	Eckman Dredge	Shoreline Sweep	Chaoborus	Nero Net	
1974	-	-	-	-	-	-
1975	-	-	-	-	-	-
1976	-	-	-	-	-	-
1977	-	-	-	-	-	-
1978	-	-	-	-	-	-
1979	-	-	-	-	-	-
1980	-	-	-	-	-	-
1981	-	-	-	-	-	AWP*
1982	-	AWP	-	-	-	-
1983	-	-	-	-	-	-
1984	-	-	-	-	-	-
1985	-	-	-	-	-	-
1986	-	-	-	-	-	-
1987	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD	AWP, LWP, WG, WLD
1988	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG, WLD
1989	-	-	-	-	-	-
1990	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	-	AWP, LWP, WG
1991	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	LWP, WG	AWP, LWP, WG
1992	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG	AWP, LWP, WG
1993	AWP, LWP, WG	-	-	-	-	AWP, LWP, WG
1994	AWP, LWP, WG	-	-	-	-	AWP, LWP, WG
1995	-	-	-	-	-	AWP, LWP, WG
1996	-	-	-	-	-	AWP, LWP, WG
1997	-	-	-	-	-	AWP, LWP, WG
1998	-	-	-	-	-	AWP, LWP, WG
1999	-	-	-	-	-	AWP, LWP, WG
2000	-	-	-	-	-	AWP, LWP, WG
2001	-	-	-	-	-	AWP, LWP, WG
2002	LWP, WG	-	-	LWP^, WG^	-	AWP, LWP, WG
2003	AWP^, LWP^, WG^	LWP^	LWP^	LWP^	-	AWP, LWP, WG
2004	-	-	-	-	-	AWP, LWP, WG
2005	-	-	-	-	-	AWP, LWP, WG
2006	-	-	-	-	-	AWP, LWP, WG

Table 3: Regional reference lakes sampled between 1981 and 2006. Samples are collected once per year, during mid-summer. Some lakes are sampled annually¹ and some periodically².

Lake Name	Latitude	Longitude	Township	Elevation (m)	Distance to Nearest Smelter (km)	2005 pH (surface)
Anvil ²	47° 25'	80° 16'	Van Nostrand	290	101	6.85
Aston ²	47° 14'	80° 06'	Aston/Cole	305	90	7.18
Bluesucker ¹	47° 10'	80° 36'	Dundee	341	66	6.07
Bob ¹	47° 10'	80° 15'	Canton	310	76	6.05
Bowland ²	47° 16'	80° 49'	Howey	381	56	6.09
Florence ¹	47° 14'	80° 32'	Parker/Dundee	365	77	6.00
Jim Edwards ¹	47° 17'	80° 25'	Selby	351	84	5.60
Klock ¹	47° 27'	80° 07'	Klock	345	110	6.13
Landers ¹	47° 16'	80° 29'	Selby	422	80	5.39
Laundrie ¹	47° 07'	80° 51'	Howey	381	60	5.72
Lepha ²	47° 32'	80° 03'	Auld	305	120	6.55
Pilgrim ¹	47° 11'	80° 39'	Dundee/Selkirk	357	67	5.95
Seagram ¹	47° 06'	80° 32'	Seagram	309	61	6.29
Stull ²	47° 16'	80° 49'	McLeod	381	76	6.76
Sugar ²	47° 21'	80° 06'	Dane	320	100	6.87
Sunnywater ¹	47° 23'	80° 37'	Gamble	486	92	4.79
Wabun ¹	47° 24'	80° 35'	Brewster	437	94	5.58
Whitepine ¹	47° 05'	80° 50'	McLeod	442	78	6.21

Program Objectives

MNR fisheries management objectives for the Aurora Trout Lakes are to preserve and maintain biodiversity by maintaining the aurora trout gene pool and restoring a self-sustaining population to its native habitat. This has been accomplished through lake rehabilitation with fish reintroductions and water quality maintenance through liming and long-term monitoring. In order to determine long-term population viability, monitoring data have been collected on the habitat, population structure, reproductive behaviour and success of the re-established populations. The objective of invertebrate sampling was to characterize the macroinvertebrate and zooplankton communities that represent a food base for the aurora trout.

MOE water quality monitoring objectives were: (1) to determine if physical and chemical changes

induced by acidification were reversed following reductions in acid deposition, and (2) to determine the pace and extent of long-term recovery of plankton, macroinvertebrates and fish in response to water quality improvements.

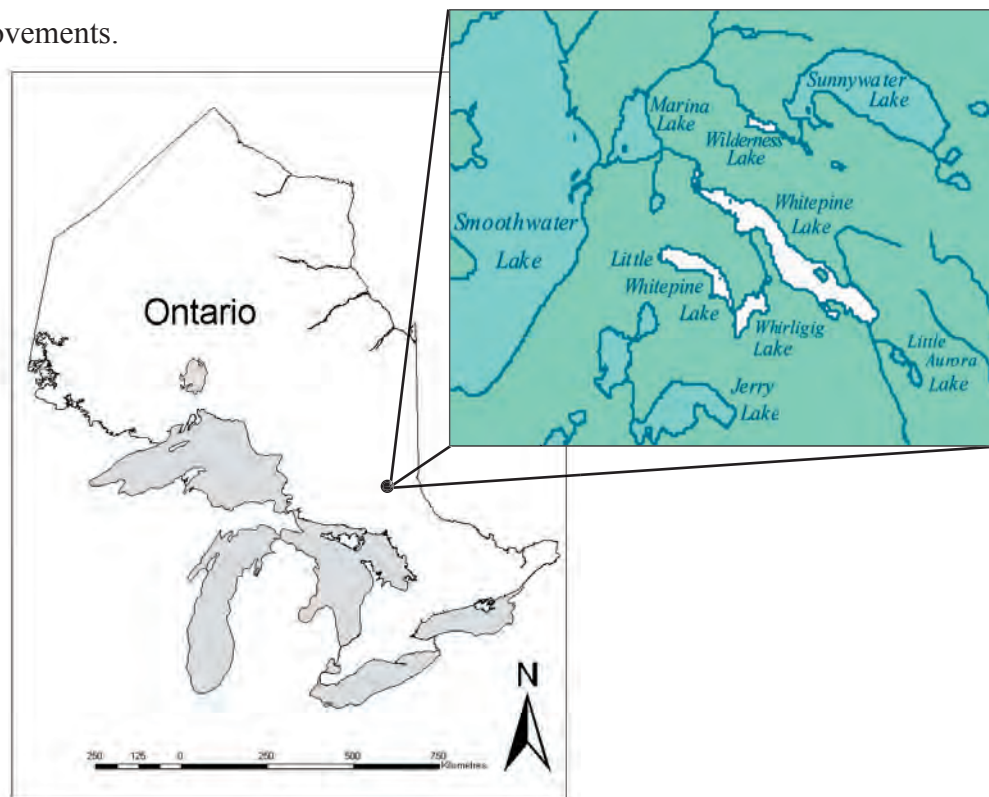
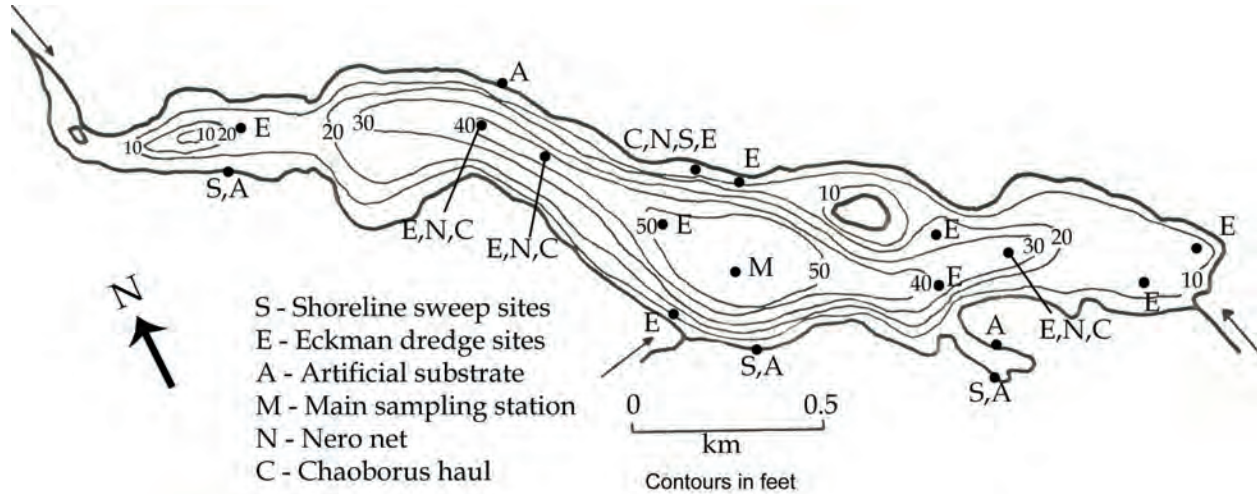


Fig. 1: Map of the Aurora Trout Lakes study region

Biophysical Description of the Study Area

Aurora Whitepine, Little Whitepine, Whirligig and Wilderness lakes are located approximately 106 km NNE of Sudbury in Gamble Township within Lady Evelyn-Smoothwater Provincial Park in the Temagami Provincial Forest (Fig. 1). The study lakes (Figs. 2 to 5) are part of an interconnected watershed that eventually drains into Smoothwater Lake. Little Whitepine Lake is upstream of Whirligig Lake, which drains into Aurora Whitepine Lake and finally to Smoothwater Lake via Marina Lake. Wilderness Lake receives inflow from Sunnywater Lake, and then drains into Marina Lake. At the boundary between the Great Lakes - St. Lawrence and the Boreal forests, the park has a wide range of vegetation types, primarily old growth white and red pine, and mature spruce (Queen's Printer for Ontario 2006). The region exhibits the rough topography of the Precambrian Shield, with terrain composed mainly of gneiss bedrock covered in a thin veneer of soil.

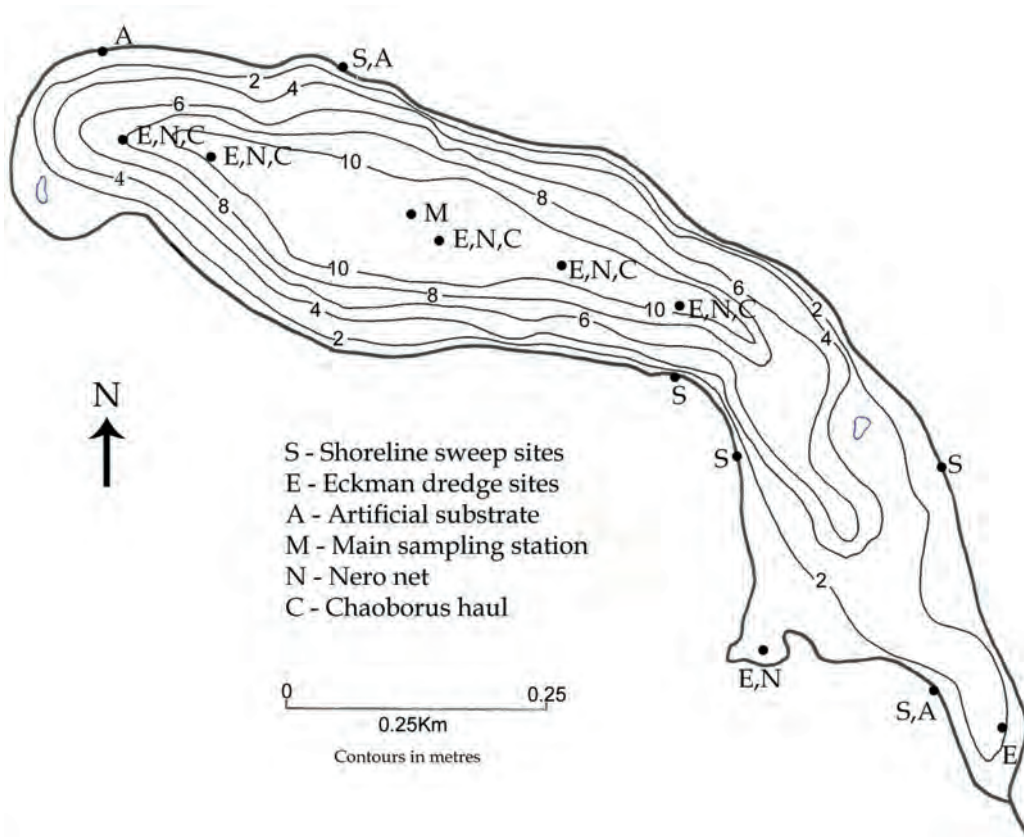
Aurora Whitepine Lake



Township	Gamble	Shoreline length (km)	8.66
Latitude	47°23'00"	Maximum depth (m)	21.3
Longitude	80°38'00"	Mean depth (m)	7.0
Elevation (m)	396	Volume (x 10⁴m³)	5.92
Watershed code	2JD04	Area (ha)	81.55

Figure 2: Aurora Whitepine Lake bathymetric map and physical data.

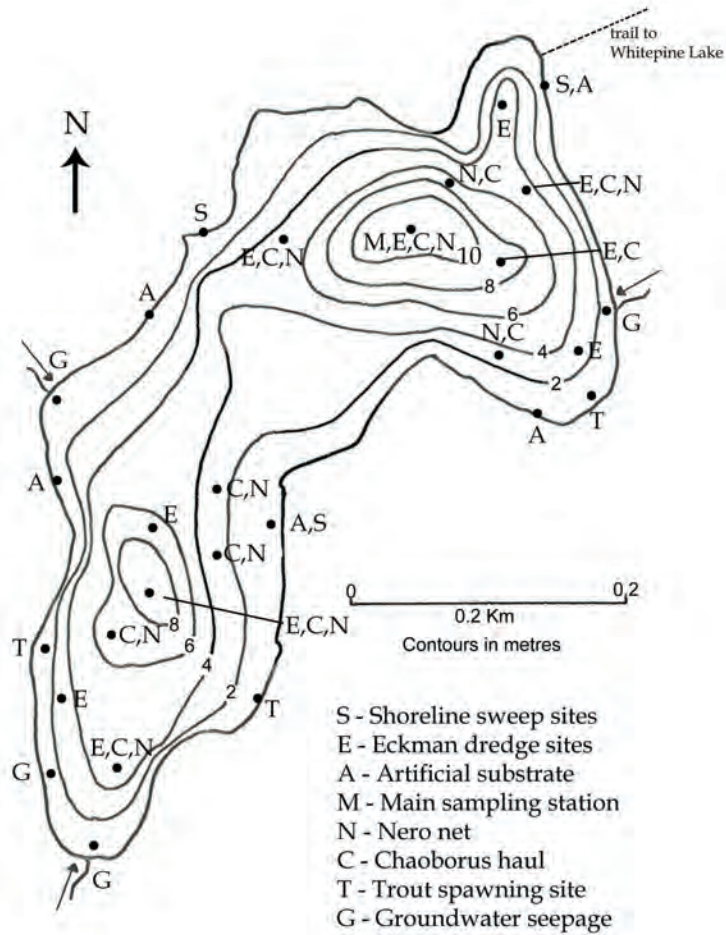
Little Whitepine Lake



Township	Gamble	Shoreline length (km)	2.93
Latitude	47°23'00"	Maximum depth (m)	12.0
Longitude	80°39'00"	Mean depth (m)	-
Elevation (m)	396	Volume (x 10⁴m³)	-
Watershed code	2JD07	Area (ha)	18.43

Figure 3: Little Whitepine Lake bathymetric map and physical data.

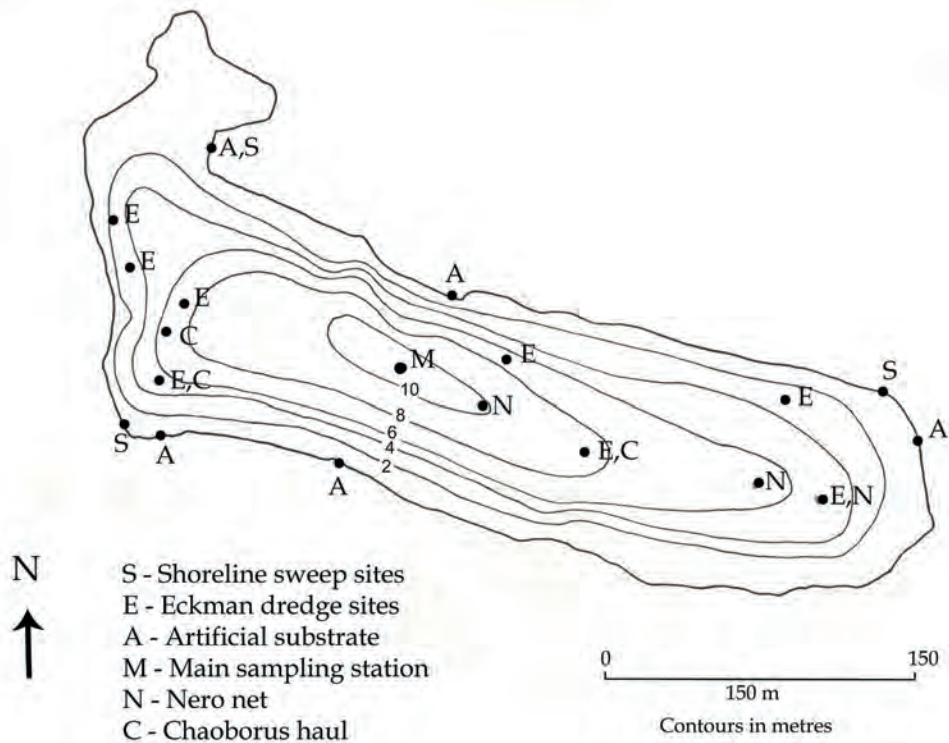
Whirligig Lake



Township	Gamble	Shoreline length (km)	1.97
Latitude	47°22'32"	Maximum depth (m)	11.0
Longitude	80°38'18"	Mean depth (m)	-
Elevation (m)	396	Volume (x 10⁴m³)	-
Watershed code	2JD07	Area (ha)	12.11

Figure 4: Whirligig Lake bathymetric map and physical data.

Wilderness Lake



Township	Gamble	Shoreline length (km)	1.20
Latitude	47°23'49"	Maximum depth (m)	9.1
Longitude	80°38'08"	Mean depth (m)	-
Elevation (m)	396	Volume (x 10⁴m³)	-
Watershed code	2JD07	Area (ha)	4.15

Figure 5: Wilderness Lake bathymetric map and physical data.

Sampling Methods and Schedule

The focus of sampling the Aurora Trout Lakes in the past two decades has been to quantify long-term limnological recovery from acidification and to assess the habitat quality for aurora trout. Data collected include thermal and oxygen profiles, transparency, water chemistry, phytoplankton and zooplankton from every sampling trip. Additionally, the benthic invertebrate community was assessed in some years. Detailed descriptions of sampling methods for early data are given in previous publications (1970's methods outlined in Conroy et al. 1974, Conroy et al. 1976, and Conroy et al. 1978; 1980's methods outlined in Pitblado and Keller 1984).

Dissolved Oxygen/Temperature Profiles

A temperature and dissolved oxygen profile was taken from the surface to 1 metre above lake bottom using YSI Model 52 or 54 dissolved oxygen / temperature meters. Temperature readings on the meters were periodically checked against a mercury thermometer. The profiles were used in the field to determine the location of lake thermal strata. The metalimnion was determined as the zone through which the rate of change of temperature was greater than 0.5 degrees Celsius per metre. This information was necessary for water sampling. Table 2a shows the historical sampling schedule for thermal profiles.

Water Sampling

A composite water sample was obtained for each of the three lakes on a monthly basis during the ice-free season by lowering a metered tygon tube to the required depth and collecting water. All chemistry samples were taken from surface to the bottom of the metalimnion except chlorophyll and nutrients, which were taken through the euphotic zone (defined as twice the Secchi depth). Chemistry was analysed following standard procedures at the MOE lab in either Rexdale, Sudbury or the Dorset Environmental Science Centre. Water chemistry samples were analyzed for nutrients

(NO₂₊₃, Total Kjeldahl-N (TKN), NH₃₊₄, total phosphorus (TP)), chlorophyll, colour, dissolved inorganic (DIC) and organic (DOC) carbon, silica (SiO₃), major ions (Ca, Mg, Na, K, Cl, SO₄), pH, total inflection point alkalinity, metals (Al, Cu, Fe, Mn, Ni, Pb, Zn) and conductivity. Table 2a shows the historical sampling schedule for chemistry by lake.

Phytoplankton

Phytoplankton were sampled monthly during the ice-free season. A single tube composite sample was taken from the deep spot on each lake. Samples were taken through the euphotic zone (defined as twice the Secchi depth). Samples were immediately preserved to a light tea colour with ~ 1 mL of Lugol's iodine and shipped to the MOE lab in Rexdale. All monthly samples were concentrated by gravity into 25 mL vials. Samples were then sub-sampled and pooled to obtain one composite sample per lake per year which was counted to obtain an ice-free season average biomass. Approximately 300 algal units were enumerated per sample, and categorized by geometric shape (e.g. sphere, cone, rectangle, etc.). Counting was done using an inverted microscope at 600 X (Utermöhl method). Hopkins and Standke (1992) describe the method and formula for determining volume in detail. Table 2a shows the historical sampling schedule for phytoplankton.

Zooplankton

Zooplankton samples were collected monthly during the ice-free season at the deep spot on each lake using a 12.5 cm diameter metered tow net with 80 µm mesh from 1m off bottom to surface. Two hauls were taken per lake: with and without the net. Net efficiency was determined by comparing the meter readings from with-net and without-net hauls. Zooplankton samples were preserved in a solution of 14% sugared buffered formalin (i.e. 33% formalin diluted with the field sample). In the lab, the sample was fractioned and a total of approximately 250 organisms was identified to the species level and measured using calipers in the Zebra program (Allen et al. 1993). Data obtained from the program include individual length measurements, abundance, mean length,

mean weight, and biomass of each taxon observed in the count. Table 2b shows the historical zooplankton sampling schedule for each lake.

Eckman Dredges

Eckman dredge samples were collected from the Aurora Trout Lakes from 1987 to 1992. Also, a single sample was collected from Aurora Whitepine Lake in 1982. Wilderness Lake was only sampled in 1987, and Little Whitepine was also sampled in 2002 and 2003. A 15 cm X 15 cm X 25 cm dredge was used to collect 5 replicates from each of 2 depth zones on Little Whitepine and Whirligig lakes, and 3 depth zones on Aurora Whitepine Lake (Figs. 2 to 5). An estimate of the percentage dredge filled was recorded for each haul, and the sample was emptied into a #30 mesh wash bucket for rinsing. Sediment descriptions were made according to Roelof's Soil Evaluation System and samples were swirled over the edge of the boat for filtering. All samples were sorted and preserved with 70% ethanol. Table 4 shows the sampling zones and schedule for Eckman dredge samples. Table 2b shows the historical sampling schedule for Eckman dredges.

Shoreline Sweeps

Because dredges could not be collected in rocky/woody littoral zones, an attempt to characterize the littoral invertebrate community was made with triangular, 229 cm³ sweep nets. Sweeps were made by standing on the water's edge, extending the net at full arm's length and net handle length (~2m), placing the net on the bottom and dragging it towards shore. Three general sampling locations were chosen per lake and usually consisted of a rock outcrop (Figs. 2 to 5). Substrate type, size, and any unusual characteristics such as algae cover were recorded. Five replicate sample sites were sampled approximately 1m apart at each sampling location, and duplicate sweeps were made at each site and pooled. Samples were live-picked in their entirety in the field and preserved in 70% ethanol. Table 2b shows the historical sampling schedule for shoreline sweeps.

Table 4: Sampling history for Aurora Trout Lakes Eckman dredges

Year	Month	Lake	Zones	# of Replicates
1982	July	Aurora Whitepine	deep spot	1
1987	July	Little Whitepine	1-5m	3
			6-12m	5
	July	Whirligig	1-5m	3
			6-12m	5
	July	Wilderness	1-5m	3
			6-12m	5
1988	August	Aurora Whitepine	3-9m	5
			9-15m	5
			16-19m	5
	July	Little Whitepine	1-5m	3
			6-12m	5
	July	Whirligig	1-5m	3
			6-12m	5
	August	Aurora Whitepine	3-9m	5
			9-15m	5
			16-19m	5
1990 - 1994	July	Little Whitepine	1-5m	3
			6-12m	3
		Whirligig	1-5m	3
			6-12m	3
	August	Aurora Whitepine	3-9m	3
			9-15m	3
			16-19m	3
2002 - 2003	August	Little Whitepine	1-5m	3
			6-12m	3

Artificial Substrate Cages

Five artificial substrate cages were set per lake. The cages were made of heavy gauge wire and were 22 cm x 22 cm x 15 cm in size. Cages were filled with shoreline cobble and submerged along the shoreline in less than 1 m of water at different locations (Figs. 2 to 5). They were set in early August and retrieved in late October. Cages were retrieved using a stick with a hook on the end. A

net was slid underneath the cage to catch invertebrates as it was lifted through the water column and into the boat. Cages were placed in plastic dish pans and rinsed with lake water. Individual rocks were rinsed, inspected, and discarded. All organisms found were picked and preserved. Table 2b shows the historical sampling schedule for substrate cages deployed in the Aurora Trout Lakes.

Chaoborus Hauls

Duplicate *Chaoborus* hauls were made during daylight at five stations per lake. Sample depth was recorded and duplicate hauls were pooled. Attempts were made to match *Chaoborus* sampling stations with Eckman dredge stations. Two stations were chosen from the shallow zone and three stations from the deep zone. Duplicate vertical hauls, 1 m off the bottom to the surface were made with a 153 micron mesh, 29.5 cm mouth diameter net. Table 2b shows the yearly *Chaoborus* sampling schedule for the Aurora Trout Lakes.

Nero Net

Vertical hauls were made during daylight with a 1m² Nero net from 1 m off bottom to the surface. Three reps were collected at each of five stations per lake, coinciding with *Chaoborus* sampling stations. Replicates were preserved in separate containers with 70% ethanol. Only large invertebrates (e.g. Notonectidae, Corixidae, Coleoptera) were live picked from the net. Table 2b shows the Nero net sampling schedule for the Aurora Trout Lakes.

Fish - Bioassay

During the period of May 11-15, 1984, in situ bioassays were conducted using aurora trout fry (Lot- AXWH83ANR) in Whirligig (pH 4.69), and Aurora Whitepine lakes (pH 4.78). The control lake was Regan Lake (pH 6.53) located in Ellis Township – Sudbury District.

At the North Bay Hatchery 150 fry (mean length = 29 mm, mean weight = 0.196 gm) were placed

in each of 4 holding pens. An individual holding pen consisted of 5 screened plastic containers, each with 30 fry. The holding pens were transported in separate coolers with hatchery water. At the first stop, Regan Lake, all hatchery water was exchanged for lake water in order to reduce the shock of transfer to both the low pH and low ionic strength waters of the Aurora Trout Lakes.

At the lake sites the pens were suspended 2 meters below a surface float and anchored in depths ranging from 4 to 6 meters. The elapsed time from leaving the hatchery to the last installation at Whirligig Lake was 3 hours (10:30 – 13:30hrs). In addition to a holding pen installation at Whirligig Lake, 2400 fry were also released. On May 15th the pens were removed and counts made to establish fry mortality figures. All remaining live fry were released into Whirligig Lake. Water temperature was recorded and water samples were taken at each lake.

Fish - Monitoring

After liming, aurora trout growth, diet, spawning site characteristics and reproductive success were monitored in Whirligig and Aurora Whitepine lakes each year during the fall spawning season from 1992-1995, and 2003-2004. Population size and biomass were estimated (for fish > age 1 yr in Whirligig Lake and size >320 mm in Aurora Whitepine Lake) using the Schnabel mark-recapture method (Ricker 1975). To obtain estimates, fish were live-captured daily during the last two weeks of October using trap nets, fyke nets, and short-duration gillnet sets. In 2003 and 2004 angling was also used. Fish were anaesthetized and measured for fork length, total length, and weight. Fin clips were used to age the fish. From 1992-1995, stomach contents were processed to determine diet. To identify subsequent recaptures, each fish was marked with a hole punch in the caudal fin. In 2003 and 2004, the tissue sample provided by the hole punch from the first 100 fish in each lake was preserved for genetic analysis by the MNR genetics laboratory (Dr. Chris Wilson, Peterborough).

During the fall of 1994 and 1995 both Aurora Whitepine and Whirligig lakes were assessed for

spawning activity. Daily shoreline cruises to locate spawning sites were conducted by boat during the final two weeks in October. To obtain data on growth and diet, aurora trout were live-captured using trap nets, fyke nets, and short-duration gillnets.

Data Gaps

All water sampling, phytoplankton and zooplankton data are current as of 2006. Samples of water, phytoplankton and zooplankton from 2007 have been collected but the data are not yet available. All macroinvertebrate samples from 2003 remain unprocessed. *Chaoborus* samples from Little Whitepine and Whirligig lakes in 2002 have also been collected but not processed.

Results

Temporal trends for Wilderness Lake are not described, as it was only sampled in 1987 and 1988. Whole-lake limestone additions to Whirligig Lake in 1989, 1993, and 1995, and its headwater Little Whitepine in 1989, were successful in raising lake pH and alkalinity, but after each liming Whirligig re-acidified (Fig.'s 7 and 8). The pH and alkalinity of Aurora Whitepine Lake slowly increased following declines in sulphate deposition. Since the last liming of Whirligig Lake in 1995, pH has remained above 5.0 in all three of the study lakes. The current pH in Whirligig Lake of ~5.2 is similar to historical background levels as estimated from diatom remains in sediment cores (Dixit et al. 1996). Consistent with general patterns observed in northeastern Ontario lakes (Keller et al. 2001b), sulphate concentrations in the three study lakes have declined over the years (Fig.'s 6, 7, and 8). This is in response to the sulphur emission controls at the Sudbury smelters and at other long-range emission sources. Concentrations of calcium and magnesium have been steadily declining in all three of the study lakes (Fig.'s 6, 7, and 8), possibly due to depletion of base cations in the catchment from acid deposition (Keller et al. 2001a). Concentrations of DOC have steadily increased in all three study lakes since the early 1990's (Fig.'s 6, 7, and 8). Aluminum concentra-

tions in Aurora Whitepine Lake have declined since the early 1990's with improvements in pH (Fig. 6). No consistent changes in surface or bottom temperature were apparent over the course of the study period (Fig. 9).

Phytoplankton community richness increased over the study period in all three study lakes in comparison to pre-liming communities (Fig. 10). In Aurora Whitepine and Whirligig lakes there were no major changes in abundance (Fig. 11), as has been previously observed in limed lakes (Dillon et al. 1977). This may be due to the presence of acid-tolerant taxa in the late 1980's and early 1990's (e.g. *Cryptomonas*) and the subsequent shift to more acid-sensitive taxa (e.g. Bacillariophyceae) post-liming (Scheider et al. 1976). Little Whitepine showed increased phytoplankton abundance in recent years (Fig. 11).

Known acid-sensitive crustacean zooplankton species that are expected in near-neutral Boreal Shield lakes (e.g. *Daphnia mendotae*, *Epischura lacustris*, *Tropocyclops extensus*, *Daphnia retrocurva*) are either rare or absent in the three study lakes, reflecting the generally low pH. However, *D. mendotae* and *T. extensus* began to appear, although rarely, in Aurora Whitepine, Little Whitepine and Whirligig lakes in the late 1990's, although large, relatively acid-tolerant species (*Holopedium gibberum*) remained abundant throughout the study period (Appendix II, Tables II-2 to II-4).

Benthic invertebrates in the rocky nearshore areas showed some community changes over time. On average, Odonata declined in abundance, perhaps due to fish predation after fish reintroduction (Appendix III, Table III-2 to III-4). Littoral Ephemeroptera increased after liming (Appendix III, Table III-2 to III-4) due to both increases in the abundance of an existing acid-tolerant species (*Leptophlebia* sp.) and successful colonization by a more acid-sensitive species (*Stenacron interpunctatum*). *Stenacron* was still abundant in Whirligig in 2002, although the pH (5.2) is now at the lower threshold for this species (Carbone et al. 1998). *Chaoborus*, a preferred prey item for fish and a major component of the aurora trout diet during their first two years, were quickly depleted

after fish reintroduction (Appendix III, Table III-1).

The low mean fish survival in the Aurora Trout Lakes in early experiments (1984) may be attributed to the low pH values (4.48-4.78), low alkalinities (-1.3 to -0.61 mg/L CaCO₃, and high aluminum (185 to 250 µg/L) levels associated with the Aurora Trout Lakes at that time (Table 5). High mortality had been previously reported (J. Gunn unpublished data) from over winter incubation experiments in 1983 with aurora trout eggs in Aurora Whitepine Lake. Similar results were obtained in Bowland Lake (Howey Township) which was a low pH lake (pH 5.05) with elevated aluminum levels (140 µg/L). At the same time, good survival was recorded in Whitepine Lake (McLeod Township) with pH 5.6, alkalinity 0.00, and relatively low aluminum at 45 µg/L.

The behavioural and physical differences between the fry held in the Aurora Trout Lakes versus those held in Regan Lake were quite apparent; those in Regan Lake were active swimmers with good external colour and bright red gill membranes while the remaining survivors in the Aurora Trout Lakes were lethargic, showed less distinct external colouration and revealed faint pink colouration of the gill membranes. The results from this study indicated that in the mid-80s the Aurora Trout Lakes were not yet suitable for the re-introduction of aurora trout.

Subsequently, improved water quality did allow for the successful re-introduction of aurora trout. Population size structure of the aurora trout based on surveys conducted in Aurora Whitepine and Whirligig lakes in October 2003 suggested that there were no missing size classes in either of the lakes (Malette et al. 2004). Relative to the population data collected in the mid-1990's, the Whirligig Lake population had similar size distribution, abundance and biomass (Appendix IV). These data suggest that transient pH depressions in 2001 and 2002 did not measurably damage the aurora trout populations in these lakes (Malette et al. 2004).

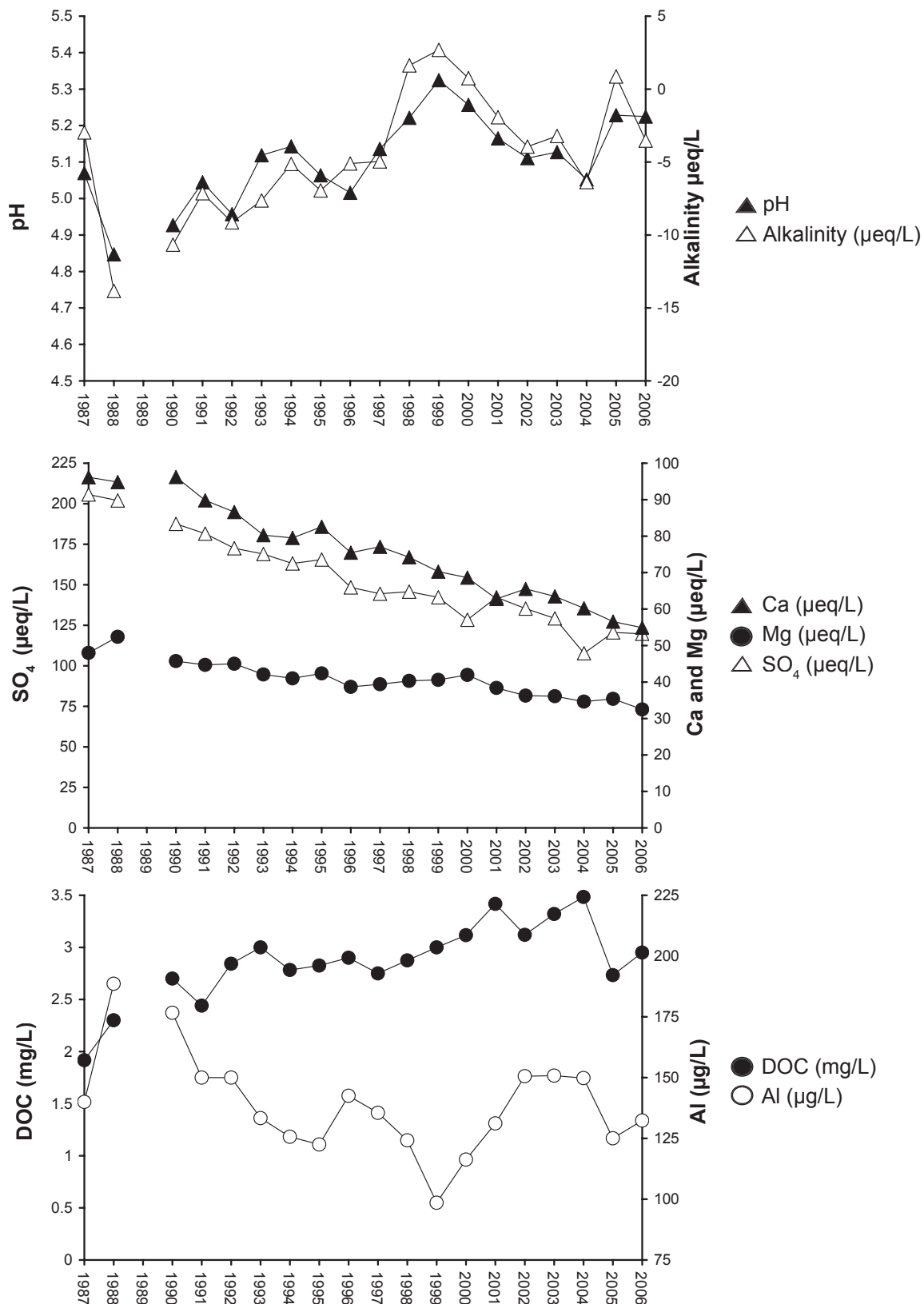


Fig. 6. Aurora Whitepine Lake acid-related parameters (pH, SO_4 , Alkalinity, Ca, Mg, DOC and Al), 1987-2006

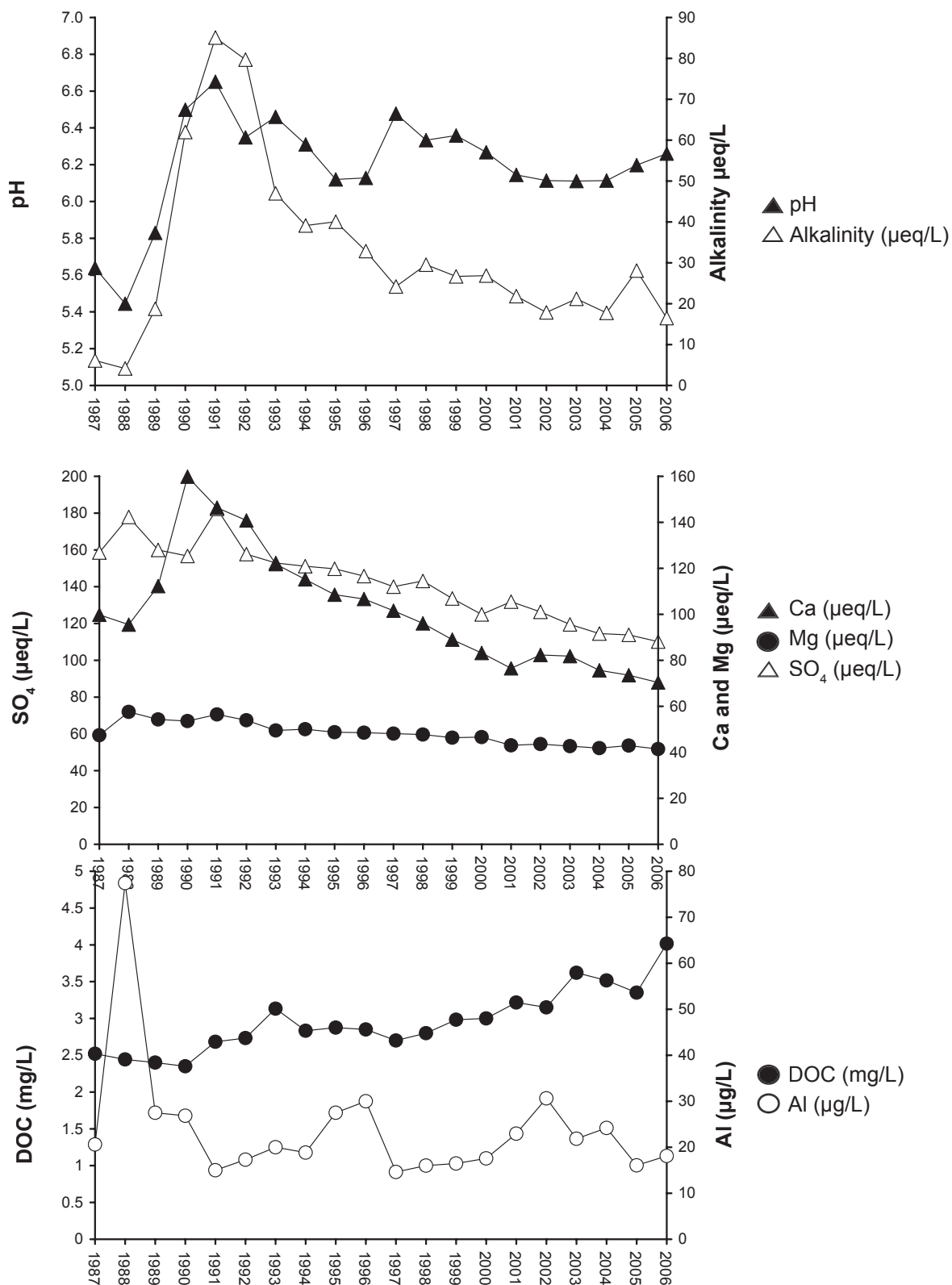


Fig. 7. Little Whitepine Lake acid-related parameters (pH, SO_4 , Alkalinity, Ca, Mg, DOC and Al), 1987-2006

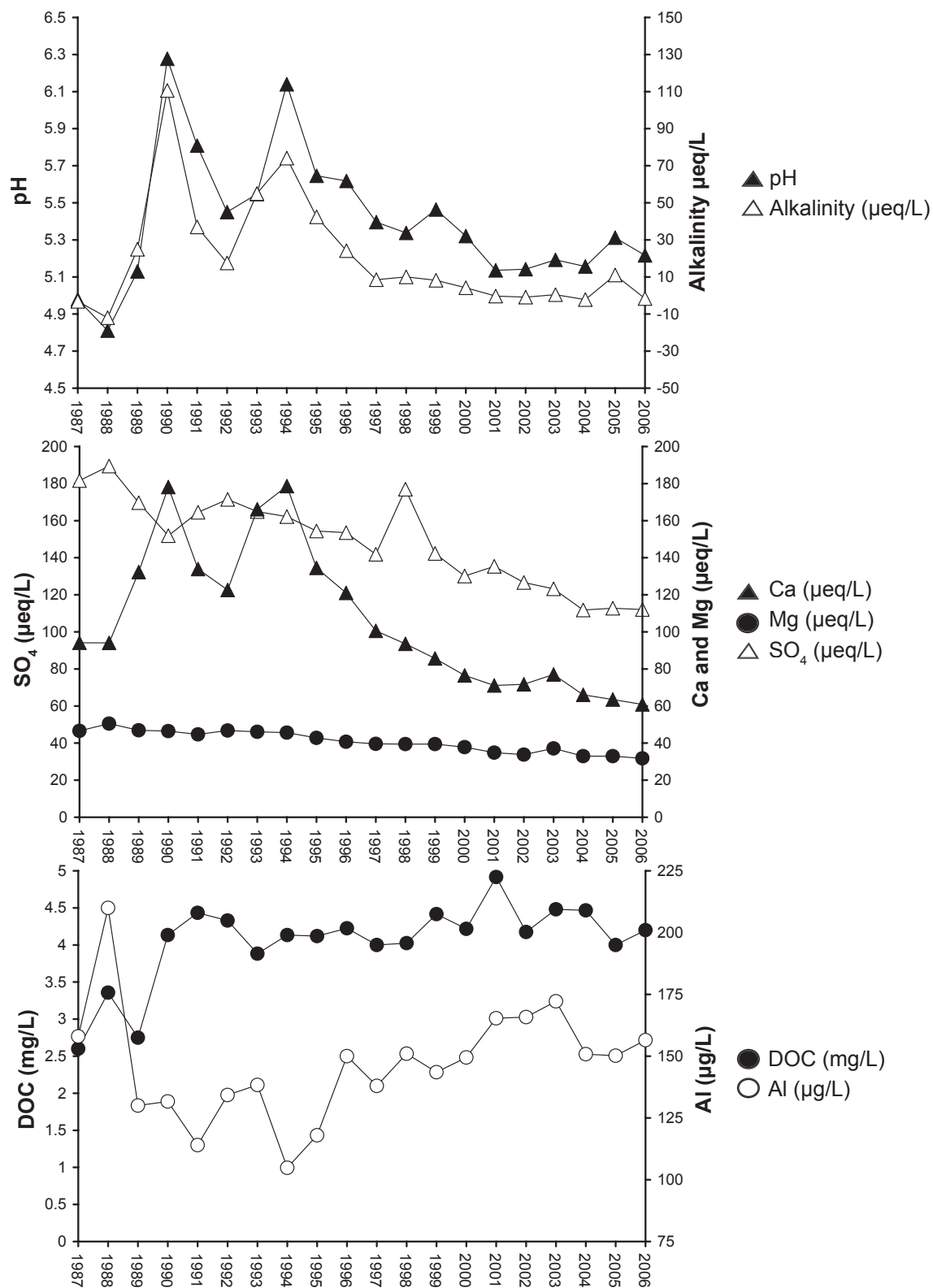


Fig. 8. Whirligig Lake acid-related parameters (pH, SO_4 , Alkalinity, Ca, Mg, DOC and Al), 1987-2006

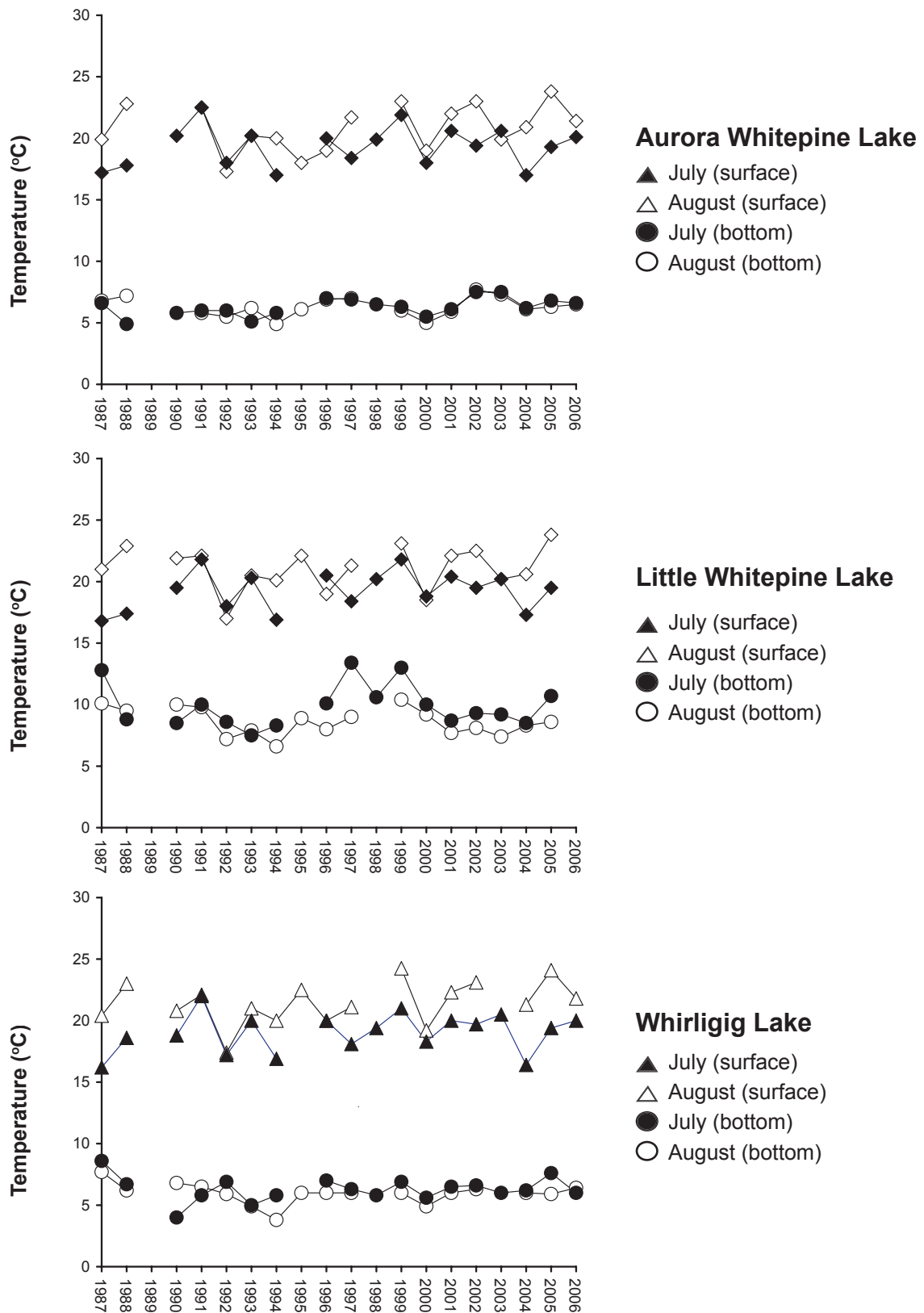


Fig. 9. Aurora Trout Lakes mid-summer temperatures, 1m off bottom and 1m from surface for July and August, 1987 - 2006.

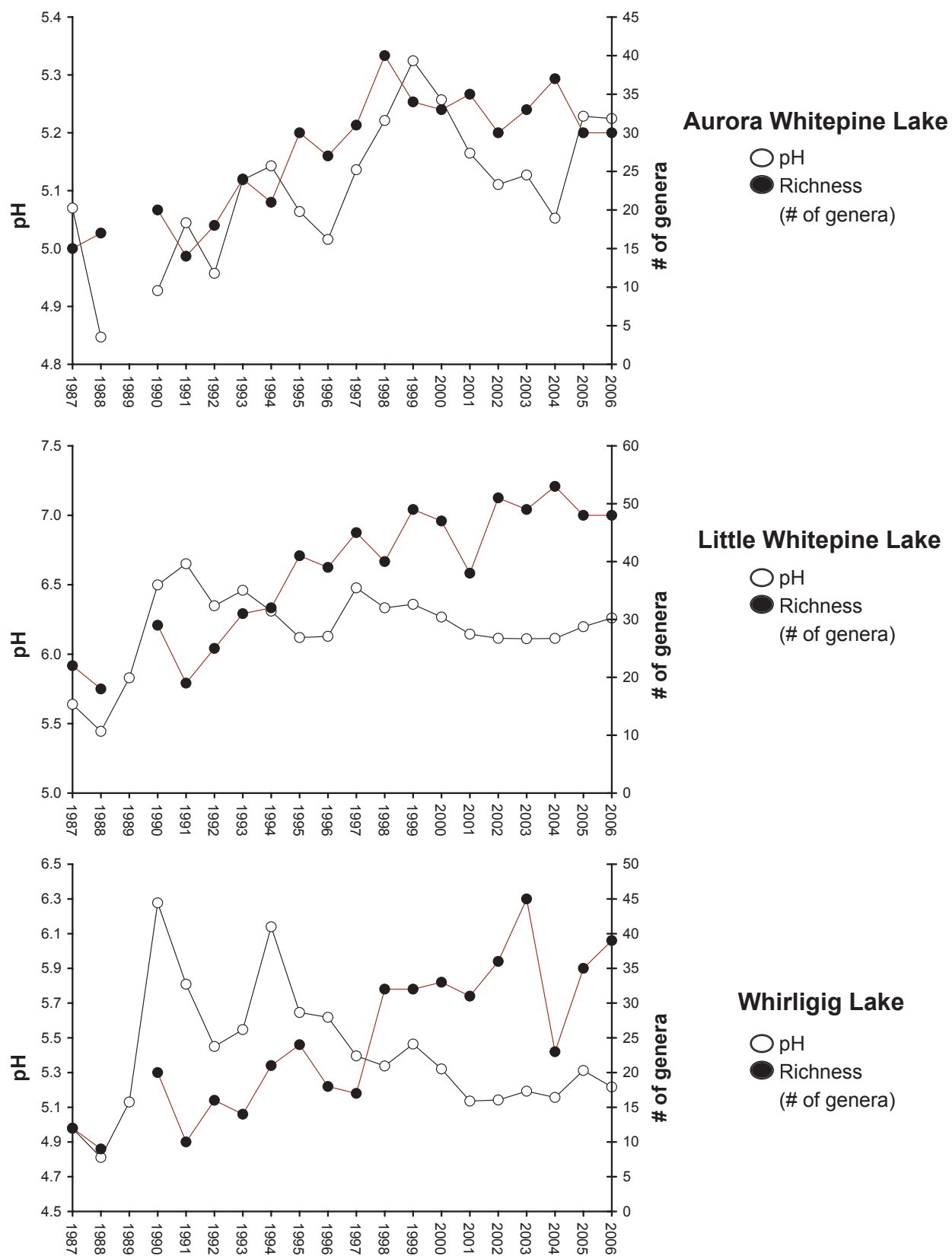


Fig. 10. Aurora Trout Lakes phytoplankton community richness and pH, 1987-2006

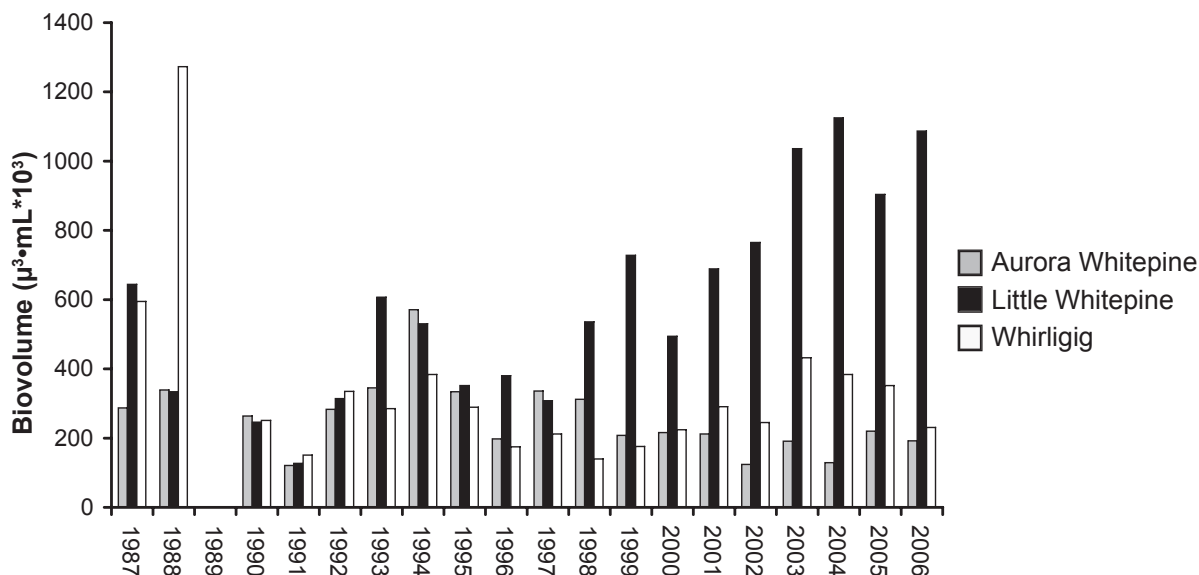


Fig. 11. Aurora Trout Lakes phytoplankton biovolume, 1987-2006.

Table 5. Percent mortality and related water chemistry during holding experiments with aurora trout in Whirligig, Aurora Whitepine, and Regan lakes. May 11-15, 1984.

Lake	% survival (95%C.I.)	pH	Alkalinity (mg/L)	Total Al (μg/L)	Temperature (°C)	Dissolved Oxygen (mg/L)
Whirligig	24.1 (11.5)	4.691	-0.77	[1] 210	[2] 9.8	10.8
Aurora Whitepine	32.5 (708)	4.776	-0.61	[3] 185	7.0	11.0
Regan	[4] 98.0 (3.7)	6.530	3.30	[3] 24	7.0	11.8

[1] Data from spring of 1984

[2] Daily mean at 1200hours from Ryan recording thermographs

[3] Data from Comparative Lakes Study reports – 1983

[4] Caught in screen

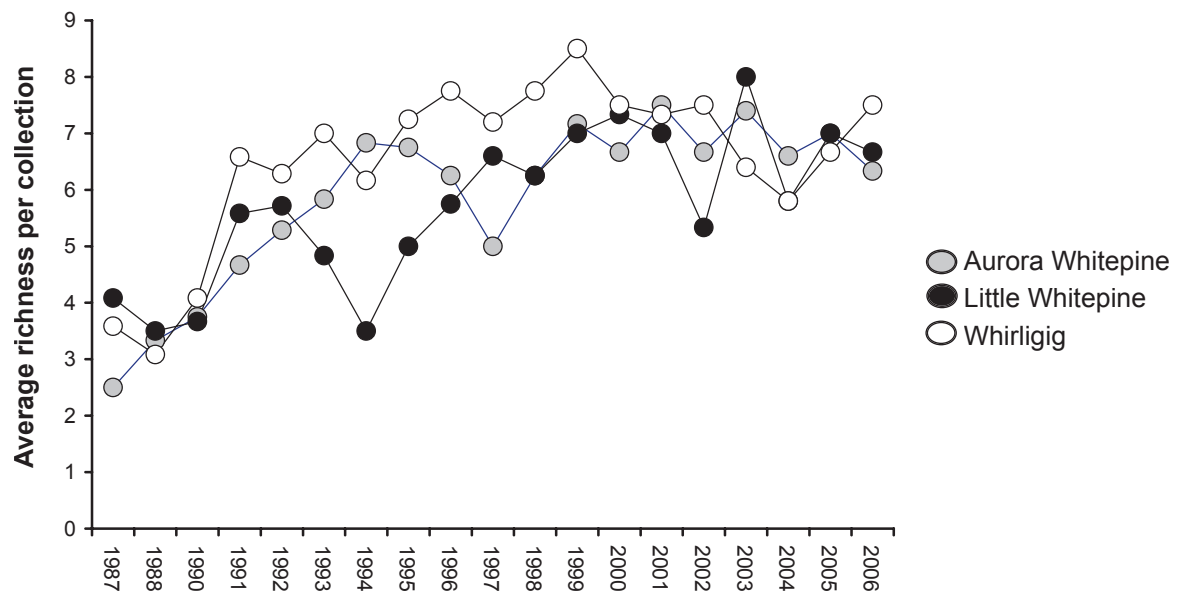


Figure 12: Aurora Trout Lakes zooplankton species richness, 1987-2006



Aurora Whitepine Lake Dock (*Cooperative Freshwater Ecology Unit*)

Conclusions

The pH of Aurora Whitepine Lake has shown a small long-term increase. Little Whitepine Lake pH has been gradually declining over the last two decades since it was limed, but is still above pH 6. Whirligig Lake has sustained a pH in the low 5's, just above the threshold for aurora trout survival. However, the continued survival of the aurora trout in the native lakes depends on maintenance of pH levels above 5.0, which may require further human intervention. Also, it is unknown if current levels of atmospheric deposition are low enough to permit sensitive lakes to continue to recover naturally. Reacidification after liming, as occurred in Whirligig Lake and has been observed in other lake liming studies (e.g. Driscoll et al. 1989), indicates that liming is a temporary measure and that control at the source is the only long-term solution to anthropogenic acidification. In addition to continued monitoring of the chemistry and biology of the native aurora trout lakes, monitoring of regional reference lakes as part of the SES is necessary in determining regional patterns in recovery from acidification, and maintaining suitable habitat quality for biota.

Acknowledgements

The complete list of people who contributed to this study over the last thirty years is much too long to provide here. In particular, we would like to thank Peggy Gale, Jim Carbone and Rod Sein for their contributions to the field studies, and Andrea Ford for data management. A special thanks to Marg Watson and all the staff at Sudbury Aviation for always getting us safely there and back.

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Liming of Whirligig Lake by helicopter (left) (*B. Keller*) and by boat (right) (*E. Snucins*)

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Appendix I

Results of phytoplankton identification and enumeration for the Aurora Trout Lakes, 1987-2006, presented as phytoplankton biovolume ($\mu^3 \cdot \text{mL}^{-1} \times 10^3$). p= present but in small quantities ($< 0.5 \mu^3 \cdot \text{mL}^{-1} \times 10^3$). In some cases nomenclature has changed but in the interest of continuity, old taxonomic names are being used.

Table I-1: Phytoplankton biovolume data for Aurora Whitepine Lake 1987-2006 ($\mu^3 \cdot \text{mL}^{-1} \times 10^3$).

Aurora Whitepine	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BACILLARIOPHYCEAE																				
<i>Actinella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-
<i>Asterionella</i>	-	5	-	p	-	p	p	1	1	1	p	p	p	p	-	2	3	1	p	-
<i>Cyclotella</i>	-	-	-	-	p	-	-	-	-	-	-	p	-	-	p	-	-	p	-	-
<i>Cymatopleura</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Eunotia</i>	-	-	-	-	-	p	-	-	p	-	2	p	p	2	1	p	-	p	-	p
<i>Frustulia</i>	-	-	-	-	-	-	-	-	-	-	-	-	p	-	p	p	-	p	p	-
<i>Melosira</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	-	-	1	-
<i>Meridion</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
<i>Navicula</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	p	-	-
<i>Nitzschia</i>	-	-	-	-	-	-	-	-	-	-	-	1	-	-	p	-	-	-	-	-
<i>Pinnularia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-
<i>Surirella</i>	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-
<i>Synedra</i>	-	-	-	-	1	-	p	-	-	-	-	p	-	2	-	-	-	p	p	p
<i>Tabellaria</i>	-	-	-	-	-	2	p	-	p	-	-	p	1	2	2	2	p	p	-	1
CHLOROPHYCEAE																				
<i>Bambusina</i>	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-	-
<i>Botryococcus</i>	4	-	-	p	-	1	2	-	3	3	2	2	7	6	6	11	4	11	-	1
<i>Chlamydomonas</i>	5	16	-	6	3	2	1	10	1	4	3	4	1	2	1	p	p	1	2	p
<i>Coccomyxa</i>	-	-	-	-	-	-	-	-	-	-	p	p	p	-	-	-	-	-	p	-
<i>Coelastrum</i>	-	-	-	p	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
<i>Dictyosphaerium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	p	-	-
<i>Gemmelicystis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-
<i>Gloeocystis</i>	-	1	-	-	-	-	-	-	-	p	10	2	2	-	-	1	1	-	-	-
<i>Gloeotila</i>	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-	-
<i>Golenkinia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-
Chlorophyceae, unid.	-	-	-	5	-	1	1	-	3	2	-	1	p	2	p	-	p	-	-	1
<i>Kirchneriella</i>	-	p	-	p	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p
<i>Koliella</i>	-	-	-	p	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Monomastix</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	p
<i>Monoraphidium</i>	-	-	-	-	-	p	p	p	p	p	p	p	p	-	p	p	-	-	-	-
<i>Mougeotia</i>	-	-	-	-	-	-	-	-	p	2	-	-	-	-	-	-	p	-	-	-
<i>Nephrochlamys</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-
<i>Oocystis</i>	p	p	-	2	p	1	1	1	2	6	2	4	1	2	3	2	4	2	1	2
<i>Paramastix</i>	-	-	-	-	-	-	-	-	-	-	p	p	-	-	-	-	-	-	-	-
<i>Pediastrum</i>	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	1	-	-	-	-
<i>Pedinomonas</i>	-	-	-	-	-	-	p	p	-	-	-	-	-	-	-	-	p	p	p	1
<i>Pleurotaenium</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
<i>Polytoma</i>	-	-	-	-	-	-	-	-	-	-	-	p	-	-	p	-	-	p	-	-
<i>Quadrigula</i>	p	-	-	p	-	-	-	p	p	p	-	p	-	-	-	-	-	p	-	-
<i>Scenedesmus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Scourfieldia</i>	-	-	-	-	-	-	1	p	p	p	-	-	p	-	-	-	-	-	-	p
<i>Sphaerocystis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	4
<i>Staurastrum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-
<i>Xanthidium</i>	-	6	-	-	-	1	p	-	4	p	1	p	2	3	4	2	1	1	-	-
CHRYSOPHYCEAE																				
<i>Bicosoeca</i>	-	-	-	-	-	-	p	-	-	-	-	-	-	-	p	-	-	-	-	-
<i>Bitrichia</i>	p	-	-	p	-	1	p	1	1	p	2	2	1	1	1	p	p	p	p	p
<i>Chromulina</i>	-	-	-	12	p	7	10	13	9	10	3	2	14	9	11	6	9	9	7	14
<i>Chrysidiastrium</i>	-	-	-	-	-	-	-	3	p	-	3	-	6	-	1	-	2	2	p	-
<i>Chrysochromulina</i>	p	p	-	p	-	-	72	357	63	13	65	93	4	-	29	p	11	10	6	12

Table I-1 continued

Aurora Whitepine	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CHRYSTOPHYCEAE CONT'D																				
<i>Chrysolykos</i>	-	-	-	-	-	-	-	-	-	-	-	-	p	p	-	-	p	-	-	-
Chrysophyte, unid.	15	4	-	27	p	13	17	24	13	11	7	8	27	22	5	12	25	11	6	10
<i>Chrysosphaerella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Chrysidiastrium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Codonocladium</i>	-	-	-	1	-	1	-	-	p	-	1	1	-	p	-	-	p	-	-	-
<i>Desmarella</i>	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-	p	p	-	-
<i>Dinobryon</i>	46	17	-	12	4	43	16	34	20	5	15	11	4	13	7	9	4	2	3	12
<i>Epipyxis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
<i>Kephyrion</i>	-	-	-	1	1	p	p	p	p	p	1	p	p	p	p	p	2	p	p	p
<i>Mallomonas</i>	1	p	-	1	1	2	6	-	3	4	2	3	4	7	4	2	10	11	3	19
<i>Ochromonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	p
<i>Pseudokephyrion</i>	p	-	-	1	-	-	1	p	1	p	p	p	p	p	p	-	p	-	p	p
<i>Rhizochrysis</i>	-	-	-	-	-	-	-	-	1	-	2	1	-	1	4	p	3	1	p	1
<i>Spiniferomonas</i>	-	-	-	-	-	-	-	-	p	-	-	-	-	1	-	-	p	1	p	p
<i>Synura</i>	p	1	-	1	-	6	1	-	-	-	10	13	11	6	8	1	17	-	3	3
<i>Uroglena</i>	-	-	-	-	-	-	-	-	-	-	-	p	4	5	1	-	1	1	2	3
CRYPTOPHYCEAE																				
<i>Cryptaulax</i>	-	-	-	-	-	-	-	-	p	-	1	p	p	-	p	p	-	p	-	1
<i>Cryptomonas</i>	100	127	-	73	40	42	61	72	107	81	90	47	29	42	36	10	25	26	43	41
<i>Cyathomonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-
<i>Katablepharis</i>	p	p	-	-	-	-	-	p	-	-	-	1	-	p	p	1	-	-	-	-
<i>Pleuromastix</i>	-	-	-	-	-	-	-	1	1	p	p	p	p	p	1	p	p	-	-	-
<i>Rhodomonas</i>	-	p	-	-	-	-	-	-	-	-	p	p	-	-	-	-	-	-	-	-
CYANOPHYCEAE																				
<i>Aphanothece</i>	-	p	-	-	p	-	-	p	-	p	p	p	-	p	-	p	-	-	p	-
Cyanophyceae, unid.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-
<i>Chroococcus</i>	-	1	-	-	-	-	p	-	p	1	-	12	2	p	11	25	5	11	16	5
<i>Gomphosphaeria</i>	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-
<i>Lyngbya</i>	p	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Merismopedia</i>	-	-	-	-	p	-	2	2	-	p	p	2	2	2	2	2	3	2	1	3
<i>Oscillatoria</i>	-	-	-	-	-	-	-	-	-	p	1	p	-	-	-	-	-	1	-	-
<i>Rhabdoderma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	-	-	-	-	-
<i>Romeria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-
DINOPHYCEAE																				
<i>Ceratium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Dinophyceae, unid.	18	115	-	-	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Gymnodinium</i>	-	-	-	78	-	85	95	27	53	12	69	78	62	65	70	28	57	21	119	57
<i>Peridinium</i>	98	46	-	44	20	75	58	25	47	42	43	24	22	19	2	5	1	3	5	p
XANTHOPHYCEAE																				
<i>Gonioclhoris</i>	p	p	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Isthmochloron</i>	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1

Table I-2: Phytoplankton biovolume data for Little Whitepine Lake 1987-2006 ($\mu^3 \cdot \text{mL}^{-1} \times 10^3$).

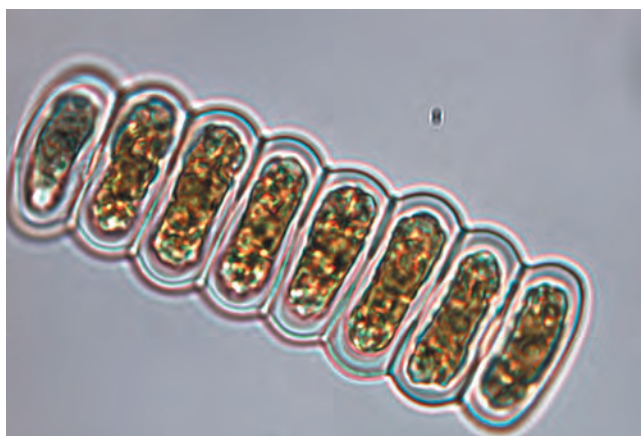
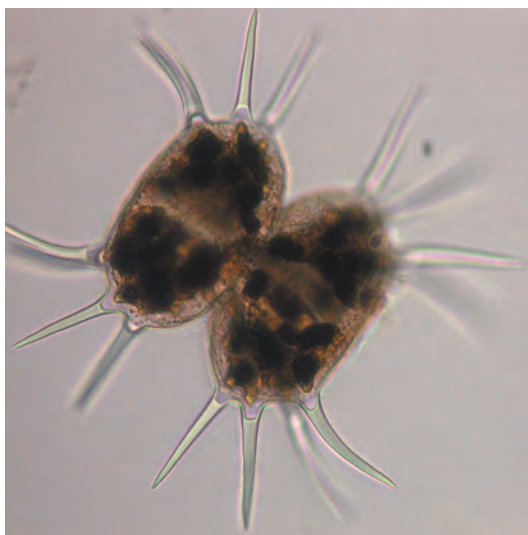
Little Whitepine L.	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BACILLARIOPHYCEAE																				
<i>Achnanthes</i>	-	-	-	-	-	-	-	-	-	-	-	p	p	p	-	-	-	-	-	-
<i>Anomoeoneis</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
<i>Asterionella</i>	1	-	-	-	-	-	-	-	-	-	-	-	53	3	-	p	p	-	p	-
<i>Cocconeis</i>	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
<i>Cyclotella</i>	-	-	-	-	-	-	-	9	12	2	3	7	9	1	-	1	-	1	2	1
<i>Cymbella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	2	-
<i>Eunotia</i>	-	-	-	-	-	-	-	-	-	-	-	-	p	p	-	-	-	-	-	1
<i>Frustulia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
<i>Melosira</i>	-	-	-	p	-	7	6	3	22	1	1	-	2	1	-	6	1	2	2	-
<i>Navicula</i>	-	-	-	-	-	-	2	-	-	-	-	2	-	1	-	-	-	-	-	-
<i>Neidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Nitzschia</i>	-	-	-	p	-	-	p	-	-	-	-	-	2	p	-	p	-	p	p	-
<i>Pinnularia</i>	-	-	-	-	-	-	-	-	2	-	-	-	12	-	-	13	-	-	-	-
<i>Rhizosolenia</i>	-	-	-	-	-	-	75	22	9	-	p	-	5	1	11	23	17	27	17	23
<i>Stauroneis</i>	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
<i>Surirella</i>	-	-	-	p	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Synedra</i>	p	-	-	-	1	2	7	2	7	p	5	2	21	6	11	12	52	16	12	50
<i>Tabellaria</i>	p	-	-	4	-	-	1	1	p	7	6	8	1	p	141	28	7	1	2	36
CHLOROPHYCEAE																				
<i>Ankistrodesmus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	p	-	-
<i>Arthrodesmus</i>	-	-	-	p	-	-	p	p	2	1	6	1	2	5	6	8	4	3	-	-
<i>Bambusina</i>	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
<i>Botryococcus</i>	252	17	-	5	-	-	3	-	-	-	1	p	p	4	p	1	1	3	1	-
<i>Carteria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
<i>Chlamydomonas</i>	10	29	-	1	6	-	3	7	4	5	p	p	1	2	-	3	p	15	p	21
<i>Closterium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p
<i>Coccomyxa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Coelastrum</i>	-	-	-	-	p	-	-	-	p	-	2	-	-	p	4	-	-	1	-	-
<i>Cosmarium</i>	-	-	-	-	-	-	-	-	-	7	2	1	-	3	-	4	-	1	2	7
<i>Crucigenia</i>	p	2	-	2	1	-	1	-	p	p	-	-	-	p	p	-	-	-	-	-
Desmid, unident.	-	-	-	-	-	-	-	3	-	-	7	-	-	-	-	7	17	-	-	-
<i>Dictyosphaerium</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	p
<i>Elakatothrix</i>	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-	-
<i>Gemmellicystis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
<i>Gloeocystis</i>	78	13	-	3	2	2	4	-	1	11	2	10	3	2	8	11	1	7	p	-
<i>Gloeotila</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
<i>Golenkinia</i>	-	-	-	-	-	-	-	-	-	4	-	p	-	-	-	-	2	3	-	p
<i>Gonatozygon</i>	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-	-	-	-	-
Chlorophyceae zoospore-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-
Chlorophyceae, unid.	-	-	-	6	-	21	1	13	-	-	1	p	1	2	1	-	2	-	-	8
<i>Gyromitus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	1
<i>Kirchneriella</i>	-	-	-	p	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-
<i>Koliella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	p	p	-	-
<i>Micractinium</i>	-	-	-	-	-	-	-	-	-	-	-	-	p	-	p	p	1	p	p	-
<i>Monomastix</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	1
<i>Monoraphidium</i>	-	-	-	-	-	p	-	-	1	p	p	p	p	-	-	-	-	-	p	-
<i>Oedogonium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
<i>Oocystis</i>	5	8	-	16	2	15	1	11	2	4	2	11	2	4	2	7	2	p	2	-
<i>Paramastix</i>	-	-	-	-	-	-	-	-	-	-	1	-	-	-	3	-	-	-	-	-
<i>Pediastrum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-

Table I-2 continued

Little Whitepine	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CHLOROPHYCEAE CONT'D																				
<i>Pedinomonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	2
<i>Planctonema</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p
<i>Polytoma</i>	-	-	-	-	-	-	-	p	-	-	-	-	p	-	-	-	-	p	-	-
<i>Quadrigula</i>	p	p	-	p	-	p	p	1	1	-	p	-	-	p	p	p	p	p	-	p
<i>Scenedesmus</i>	-	-	-	-	1	7	8	11	3	1	3	-	2	3	2	2	1	1	p	4
<i>Scourfieldia</i>	-	-	-	-	-	-	-	-	p	1	p	-	-	-	-	-	-	-	p	p
<i>Sphaerocystis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
<i>Sphaeroszma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	3	-	-
<i>Spondylosium</i>	-	-	-	-	-	-	-	6	1	5	3	15	15	9	3	34	3	2	-	p
<i>Staurastrum</i>	-	-	-	-	-	-	-	2	7	-	p	-	1	-	p	6	2	1	10	3
<i>Stenopterobia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-
<i>Staurodesmus</i>	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5
<i>Tetraëdron</i>	-	-	-	-	-	-	-	-	2	14	8	4	p	-	2	p	-	p	-	-
<i>Tetrastrum</i>	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-	-	-	-	-
<i>Xanthidium</i>	-	2	-	-	-	-	6	-	7	p	1	2	1	p	-	4	5	3	-	-
CHRYSTOPHYCEAE																				
<i>Bicosoeca</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	p	-	-	-
<i>Bitrichia</i>	-	p	-	p	p	1	p	1	-	p	p	p	-	-	p	p	p	p	p	-
<i>Chromulina</i>	-	p	-	9	-	23	8	13	28	11	9	20	22	4	21	14	27	113	438	562
<i>Chrysidiastrium</i>	-	-	-	2	-	-	9	17	p	1	1	9	p	3	3	14	7	39	7	4
<i>Chrysochromulina</i>	p	p	-	1	-	p	14	29	p	36	16	1	8	20	205	140	181	163	154	24
<i>Chrysococcus</i>	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-	-	-	-
<i>Chrysolykos</i>	-	-	-	-	p	-	-	1	1	p	-	p	p	p	-	-	p	p	p	p
Chrysophyte, unid.	3	9	-	24	5	48	50	85	27	23	36	27	24	48	67	34	61	30	20	27
<i>Chrysosphaerella</i>	-	-	-	-	-	-	-	-	-	-	5	-	2	54	13	17	134	247	7	3
<i>Chrysostephanosphaera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	p
<i>Codonocladium</i>	-	-	-	-	-	-	-	-	-	p	-	1	p	-	p	1	p	-	-	-
<i>Desmarella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	p	-	-	-
<i>Dinobryon</i>	47	23	-	9	1	32	22	8	7	4	4	3	24	14	14	18	15	21	8	27
<i>Epipyxis</i>	-	-	-	-	-	p	-	-	p	1	1	2	-	1	-	p	1	p	p	6
<i>Kephyrion</i>	-	-	-	p	p	p	3	p	2	1	p	p	p	1	p	1	1	p	p	1
<i>Mallomonas</i>	6	5	-	-	2	-	-	6	3	-	-	3	7	9	3	20	8	58	7	2
<i>Ochromonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	p	-	-	-	-	-	5
<i>Pseudokephyrion</i>	2	1	-	p	-	1	1	p	p	p	p	p	1	p	4	3	1	2	1	1
<i>Rhizochrysis</i>	-	-	-	-	-	-	-	-	2	1	2	-	2	12	5	11	14	13	3	3
<i>Spiniferomonas</i>	-	-	-	-	-	-	-	1	-	1	-	-	2	1	4	p	-	1	p	3
<i>Stelaxomonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-
<i>Synura</i>	1	5	-	-	2	-	-	2	-	-	-	10	11	1	-	37	100	7	-	6
<i>Uroglena</i>	1	-	-	2	7	31	3	17	p	1	1	230	88	6	26	4	13	40	1	1
CRYPTOPHYCEAE																				
<i>Cryptaulax</i>	-	-	-	p	-	2	-	2	-	-	-	-	1	-	-	p	-	1	1	-
<i>Cryptomonas</i>	51	38	-	6	23	10	23	20	11	26	10	25	11	8	8	23	30	41	18	4
<i>Katablepharis</i>	2	1	-	p	1	1	6	7	1	2	1	3	5	1	2	10	3	3	1	8
<i>Pleuromastix</i>	-	-	-	-	-	-	-	-	p	p	1	p	-	p	p	1	p	-	-	-
<i>Rhodomonas</i>	-	-	-	-	-	1	1	1	-	p	p	2	-	p	-	-	2	-	-	1
CYANOPHYCEAE																				
<i>Anabaena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-
<i>Aphanothece</i>	-	-	-	-	p	-	-	-	-	-	-	p	p	p	-	p	p	p	-	-
Cyanophyceae, unid.	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-
<i>Chroococcus</i>	-	-	-	-	-	p	-	-	p	-	p	p	3	-	p	p	-	-	2	-

Table I-2 continued

Little Whitepine	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CYANOPHYCEAE CONT'D																				
<i>Gomphosphaeria</i>	-	-	-	p	-	-	-	-	-	-	p	-	-	-	-	-	-	-	-	-
<i>Lyngbya</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	1	-	p
<i>Merismopedia</i>	p	4	-	1	p	p	p	1	p	p	p	p	p	-	p	p	p	p	p	p
<i>Oscillatoria</i>	1	-	-	p	-	1	p	-	p	p	p	1	1	-	-	-	-	-	-	p
<i>Pseudanabaena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-
<i>Rhabdoderma</i>	-	-	-	-	-	p	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Romeria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	p	-
DINOPHYCEAE																				
Dinophyceae, unid.	36	5	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Gymnodinium</i>	-	-	-	49	-	24	147	67	24	32	25	23	47	15	32	75	54	30	20	101
<i>Peridinium</i>	145	172	-	105	46	85	148	161	162	171	141	111	331	247	86	170	249	224	156	109
EUGLENOPHYCEAE																				
<i>Euglena</i>	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
XANTHOPHYCEAE																				
<i>Stipitococcus</i>	-	-	-	-	-	-	54	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Isthmochloron</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	11



Phytoplankton from the family Chlorophyceae, *Xanthidium* (top) and *Scenedesmus* (bottom) (L. Heintsch)

Table I-3: Phytoplankton biovolume data for Whirligig Lake 1987-2006 ($\mu^3 \cdot \text{mL}^{-1} \times 10^3$).

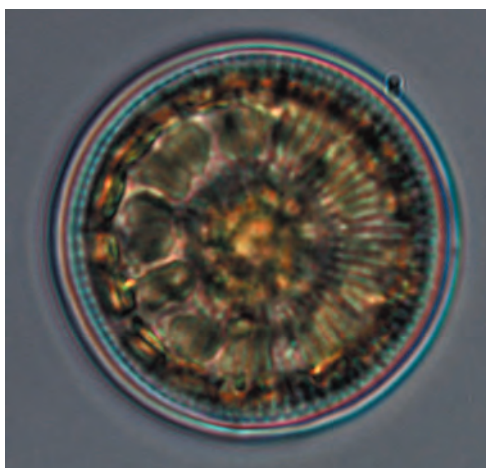
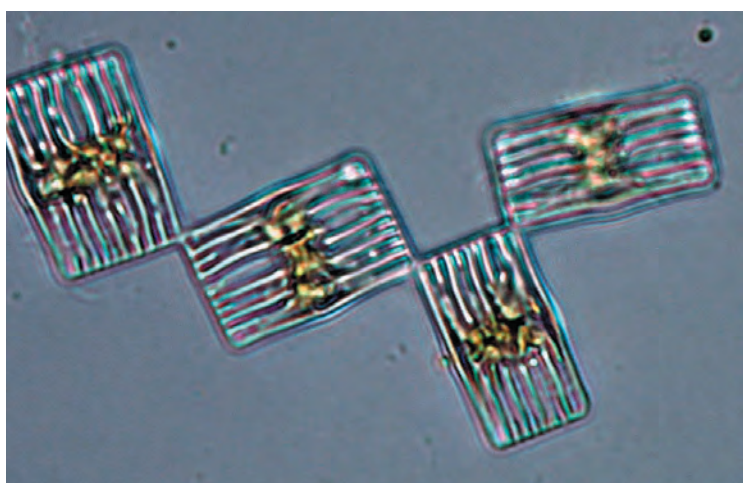
Whirligig L.	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BACILLARIOPHYCEAE																				
<i>Actinella</i>	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Achnanthes</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p
<i>Amphora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-
<i>Asterionella</i>	-	-	-	-	-	-	-	-	-	1	-	1	-	-	p	4	p	-	p	-
<i>Cyclotella</i>	-	-	-	-	-	-	-	-	-	1	-	p	1	p	1	p	p	-	-	-
<i>Denticula</i>	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-
<i>Eunotia</i>	3	-	-	-	-	-	-	-	-	-	2	-	p	1	-	-	-	-	4	1
<i>Fragilaria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
<i>Frustulia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	2	-	-
<i>Melosira</i>	-	-	-	-	-	-	-	4	1	20	-	-	p	p	-	p	-	-	12	2
<i>Meridion</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-
<i>Neidium</i>	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
<i>Nitzschia</i>	-	-	-	-	-	-	-	-	-	-	-	p	-	-	p	-	-	-	-	-
<i>Pinnularia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
<i>Rhizosolenia</i>	-	-	-	-	-	-	-	2	1	2	-	-	-	-	-	-	-	-	-	-
<i>Stenopterobia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	1
<i>Synedra</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	p	p	p	2	-	p	p
<i>Tabellaria</i>	13	-	-	-	-	-	-	1	-	-	4	1	p	2	2	-	p	7	-	1
CHLOROPHYCEAE																				
<i>Arthrodesmus</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	1	p	-	-	-
<i>Botryococcus</i>	-	-	-	-	-	2	1	-	-	2	14	20	3	2	3	-	3	48	25	53
<i>Chlamydomonas</i>	57	25	-	26	1	9	-	11	1	3	-	p	1	1	1	3	11	2	1	2
<i>Coccomyxa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	p
<i>Coelastrum</i>	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	p
<i>Crucigenia</i>	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desmid, unid.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
<i>Dictyosphaerium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	p	-
<i>Euastrum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-
<i>Gemmelicystis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	-	3	-	p	-
<i>Gloeocystis</i>	-	2	-	-	-	8	4	1	4	3	11	4	5	4	4	5	p	6	-	-
<i>Gloeotila</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p
<i>Golenkinia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
Green, unid.	-	-	-	3	-	2	-	4	2	1	1	p	-	p	p	3	2	-	p	-
<i>Gyromitus</i>	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
<i>Kirchneriella</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-
<i>Monomastix</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	1
<i>Monoraphidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	p	-	-	-	-
<i>Mougeotia</i>	-	-	-	-	-	-	-	-	-	-	2	11	-	-	14	-	-	-	-	p
<i>Oedogonium</i>	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Oocystis</i>	1	-	-	4	8	36	5	15	6	11	2	4	6	6	12	7	1	3	3	1
<i>Pedinomonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	3
<i>Pleurotaenium</i>	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
<i>Polytoma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	-	-	-	p
<i>Quadrigula</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Scenedesmus</i>	-	-	-	-	-	1	-	1	1	-	-	-	-	p	-	-	p	-	-	-
<i>Scourfieldia</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	p	1	-	-	p
<i>Sphaerocystis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
<i>Staurastrum</i>	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	p	-
<i>Tetracladus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-
<i>Tetraëdron</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-

Table I-3 continued

Whirligig L.	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CHLOROPHYCEAE CONT'D																				
<i>Xanthidium</i>	1	4	-	2	-	-	-	-	1	-	1	-	-	1	-	14	14	1	-	-
CHRYSTOPHYCEAE																				
<i>Bicosoeca</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	1	-	-	p
<i>Bitrichia</i>	-	-	-	-	-	-	-	-	1	-	-	p	p	p	p	p	p	-	p	p
<i>Chromulina</i>	-	-	-	9	-	7	5	12	16	6	3	5	1	1	6	5	16	10	3	36
<i>Chrysidiastrium</i>	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	3	-	-	3
<i>Chrysochromulina</i>	-	-	-	-	-	-	-	8	7	-	-	-	1	-	39	13	150	1	1	8
<i>Chrysococcus</i>	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-	-	-
<i>Chrysolykos</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	p	p	-	-	-
Chrysophyte, unid.	22	2	-	18	1	2	34	17	16	8	17	7	3	7	7	10	39	7	10	2
<i>Chrysosphaerella</i>	-	-	-	-	-	-	-	-	-	-	44	3	15	5	76	10	22	3	28	4
<i>Codonocladium</i>	-	-	-	-	-	1	-	1	1	-	-	p	p	2	p	1	-	-	-	-
<i>Desmarella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	p	-	-	-
<i>Dinobryon</i>	200	97	-	11	3	6	2	84	19	12	32	5	26	15	12	6	23	9	9	24
<i>Epipyxis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-	-	-
<i>Kephyrion</i>	-	-	-	1	-	-	-	-	1	-	-	p	1	p	p	p	1	-	p	p
<i>Mallomonas</i>	1	7	-	3	26	25	5	87	5	3	12	1	10	27	11	2	10	9	44	3
<i>Pleuromonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-
<i>Pseudokephyrion</i>	-	1	-	-	-	-	-	-	-	-	-	p	1	-	-	-	2	-	-	-
<i>Rhizochrysis</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	7	-	-	-
<i>Spiniferomonas</i>	-	-	-	3	-	-	-	-	-	-	-	-	1	-	-	p	1	-	-	-
<i>Synura</i>	8	5	-	2	-	-	4	78	6	-	-	8	2	2	5	2	39	8	3	3
<i>Uroglena</i>	-	-	-	-	17	183	26	10	20	33	2	9	29	24	2	1	2	90	12	12
CRYPTOPHYCEAE																				
<i>Chroomonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
<i>Cryptaulax</i>	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	4	p	1	p	p
<i>Cryptomonas</i>	112	1061	-	94	64	28	40	29	26	35	23	15	23	37	17	39	14	17	35	17
<i>Cyathomonas</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
<i>Katablepharis</i>	-	-	-	2	2	7	2	4	1	1	-	p	p	1	1	-	-	-	p	p
<i>Pleuromastix</i>	-	-	-	-	-	-	-	-	-	-	2	p	1	1	1	p	1	-	-	-
<i>Rhodomonas</i>	-	-	-	-	-	-	-	1	1	1	-	p	-	-	-	-	-	-	p	-
CYANOPHYCEAE																				
<i>Anabaena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-
<i>Aphanothece</i>	-	-	-	-	-	-	-	-	-	-	-	p	p	p	-	-	p	-	-	-
<i>Chroococcus</i>	-	-	-	-	-	-	8	2	-	-	-	10	p	1	1	6	1	11	3	6
<i>Cyanarcus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	p	-
<i>Lyngbya</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	p	-	-	-	-
<i>Merismopedia</i>	-	-	-	-	-	1	1	-	-	-	-	2	1	3	8	10	2	6	5	5
<i>Oscillatoria</i>	-	-	-	1	-	-	-	-	-	-	-	p	-	p	-	-	-	-	-	-
DINOPHYCEAE																				
Dinophyceae, unid.	16	10	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Gymnodinium</i>	-	-	-	9	-	12	142	7	136	6	34	29	40	80	62	90	52	137	148	27
<i>Peridinium</i>	159	59	-	53	11	3	6	-	13	25	4	-	-	1	4	2	7	1	2	10
EUGLENOPHYCEAE																				
<i>Euglena</i>	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Euglenophyceae, unid.	-	-	-	-	-	-	-	-	-	-	-	3	1	-	-	7	1	-	-	-
XANTHOPHYCEAE																				
<i>Gonioclhoris</i>	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Isthmochloron</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1

Table I-4: Phytoplankton biovolume data for Wilderness Lake 1987-2006 ($\mu^3 \cdot \text{mL}^{-1} \times 10^3$).

Wilderness Lake	1987	1988	Wilderness Lake	1987	1988
BACILLARIOPHYCEAE			CHRYSOPHYCEAE		
<i>Achnanthes</i>	-	1	<i>Bitrichia</i>	p	-
<i>Asterionella</i>	1	1	<i>Chromulina</i>	-	14
<i>Eunotia</i>	-	p	<i>Chrysochromulina</i>	p	p
<i>Navicula</i>	1	1	Chrysophyte, unid.	11	37
<i>Nitzschia</i>	-	2	<i>Dinobryon</i>	23	4
<i>Tabellaria</i>	-	1	<i>Mallomonas</i>	19	-
CHLOROPHYCEAE			<i>Synura</i>	1	-
<i>Chlamydomonas</i>	1	p	<i>Uroglena</i>	1	-
<i>Euastrum</i>	-	p	CRYPTOPHYCEAE		
<i>Gloeocystis</i>	4	-	<i>Cryptomonas</i>	26	2
Green, unid.	-	3	DINOPHYCEAE		
<i>Kirchneriella</i>	4	-	Dinophyceae, unid.	3	-
<i>Oocystis</i>	7	37	<i>Gymnodinium</i>	-	4
<i>Quadrigula</i>	-	p	XANTHOPHYCEAE		
<i>Xanthidium</i>	1	-	<i>Goniochloris</i>	-	1



Phytoplankton from the family Bacillariophyceae, *Cyclotella* (top) and *Tabellaria* (bottom) (L. Heintsch)

Appendix II

Results of crustacean zooplankton enumeration and identification for the Aurora Trout Lakes,
1987 - 2006

Before species richness calculations were completed, some groups were combined and reduced into single taxonomic groups, according to current understanding of zooplankton taxonomy. These taxonomic reductions are necessary to avoid counting species/groups separately when they are in fact considered the same due to recent changes in taxonomy, or for taxa so physically similar that identifications are not reliable. These are:

Daphnia pulex + *Daphnia pulicaria* + *Daphnia catawba* + *Daphnia minnehaha* = *Daphnia pulex*
complex

Bosmina (Sinobosmina) sp. + *Bosmina longirostris* + *Bosmina freyi* + *Bosmina lieperi* =
Bosmina sp.

Epischura lacustris + *Epischura lacustris copepodid* = *Epischura lacustris*

Eucyclops speratus + *Eucyclops neomacruroides* + *Eucyclops elegans* = *Eucyclops elegans*

Diaphanosoma brachyurum + *Diaphanosoma birgei* = *Diaphanosoma birgei*

Daphnia mendotae + *Daphnia rosea* = *Daphnia mendotae*

Tropocyclops prasinus mexicanus + *Tropocyclops extensus* = *Tropocyclops extensus*

Holopedium gibberum + *Holopedium glacialis* = *Holopedium gibberum*

Calanoid nauplii + *Calanoid copepodid* = *Calanoid immature*

Cyclopoid nauplii + *Cyclopoid copepodid* = *Cyclopoid immature*

Table II - 1: Guide to abbreviations used in this section. Taxa indicated with an asterisk have been combined with others as per description on the previous page.

SP CODE	ABBREVIATION	FULL NAME
101	A CURVIROSTRIS	ACANTHOLEBERIS CURVIROSTRIS
102	A HARPAE	ACROPERUS HARPAE
109	ALONA SP	ALONA SP
115	CERIODAPHNIA SP	CERIODAPHNIA SP.
118	C SPHAERICUS	CHYDORUS SPHAERICUS
119	D AMBIGUA	DAPHNIA (DAPHNIA) AMBIGUA
122	D MENDOTAE*	DAPHNIA (HYALODAPHNIA) MENDOTAE*
126	D PULEX COMPLEX*	DAPHNIA (DAPHNIA) PULEX COMPLEX *
132	E COREGONI	EUBOSMINA (EUBOSMINA) COREGONI
133	E TUBICEN	EUBOSMINA (NEOBOSMINA) TUBICEN
135	H GIBBERUM*	HOLOPEDIDIUM GIBBERUM*
136	I SPINIFER	ILYOCRYPTUS SPINIFER
137	L SETIFERA	LATONA SETIFERA
142	P PEDICULUS	POLYPHEMUS PEDICULUS
145	S CRYSTALLINA	SIDA CRYSTALLINA
150	E LONGISPINA	EUBOSMINA (EUBOSMINA) LONGISPINA
152	D BIRGEI*	DIAPHANOSOMA BIRGEI*
155	D ACUTIROSTRIS	DISPARALONA ACUTIROSTRIS
164	DAPHNIA SP	DAPHNIA SP.
168	BOSMINA SP*	BOSMINA SP.*
204	L MINUTUS	LEPTODIAPTOMUS MINUTUS
205	S OREGONENSIS	SKISTODIAPTOMUS OREGONENSIS
208	L SICILIS	LEPTODIAPTOMUS SICILIS
210	E LACUSTRIS*	EPISCHURA LACUSTRIS*
302	D B THOMASI	DIACYCLOPS BICUSPIDATUS THOMASI
303	C SCUTIFER	CYCLOPS SCUTIFER
304	A VERN COMPLEX	ACANTHOCYCLOPS VERNALIS COMPLEX
306	E AGILIS	EUCYCLOPS AGILIS
308	M ALBIDUS	MACROCYCLOPS ALBIDUS
309	M EDAX	MESOCYCLOPS EDAX
310	O MODESTUS	ORTHOCYCLOPS MODESTUS
338	E ELEGANS*	EUCYCLOPS ELEGANS*
347	T EXTENSUS*	TROPOCYCLOPS EXTENSUS*
345	HARPACTICOID SP	HARPACTICOID SP
	CALANOID IMMATURE*	CALANOID IMMATURE*
	CYCLOPOID IMMATURE*	CYCLOPOID IMMATURE*
	NAUPLII	NAUPLII

Table II-2: Crustacean zooplankton species presence/absence data for Aurora Whitepine Lake, 1981-2006. * indicates taxa where more than one group were combined - see p. 44 for further explanation. X = species present; - = species not present; R = rare (only one individual found in a given year).

		SAMPLE SIZE	102 - A HARPAE	109 - ALONA SP	115 - CERIODAPHNIA SP	118 - C SPHAERICUS	122 - D MENDOTAE*	126 - D PULEX COMPLEX*	135 - H GIBBERUM*	136 - I SPINIFER	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	155 - D ACUTIROSTRIS	168 - DAPHNIA SP	164 - BOSMINA SP*	204 - L MINUTUS	205 - S OREGONENSIS	208 - L SICILIS	210 - E LACUSTRIS*	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	306 - E AGILIS	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	334 - E ELEGANS*	338 - T EXTENSUS*	345 - HARPACTICOID SP	IMMATURE CALANOID*	IMMATURE CYCLOPOID*	
AWP	1981	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	X	-	-	-	-	X	-		
AWP	1987	12	R	-	-	-	-	-	X	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	X	-	-	-	X	X	
AWP	1988	12	R	R	-	X	-	-	R	-	R	-	-	-	-	-	-	X	X	-	-	-	X	-	-	-	-	-	X	-	-	-	X	X	
AWP	1990	12	R	-	-	X	-	-	-	-	-	R	-	X	-	-	-	X	X	-	-	-	-	-	R	-	-	X	X	R	-	-	-	X	X
AWP	1991	12	-	-	-	X	-	X	R	-	-	X	R	R	-	-	-	X	X	-	-	-	R	-	-	-	-	X	X	-	-	-	-	X	X
AWP	1992	7	X	X	-	X	-	X	X	-	-	R	-	X	-	-	-	X	X	-	-	-	X	-	-	-	-	X	X	-	-	-	-	X	X
AWP	1993	6	R	R	R	X	-	X	X	-	-	-	-	X	-	-	-	X	X	-	-	-	-	-	X	-	-	X	X	-	-	-	-	X	X
AWP	1994	6	-	R	-	X	X	X	X	-	-	X	-	X	R	-	R	X	X	X	-	X	X	-	-	-	-	X	X	-	-	-	-	X	X
AWP	1995	4	-	X	-	X	-	X	X	-	-	-	-	-	-	-	-	X	X	-	-	-	-	X	-	-	-	X	X	-	-	-	-	X	X
AWP	1996	4	-	-	-	-	-	X	X	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	R	-	-	X	X	-	-	-	-	X	X
AWP	1997	5	R	-	-	R	R	X	R	-	-	-	-	-	-	-	X	X	X	-	-	-	-	R	-	-	-	X	X	-	X	-	-	X	X
AWP	1998	4	R	-	-	R	-	X	X	R	-	R	-	-	-	-	X	X	X	-	-	-	-	X	-	-	-	X	X	-	-	-	-	X	X
AWP	1999	6	R	R	-	X	R	X	X	-	-	R	-	-	R	R	X	X	X	-	-	-	R	-	-	X	-	X	X	-	X	-	-	X	X
AWP	2000	6	-	R	-	X	-	X	X	-	-	X	-	-	-	R	X	X	X	-	-	-	R	R	-	-	-	X	X	-	X	-	-	X	X
AWP	2001	6	-	R	-	X	X	X	X	-	-	X	-	X	-	-	X	X	X	-	-	-	X	-	-	-	R	X	X	-	-	-	-	X	X
AWP	2002	6	-	-	-	-	-	X	X	-	-	X	-	X	-	-	X	X	X	-	-	-	R	R	-	-	-	X	-	-	X	-	-	X	X
AWP	2003	5	-	-	-	-	R	X	X	-	-	X	-	X	-	-	X	X	X	-	-	-	R	-	-	-	-	X	R	-	X	-	-	X	X
AWP	2004	5	-	-	-	X	-	X	X	-	-	X	-	X	-	R	X	X	X	-	-	-	R	-	-	-	-	X	-	-	-	-	-	X	X
AWP	2005	6	-	-	-	R	-	X	X	-	R	-	-	X	X	-	X	X	X	-	-	-	R	X	-	-	-	X	-	-	X	-	-	X	X
AWP	2006	6	-	-	-	X	-	X	X	-	-	X	-	X	-	-	X	X	X	-	-	R	X	R	-	-	-	X	R	-	-	R	X	X	

Table II-3: Crustacean zooplankton species presence/absence data for Little Whitepine Lake, 1987-2006. * indicates taxa where more than one group were combined - see p.44 for further explanation. X = species present; - = species not present; R = rare (only one individual found in a given year).

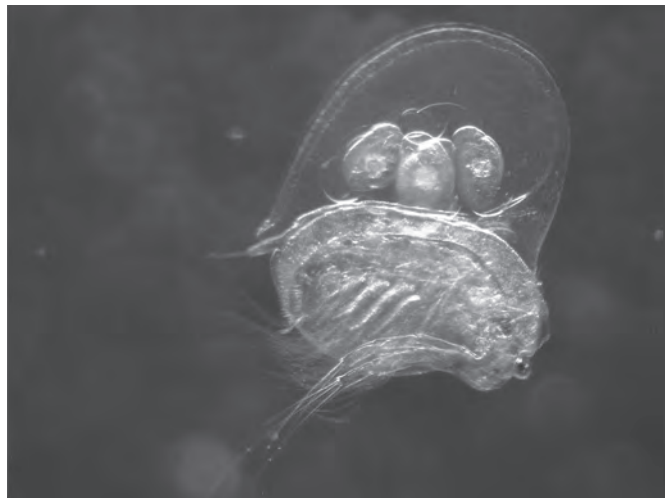
		SAMPLE SIZE	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE*	126 - D PULEX COMPLEX*	132 - E COREGONI	133 - E TUBICEN	135 - H GIBBERUM*	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	168 - DAPHNIA SP	164 - BOSMINA SP*	204 - L MINUTUS	302 - D B THOMASI	303 - C SCUTIFER	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	IMMATURE CALANOID*	IMMATURE CYCLOPOID*	
LITTLE WHITEPINE	1987	12	-	R	R	-	R	X	X	-	X	-	-	-	-	-	-	X	X	X	-	-	X	X	-	X	X	
LITTLE WHITEPINE	1988	12	R	-	-	-	-	X	-	-	X	-	-	-	-	-	X	-	X	-	-	-	R	X	-	X	X	
LITTLE WHITEPINE	1990	12	-	-	-	-	-	X	-	-	X	-	-	-	-	X	-	X	X	-	X	-	X	X	-	X	X	
LITTLE WHITEPINE	1991	12	-	-	X	-	-	X	-	R	X	R	X	-	X	X	R	X	X	X	R	-	R	X	-	X	X	
LITTLE WHITEPINE	1992	7	-	-	R	-	-	X	R	-	X	-	-	X	X	X	X	X	X	X	R	-	-	X	-	X	X	
LITTLE WHITEPINE	1993	6	-	-	X	-	-	X	-	-	X	-	-	-	R	X	-	X	X	R	X	-	-	-	-	R	X	X
LITTLE WHITEPINE	1994	6	-	-	-	-	-	X	-	-	X	-	-	-	-	X	-	X	X	X	-	-	-	-	-	-	X	X
LITTLE WHITEPINE	1995	4	-	-	R	-	-	X	-	-	X	-	-	-	X	X	R	X	X	-	-	-	-	X	-	X	X	
LITTLE WHITEPINE	1996	4	-	-	R	-	-	X	-	-	X	-	-	R	-	X	-	X	X	-	-	-	-	X	X	X	X	
LITTLE WHITEPINE	1997	5	-	-	-	-	-	X	-	-	X	-	-	-	X	X	X	X	X	X	-	-	-	R	X	X	X	
LITTLE WHITEPINE	1998	4	-	-	-	-	-	-	-	-	X	-	X	-	X	X	X	X	X	X	-	-	-	-	X	X	X	
LITTLE WHITEPINE	1999	6	-	-	R	-	-	X	-	-	X	-	-	-	X	X	-	X	X	X	X	-	-	X	X	X	X	
LITTLE WHITEPINE	2000	6	-	-	R	-	-	-	-	-	X	-	-	-	X	X	-	X	X	X	X	-	R	X	X	X	X	
LITTLE WHITEPINE	2001	6	-	-	R	-	X	R	-	-	X	-	X	-	X	X	R	X	X	X	-	R	R	-	X	X	X	
LITTLE WHITEPINE	2002	6	-	-	X	-	R	R	-	R	X	-	X	-	-	X	R	X	X	-	R	-	-	-	X	X	X	
LITTLE WHITEPINE	2003	5	-	-	R	-	X	X	-	R	X	R	R	-	X	X	X	X	X	R	X	-	X	-	X	X	X	
LITTLE WHITEPINE	2004	5	-	-	R	-	-	R	-	-	X	-	-	-	X	X	-	X	X	R	X	-	-	-	X	X	X	
LITTLE WHITEPINE	2005	6	-	-	R	-	X	X	-	-	X	-	R	-	X	X	-	X	X	X	X	-	R	-	X	X	X	
LITTLE WHITEPINE	2006	6	-	R	X	R	-	X	-	-	X	R	-	X	X	X	-	X	X	-	-	-	X	-	X	X	X	

Table II-4: Crustacean zooplankton species presence/absence data for Whirligig Lake, 1987-2006. * indicates taxa where more than one group were combined - see p.44 for further explanation. X = species present; - = species not present; R = rare (only one individual found in a given year).

		SAMPLE SIZE	101 - A CURVIOSTRIS	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE*	126 - D PULEX COMPLEX*	135 - H GIBBERUM*	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	168 - DAPHNIA SP	164 - BOSMINA SP*	204 - L MINUTUS	205 - S OREGONENSIS	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	IMMATURE CALANOID*	IMMATURE CYCLOPOID*
Whirligig	1987	12	-	-	-	X	-	-	X	X	-	-	-	-	-	X	X	-	-	-	R	X	X	-	X	X
Whirligig	1988	12	-	-	R	X	-	-	-	X	-	-	-	-	-	X	X	-	-	-	R	X	X	-	X	X
Whirligig	1990	12	-	-	R	-	-	-	X	X	-	-	-	X	-	X	X	-	-	-	-	X	X	X	X	X
Whirligig	1991	12	-	-	R	R	-	-	X	X	X	X	-	X	-	X	X	-	R	-	-	X	X	-	X	X
Whirligig	1992	7	-	-	-	X	-	-	X	X	-	-	X	-	-	X	X	-	-	-	-	X	X	-	X	X
Whirligig	1993	6	-	-	-	-	-	X	X	X	-	-	X	X	-	X	X	-	R	-	-	X	X	-	X	X
Whirligig	1994	6	-	-	-	R	-	-	X	X	R	-	X	-	-	X	X	-	R	-	-	X	X	-	X	X
Whirligig	1995	4	-	-	-	R	-	-	X	X	-	-	X	R	-	X	X	-	-	-	-	X	X	-	X	X
Whirligig	1996	4	-	-	-	-	X	-	X	X	-	-	X	R	-	X	X	R	-	R	-	X	X	-	X	X
Whirligig	1997	5	-	-	-	R	X	-	X	X	X	-	X	-	X	X	X	-	-	R	-	X	X	X	X	X
Whirligig	1998	4	-	-	-	-	X	-	X	X	X	-	X	-	X	X	X	-	R	-	-	X	X	R	X	X
Whirligig	1999	6	-	-	-	R	X	R	X	X	R	-	X	-	X	X	X	-	-	-	-	X	X	X	X	X
Whirligig	2000	6	-	-	-	-	X	-	X	X	X	-	X	-	X	X	X	-	-	-	-	X	X	-	X	X
Whirligig	2001	6	-	-	-	X	X	-	X	X	X	-	X	-	X	X	X	-	-	-	-	X	X	-	X	X
Whirligig	2002	6	R	R	-	R	-	R	X	X	R	-	R	X	X	X	X	-	-	-	-	X	X	X	X	X
Whirligig	2003	5	-	-	-	-	-	X	X	X	-	-	-	-	X	X	X	-	R	-	-	X	X	X	X	X
Whirligig	2004	5	-	-	-	R	-	-	X	X	R	-	-	-	X	X	X	-	-	-	-	X	X	X	X	X
Whirligig	2005	6	-	-	R	-	-	X	X	X	X	-	-	R	X	X	X	-	-	X	-	X	X	X	X	X
Whirligig	2006	6	-	-	-	-	-	R	X	X	X	-	X	-	X	X	X	-	R	-	-	X	X	X	X	X

Table II-5: Crustacean zooplankton species presence/absence data for Wilderness Lake, 1987-1988. * indicates taxa where more than one group were combined - see p.44 for further explanation. X = species present; - = species not present; R = rare (only one individual found in a given year).

		SAMPLE SIZE	101 - A CURVIOSTRIS	118 - C SPHAERICUS	137 - L SETIFERA	142 - P PEDICULUS	164 - BOSMINA SP*	204 - L MINUTUS	IMMATURE CYCLOPOID*	IMMATURE CALANOID*
Wilderness	1987	12	X	X	-	X	X	X	X	X
Wilderness	1988	2	-	-	R	-	-	X	-	X



Two crustacean zooplankton species commonly found in the study lakes; *Daphnia catawba* (part of the *Daphnia pulex* complex) (Top); *Holopedium gibberum* (Bottom) (L. Witty)

Table II-6: Crustacean zooplankton density data (number per m³) for Aurora Whitepine Lake, 1981-2006. * indicates taxa where more than one group were combined - see p.44 for further explanation. Superscripts indicate where replicate samples were taken.

	102 - A HARPAE	109 - ALONA SP	115 - CERIODAPHNIA SP.	118 - C SPHAERICUS	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	136 - I SPINIFER	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	155 - D ACUTIROSTRIS	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	208 - L SICILIS	210 - E LACUSTRIS*	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	306 - E AGILIS	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	347 - E ELEGANS*	345 - HARPACTICOID SP	CALANOID IMMATURE*	CYCLOPOID IMMATURE*	NAUPLII
6/1/81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	2.1	0.0	0.1
5/27/87 ^a	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.5	0.0	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	472.3	222.2	0.0
5/27/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	138.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	791.8	430.6	0.0
6/22/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	252.7	0.0	285.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	582.3	76.9	0.0
6/22/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	604.0	0.0	648.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	0.0	0.0	0.0	1378.5	188.7	0.0
7/29/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	172.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	192.7	0.0	0.0	0.0	669.4	1463.4	0.0
7/29/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	129.3	0.0	0.0	0.0	312.5	355.6	0.0
8/27/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	742.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1125.6	0.0	0.0	0.0	1029.8	22961.7	0.0
8/27/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	417.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	778.2	0.0	0.0	0.0	911.0	5678.7	0.0
10/1/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	107.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.6	0.0	0.0	0.0	91.3	572.8	0.0
10/1/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	109.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6	0.0	0.0	0.0	147.9	155.7	0.0
10/21/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	126.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63.3	27.1	0.0
10/21/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	58.2	0.0
5/25/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	123.4	137.1	0.0
5/25/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	231.4	81.0	0.0
6/20/88 ^a	0.0	0.0	0.0	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.7	0.0	594.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.0	0.0	0.0	773.5	350.1	0.0
6/20/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	7.2	0.0	0.0	0.0	0.0	0.0	35.9	0.0	459.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0	839.2	316.1	0.0
7/28/88 ^a	0.0	0.0	0.0	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	484.2	0.0	586.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.0	0.0	0.0	0.0	1907.3	2841.3	0.0
7/28/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	221.8	0.0	454.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1528.0	1503.4	0.0
8/31/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	182.2	0.0	694.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	192.4	0.0	0.0	0.0	1212.9	1916.9	0.0
8/31/88 ^b	0.0	0.0	0.0	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	202.5	0.0	823.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	354.4	0.0	0.0	0.0	968.6	1781.9	0.0
9/20/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1747.0	0.0	1924.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	1935.8	830.2	0.0
9/20/88 ^a	11.1	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1199.2	0.0	1510.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	111.0	0.0	0.0	0.0	1665.6	1199.2	0.0
11/2/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	506.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.2	0.0
11/2/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	805.2	0.0	0.0	0.0	18.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0
5/15/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	35.5	7.1	0.0
5/15/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	642.9	0.0	0.0
6/19/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	140.3	0.0	50.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.2	40.1	0.0

Table II-6 continued

	102 - A HARPAE	109 - ALONA SP	115 - CERIODAPHNIA SP.	118 - C SPHAERICUS	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	136 - I SPINIFER	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	155 - D ACUTIROSTRIS	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	208 - L SICILIS	210 - E LACUSTRIS*	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	306 - E AGILIS	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	347 - E ELEGANS*	345 - HARPACTICOID SP	CALANOID IMMATURE*	CYCLOPOID IMMATURE*	NAUPLII
6/19/90 ^b	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	10.0	0.0	0.0	370.8	0.0	200.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	340.7	200.4	0.0
8/1/90 ^a	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.6	0.0	470.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	328.3	0.0	0.0	0.0	523.5	3617.2	0.0
8/1/90 ^b	0.0	0.0	0.0	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	133.1	0.0	346.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0	0.0	0.0	230.7	0.0	0.0	0.0	381.5	5427.0	0.0
8/30/90 ^a	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.4	0.0	179.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	348.9	0.0	0.0	0.0	414.9	2800.4	0.0
8/30/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.0	0.0	226.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	433.7	0.0	0.0	0.0	386.6	3607.5	0.0
9/26/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	351.8	0.0	615.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.0	1090.6	0.0	0.0	0.0	193.5	3992.9	0.0
9/26/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	161.2	0.0	586.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.0	1583.1	0.0	0.0	0.0	88.0	5145.1	0.0
11/1/90 ^a	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	0.0	114.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.5	0.0	9.5	0.0	38.0	76.0	0.0
11/1/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	47.5	0.0
5/28/91 ^a	0.0	0.0	0.0	0.0	0.0	55.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.3	0.0	13.9	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1074.1	416.7	0.0
5/28/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	104.2	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	1444.5	444.5	0.0
6/17/91 ^a	0.0	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	0.0	1413.8	0.0	559.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.9	9.6	0.0	0.0	0.0	1044.5	694.1	0.0
6/17/91 ^b	0.0	0.0	0.0	31.8	0.0	0.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	3512.2	0.0	604.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.4	21.2	0.0	0.0	0.0	2555.5	519.6	0.0
7/24/91 ^a	0.0	0.0	0.0	15.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	105.7	0.0	754.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	211.3	0.0	0.0	0.0	0.0	3396.5	2898.3	0.0
7/24/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	14.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.5	0.0	622.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	212.3	14.2	0.0	0.0	0.0	3594.5	2193.5	0.0
8/14/91 ^a	0.0	0.0	0.0	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.9	0.0	430.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	513.4	111.0	0.0	0.0	0.0	832.6	9176.8	0.0
8/14/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	455.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	287.6	191.7	0.0	0.0	0.0	455.4	8125.1	0.0
9/9/91 ^a	0.0	0.0	0.0	16.3	0.0	8.2	0.0	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0	0.0	171.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	114.2	228.4	0.0	0.0	0.0	244.7	3153.6	0.0
9/9/91 ^b	0.0	0.0	0.0	27.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2	0.0	282.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	136.5	282.0	0.0	0.0	0.0	282.0	3438.6	0.0
10/9/91 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	17.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	549.3	0.0	0.0	0.0	71.7	1599.8	0.0
10/9/91 ^b	0.0	0.0	0.0	13.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	79.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	857.4	0.0	0.0	0.0	119.4	2229.1	0.0
5/26/92	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	304.6	249.2	0.0
6/22/92	27.5	18.4	0.0	91.8	0.0	5.7	0.0	0.0	0.0	9.2	0.0	9.2	0.0	0.0	156.1	0.0	459.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.5	0.0	0.0	0.0	532.5	1932.6	0.0
7/13/92	3.9	0.0	0.0	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	179.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	235.7	0.0	0.0	0.0	608.0	2152.6	0.0
8/12/92	0.0	0.0	0.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.8	0.0	0.0	0.0	7.9	0.0	0.0	0.0	0.0	23.7	220.9	0.0	0.0	0.0	575.8	1175.3	0.0
9/9/92	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	184.5	0.0	228.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.7	361.6	0.0	0.0	0.0	162.4	1500.6	0.0
10/6/92	0.0	0.0	0.0	0.0	0.0	0.0	34.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	104.7	0.0	62.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	293.1	0.0	0.0	0.0	55.8	635.1	0.0
10/27/92	0.0	0.0	0.0	0.0	0.0	13.7	36.4	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	104.7	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	22.8	0.0	0.0	0.0	27.3	245.8	0.0

Table II-6 continued

	102 - A HARPAE	109 - ALONA SP	115 - CERIODAPHNIA SP.	118 - C SPHAERICUS	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	136 - I SPINIFER	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	155 - D ACUTIROSTRIS	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	208 - L SICILIS	210 - E LACUSTRIS*	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	306 - E AGILIS	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	347 - E ELEGANS*	345 - HARPACTICOID SP	CALANOID IMMATURE*	CYCLOPOID IMMATURE*	NAUPLII
6/1/93	0.0	7.3	0.0	0.0	0.0	0.0	14.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	793.7	1301.0	0.0
6/22/93	6.9	0.0	0.0	20.7	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.5	0.0	325.0	0.0	0.0	0.0	0.0	0.0	27.7	0.0	0.0	6.9	27.7	0.0	0.0	0.0	297.3	861.4	0.0
7/29/93	0.0	0.0	0.0	0.0	0.0	0.0	16.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	353.5	0.0	875.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.5	252.5	0.0	0.0	0.0	2356.8	8005.9	0.0
8/23/93	0.0	0.0	0.0	11.5	0.0	45.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	290.7	0.0	260.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	149.2	765.1	0.0	0.0	0.0	612.1	12417.5	0.0
9/29/93	0.0	0.0	9.5	0.0	0.0	85.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	265.6	0.0	417.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	417.4	0.0	0.0	0.0	237.2	4032.4	0.0
10/28/93	0.0	0.0	0.0	0.0	0.0	36.7	0.0	0.0	0.0	0.0	0.0	12.2	0.0	0.0	18.4	0.0	201.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	0.0	0.0	189.6	367.0	0.0
5/17/94	0.0	5.3	0.0	5.3	26.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.8	5.3	21.2	0.0	0.0	5.3	5.3	0.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	248.7	84.7	0.0
6/16/94	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	23.6	0.0	0.0	0.0	0.0	269.5	0.0	463.3	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	4.7	18.9	0.0	0.0	0.0	1248.1	728.0	0.0
7/20/94	0.0	0.0	0.0	0.0	14.7	117.7	0.0	0.0	0.0	0.0	0.0	5.5	0.0	0.0	44.1	0.0	183.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.2	868.1	0.0	0.0	0.0	360.5	2582.4	0.0
8/22/94	0.0	0.0	0.0	0.0	0.0	209.9	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	123.4	0.0	197.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.6	790.0	0.0	0.0	0.0	331.7	12572.4	0.0
10/4/94	0.0	0.0	0.0	4.9	9.8	117.9	137.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63.9	9.8	0.0	14.7	0.0	0.0	0.0	0.0	0.0	0.0	456.0	0.0	0.0	0.0	34.4	1439.6	0.0
10/25/94	0.0	0.0	0.0	0.0	0.0	260.9	22.2	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	299.8	0.0	0.0	0.0	5.6	794.5	0.0
5/31/95	0.0	11.6	0.0	11.6	0.0	29.1	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	325.7	610.6	0.0
7/11/95	0.0	9.4	0.0	0.0	0.0	414.2	113.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	263.6	0.0	216.5	0.0	0.0	0.0	0.0	0.0	18.8	0.0	0.0	18.8	56.5	0.0	0.0	0.0	1271.0	828.5	0.0
9/20/95	0.0	0.0	0.0	0.0	0.0	118.3	118.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.8	0.0	80.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.2	393.5	0.0	0.0	0.0	64.6	6778.3	0.0
10/24/95	0.0	4.8	0.0	4.8	0.0	38.3	158.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	76.6	0.0	0.0	0.0	28.7	229.9	0.0
6/12/96	0.0	0.0	0.0	0.0	0.0	0.0	58.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.7	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	5.8	0.0	0.0	0.0	517.6	1128.7	0.0
7/16/96	0.0	0.0	0.0	0.0	0.0	49.7	810.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.7	0.0	612.3	0.0	0.0	0.0	0.0	0.0	16.6	0.0	0.0	82.8	66.2	0.0	0.0	0.0	1439.8	1191.6	0.0
8/26/96	0.0	0.0	0.0	0.0	0.0	106.8	783.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	237.4	0.0	498.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.1	83.1	0.0	0.0	0.0	712.2	1744.9	0.0
9/23/96	0.0	0.0	0.0	0.0	0.0	77.7	764.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.7	0.0	145.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.1	997.4	0.0	0.0	0.0	48.6	18069.6	0.0
5/27/97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.2	0.0	0.0	143.7	47.9	0.0
6/23/97	0.0	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1525.3	14.7	234.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1407.9	704.0	0.0
7/21/97	8.6	0.0	0.0	0.0	8.6	17.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.8	8.6	368.0	0.0	0.0	0.0	0.0	8.6	0.0	0.0	0.0	34.2	25.7	0.0	0.0	0.0	7411.2	179.7	0.0
8/18/97	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	139.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.6	172.2	0.0	0.0	0.0	1582.2	1328.1	0.0
9/15/97	0.0	0.0	0.0	0.0	0.0	40.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	116.9	122.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.5	0.0	0.0	0.0	0.0	127.0	569.1	0.0
5/12/98	0.0	0.0	0.0	0.0	0.0	12.6	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	25.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	1955.4	333.2	0.0
6/22/98	0.0	0.0	0.0	6.7	0.0	361.8	6.7	0.0	0.0	6.7	0.0	0.0	0.0	0.0	428.8	113.9	167.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.3	0.0	0.0	0.0	0.0	643.3	402.0	0.0
8/18/98	0.0	0.0	0.0	0.0	0.0	297.5	1368.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	773.5	89.2	357.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.7	1576.7	0.0	0.0	0.0	12133.7	8476.4	0.0

Table II-6 continued

	102 - A HARPAE	109 - ALONA SP	115 - CERIODAPHNIA SP.	118 - C SPHAERICUS	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	136 - I SPINIFER	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	155 - D ACUTIROSTRIS	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	208 - L SICILIS	210 - E LACUSTRIS*	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	306 - E AGILIS	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	347 - E ELEGANS*	345 - HARPACTICOID SP	CALANOID IMMATURE*	CYCLOPOID IMMATURE*	NAUPLII
9/28/98	10.1	0.0	0.0	0.0	0.0	20.2	1110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	242.3	20.2	434.1	0.0	0.0	0.0	0.0	20.2	0.0	0.0	0.0	232.2	0.0	0.0	0.0	3382.3	1615.4	0.0	
5/10/99	0.0	5.4	0.0	5.4	0.0	16.2	744.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.4	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	5.4	0.0	0.0	5210.4	598.9	0.0	
6/15/99	13.2	0.0	0.0	13.2	13.2	105.6	2376.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	779.0	52.8	686.5	0.0	0.0	0.0	0.0	0.0	0.0	26.4	0.0	0.0	0.0	0.0	0.0	2033.2	1795.6	0.0	
7/19/99	0.0	0.0	0.0	12.8	0.0	115.2	1484.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	128.0	198.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.2	0.0	0.0	0.0	0.0	882.9	262.3	0.0
8/24/99	0.0	0.0	0.0	0.0	0.0	58.0	1237.1	0.0	0.0	0.0	0.0	0.0	6.4	0.0	6.4	51.5	58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.8	6.4	0.0	0.0	0.0	914.9	631.4	0.0
9/21/99	0.0	0.0	0.0	0.0	0.0	118.4	1313.3	0.0	0.0	4.7	0.0	0.0	0.0	4.7	14.2	47.4	113.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	347.3	14.2	0.0	0.0	530.4	722.9	0.0
10/25/99	0.0	0.0	0.0	0.0	0.0	28.5	1156.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.0	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	182.6	154.0	0.0
5/29/00	0.0	6.0	0.0	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.1	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	867.2	1644.1	0.0
6/19/00	0.0	0.0	0.0	11.1	0.0	11.1	996.8	0.0	0.0	33.2	0.0	0.0	0.0	0.0	498.4	66.5	487.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	22.2	0.0	0.0	3510.8	780.8	0.0
7/24/00	0.0	0.0	0.0	0.0	0.0	83.8	1425.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.9	21.0	188.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.9	0.0	0.0	0.0	0.0	1355.4	901.3	0.0
8/21/00	0.0	0.0	0.0	10.7	0.0	904.6	512.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.7	192.0	53.3	0.0	0.0	0.0	10.7	0.0	0.0	0.0	0.0	21.3	0.0	0.0	0.0	0.0	748.9	1052.6	0.0
9/18/00	0.0	0.0	0.0	5.3	0.0	133.3	1108.9	0.0	0.0	0.0	0.0	0.0	0.0	5.3	69.3	16.0	127.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	186.6	0.0	0.0	0.0	245.2	607.7	0.0
10/16/00	0.0	0.0	0.0	0.0	0.0	287.7	356.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	156.3	18.8	0.0	0.0	93.8	431.5	0.0
6/4/01	0.0	5.6	0.0	5.6	5.6	16.8	343.9	0.0	0.0	22.4	0.0	22.4	0.0	0.0	257.9	78.5	246.7	0.0	0.0	0.0	11.2	0.0	0.0	0.0	5.6	22.4	5.6	0.0	0.0	0.0	1480.2	751.3	0.0
6/25/01	0.0	0.0	0.0	13.0	0.0	117.3	638.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2189.7	117.3	599.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.1	0.0	0.0	0.0	0.0	4379.3	404.0	0.0
7/26/01	0.0	0.0	0.0	0.0	0.0	49.9	1248.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	2471.1	74.9	524.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	324.5	0.0	0.0	0.0	0.0	3519.4	1909.5	0.0
8/27/01	0.0	0.0	0.0	0.0	38.7	193.6	716.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3344.7	96.8	1142.1	0.0	0.0	0.0	19.4	0.0	0.0	0.0	0.0	696.9	0.0	0.0	0.0	0.0	483.9	1211.7	0.0
9/29/01	0.0	0.0	0.0	18.5	0.0	906.1	832.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	998.6	240.4	813.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	351.3	0.0	0.0	0.0	0.0	240.4	716.6	0.0
10/23/01	0.0	0.0	0.0	0.0	0.0	690.1	558.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	542.2	0.0	706.5	0.0	0.0	0.0	65.7	0.0	0.0	0.0	0.0	147.9	115.0	0.0	0.0	0.0	2514.0	2218.2	0.0
5/28/02	0.0	0.0	0.0	0.0	0.0	11.3	1176.4	0.0	0.0	17.0	0.0	0.0	0.0	0.0	346.9	39.6	96.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0	9114.4	2217.1	0.0
6/24/02	0.0	0.0	0.0	0.0	0.0	153.0	1568.6	0.0	0.0	0.0	0.0	267.8	0.0	0.0	17440.6	267.8	1415.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5509.3	1033.0	0.0
7/31/02	0.0	0.0	0.0	0.0	0.0	501.4	640.6	0.0	0.0	0.0	0.0	55.7	0.0	0.0	9191.6	139.3	1420.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	417.8	0.0	0.0	0.0	0.0	6099.9	696.3	0.0
8/26/02	0.0	0.0	0.0	0.0	0.0	600.4	225.1	0.0	0.0	0.0	0.0	125.1	0.0	0.0	9155.7	450.3	925.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	250.2	0.0	75.0	0.0	0.0	2476.5	1688.6	0.0
9/25/02	0.0	0.0	0.0	0.0	0.0	1124.2	337.3	0.0	0.0	0.0	0.0	318.5	0.0	0.0	9555.6	393.5	768.2	0.0	0.0	0.0	0.0	18.7	0.0	0.0	0.0	131.2	0.0	18.7	0.0	0.0	1171.0	1068.0	0.0
10/22/02	0.0	0.0	0.0	0.0	0.0	729.9	2036.8	0.0	0.0	0.0	0.0	50.9	0.0	0.0	2418.7	17.0	1867.1	0.0	0.0	0.0	17.0	0.0	0.0	0.0	0.0	17.0	0.0	0.0	0.0	0.0	152.8	1612.5	0.0
6/2/03	0.0	0.0	0.0	0.0	0.0	6.2	442.3	0.0	0.0	24.8	0.0	6.2	0.0	0.0	596.2	12.4	260.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.4	6.2	6.2	0.0	0.0	18388.8	260.2	0.0
6/23/03	0.0	0.0	0.0	0.0	0.0	12.2	231.7	0.0	0.0	24.4	0.0	85.3	0.0	0.0	2292.1	85.3	1024.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	12.2	0.0	0.0	8193.1	1365.5	0.0
7/28/03	0.0	0.0	0.0	0.0	0.0	85.0	2549.7	0.0	0.0	0.0	0.0	42.5	0.0	0.0	5665.3	0.0	1274.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	212.5	0.0	0.0	0.0	0.0	4546.9	2422.2	0.0

Table II-6 continued

	102 - A HARPAE	109 - ALONA SP	115 - CERIODAPHNIA SP.	118 - C SPHAERICUS	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	136 - I SPINIFER	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	155 - D ACUTIROSTRIS	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	208 - L SICILIS	210 - E LACUSTRIS*	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	306 - E AGILIS	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	347 - E ELEGANS*	345 - HARPACTICOID SP	CALANOID IMMATURE*	CYCLOPOID IMMATURE*	NAUPLII
8/25/03	0.0	0.0	0.0	0.0	0.0	504.0	661.5	0.0	0.0	0.0	0.0	15.8	0.0	0.0	3654.0	110.3	661.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.5	0.0	0.0	0.0	0.0	2480.7	1984.5	0.0	
10/13/03	0.0	0.0	0.0	0.0	24.0	1321.5	816.9	0.0	0.0	0.0	0.0	24.0	0.0	0.0	2643.0	96.1	2162.4	0.0	0.0	0.0	24.0	0.0	0.0	0.0	0.0	144.2	0.0	0.0	0.0	0.0	336.4	1153.3	0.0
5/25/04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	175.8	37.0	444.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10534.7	180.4	0.0
6/21/04	0.0	0.0	0.0	5.0	0.0	25.1	20.1	0.0	0.0	10.0	0.0	5.0	0.0	0.0	5140.3	30.1	417.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	0.0	0.0	0.0	0.0	21708.3	190.8	0.0
7/19/04	0.0	0.0	0.0	0.0	0.0	156.7	0.0	0.0	0.0	11.2	0.0	246.3	0.0	0.0	12178.9	56.0	626.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112.0	0.0	0.0	0.0	0.0	19970.2	821.0	0.0
9/21/04	0.0	0.0	0.0	0.0	0.0	2528.0	24.3	0.0	0.0	0.0	0.0	48.6	0.0	0.0	729.2	1341.8	1020.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	218.8	0.0	0.0	0.0	0.0	8164.9	486.2	0.0
10/18/04	0.0	0.0	0.0	4.9	0.0	2128.6	4.9	0.0	0.0	0.0	0.0	24.6	0.0	0.0	1708.1	0.0	7253.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	19.7	0.0	0.0	0.0	0.0	399.1	683.3	0.0
5/17/05	0.0	0.0	0.0	0.0	0.0	0.0	20.6	0.0	4.1	0.0	0.0	0.0	4.1	0.0	395.7	16.5	890.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.6	0.0	8.2	0.0	0.0	8460.5	457.6	0.0
6/20/05	0.0	0.0	0.0	3.9	0.0	104.9	3.9	0.0	0.0	0.0	0.0	0.0	3.9	0.0	3605.3	3.9	476.6	0.0	0.0	0.0	3.9	11.7	0.0	0.0	0.0	15.5	0.0	23.3	0.0	0.0	8855.2	2175.6	0.0
7/20/05	0.0	0.0	0.0	5.7	0.0	124.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2221.8	28.3	113.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	266.4	0.0	5.7	0.0	0.0	8014.5	1008.9	0.0
8/25/05	0.0	0.0	0.0	0.0	0.0	372.3	0.0	0.0	0.0	0.0	0.0	0.0	16.5	0.0	2382.5	24.8	231.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	124.1	0.0	16.5	0.0	0.0	7988.9	2184.0	0.0
9/21/05	0.0	0.0	0.0	0.0	0.0	674.5	28.1	0.0	0.0	0.0	0.0	56.2	0.0	0.0	876.9	0.0	1117.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	421.6	0.0	0.0	0.0	0.0	3878.4	1222.5	0.0
10/17/05	0.0	0.0	0.0	0.0	0.0	993.8	0.0	0.0	0.0	0.0	0.0	76.4	0.0	0.0	1911.2	0.0	9376.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	133.8	0.0	38.2	0.0	0.0	363.1	1376.1	0.0
5/23/06	0.0	0.0	0.0	8.2	0.0	36.9	0.0	0.0	0.0	20.5	0.0	0.0	0.0	0.0	212.9	41.0	2315.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	12.3	0.0	0.0	0.0	4.1	23569.0	2342.3	0.0
6/20/06	0.0	0.0	0.0	12.4	0.0	484.3	0.0	0.0	0.0	0.0	0.0	211.1	0.0	0.0	8642.6	74.5	372.5	0.0	0.0	0.0	0.0	12.4	0.0	0.0	0.0	322.9	12.4	0.0	0.0	0.0	15259.7	2533.2	0.0
7/25/06	0.0	0.0	0.0	0.0	0.0	822.1	0.0	0.0	0.0	0.0	0.0	7.9	0.0	0.0	4131.4	197.6	134.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	495.4	0.0	0.0	0.0	0.0	34367.5	8155.0	0.0
8/22/06	0.0	0.0	0.0	0.0	0.0	1147.0	29.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2452.2	296.6	148.3	0.0	0.0	9.9	0.0	0.0	0.0	0.0	0.0	187.9	0.0	0.0	0.0	0.0	10148.1	830.6	0.0
9/26/06	0.0	0.0	0.0	0.0	0.0	897.3	284.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	914.5	51.8	1794.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	349.4	0.0	0.0	0.0	0.0	6210.0	685.9	0.0
10/25/06	0.0	0.0	0.0	0.0	0.0	279.2	837.6	0.0	0.0	0.0	0.0	74.5	0.0	0.0	1876.1	0.0	16679.0	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.8	372.2	0.0

Table II-7: Crustacean zooplankton density data (number per m³) for Little Whitepine Lake, 1987-2006. * indicates taxa where more than one group were combined - see p.44 for further explanation. Superscripts indicate where replicate samples were taken.

ZDATE	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	132 - E COREGONI	133 - E TUBICEN	135 - H GIBBERUM*	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	302 - D B THOMASI	303 - C SCUTIFER	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
5/26/87 ^a	0.0	0.0	0.0	0.0	0.0	35.2	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0	52.7	0.0	52.7	0.0	0.0	0.0	0.0	35.2	0.0	2033.7	158.2
5/26/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	140.6	0.0	0.0	0.0	0.0	70.3	0.0	890.7	117.2
6/22/87 ^a	0.0	0.0	0.0	0.0	0.0	1277.5	0.0	0.0	1444.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	166.6	0.0	0.0	0.0	0.0	0.0	0.0	1166.4	277.7
6/22/87 ^b	0.0	0.0	0.0	0.0	0.0	422.0	0.0	0.0	644.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.4	0.0	0.0	0.0	0.0	22.2	0.0	377.6	111.1
7/29/87 ^a	0.0	0.0	19.2	0.0	0.0	615.8	0.0	0.0	1077.7	0.0	0.0	0.0	0.0	0.0	19.2	0.0	230.9	0.0	0.0	0.0	0.0	0.0	0.0	904.5	19.2
7/29/87 ^b	0.0	0.0	0.0	0.0	0.0	919.7	0.0	0.0	2155.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	149.7	0.0	0.0	0.0	0.0	0.0	0.0	876.9	0.0
8/26/87 ^a	0.0	0.0	0.0	0.0	0.0	104.8	0.0	0.0	3966.5	0.0	0.0	0.0	0.0	0.0	10.5	0.0	83.8	0.0	0.0	0.0	0.0	0.0	0.0	261.9	0.0
8/26/87 ^b	0.0	0.0	0.0	0.0	9.6	134.4	19.2	0.0	7144.1	0.0	0.0	0.0	0.0	0.0	9.6	0.0	144.0	19.2	0.0	0.0	19.2	0.0	0.0	825.8	220.8
10/1/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4119.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	133.2	0.0	0.0	0.0	0.0	0.0	0.0	346.3	13.3
10/1/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4464.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	213.1	0.0	0.0	0.0	0.0	0.0	0.0	487.0	45.7
10/21/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2583.9	0.0	0.0	0.0	0.0	0.0	23.1	0.0	150.0	0.0	0.0	0.0	0.0	0.0	0.0	46.1	11.5
10/21/87 ^b	0.0	11.5	0.0	0.0	0.0	0.0	0.0	0.0	3322.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	265.3	0.0	0.0	0.0	0.0	0.0	0.0	57.7	0.0
5/26/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.5	45.4
5/26/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.3	32.6
6/20/88 ^a	0.0	0.0	0.0	0.0	0.0	80.8	0.0	0.0	3337.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.9	0.0	0.0	0.0	0.0	0.0	0.0	201.9	107.7
6/20/88 ^b	0.0	0.0	0.0	0.0	0.0	53.8	0.0	0.0	2189.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.4	0.0	0.0	0.0	0.0	0.0	0.0	255.7	80.8
7/27/88 ^a	0.0	0.0	0.0	0.0	0.0	288.7	0.0	0.0	2576.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.2	0.0	0.0	0.0	0.0	11.1	0.0	199.9	11.1
7/27/88 ^b	0.0	0.0	0.0	0.0	0.0	145.3	0.0	0.0	2664.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.6	0.0	0.0	0.0	0.0	0.0	0.0	436.0	0.0
8/31/88 ^a	0.0	0.0	0.0	0.0	0.0	190.4	0.0	0.0	1427.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.5	0.0	0.0	0.0	0.0	0.0	0.0	1534.7	261.7
8/31/88 ^b	0.0	0.0	0.0	0.0	0.0	130.9	0.0	0.0	1104.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.4	0.0	0.0	0.0	11.9	11.9	0.0	1058.8	190.4
9/20/88 ^a	12.2	0.0	0.0	0.0	0.0	171.0	0.0	0.0	1133.4	0.0	0.0	0.0	0.0	0.0	0.0	36.6	158.8	0.0	0.0	0.0	0.0	0.0	0.0	2422.2	195.4
9/20/88 ^b	0.0	0.0	0.0	0.0	0.0	61.1	0.0	0.0	1563.5	0.0	0.0	0.0	0.0	0.0	0.0	15.3	152.7	0.0	0.0	0.0	0.0	15.3	0.0	2580.4	290.1
11/1/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	161.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	556.4	0.0	0.0	0.0	0.0	0.0	0.0	366.0	0.0
11/1/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	410.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	644.3	0.0	0.0	0.0	0.0	0.0	0.0	156.2	0.0
5/15/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.9	0.0	183.0	0.0	0.0	0.0	0.0	0.0	0.0	1304.1	148.7
5/15/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.8	0.0	207.3	0.0	14.8	0.0	0.0	0.0	0.0	5601.5	14.8
6/19/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2377.7	0.0	0.0	0.0	0.0	0.0	101.9	0.0	84.9	0.0	0.0	0.0	0.0	0.0	0.0	10697.4	67.9
6/19/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2411.6	0.0	0.0	0.0	0.0	17.0	169.8	0.0	186.8	0.0	17.0	0.0	0.0	0.0	0.0	12622.8	0.0

Table II-7 continued

ZDATE	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	132 - E COREGONI	133 - E TUBICEN	135 - H GIBBERUM*	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	302 - D B THOMASI	303 - C SCUTIFER	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
7/31/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1369.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.5	0.0	0.0	0.0	0.0	0.0	0.0	610.8	18.5
7/31/90 ^b	0.0	0.0	0.0	0.0	0.0	18.5	0.0	0.0	1203.0	0.0	0.0	0.0	0.0	18.5	18.5	0.0	259.1	0.0	0.0	0.0	0.0	37.0	0.0	814.3	129.6
8/30/90 ^a	0.0	0.0	0.0	0.0	0.0	15.2	0.0	0.0	2885.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	0.0	121.9	61.0
8/30/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4491.0	0.0	0.0	0.0	0.0	0.0	129.5	0.0	21.6	0.0	0.0	0.0	43.2	21.6	0.0	151.1	626.1
9/25/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1273.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.7	33.1
9/25/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1373.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	165.4	16.5
10/30/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	519.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.5	0.0	0.0	0.0	0.0	0.0	0.0	77.0	38.5
10/30/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	526.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/28/91 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	279.0	0.0	0.0	0.0	10.0	10.0	69.8	0.0	119.6	0.0	0.0	0.0	10.0	0.0	0.0	1126.0	249.1
5/28/91 ^b	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	393.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.4	0.0	0.0	0.0	0.0	0.0	0.0	191.9	86.4
6/17/91 ^a	0.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0	9803.3	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	521.1	104.2
6/17/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14235.6	0.0	0.0	0.0	10.3	0.0	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	0.0	587.0	82.4
7/24/91 ^a	0.0	0.0	7.8	0.0	0.0	0.0	0.0	0.0	100.8	0.0	31.0	0.0	0.0	0.0	54.3	0.0	1778.4	0.0	0.0	0.0	0.0	0.0	0.0	10817.1	23.3
7/24/91 ^b	0.0	0.0	8.1	0.0	0.0	16.1	0.0	0.0	209.7	0.0	0.0	0.0	0.0	0.0	72.6	8.1	3871.0	0.0	0.0	0.0	0.0	0.0	0.0	16519.0	0.0
8/14/91 ^a	0.0	0.0	0.0	0.0	0.0	59.2	0.0	0.0	133.2	0.0	0.0	0.0	0.0	0.0	592.2	0.0	1322.5	0.0	0.0	0.0	0.0	0.0	0.0	21622.8	14.8
8/14/91 ^b	0.0	0.0	0.0	0.0	0.0	142.8	0.0	0.0	232.0	0.0	0.0	0.0	0.0	0.0	945.7	0.0	1427.5	0.0	0.0	0.0	0.0	35.7	0.0	22662.1	0.0
9/9/91 ^a	0.0	0.0	0.0	0.0	0.0	1483.8	0.0	0.0	269.8	0.0	0.0	0.0	0.0	37.9	2124.5	0.0	573.3	33.7	0.0	0.0	0.0	269.8	0.0	10116.6	1281.4
9/9/91 ^b	0.0	0.0	0.0	0.0	0.0	1285.4	0.0	0.0	257.1	28.6	0.0	0.0	0.0	28.6	2570.7	0.0	1056.9	0.0	0.0	0.0	0.0	85.7	0.0	10140.1	628.4
10/9/91 ^a	0.0	0.0	0.0	0.0	0.0	224.3	0.0	0.0	9.0	0.0	0.0	0.0	0.0	9.0	556.3	0.0	556.3	0.0	0.0	0.0	0.0	0.0	0.0	1624.0	80.8
10/9/91 ^b	0.0	0.0	0.0	0.0	0.0	217.1	0.0	0.0	9.9	0.0	0.0	0.0	0.0	19.7	690.9	0.0	602.0	9.9	0.0	0.0	0.0	0.0	0.0	1717.3	59.2
5/26/92	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1018.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1201.2	101.8
6/22/92	0.0	0.0	0.0	0.0	0.0	95.9	0.0	0.0	3259.6	0.0	0.0	0.0	263.6	0.0	767.0	0.0	479.4	24.0	24.0	0.0	0.0	0.0	0.0	2253.0	1078.6
7/13/92	0.0	0.0	0.0	0.0	0.0	229.5	7.4	0.0	2102.2	0.0	0.0	0.0	0.0	7.4	14.8	0.0	133.2	7.4	0.0	0.0	0.0	14.8	0.0	1099.3	318.3
8/12/92	0.0	0.0	10.7	0.0	0.0	21.5	0.0	0.0	21.5	0.0	0.0	0.0	0.0	21.5	0.0	0.0	53.7	10.7	0.0	0.0	0.0	0.0	0.0	1363.6	343.6
9/9/92	0.0	0.0	0.0	0.0	0.0	27.3	0.0	0.0	0.0	0.0	0.0	18.2	0.0	346.2	27.3	18.2	510.2	0.0	0.0	0.0	0.0	0.0	0.0	3162.1	82.0
10/5/92	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	201.3	0.0	0.0	0.0	12.6	490.8	0.0	0.0	113.3	0.0	0.0	0.0	0.0	0.0	0.0	515.9	37.8
10/27/92	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.6	0.0	0.0	0.0	9.7	38.9	0.0	0.0	233.2	0.0	0.0	0.0	0.0	0.0	0.0	272.0	97.2
6/1/93	0.0	0.0	20.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.4	0.0	20.4	0.0	61.1	0.0	0.0	0.0	0.0	488.6	30.5

Table II-7 continued

ZDATE	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	132 - E COREGONI	133 - E TUBICEN	135 - H GIBBERUM*	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	302 - D B THOMASI	303 - C SCUTIFER	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
6/22/93	0.0	0.0	14.1	0.0	0.0	28.1	0.0	0.0	42.2	0.0	0.0	0.0	0.0	0.0	14.1	0.0	168.8	0.0	14.1	0.0	0.0	0.0	0.0	239.1	42.2
7/29/93	0.0	0.0	0.0	0.0	0.0	102.7	0.0	0.0	565.6	0.0	0.0	0.0	0.0	74.7	121.4	0.0	46.7	0.0	0.0	0.0	0.0	0.0	0.0	224.1	0.0
8/23/93	0.0	0.0	0.0	0.0	0.0	47.3	0.0	0.0	9.5	0.0	0.0	0.0	9.5	2687.1	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0	28.4	9.5
9/27/93	0.0	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	103.4	0.0	155.1	0.0	0.0	0.0	0.0	0.0	10.3	444.6	124.1
10/28/93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	82.4	0.0	133.8	0.0	0.0	0.0	0.0	0.0	0.0	133.8	20.6
5/17/94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	204.3	8.9
6/16/94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.6	0.0	0.0	0.0	0.0	0.0	60.8	0.0	60.8	0.0	0.0	0.0	0.0	0.0	0.0	334.2	45.6
7/19/94	0.0	0.0	0.0	0.0	0.0	32.7	0.0	0.0	3606.9	0.0	0.0	0.0	0.0	10.9	0.0	0.0	261.8	43.6	0.0	0.0	0.0	0.0	0.0	1965.0	54.5
8/22/94	0.0	0.0	0.0	0.0	0.0	15.5	0.0	0.0	7.8	0.0	0.0	0.0	0.0	93.3	15.5	0.0	225.4	0.0	0.0	0.0	0.0	0.0	0.0	2821.2	38.9
10/4/94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	723.9	0.0	0.0	0.0	0.0	0.0	0.0	2368.4	18.7
10/24/94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	536.5	0.0	0.0	0.0	0.0	0.0	0.0	541.1	0.0
5/31/95	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	10.6	0.0	1080.2	232.7
6/24/95	0.0	0.0	0.0	0.0	0.0	241.8	0.0	0.0	449.1	0.0	0.0	0.0	0.0	3612.3	310.9	34.5	1796.2	0.0	0.0	0.0	0.0	483.6	0.0	4697.8	69.1
9/19/95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.2	155.1	1196.5	0.0	1285.1	0.0	0.0	0.0	0.0	44.3	0.0	4347.9	553.9
10/23/95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.3	20.3	81.2	0.0	703.3	0.0	0.0	0.0	0.0	10.1	0.0	977.2	50.7
6/12/96	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	237.3	24.5
7/16/96	0.0	0.0	0.0	0.0	0.0	94.4	0.0	0.0	377.5	0.0	0.0	0.0	0.0	251.7	1698.8	0.0	597.7	0.0	0.0	0.0	0.0	15.7	0.0	7676.2	15.7
8/26/96	0.0	0.0	0.0	0.0	0.0	41.4	0.0	0.0	69.1	0.0	0.0	13.8	0.0	1841.6	442.0	0.0	345.3	0.0	0.0	0.0	0.0	82.9	13.8	5662.9	566.3
9/23/96	0.0	0.0	20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	372.9	269.3	0.0	580.1	0.0	0.0	0.0	0.0	165.7	745.8	1657.4	2382.5
5/27/97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.0	0.0	0.0	0.0	76.0	0.0	76.0	0.0	38.0	19.0	0.0	0.0	0.0	0.0	836.2	3097.7	323.1
6/23/97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.5	0.0	0.0	0.0	111.8	40.7	213.4	10.2	182.9	0.0	0.0	0.0	0.0	0.0	477.6	2266.3	2825.2
7/21/97	0.0	0.0	0.0	0.0	0.0	48.1	0.0	0.0	288.8	0.0	0.0	0.0	16.0	689.8	48.1	160.4	449.2	32.1	0.0	0.0	0.0	0.0	1973.3	1042.8	19636.6
8/18/97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.5	0.0	0.0	0.0	0.0	0.0	455.7	28.5	142.4	57.0	0.0	0.0	0.0	28.5	1566.5	2947.8	22379.4
9/13/97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.5	34.2	308.1	0.0	136.9	0.0	0.0	0.0	0.0	0.0	5682.5	1078.3	6641.0
5/12/98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	0.0	0.0	8.2	16.3	8.2	0.0	0.0	8.2	0.0	0.0	0.0	0.0	335.1	931.8	65.4
6/22/98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.3	0.0	45.2	0.0	0.0	0.0	72.3	0.0	216.8	0.0	0.0	0.0	0.0	0.0	5877.7	1126.2	1180.4
8/18/98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1788.2	0.0	0.0	0.0	188.2	17222.8	1317.6	188.2	564.7	0.0	0.0	0.0	0.0	0.0	4988.0	6682.1	11952.5
9/28/98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.4	1419.1	177.4	0.0	1170.7	71.0	0.0	0.0	0.0	0.0	3051.0	2270.5	49372.6

Table II-7 continued

ZDATE	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	132 - E COREGONI	133 - E TUBICEN	135 - H GIBBERUM*	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGE*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	302 - D B THOMASI	303 - C SCUTIFER	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
5/10/99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0	0.0	0.0	9.3	0.0	0.0	0.0	55.7	0.0	18.6	0.0	0.0	0.0	2329.0	3753.6	576.0
6/15/99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1237.4	0.0	0.0	0.0	4612.2	675.0	6412.2	0.0	337.5	0.0	0.0	0.0	0.0	112.5	1462.4	10293.2	30252.6
7/19/99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	479.2	0.0	0.0	0.0	39.9	7028.1	599.0	0.0	5430.8	0.0	0.0	0.0	0.0	279.5	1198.0	3354.3	1437.6
8/24/99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.0	0.0	0.0	0.0	0.0	23701.2	376.3	0.0	611.4	94.1	0.0	0.0	0.0	282.2	658.4	4044.7	3597.9
9/21/99	0.0	0.0	37.5	0.0	0.0	0.0	0.0	0.0	150.2	0.0	0.0	0.0	37.5	4605.0	150.2	0.0	1276.4	37.5	0.0	0.0	0.0	788.4	825.9	4555.0	4354.8
10/25/99	0.0	0.0	0.0	0.0	0.0	42.7	0.0	0.0	106.7	0.0	0.0	0.0	21.3	768.3	469.5	0.0	1750.1	0.0	0.0	0.0	0.0	0.0	683.0	2411.7	939.1
5/29/00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	331.6	0.0	0.0	0.0	153.0	89.3	714.2	0.0	382.6	0.0	38.3	0.0	12.8	12.8	331.6	4361.6	7932.4
6/19/00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1788.6	0.0	0.0	0.0	4390.2	325.2	16585.4	0.0	3414.6	0.0	0.0	0.0	0.0	0.0	3577.2	28448.0	6666.7
7/24/00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4986.5	0.0	0.0	0.0	433.6	16910.6	433.6	0.0	1951.2	108.4	0.0	0.0	0.0	325.2	1409.2	3685.6	26117.6
8/21/00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	154.9	0.0	0.0	0.0	0.0	8826.9	658.2	0.0	967.9	38.7	0.0	0.0	0.0	116.1	967.9	2129.3	4684.5
9/18/00	0.0	0.0	38.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4476.2	964.7	0.0	385.9	38.6	0.0	0.0	0.0	77.2	1003.3	2045.1	5556.6
10/16/00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.7	0.0	0.0	0.0	59.1	216.8	374.5	0.0	709.5	19.7	0.0	0.0	0.0	0.0	2246.7	1044.5	7489.2
6/4/01	0.0	0.0	0.0	0.0	20.9	0.0	0.0	0.0	83.6	0.0	0.0	0.0	167.2	209.1	355.4	0.0	836.2	0.0	0.0	0.0	0.0	0.0	1797.8	2884.9	8320.3
6/25/01	0.0	0.0	36.6	0.0	0.0	0.0	0.0	0.0	439.0	0.0	548.8	0.0	585.4	1024.4	2414.7	0.0	475.6	0.0	0.0	36.6	0.0	0.0	914.7	2414.7	658.6
7/26/01	0.0	0.0	0.0	0.0	0.0	9.7	0.0	0.0	338.8	0.0	0.0	0.0	87.1	2322.9	367.8	9.7	261.3	19.4	0.0	0.0	9.7	0.0	183.9	803.3	754.9
8/27/01	0.0	0.0	0.0	0.0	17.3	0.0	0.0	0.0	51.8	0.0	0.0	0.0	34.6	2764.3	1336.1	0.0	120.9	17.3	0.0	0.0	0.0	0.0	0.0	1157.6	1148.9
9/29/01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	47.0	65.8	47.0	0.0	84.7	0.0	0.0	0.0	0.0	0.0	0.0	282.2	244.6
10/23/01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.2	0.0	0.0	0.0	0.0	24.5	0.0	0.0	32.7	0.0	0.0	0.0	0.0	0.0	163.4	212.4	114.4
5/28/02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	95.6	1501.7	95.6
6/24/02	0.0	0.0	15.7	0.0	0.0	0.0	0.0	0.0	251.0	0.0	15.7	0.0	0.0	329.5	1412.1	0.0	345.2	0.0	0.0	0.0	0.0	0.0	243.2	3365.5	509.9
7/31/02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.6	0.0	0.0	0.0	0.0	8502.4	792.3	0.0	154.6	0.0	0.0	0.0	0.0	0.0	5256.0	5545.9	2898.6
8/26/02	0.0	0.0	0.0	0.0	0.0	38.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4826.5	3696.9	0.0	38.5	0.0	0.0	0.0	0.0	0.0	8780.2	16592.5	19250.1
9/25/02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.2	92.9	0.0	0.0	0.0	0.0	1533.1	673.6	0.0	46.5	0.0	0.0	0.0	0.0	0.0	35180.1	25288.3	34926.5
10/22/02	0.0	0.0	0.0	0.0	8.1	0.0	0.0	0.0	122.0	0.0	0.0	0.0	0.0	56.9	32.5	8.1	65.0	0.0	0.0	0.0	0.0	0.0	16130.1	12053.1	17686.9
6/2/03	0.0	0.0	0.0	0.0	0.0	7.7	0.0	7.7	46.5	0.0	0.0	0.0	7.7	193.6	0.0	0.0	85.2	0.0	15.5	0.0	0.0	0.0	4026.3	9412.6	9350.6
6/23/03	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0	227.2	0.0	9.1	0.0	18.2	1090.4	245.3	9.1	63.6	0.0	0.0	0.0	0.0	0.0	13085.0	836.0	40133.0
7/28/03	0.0	0.0	10.7	0.0	0.0	21.5	0.0	0.0	128.9	10.7	0.0	0.0	0.0	2147.5	3710.9	0.0	139.6	0.0	0.0	0.0	10.7	0.0	3298.6	268.4	5207.8
8/25/03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.0	0.0	0.0	0.0	0.0	828.9	2398.6	0.0	11.8	11.8	0.0	0.0	0.0	0.0	599.6	646.7	4268.1

Table II-7 continued

ZDATE	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	132 - E COREGONI	133 - E TUBICEN	135 - H GIBBERUM*	137 - L SETIFERA	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	302 - D B THOMASI	303 - C SCUTIFER	308 - M ALBIDUS	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
10/13/03	0.0	0.0	0.0	0.0	20.4	30.6	0.0	0.0	51.0	0.0	0.0	0.0	10.2	30.6	244.7	10.2	285.5	0.0	0.0	0.0	10.2	0.0	2990.8	15105.3	11742.2
5/25/04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	21.9	11.0	54.8	0.0	0.0	0.0	987.3	2139.1	329.1
6/21/04	0.0	0.0	18.5	0.0	0.0	0.0	0.0	0.0	905.4	0.0	0.0	0.0	0.0	92.4	3843.3	0.0	73.9	0.0	0.0	0.0	0.0	0.0	4804.1	20313.2	9164.8
7/19/04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4828.5	0.0	0.0	0.0	0.0	2795.4	1101.2	0.0	338.8	0.0	0.0	0.0	0.0	0.0	6353.2	5082.6	5717.9
9/21/04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	108.9	0.0	0.0	0.0	15.6	373.4	217.8	0.0	980.2	0.0	0.0	0.0	0.0	0.0	1991.6	1151.4	7095.1
10/18/04	0.0	0.0	0.0	0.0	0.0	8.6	0.0	0.0	137.6	0.0	0.0	0.0	8.6	77.4	146.3	0.0	481.8	0.0	0.0	0.0	0.0	0.0	3303.5	2176.5	18165.1
5/17/05	0.0	0.0	0.0	0.0	0.0	9.1	0.0	0.0	27.4	0.0	0.0	0.0	0.0	0.0	18.3	0.0	27.4	0.0	27.4	0.0	0.0	0.0	474.8	1406.0	18.3
6/20/05	0.0	0.0	27.5	0.0	82.6	27.5	0.0	0.0	523.1	0.0	27.5	0.0	110.1	936.0	468.0	0.0	963.5	27.5	110.1	0.0	27.5	0.0	3234.7	4267.0	12109.9
7/20/05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	520.3	0.0	0.0	0.0	0.0	2688.3	2471.5	0.0	693.8	0.0	0.0	0.0	0.0	0.0	1734.4	2948.5	24795.3
8/25/05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.5	0.0	0.0	0.0	22.2	800.5	1267.5	0.0	378.0	22.2	0.0	0.0	0.0	0.0	1445.4	1445.4	8539.0
9/21/05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.7	130.9	3268.5	0.0	486.4	0.0	0.0	0.0	0.0	0.0	897.9	1878.7	7786.8
10/17/05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	167.2	0.0	0.0	0.0	185.8	55.8	669.0	0.0	1300.8	0.0	0.0	0.0	0.0	0.0	5096.8	952.4	6424.4
5/23/06	0.0	0.0	19.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.8	0.0	19.1	0.0	0.0	0.0	0.0	0.0	1622.2	1568.6	8455.3
6/20/06	0.0	0.0	120.0	0.0	0.0	0.0	0.0	0.0	479.9	0.0	0.0	0.0	2759.4	0.0	8398.2	0.0	359.9	0.0	0.0	0.0	0.0	0.0	6698.5	2174.5	38807.0
7/25/06	0.0	0.0	0.0	0.0	0.0	28.9	0.0	0.0	664.9	14.5	0.0	0.0	14.5	332.4	5665.8	0.0	375.8	0.0	0.0	0.0	14.5	0.0	708.2	2124.7	57.8
8/22/06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.7	0.0	0.0	21.7	0.0	3295.4	8498.6	0.0	140.9	0.0	0.0	0.0	0.0	0.0	184.3	2457.1	1734.4
9/26/06	0.0	11.0	0.0	11.0	0.0	0.0	0.0	0.0	110.0	0.0	0.0	0.0	242.1	44.0	1437.8	0.0	264.1	0.0	0.0	0.0	0.0	0.0	407.1	1430.5	1613.9
10/25/06	0.0	0.0	0.0	0.0	0.0	77.1	0.0	0.0	180.0	0.0	0.0	0.0	17.1	0.0	85.7	0.0	925.8	0.0	0.0	0.0	8.6	0.0	788.6	94.3	128.6

Table II-8: Crustacean zooplankton density data (number per m³) for Whirligig Lake, 1987-2006. * indicates taxa where more than one group were combined - see p.44 for further explanation. Superscript letters indicate where replicate samples were taken.

ZDATE	101 - A CURVIROSTRIS	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
5/26/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.6	0.0	81.4	0.0	0.0	0.0	0.0	32.6	0.0	0.0	114.0	325.7
5/26/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.5	0.0	0.0	0.0	0.0	39.1	39.1	0.0	195.4	605.8
6/22/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.4	0.0	54.9	0.0	0.0	0.0	0.0	178.3	0.0	0.0	137.1	1911.8
6/22/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.6	0.0	55.8	0.0	0.0	0.0	18.6	279.2	74.5	0.0	279.2	2940.8
7/29/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	134.3	0.0	134.3	0.0	0.0	0.0	0.0	201.5	67.2	0.0	1208.8	4230.8
7/29/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.4	0.0	0.0	0.0	0.0	226.7	25.2	0.0	428.2	5155.1
8/27/87 ^a	0.0	0.0	0.0	17.5	0.0	0.0	70.0	35.0	0.0	0.0	0.0	0.0	17.5	0.0	87.6	0.0	0.0	0.0	0.0	105.1	0.0	0.0	788.0	1120.7
8/27/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.5	0.0	35.0	0.0	0.0	0.0	0.0	350.2	0.0	0.0	595.4	1365.9
10/1/87 ^a	0.0	0.0	0.0	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	171.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	195.4	244.3
10/1/87 ^b	0.0	0.0	0.0	40.7	0.0	0.0	0.0	20.4	0.0	0.0	0.0	0.0	0.0	0.0	264.7	0.0	0.0	0.0	0.0	20.4	0.0	0.0	142.5	122.2
10/21/87 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.1	0.0	108.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.3	72.4
10/21/87 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.1	0.0	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.2	18.1
5/26/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.3	0.0	0.0	0.0	0.0	45.3	45.3	0.0	0.0	135.8
5/26/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.3	0.0	45.3	0.0	0.0	0.0	0.0	45.3	0.0	0.0	45.3	45.3
6/20/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.0	0.0	0.0	0.0	0.0	0.0	0.0	275.0	0.0	0.0	0.0	14.5	14.5	43.4	0.0	463.2	2220.9
6/20/88 ^b	0.0	0.0	16.1	0.0	0.0	0.0	0.0	32.2	0.0	0.0	0.0	0.0	0.0	0.0	386.0	0.0	0.0	0.0	0.0	48.3	32.2	0.0	579.0	2463.0
7/28/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.5	0.0	0.0	0.0	0.0	132.3	26.5	0.0	119.1	3298.8
7/28/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.8	0.0	0.0	0.0	0.0	88.2	58.8	0.0	176.4	2455.4
8/31/88 ^a	0.0	0.0	0.0	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.1	0.0	0.0	0.0	0.0	287.4	82.1	0.0	20.5	2319.9
8/31/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.9	0.0	0.0	0.0	0.0	197.6	0.0	0.0	89.8	2101.3
9/20/88 ^a	0.0	0.0	0.0	18.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.5	0.0	0.0	0.0	0.0	199.9	72.7	0.0	0.0	963.3
9/20/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.1	0.0	0.0	0.0	0.0	0.0	0.0	23.1	0.0	0.0	0.0	0.0	46.3	0.0	0.0	185.1	1480.5
11/2/88 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.5	0.0	46.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.5	0.0
11/2/88 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/15/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.3	32.6	0.0	65.1	65.1
5/15/90 ^b	0.0	0.0	16.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.3	0.0	358.2	211.7
6/19/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.5	0.0	0.0	0.0	0.0	22.3	155.9	0.0	400.9	1135.9
6/19/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.3	0.0	72.4	0.0	0.0	0.0	0.0	0.0	36.2	0.0	343.8	1122.0

Table II-8 continued

ZDATE	101 - A CURVIROSTRIS	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
7/31/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.5	0.0	0.0	0.0	0.0	375.6	0.0	590.2	0.0	0.0	0.0	0.0	321.9	134.1	0.0	670.7	4941.4
7/31/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.8	0.0	0.0	0.0	0.0	563.4	0.0	885.3	0.0	0.0	0.0	0.0	482.9	134.1	0.0	724.3	13391.7
8/30/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	16.2	0.0	0.0	0.0	0.0	32.3	7241.9	0.0	323.3	0.0	0.0	0.0	0.0	598.1	0.0	32.3	242.5	2554.1
8/30/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5043.5	0.0	452.6	0.0	0.0	0.0	0.0	307.1	16.2	0.0	258.6	2629.5
9/25/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	32.0	16.0	0.0	0.0	0.0	0.0	3882.5	0.0	32.0	0.0	0.0	0.0	0.0	480.0	0.0	0.0	64.0	640.0
9/25/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	34.3	0.0	0.0	0.0	0.0	0.0	2914.2	0.0	137.1	0.0	0.0	0.0	0.0	274.3	17.1	0.0	154.3	394.3
10/31/90 ^a	0.0	0.0	0.0	0.0	0.0	0.0	24.9	0.0	0.0	0.0	0.0	0.0	970.3	0.0	99.5	0.0	0.0	0.0	0.0	149.3	0.0	0.0	24.9	248.8
10/31/90 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	845.9	0.0	0.0	0.0	0.0	0.0	0.0	199.0	0.0	0.0	24.9	149.3
5/28/91 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.7	0.0	0.0	0.0	1551.9	0.0	357.6	0.0	0.0	0.0	0.0	191.6	9.6	0.0	843.0	2184.2
5/28/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.3	9.6	0.0	0.0	0.0	613.1	0.0	172.4	0.0	0.0	0.0	0.0	67.1	9.6	0.0	536.5	1941.5
6/17/91 ^a	0.0	0.0	20.4	20.4	0.0	0.0	20.4	244.3	0.0	20.4	0.0	0.0	3691.4	0.0	447.9	0.0	0.0	0.0	0.0	590.4	81.4	0.0	61.1	14494.1
6/17/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	10.7	490.5	0.0	10.7	0.0	0.0	4862.2	0.0	447.8	0.0	0.0	0.0	0.0	490.5	42.7	0.0	85.3	20304.0
7/24/91 ^a	0.0	0.0	0.0	0.0	0.0	0.0	274.9	1060.4	0.0	0.0	0.0	0.0	1492.4	0.0	73.6	0.0	0.0	0.0	0.0	942.5	1256.7	0.0	392.7	22346.0
7/24/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	942.5	981.8	0.0	0.0	0.0	0.0	2798.2	0.0	24.5	0.0	0.0	0.0	0.0	981.8	589.1	0.0	314.2	17568.7
8/14/91 ^a	0.0	0.0	0.0	0.0	0.0	0.0	1845.7	2062.8	0.0	0.0	0.0	0.0	1520.0	0.0	81.4	0.0	0.0	0.0	0.0	1791.4	1302.8	0.0	108.6	19083.7
8/14/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	4598.5	1642.3	0.0	0.0	0.0	119.7	2135.0	0.0	119.7	0.0	0.0	0.0	0.0	1724.4	1642.3	0.0	236.1	21557.6
9/9/91 ^a	0.0	0.0	0.0	0.0	0.0	0.0	593.7	288.4	0.0	0.0	0.0	21.2	31.8	0.0	95.4	0.0	0.0	0.0	0.0	1668.1	441.0	0.0	10.6	11563.4
9/9/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	398.3	221.3	0.0	0.0	0.0	33.2	11.1	0.0	132.8	0.0	0.0	0.0	0.0	1711.0	730.1	0.0	33.2	7664.2
10/8/91 ^a	0.0	0.0	0.0	0.0	0.0	0.0	3016.0	1168.2	0.0	0.0	0.0	0.0	66.4	0.0	26.6	0.0	0.0	0.0	0.0	185.8	26.6	0.0	26.6	1588.6
10/8/91 ^b	0.0	0.0	0.0	0.0	0.0	0.0	3257.1	1339.0	0.0	0.0	0.0	11.3	124.4	0.0	11.3	0.0	11.3	0.0	0.0	181.0	0.0	0.0	22.6	1436.3
5/26/92	0.0	0.0	0.0	0.0	0.0	0.0	24.2	1531.5	0.0	0.0	0.0	0.0	1575.1	0.0	12.1	0.0	0.0	0.0	0.0	12.1	0.0	0.0	533.1	1054.1
6/22/92	0.0	0.0	0.0	13.4	0.0	0.0	1288.0	3091.3	0.0	0.0	0.0	0.0	590.3	0.0	429.3	0.0	0.0	0.0	0.0	93.9	53.7	0.0	241.5	7084.1
7/13/92	0.0	0.0	0.0	0.0	0.0	0.0	1248.6	2008.5	0.0	0.0	0.0	0.0	244.3	0.0	190.0	0.0	0.0	0.0	0.0	27.1	271.4	0.0	108.6	3045.4
8/12/92	0.0	0.0	0.0	0.0	0.0	0.0	1169.1	960.3	0.0	0.0	0.0	0.0	125.3	0.0	104.4	0.0	0.0	0.0	0.0	83.5	313.2	0.0	438.4	2045.9
9/9/92	0.0	0.0	0.0	11.1	0.0	0.0	690.9	236.9	0.0	0.0	19.7	0.0	3730.9	0.0	177.7	0.0	0.0	0.0	0.0	197.4	217.1	0.0	414.5	2069.2
10/5/92	0.0	0.0	0.0	0.0	0.0	0.0	1676.9	2587.2	0.0	0.0	136.9	0.0	24639.5	0.0	342.2	0.0	0.0	0.0	0.0	136.9	513.3	0.0	410.7	1984.9
10/27/92	0.0	0.0	0.0	0.0	0.0	0.0	327.7	384.7	0.0	0.0	0.0	0.0	4502.9	0.0	1168.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	342.0	228.0
6/1/93	0.0	0.0	0.0	0.0	0.0	0.0	23.5	2255.0	0.0	0.0	0.0	23.5	704.7	0.0	469.8	0.0	0.0	0.0	0.0	328.8	0.0	0.0	5172.1	258.4

Table II-8 continued

ZDATE	101 - A CURVIROSTRIS	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	309 - M EDAX	310 - O MODESTUS	338 - T TEXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
6/22/93	0.0	0.0	0.0	0.0	0.0	0.0	26.7	854.7	0.0	0.0	0.0	0.0	106.8	0.0	547.5	0.0	0.0	0.0	0.0	106.8	106.8	0.0	2617.5	560.9
7/29/93	0.0	0.0	0.0	0.0	0.0	0.0	2737.6	64.2	0.0	0.0	0.0	0.0	385.0	0.0	577.5	0.0	0.0	0.0	0.0	342.2	192.5	0.0	1390.2	2917.9
8/23/93	0.0	0.0	0.0	0.0	0.0	14.0	191.9	415.8	0.0	0.0	28.0	14.0	3190.7	0.0	1055.6	0.0	14.0	0.0	0.0	1119.6	383.8	0.0	1535.4	2175.1
9/28/93	0.0	0.0	0.0	0.0	0.0	27.1	271.4	81.4	0.0	0.0	0.0	0.0	502.2	0.0	556.4	0.0	0.0	0.0	0.0	461.4	40.7	0.0	475.0	1058.6
10/28/93	0.0	0.0	0.0	0.0	0.0	0.0	450.8	54.6	0.0	0.0	13.7	0.0	1666.4	0.0	3606.1	0.0	0.0	0.0	0.0	13.7	13.7	0.0	409.8	382.5
5/17/94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.9	0.0	0.0	0.0	0.0	0.0	21.1	0.0	1868.3	73.9
6/16/94	0.0	0.0	0.0	0.0	0.0	0.0	347.3	104.2	17.4	0.0	17.4	0.0	312.6	0.0	538.3	0.0	0.0	0.0	0.0	34.7	0.0	0.0	4653.6	798.8
7/20/94	0.0	0.0	0.0	0.0	0.0	0.0	1346.2	210.3	0.0	0.0	42.1	0.0	420.7	0.0	1009.6	0.0	42.1	0.0	0.0	462.8	967.6	0.0	2271.7	7984.6
8/22/94	0.0	0.0	0.0	0.0	0.0	0.0	2435.7	292.3	0.0	0.0	1607.6	0.0	194.9	0.0	243.6	0.0	0.0	0.0	0.0	730.7	1899.8	0.0	828.1	7176.4
10/4/94	0.0	0.0	0.0	22.1	0.0	0.0	1492.8	0.0	0.0	0.0	751.9	0.0	0.0	0.0	287.5	0.0	0.0	0.0	0.0	597.1	376.0	0.0	552.9	1901.9
10/24/94	0.0	0.0	0.0	0.0	0.0	0.0	825.5	31.6	0.0	0.0	286.4	0.0	10.5	0.0	1326.7	0.0	0.0	0.0	0.0	168.5	303.2	0.0	353.8	1297.2
5/31/95	0.0	0.0	0.0	0.0	0.0	0.0	33.7	505.3	0.0	0.0	84.2	0.0	960.0	0.0	185.3	0.0	0.0	0.0	0.0	50.5	84.2	0.0	808.5	4008.6
7/24/95	0.0	0.0	0.0	0.0	0.0	0.0	279.2	0.0	0.0	0.0	325.7	15.5	93.1	0.0	465.3	0.0	0.0	0.0	0.0	62.0	341.2	0.0	666.9	5994.1
9/18/95	0.0	0.0	0.0	0.0	0.0	0.0	879.3	195.4	0.0	0.0	716.5	0.0	683.9	0.0	1237.6	0.0	0.0	0.0	0.0	716.5	651.4	0.0	1050.3	2735.7
10/24/95	0.0	0.0	0.0	20.4	0.0	0.0	592.9	368.0	0.0	0.0	511.1	0.0	327.1	0.0	5577.6	0.0	0.0	0.0	0.0	81.8	61.3	0.0	613.4	1443.5
6/12/96	0.0	0.0	0.0	0.0	751.7	0.0	62.6	1973.1	0.0	0.0	720.3	0.0	94.0	0.0	219.2	23.5	0.0	23.5	0.0	94.0	0.0	0.0	4429.4	970.9
7/16/96	0.0	0.0	0.0	0.0	2116.9	0.0	1310.5	970.2	0.0	0.0	705.6	0.0	617.4	0.0	2161.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4527.8	1360.9
8/26/96	0.0	0.0	0.0	0.0	640.0	0.0	194.8	1224.4	0.0	0.0	0.0	27.8	194.8	0.0	1140.9	0.0	0.0	0.0	0.0	417.4	111.3	0.0	2254.0	4090.5
9/23/96	0.0	0.0	0.0	0.0	183.1	0.0	586.1	1098.9	0.0	0.0	36.6	0.0	0.0	0.0	293.0	0.0	0.0	0.0	0.0	366.3	201.5	0.0	695.9	3858.2
5/27/97	0.0	0.0	0.0	0.0	26.0	0.0	26.0	2497.4	0.0	0.0	78.0	0.0	130.1	0.0	884.5	0.0	0.0	26.0	0.0	0.0	0.0	104.1	16129.0	2185.2
6/23/97	0.0	0.0	0.0	0.0	102.7	0.0	51.3	4381.3	136.9	0.0	17.1	0.0	0.0	0.0	376.5	0.0	0.0	0.0	0.0	51.3	0.0	0.0	8899.5	2567.2
7/21/97	0.0	0.0	0.0	0.0	102.0	0.0	408.1	4013.1	0.0	0.0	153.0	0.0	2040.6	357.1	1836.5	0.0	0.0	0.0	0.0	1071.3	0.0	0.0	6189.7	5356.5
8/18/97	0.0	0.0	0.0	24.4	316.6	0.0	560.1	1363.7	0.0	0.0	0.0	0.0	48.7	0.0	1241.9	0.0	0.0	0.0	0.0	754.9	292.2	0.0	6623.6	7402.9
9/15/97	0.0	0.0	0.0	0.0	100.0	0.0	600.1	160.0	0.0	0.0	0.0	0.0	260.0	240.0	820.1	0.0	0.0	0.0	0.0	1320.1	0.0	0.0	6560.7	1320.1
5/12/98	0.0	0.0	0.0	0.0	71.4	0.0	153.0	959.0	20.4	0.0	0.0	0.0	387.7	10.2	2056.7	0.0	10.2	0.0	0.0	81.6	0.0	10.2	38205.5	40.8
6/22/98	0.0	0.0	0.0	0.0	13.2	0.0	66.1	0.0	0.0	0.0	13.2	0.0	13.2	0.0	158.6	0.0	0.0	0.0	0.0	105.8	0.0	0.0	10244.5	66.1
8/18/98	0.0	0.0	0.0	0.0	1784.8	0.0	649.0	2433.8	0.0	0.0	2271.5	0.0	14764.8	0.0	649.0	0.0	0.0	0.0	0.0	730.1	324.5	0.0	19627.6	5192.0
9/28/98	0.0	0.0	0.0	0.0	240.9	0.0	1059.8	963.4	0.0	0.0	240.9	0.0	9248.8	433.5	2312.2	0.0	0.0	0.0	0.0	770.7	96.3	0.0	9248.8	3709.1

Table II-8 continued

ZDATE	101 - A CURVIROSTRIS	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	309 - M EDAX	310 - O MODESTUS	338 - T TEXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
5/10/99	0.0	0.0	0.0	0.0	141.7	0.0	43.6	261.7	0.0	0.0	174.4	0.0	32.7	0.0	1351.9	0.0	0.0	0.0	0.0	163.5	0.0	32.7	26161.0	1461.0
6/15/99	0.0	0.0	0.0	23.2	766.6	0.0	232.3	7433.2	23.2	0.0	232.3	0.0	69.7	116.1	302.0	0.0	0.0	0.0	0.0	69.7	46.5	0.0	17091.6	3066.2
7/19/99	0.0	0.0	0.0	0.0	1028.2	41.1	287.9	3865.9	0.0	0.0	1110.4	0.0	82.3	164.5	370.1	0.0	0.0	0.0	0.0	987.0	123.4	0.0	22367.5	3372.4
8/24/99	0.0	0.0	0.0	0.0	563.7	0.0	563.7	2124.7	0.0	0.0	260.2	0.0	2428.2	0.0	1127.4	0.0	0.0	0.0	0.0	346.9	86.7	0.0	8758.8	1994.6
9/21/99	0.0	0.0	0.0	0.0	336.4	0.0	672.8	269.1	0.0	0.0	605.5	0.0	515.8	269.1	695.2	0.0	0.0	0.0	0.0	762.5	112.1	22.4	4530.2	874.6
10/25/99	0.0	0.0	0.0	0.0	111.4	0.0	980.4	623.9	0.0	0.0	1091.8	0.0	2005.3	111.4	4545.5	0.0	0.0	0.0	0.0	22.3	0.0	0.0	445.6	178.3
5/29/00	0.0	0.0	0.0	0.0	23.2	0.0	104.5	1718.9	23.2	0.0	394.9	0.0	197.4	104.5	1324.0	0.0	0.0	0.0	0.0	23.2	0.0	0.0	37154.2	209.1
6/19/00	0.0	0.0	0.0	0.0	23.2	0.0	441.3	5017.4	69.7	0.0	46.5	0.0	69.7	81.3	867.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10964.0	1130.5
7/24/00	0.0	0.0	0.0	0.0	0.0	0.0	108.4	7226.7	0.0	0.0	94.9	0.0	149.1	81.3	1842.8	0.0	0.0	0.0	0.0	203.3	0.0	0.0	21700.4	2005.4
8/21/00	0.0	0.0	0.0	0.0	47.8	0.0	1339.1	2486.8	0.0	0.0	47.8	0.0	2247.7	0.0	1004.3	0.0	0.0	0.0	0.0	669.5	334.8	0.0	12242.9	9756.1
9/18/00	0.0	0.0	0.0	0.0	66.3	0.0	508.0	861.3	0.0	0.0	375.4	0.0	706.7	220.8	750.9	0.0	0.0	0.0	0.0	331.3	176.7	0.0	4770.3	574.2
10/16/00	0.0	0.0	0.0	0.0	0.0	0.0	1370.7	776.3	0.0	0.0	335.7	0.0	797.2	21.0	7384.4	0.0	0.0	0.0	0.0	62.9	104.9	0.0	2244.8	1825.2
6/4/01	0.0	0.0	0.0	0.0	0.0	0.0	203.3	4065.0	29.0	0.0	58.1	0.0	1074.3	58.1	1074.3	0.0	0.0	0.0	0.0	58.1	0.0	0.0	53641.4	5589.4
6/25/01	0.0	0.0	0.0	11.0	0.0	0.0	198.7	4591.1	22.1	0.0	33.1	0.0	463.5	44.1	419.4	0.0	0.0	0.0	0.0	132.4	0.0	0.0	12401.2	540.8
7/26/01	0.0	0.0	0.0	16.9	16.9	0.0	677.5	6639.6	0.0	0.0	16.9	0.0	18212.5	203.3	16.9	0.0	0.0	0.0	0.0	321.8	0.0	0.0	26416.3	6673.4
8/27/01	0.0	0.0	0.0	0.0	0.0	0.0	573.9	2247.7	0.0	0.0	0.0	0.0	5069.3	0.0	47.8	0.0	0.0	0.0	0.0	669.5	0.0	0.0	10616.9	4065.0
9/29/01	0.0	0.0	0.0	41.9	83.8	0.0	1173.6	964.1	0.0	0.0	83.8	0.0	2221.5	922.1	1341.3	0.0	0.0	0.0	0.0	1173.6	503.0	0.0	3395.2	1173.6
10/23/01	0.0	0.0	0.0	0.0	0.0	0.0	2013.8	4728.0	0.0	0.0	569.1	0.0	3502.2	0.0	25680.4	0.0	0.0	0.0	0.0	350.2	43.8	0.0	218.9	87.6
5/28/02	10.4	0.0	0.0	0.0	0.0	0.0	83.1	519.6	0.0	0.0	10.4	0.0	311.8	41.6	2161.5	0.0	0.0	0.0	0.0	571.5	0.0	0.0	31599.5	997.6
6/24/02	0.0	62.8	0.0	0.0	0.0	0.0	627.8	3201.9	62.8	0.0	0.0	0.0	4080.8	376.7	1506.8	0.0	0.0	0.0	0.0	125.6	62.8	0.0	43644.8	3688.4
7/31/02	0.0	0.0	0.0	11.7	0.0	11.7	234.7	117.3	0.0	0.0	0.0	23.5	8448.7	164.3	281.6	0.0	0.0	0.0	0.0	328.6	35.2	11.7	33033.3	3074.4
8/26/02	0.0	0.0	0.0	0.0	0.0	0.0	379.0	1124.7	0.0	0.0	0.0	0.0	2689.5	0.0	61.1	0.0	0.0	0.0	0.0	330.1	171.2	12.2	20342.3	3227.4
9/25/02	0.0	0.0	0.0	0.0	0.0	0.0	1899.9	1266.6	0.0	0.0	0.0	42.2	802.2	1182.2	675.5	0.0	0.0	0.0	0.0	295.5	0.0	42.2	13806.2	1688.8
10/22/02	0.0	0.0	0.0	0.0	0.0	0.0	6102.9	1861.4	0.0	0.0	0.0	0.0	206.0	22.9	5218.0	0.0	0.0	0.0	0.0	45.8	0.0	22.9	4050.8	1510.5
6/2/03	0.0	0.0	0.0	0.0	0.0	0.0	64.4	386.2	0.0	0.0	0.0	0.0	42.9	10.7	622.2	0.0	0.0	0.0	0.0	118.0	10.7	0.0	15447.3	1727.1
6/23/03	0.0	0.0	0.0	0.0	0.0	0.0	416.9	6270.2	0.0	0.0	0.0	0.0	1701.1	528.1	611.5	0.0	0.0	0.0	0.0	194.6	0.0	0.0	22343.2	8838.9
7/28/03	0.0	0.0	0.0	0.0	0.0	0.0	440.1	4694.4	0.0	0.0	0.0	0.0	456.4	81.5	489.0	0.0	0.0	0.0	0.0	423.8	114.1	0.0	7970.7	6161.4
8/25/03	0.0	0.0	0.0	0.0	0.0	0.0	494.5	1213.9	0.0	0.0	0.0	0.0	1906.3	179.8	179.8	0.0	0.0	0.0	0.0	337.2	157.4	45.0	7193.4	1191.4

Table II-8 continued

ZDATE	101 - A CURVIOSTRIS	102 - A HARPAE	109 - ALONA SP	118 - C SPHAERICUS	119 - D AMBIGUA	122 - D MENDOTAE	126 - D PULEX COMPLEX *	135 - H GIBBERUM*	142 - P PEDICULUS	145 - S CRYSTALLINA	150 - E LONGISPINA	152 - D BIRGEI*	164 - BOSMINA SP *	168 - DAPHNIA SP	204 - L MINUTUS	205 - S OREGONENSIS	302 - D B THOMASI	303 - C SCUTIFER	304 - A VERN COMPLEX	309 - M EDAX	310 - O MODESTUS	338 - T EXTENSUS*	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
10/13/03	0.0	0.0	0.0	0.0	0.0	79.5	1656.1	1172.5	0.0	0.0	0.0	0.0	218.6	159.0	2434.5	0.0	19.9	0.0	0.0	198.7	99.4	0.0	1589.9	477.0
5/25/04	0.0	0.0	0.0	8.5	0.0	0.0	34.1	435.4	0.0	0.0	0.0	0.0	51.2	25.6	222.0	0.0	0.0	0.0	0.0	34.1	0.0	42.7	20493.6	1889.5
6/21/04	0.0	0.0	0.0	0.0	0.0	0.0	224.7	6091.2	0.0	0.0	0.0	0.0	823.8	0.0	767.6	0.0	0.0	0.0	0.0	131.1	0.0	0.0	14525.5	674.0
7/19/04	0.0	0.0	0.0	0.0	0.0	0.0	853.7	3122.0	20.3	0.0	0.0	0.0	2439.0	223.6	630.1	0.0	0.0	0.0	0.0	528.5	0.0	0.0	15117.4	1138.2
9/21/04	0.0	0.0	0.0	0.0	0.0	0.0	1576.0	685.9	0.0	0.0	0.0	0.0	1891.2	43.8	218.9	0.0	0.0	0.0	0.0	262.7	0.0	29.2	6566.7	569.1
10/18/04	0.0	0.0	0.0	0.0	0.0	0.0	1665.0	1526.3	0.0	0.0	0.0	0.0	1214.1	0.0	8498.6	0.0	0.0	0.0	0.0	0.0	173.4	0.0	1561.0	1075.3
5/17/05	0.0	0.0	0.0	0.0	0.0	0.0	44.9	2018.4	0.0	0.0	0.0	0.0	11.2	56.1	2819.3	0.0	0.0	0.0	0.0	67.3	11.2	0.0	43132.1	650.4
6/20/05	0.0	0.0	0.0	0.0	0.0	0.0	181.7	2550.6	28.7	0.0	0.0	0.0	650.4	9.6	363.5	0.0	0.0	19.1	0.0	38.3	0.0	0.0	11726.4	5356.3
7/20/05	0.0	0.0	0.0	0.0	0.0	0.0	953.9	2549.4	0.0	0.0	0.0	0.0	3329.9	0.0	34.7	0.0	0.0	0.0	0.0	381.5	0.0	17.3	19157.9	4058.3
8/25/05	0.0	0.0	0.0	0.0	0.0	0.0	800.5	1125.7	0.0	0.0	0.0	0.0	1300.8	166.8	16.7	0.0	0.0	0.0	0.0	333.5	0.0	16.7	10806.8	5403.4
9/21/05	0.0	0.0	0.0	0.0	0.0	0.0	3252.0	1158.5	0.0	0.0	0.0	20.3	508.1	203.3	365.9	0.0	0.0	0.0	0.0	670.7	20.3	0.0	6849.6	569.1
10/17/05	0.0	0.0	42.5	0.0	0.0	85.1	6123.4	2608.3	0.0	0.0	0.0	0.0	2721.7	85.1	20998.6	0.0	0.0	0.0	0.0	297.7	212.6	0.0	127.6	1956.2
5/23/06	0.0	0.0	0.0	0.0	0.0	0.0	145.0	1570.6	54.4	0.0	54.4	0.0	779.3	90.6	1184.0	0.0	0.0	0.0	0.0	72.5	0.0	18.1	46408.5	5962.3
6/20/06	0.0	0.0	0.0	0.0	0.0	0.0	382.6	3672.9	102.0	0.0	102.0	0.0	3443.3	306.1	331.6	0.0	0.0	0.0	0.0	637.7	0.0	25.5	23498.6	5279.8
7/25/06	0.0	0.0	0.0	0.0	0.0	0.0	428.5	802.6	10.2	0.0	20.4	0.0	1414.7	81.6	10.2	0.0	10.2	0.0	0.0	224.4	10.2	0.0	15022.7	3611.5
8/22/06	0.0	0.0	0.0	0.0	0.0	0.0	700.4	940.6	0.0	0.0	0.0	0.0	3535.5	20.0	20.0	0.0	0.0	0.0	0.0	440.3	140.1	0.0	9606.0	8405.3
9/26/06	0.0	0.0	0.0	0.0	0.0	57.8	2890.7	3006.4	0.0	0.0	173.4	0.0	2370.4	751.6	1214.1	0.0	0.0	0.0	0.0	404.7	0.0	0.0	21847.1	2601.7
10/25/06	0.0	0.0	0.0	0.0	0.0	0.0	1973.1	559.8	0.0	0.0	14.0	0.0	1175.5	42.0	7119.6	0.0	0.0	0.0	0.0	70.0	28.0	0.0	125.9	454.8

Table II-9: Crustacean zooplankton density data (number per m³) for Wilderness Lake, 1987-1988.

* indicates taxa where more than one group were combined - see p.44 for further explanation.

ZDATE	101 - A CURVIOSTRIS	118 - C SPHAERICUS	137 - L SETIFERA	142 - P PEDICULUS	164 - BOSMINA SP *	204 - L MINUTUS	CALANOID IMMATURE*	CYCLOPOID IMMATURE*
5/26/1987	0.0	0.0	0.0	0.0	156.6	250.3	15782.7	0.0
5/26/1987	0.0	0.0	0.0	0.0	364.5	296.1	14942.7	0.0
6/22/1987	0.0	0.0	0.0	79.4	555.7	2363.9	34320.1	0.0
6/22/1987	0.0	0.0	0.0	44.1	396.9	1793.5	28160.9	0.0
7/28/1987	0.0	0.0	0.0	0.0	840.0	122251.1	35919.6	0.0
7/28/1987	0.0	25.7	0.0	0.0	1157.2	8023.0	28233.7	24.7
8/25/1987	36.4	0.0	0.0	0.0	7076.5	8869.8	35428.5	0.0
8/25/1987	18.2	0.0	0.0	0.0	6368.9	10614.7	22131.1	0.0
10/1/1987	0.0	0.0	0.0	0.0	738.3	10249.1	5493.7	21.7
10/1/1987	0.0	0.0	0.0	0.0	2135.4	10134.0	5439.9	0.0
10/20/1987	0.0	18.3	0.0	0.0	1214.3	9819.1	751.1	0.0
10/20/1987	0.0	18.3	0.0	0.0	1465.5	8793.6	537.4	12.2
5/25/1988	0.0	0.0	0.0	0.0	0.0	0.0	526.2	0.0
5/25/1988	0.0	0.0	23.3	0.0	0.0	162.8	1907.5	0.0



A commonly found zooplankton species in the study lakes: *Mesocyclops edax* (L. Witty)

Table II-10: Average zooplankton richness data (number of species per collection) for the Aurora Trout Lakes, 1987-2006.

	Aurora Whitepine		Little Whitepine		Whirligig		Wilderness	
	Richness	Sample size	Richness	Sample size	Richness	Sample size	Richness	Sample size
1987	2.5	12	4.1	12	3.6	12	2.8	12
1988	3.3	12	3.5	12	3.1	12	1.5	2
1990	3.8	12	3.7	12	4.1	12	-	-
1991	4.7	12	5.6	12	6.6	12	-	-
1992	5.3	7	5.7	7	6.3	7	-	-
1993	5.8	6	4.8	6	7.0	6	-	-
1994	6.8	6	3.5	6	6.2	6	-	-
1995	6.8	4	5.0	4	7.3	4	-	-
1996	6.3	4	5.8	4	7.8	4	-	-
1997	5.0	5	6.6	5	7.2	5	-	-
1998	6.3	4	6.3	4	7.8	4	-	-
1999	7.2	6	7.0	6	8.5	6	-	-
2000	6.7	6	7.3	6	7.5	6	-	-
2001	7.5	6	7.0	6	7.3	6	-	-
2002	6.7	6	5.3	6	7.5	6	-	-
2003	7.4	5	8.0	5	6.4	5	-	-
2004	6.6	5	5.8	5	5.8	5	-	-
2005	7.0	6	7.0	6	6.7	6	-	-
2006	6.3	6	6.7	6	7.5	6	-	-