DEPARTMENT of ENVIRONMENTAL SERVICES
Water Division - Watershed Management Bureau

LAKE TROPHIC DATA

MORPHOMETRIC:

Lake:	KNOWLES POND	Lake Area (ha):	24.28
Town:	NORTHFIELD	Maximum depth (m):	17.0
County:	Merrimack	Mean depth (m):	5.8
River Basin:	Merrimack	Volume (m^3):	1396500
Latitude:	43°25'42" N	Relative depth:	3.1
Longitude:	71°32'22" W	Shore configuration:	1.49
Elevation (ft):	746	Areal water load (m/yr):	3.24
Shore length (m):	2600	Flushing rate (yr^{-1}):	0.60
Watershed area (ha):	147.6	P retention coeff.:	0.73
% watershed ponded:	0.0	Lake type:	natural w/dam

BIOLOGICAL:		9 January 2001	17 July 2000
DOM. PHYTOPLANKTON (% TOTAL)	#1	DINOBRYON 90%	SYNURA 90%
	#2	ASTERIONELLA 7%	ANABAENA 7%
	#3		
PHYTOPLANKTON ABUNDANCE (units/mL)			
CHLOROPHYLL-A (μg/L)			2.32
DOM. ZOOPLANKTON (% TOTAL)	#1	ASPLANCHNA (36%)	KERATELLA 23%
	#2	POLYARTHRA (34%)	VORTICELLA 23%
	#3	KERATELLA (16%)	DAPHNIA 13%
ROTIFERS/LITER			78
MICROCRUSTACEA/LITER			29
ZOOPLANKTON ABUNDANCE (#/L)			146
VASCULAR PLANT ABUNDANCE			Scattered
SECCHI DISK TRANSPARENCY (m)			6.9
BOTTOM DISSOLVED OXYGEN (mg/L)		7.1	1.8
BACTERIA (E. coli, #/100 ml)	#1		< 1
	#2		1
	#3		

SUMMER THERMAL STRATIFICATION:

stratified

Depth of thermocline (m): 5.8
Hypolimnion volume (m^3) : 80750
Anoxic volume (m^3) : None

CHEMICAL:

Lake: KNOWLES POND
Town: NORTHFIELD

	9 January 2001		17 July 2000		
DEPTH (m)	6.0	12.0	2.5	8.0	15.0
pH (units)	6.3	6.0	6.6	6.4	6.0
A.N.C. (Alkalinity)	2.4	2.4	2.1	1.8	2.5
NITRATE NITROGEN	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TOTAL KJELDAHL NITROGEN	0.56	0.11	0.16	0.39	0.26
TOTAL PHOSPHORUS	0.006	0.006	<0.005	0.007	0.005
CONDUCTIVITY (µmhos/cm)	31.9	31.8	30.0	30.3	31.3
APPARENT COLOR (cpu)	5	5	< 5	< 5	8
MAGNESIUM			0.57		
CALCIUM			1.0		
SODIUM			3.2		
POTASSIUM			< 0.40		
CHLORIDE	6	5	4	4	4
SULFATE	3	3	4	3	4
TN : TP	93	18		56	52
CALCITE SATURATION INDEX					

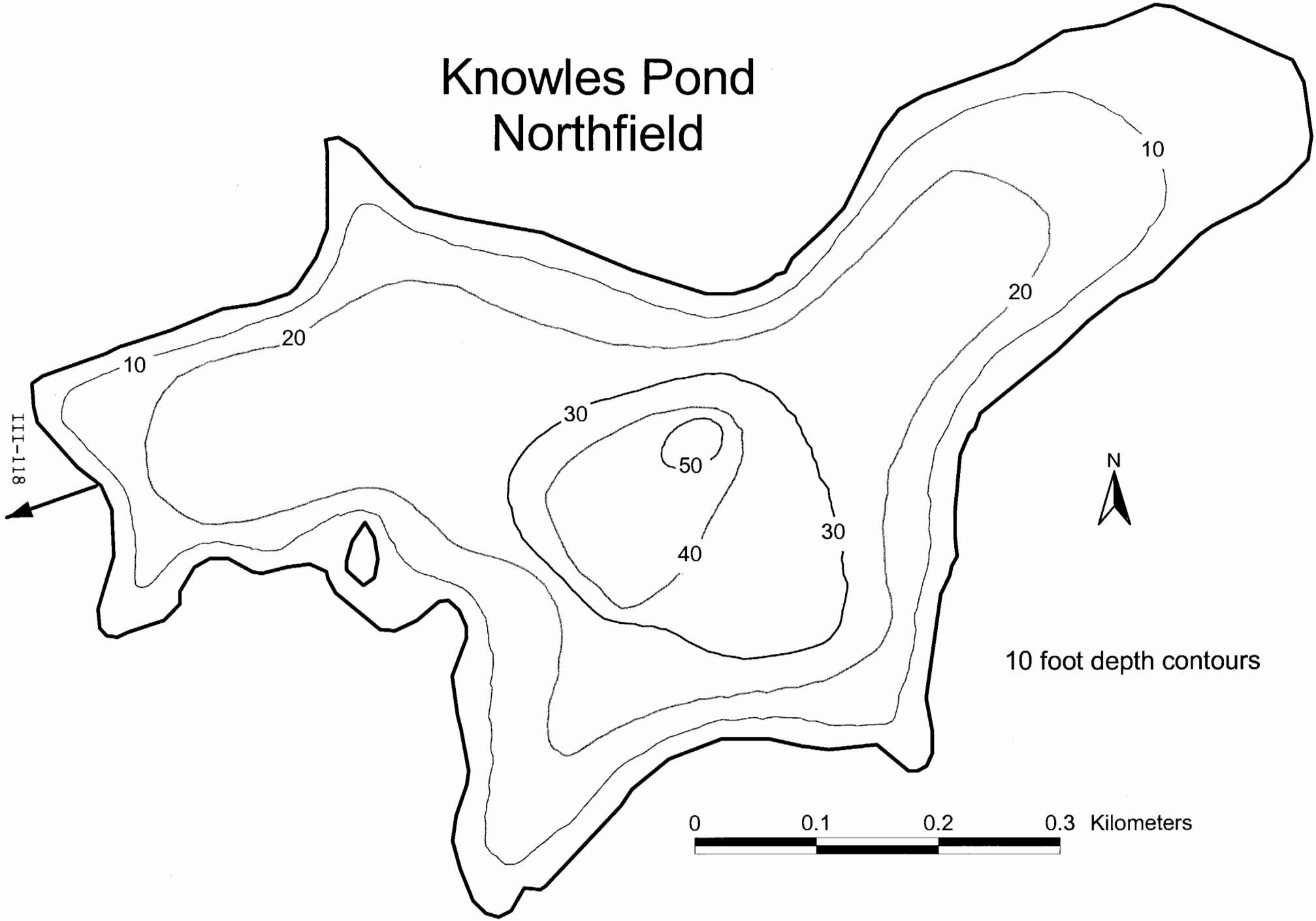
All results in mg/L unless indicated otherwise

TROPHIC CLASSIFICATION: 2000

D.O.	S.D.	PLANT	CHL	TOTAL	CLASS
1	1	1	0	3	Oligo.

COMMENTS:

1. Formerly a public water supply for the Town of Northfield.
2. No motors allowed.
3. Shoreline completely undeveloped.
4. The blue-green alga *Anabaena* was the second dominant net phytoplanter during the summer – but was not in nuisance amounts.


Knowles Pond
Northfield
10
20
30
40
50
N
10 foot depth contours
0
0.1
0.2
0.3
Kilometers

FIELD DATA SHEET

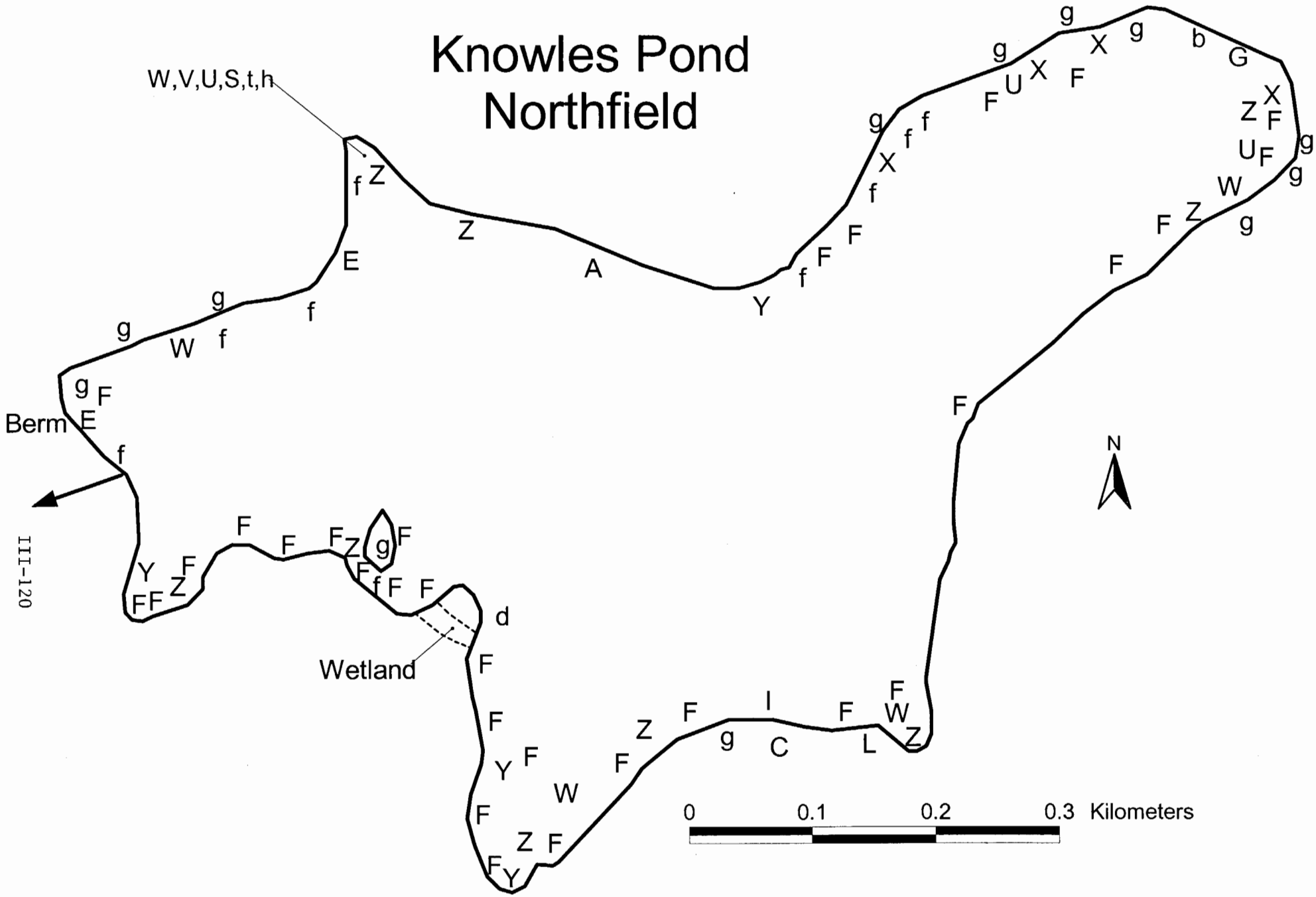
LAKE: KNOWLES POND TOWN: NORTHFIELD
DATE: 07/17/2000 WEATHER: overcast; calm

	DEPTH (M)	TEMP (°C)	*DISSOLVED OXYGEN	OXYGEN SATURATION
	0.1	22.2	8.3	94 %
	1.0	22.2	8.4	95 %
	2.0	22.1	8.4	95 %
	3.0	22.1	8.3	94 %
	4.0	22.0	8.3	94 %
	5.0	21.8	8.4	94 %
	6.0	18.5	12.1	128 %
	7.0	16.4	12.3	124 %
	8.0	14.0	11.9	113 %
	9.0	12.0	11.5	106 %
	10.0	10.3	10.3	91 %
	11.0	9.3	8.4	72 %
	12.0	8.6	6.4	54 %
	13.0	8.2	4.7	39 %
	14.0	8.0	2.7	22 %
	15.0	7.8	1.9	15 %
	16.0	7.8	1.7	14 %
	16.5	7.8	1.8	15 %

SECCHI DISK (m): 6.9 COMMENTS:
BOTTOM DEPTH (m): 16.9
TIME: 1200

*Dissolved oxygen values are in mg/L

Knowles Pond
Northfield



AQUATIC PLANT SURVEY

LAKE: KNOWLES POND TOWN: NORTHFIELD DATE: 07/17/2000

Key	PLANT NAME		ABUNDANCE
	GENERIC	COMMON	
g	Myrica gale	Sweet gale	Common
F	Nymphoides cordatum	Floating heart	Scattered
X		Bottom growth	Scattered
Z		Broad-leaf bottom growth	Scattered
G	Gramineae	Grass family	Sparse
b	Scirpus	Bulrush	Sparse
f		Filamentous algae	Scattered
U	Utricularia	Bladderwort	Scattered
Y	Nuphar	Yellow water lily	Sparse
A	Sagittaria	Arrowhead	Sparse
W	Potamogeton	Pondweed	Sparse
S	Sparganium	Bur reed	Sparse
V	Vallisneria americana	Tape grass	Sparse
h	Sphagnum	Peat moss	Sparse
t		Sterile thread-like leaf	Sparse
E	Eriocaulon septangulare	Pipewort	Sparse
d	Dulichium arundinaceum	Three-way sedge	Sparse
I	Iris	Iris	Sparse
C	Vaccinium corymbosum	High-bush blueberry	Scattered
L	Kalmia	Laurel	Scattered

OVERALL ABUNDANCE: Scattered

GENERAL OBSERVATIONS:

1. Pond was surrounded by woody shrubs – e.g., sweet gale, blueberry, laurel, etc.
2. Freshwater sponges were common.
3. Floating heart was around much of the shoreline but its sparse growth habit gave it a scattered rating.
4. Two adult loons and two chicks were observed.