DEPARTMENT of ENVIRONMENTAL SERVICES
Water Division - Watershed Management Bureau

LAKE TROPHIC DATA

MORPHOMETRIC:

Lake:	ZEPHYR LAKE	Lake Area (ha):	12.50
Town:	GREENFIELD	Maximum depth (m):	5.2
County:	Hillsborough	Mean depth (m):	2.7
River Basin:	Merrimack	Volume (m^3):	341500
Latitude:	42°56'03" N	Relative depth:	1.3
Longitude:	71°51'23" W	Shore configuration:	1.12
Elevation (ft):	825	Areal water load (m/yr):	7.15
Shore length (m):	1400	Flushing rate (yr^{-1}):	2.60
Watershed area (ha):	186.5	P retention coeff.:	0.60
% watershed ponded:	1.0	Lake type:	natural

BIOLOGICAL:		9 February 1999	27 July 1998
DOM. PHYTOPLANKTON (% TOTAL)	#1	MELOSIRA 55%	MICROCYSTIS 25%
	#2	ASTERIONELLA 25%	MELOSIRA 25%
	#3		TABELLARIA 25%
PHYTOPLANKTON ABUNDANCE (units/mL)			
CHLOROPHYLL-A (µg/L)			6.37
DOM. ZOOPLANKTON (% TOTAL)	#1	ACTINOPHRYS 50%	NAUPLIUS LARVA 30%
	#2	KERATELLA 20%	BOSMINA 16%
	#3	POLYARTHRA 20%	CONOCHILOIDES 15%
ROTIFERS/LITER		55	61
MICROCRUSTACEA/LITER		6	101
ZOOPLANKTON ABUNDANCE (#/L)		122	165
VASCULAR PLANT ABUNDANCE			Common
SECCHI DISK TRANSPARENCY (m)			3.6
BOTTOM DISSOLVED OXYGEN (mg/L)		8.7	0.2
BACTERIA (E. coli, #/100 ml)	#1		
	#2		
	#3		

SUMMER THERMAL STRATIFICATION:

stratified

Depth of thermocline (m): 2.4
Hypolimnion volume (m^3) : 19050
Anoxic volume (m^3) : 68600

CHEMICAL:

Lake: ZEPHYR LAKE
Town: GREENFIELD

	9 February 1999		27 July 1998		
DEPTH (m)	1.5	3.0	1.5	3.0	4.5
pH (units)	6.2	6.4	6.9	6.3	6.3
A.N.C. (Alkalinity)	6.1	9.1	5.8	7.3	12.1
NITRATE NITROGEN	0.16	0.23	< 0.05	< 0.05	0.06
TOTAL KJELDAHL NITROGEN	0.40	0.40	0.40	0.30	0.60
TOTAL PHOSPHORUS	0.003	0.006	0.009	0.006	0.014
CONDUCTIVITY (µmhos/cm)	92.2	114.1	93.5	90.2	106.5
APPARENT COLOR (cpu)	28	16	35	38	38
MAGNESIUM			0.69		
CALCIUM			3.7		
SODIUM			12.3		
POTASSIUM			0.69		
CHLORIDE	21	24	21	18	21
SULFATE	4	4	3	3	4
TN : TP	187	105	44	50	47
CALCITE SATURATION INDEX			3.1		

All results in mg/L unless indicated otherwise

TROPHIC CLASSIFICATION: 1998

D.O.	S.D.	PLANT	CHL	TOTAL	CLASS
4	2	3	1	10	Meso.

COMMENTS:

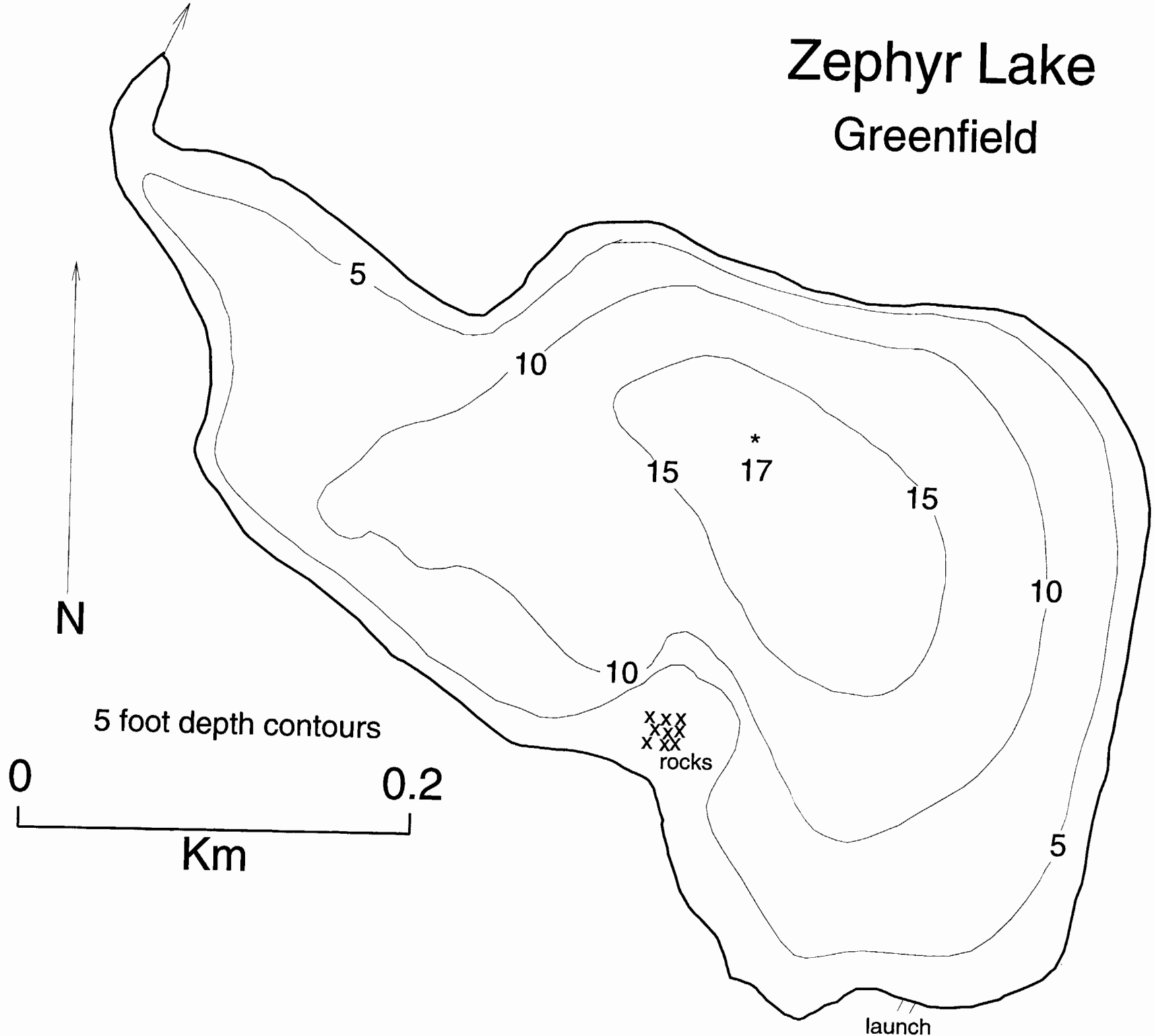
1. Zephyr Lake was previously surveyed and classified in 1980. There was no change in trophic class and little change in trophic quality between the two sampling dates separated by 18 years.

2. The lake has participated in VLAP since 1989. Trophic quality has been relatively stable over this time period with a slight improvement in total phosphorus.

3. 10 mph speed limit on the pond.

4. Sodium, chloride and conductivity values were somewhat elevated, indicating some road salt runoff.

5. Good dirt boat launch into shallow water was located next to the town beach.


Zephyr Lake
Greenfield
N
5
10
15
17
15
10
10
5
5 foot depth contours
0
0.2
Km
rocks
launch

FIELD DATA SHEET

LAKE: ZEPHYR LAKE
DATE: 07/27/1998

TOWN: GREENFIELD
WEATHER: SUNNY & BREEZY; 80s

	DEPTH (M)	TEMP (°C)	*DISSOLVED OXYGEN	OXYGEN SATURATION
	0.1	24.4	7.5	88 %
	0.5	24.0	7.5	87 %
	1.0	23.6	7.3	85 %
	1.5	23.4	7.2	84 %
	2.0	22.6	5.6	63 %
	2.5	19.5	2.3	25 %
	3.0	17.4	0.5	5 %
	3.5	15.8	0.1	1 %
	4.0	13.6	0.1	1 %
	4.5	13.6	0.1	1 %
	5.0	13.4	0.2	2 %

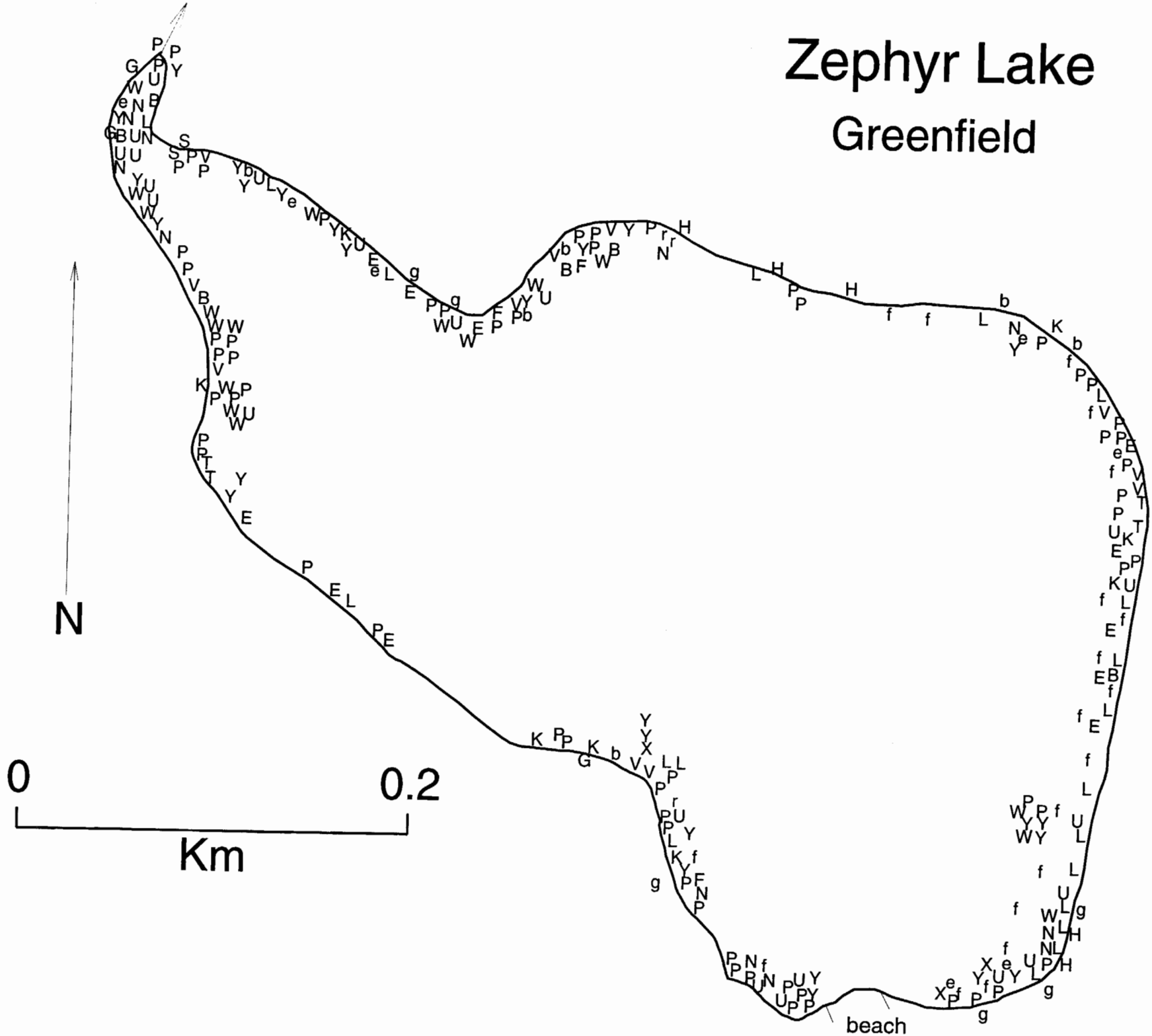
SECCHI DISK (m): 3.6
BOTTOM DEPTH (m): 5.2
TIME: 1100

COMMENTS:

*Dissolved oxygen values are in mg/L

Zephyr Lake

Greenfield



AQUATIC PLANT SURVEY

LAKE: ZEPHYR LAKE TOWN: GREENFIELD DATE: 07/27/1998

Key	PLANT NAME		ABUNDANCE
	GENERIC	COMMON	
G	Gramineae	Grass family	Sparse
S	Sparganium	Bur reed	Sparse
r	Eleocharis	Spike rush	Sparse
B	Brasenia schreberi	Water shield	Scattered
F	Nymphoides cordatum	Floating heart	Sparse
b	Scirpus	Bulrush	Sparse
g	Myrica gale	Sweet gale	Scattered
P	Pontederia cordata	Pickerelweed	Common
U	Utricularia	Bladderwort	Common
Y	Nuphar	Yellow water lily	Common
e	Elodea nuttallii	Waterweed	Sparse
X		Sterile thread-like leaf	Sparse
f		Filamentous algae	Common
L	Lobelia dortmanna	Water lobelia	Common
N	Nymphaea	White water lily	Scattered
W	Potamogeton natans	Floating-leaf pondweed	Scattered
H	Hypericum	St. John's-wort	Sparse
E	Eriocaulon septangulare	Pipewort	Sparse
K	Lysimachia terrestris	Swampcandle	Sparse
T	Typha	Cattail	Sparse
V	Scirpus validus	Softstem bulrush	Sparse

OVERALL ABUNDANCE: Common

GENERAL OBSERVATIONS:

1. Dense *Lobelia* growth occurred along the eastern shoreline.
2. Filamentous algae and algal mats were present along the entire bottom near the launch area and along the eastern shoreline.
3. The end of the outlet cove was non-navigable due to plant densities.
4. Large numbers of mussels were visible along the bottom, particularly along the eastern shore and in the outlet cove. Two painted turtles and a kingfisher were also observed.