

**DISPLAY
ONLY**

ISSN 1366-7300



**ENVIRONMENTAL CHANGE
RESEARCH CENTRE**

University College London

RESEARCH REPORT

No. 15

Integrated classification and assessment of lakes in

Wales: Phase II

Editor: D.T. Monteith

A Preliminary Data Report to the Countryside Council for Wales under
Contract No: FC 73-01-13

March 1995

**Environmental Change Research Centre
University College London
26 Bedford Way
London
WC1H 0AP**

Table of Contents

Page

Introduction	1
List of Contributors	
Site information Table	2
List of site specific data Tables:	
1.1 Bugeilyn: water chemistry	3
1.2 Bugeilyn: aquatic macrophyte abundance summary	5
1.3 Bugeilyn: epilithic diatom summary	7
1.4 Bugeilyn: zooplankton abundance summary	8
1.5 Bugeilyn: zooplankton characteristics	8
1.6 Bugeilyn: littoral macroinvertebrate summary	9
2.1 Llyn Eiddwen: water chemistry	10
2.2 Llyn Eiddwen: aquatic macrophyte abundance summary	12
2.3 Llyn Eiddwen: epilithic diatom summary	14
2.4 Llyn Eiddwen: zooplankton abundance summary	15
2.5 Llyn Eiddwen: zooplankton characteristics	15
2.6 Llyn Eiddwen: littoral macroinvertebrate summary	16
3.1 Llyn Fanod: water chemistry	17
3.2 Llyn Fanod: aquatic macrophyte abundance summary	19
3.3 Llyn Fanod: epilithic diatom summary	21
3.4 Llyn Fanod: zooplankton abundance summary	22
3.5 Llyn Fanod: zooplankton characteristics	22
3.6 Llyn Fanod: littoral macroinvertebrate summary	23
4.1 Llyn Glanmerin: water chemistry	24
4.2 Llyn Glanmerin: aquatic macrophyte abundance summary	26
4.3 Llyn Glanmerin: epilithic diatom summary	28
4.4 Llyn Glanmerin: zooplankton abundance summary	29
4.5 Llyn Glanmerin: zooplankton characteristics	29
4.6 Llyn Glanmerin: littoral macroinvertebrate summary	30
5.1 Llyn Gynon: water chemistry	31
5.2 Llyn Gynon: aquatic macrophyte abundance summary	33
5.3 Llyn Gynon: epilithic diatom summary	35
5.4 Llyn Gynon: zooplankton abundance summary	36
5.5 Llyn Gynon: zooplankton characteristics	36
5.6 Llyn Gynon: littoral macroinvertebrate summary	37
6.1 Llyn Hir: water chemistry	39
6.2 Llyn Hir: aquatic macrophyte abundance summary	41
6.3 Llyn Hir: epilithic diatom summary	43
6.4 Llyn Hir: zooplankton abundance summary	44
6.5 Llyn Hir: zooplankton characteristics	44
6.6 Llyn Hir: littoral macroinvertebrate summary	45

7.1	Llynnoedd Ieuan (West Lake): water chemistry	46
7.2	Llynnoedd Ieuan (West Lake): aquatic macrophyte abundance summary	48
7.3	Llynnoedd Ieuan (West Lake): epilithic diatom summary	50
7.4	Llynnoedd Ieuan (West Lake): zooplankton abundance summary	51
7.5	Llynnoedd Ieuan (West Lake): zooplankton characteristics	51
7.6	Llynnoedd Ieuan (West Lake): littoral macroinvertebrate summary	52
8.1	Maes-llyn: water chemistry	53
8.2	Maes-llyn: aquatic macrophyte abundance summary	55
8.3	Maes-llyn: epilithic diatom summary	57
8.4	Maes-llyn: zooplankton abundance summary	58
8.5	Maes-llyn: zooplankton characteristics	58
8.6	Maes-llyn: littoral macroinvertebrate summary	59
9.1	Upper Talley Lake: water chemistry	60
9.2	Upper Talley Lake: aquatic macrophyte abundance summary	62
9.3	Upper Talley Lake: epilithic diatom summary	64
9.4	Upper Talley Lake: zooplankton abundance summary	65
9.5	Upper Talley Lake: zooplankton characteristics	65
9.6	Upper Talley Lake: littoral macroinvertebrate summary	66-67
10.1	Lower Talley Lake: water chemistry	68
10.2	Lower Talley Lake: aquatic macrophyte abundance summary	70
10.3	Lower Talley Lake: epilithic diatom summary	72
10.4	Lower Talley Lake: zooplankton abundance summary	73
10.5	Lower Talley Lake: zooplankton characteristics	73
10.6	Lower Talley Lake: littoral macroinvertebrate summary	74

List of Figures:

1.1	Bugeilyn: Temperature and oxygen profiles	4
1.2	Bugeilyn: Aquatic macrophyte distribution map	6
2.1	Llyn Eiddwen: Temperature and oxygen profiles	11
2.2	Llyn Eiddwen: Aquatic macrophyte distribution map	13
3.1	Llyn Fanod: Temperature and oxygen profiles	18
3.2	Llyn Fanod: Aquatic macrophyte distribution map	20
4.1	Llyn Glanmerin: Temperature and oxygen profiles	25
4.2	Llyn Glanmerin: Aquatic macrophyte distribution map	26
5.1	Llyn Gynon: Temperature and oxygen profiles	32
5.2	Llyn Gynon: Aquatic macrophyte distribution map	34
6.1	Llyn Hir: Temperature and oxygen profiles	40
6.2	Llyn Hir: Aquatic macrophyte distribution map	42
7.1	Llynnoedd Ieuan (West Lake): Temperature and oxygen profiles	47
7.2	Llynnoedd Ieuan (West Lake): Aquatic macrophyte distribution map	47
8.1	Maes-llyn: Temperature and oxygen profiles	54
8.2	Maes-llyn: Aquatic macrophyte distribution map	56
9.1	Upper Talley Lake: Temperature and oxygen profiles	61
9.2	Upper Talley Lake: Aquatic macrophyte distribution map	63
10.1	Lower Talley Lake: Temperature and oxygen profiles	69
10.2	Lower Talley Lake: Aquatic macrophyte distribution map	71

Introduction

This report presents preliminary data from the second phase of the study on integrated classification and assessment of lakes in Wales. The classification and assessment project is described in detail by Allott *et al.* (1994).

Ten lakes, listed on the following page are in the process of assessment. The report includes data on water chemistry and physical variables, aquatic macrophyte distribution maps, and species lists of aquatic macrophytes, epilithic diatoms, open water zooplankton and littoral macroinvertebrates. Methodologies follow those given by Allott *et al.* (1994).

A second report in July 1995 will incorporate further site specific information, including full site descriptions, sampling site information, and additional chemistry, littoral cladoceran and surface sediment diatom data. Further development of classification techniques will require a minimum of thirty lake integrated data sets.

List of Contributors

Allott, T.E.H.	Environmental Change Research Centre, University College London.
Bennion, H.	Environmental Change Research Centre, University College London.
Carvalho, L.	Environmental Change Research Centre, University College London.
Duigan, C.A.	Countryside Council for Wales, Bangor.
Harriman, R.	Freshwater Fisheries Laboratory, Pitlochry.
Kirika, A.	Institute of Freshwater Ecology, Penicuik.
Lancaster, J.	School of Biological Sciences, Queen Mary and Westfield College.
Monteith, D.T.	Environmental Change Research Centre, University College London.
Patrick, S.T.	Environmental Change Research Centre, University College London.
Seda, M.	Department of Biology, Royal Holloway and Bedford New College.

Reference

Allott, T.E.H., Monteith, D.T., Patrick, S.T., Duigan, C.A., Lancaster, J., Seda, M., Kirika, A., Bennion, H. & Harriman, R. (1994). Integrated Classification and Assessment of Lakes in Wales: Phase I. A Final Report to the Countryside Council for Wales under Contract No. FC 73-01-71. Research Paper No.6, Environmental Change Research Centre.

Site information for lakes in the process of assessment under Phase II

Site name	Grid reference	Lake catchment area (ha)	Lake altitude (m)	Lake area (ha)	Lake maximum depth (m)	Lake mean depth (m)	Approximate lake volume (10 ³ m ³)
Bugeilyn	SN 822923	143	455	9	2.1	1.9	171
Llyn Eiddwen	SN 605670	45	305	10	7.2	2.6	260
Llyn Fanod	SN 603643	40	310	5	8.7	3.8	190
Llyn Gŵlanmerin	SN 755991	36	195	3	3.1	1.6	48
Llyn Gynon	SN 800647	225	425	25	11	2.1	525
Llyn Hir	SN 789677	22	435	5	8.8	2.8	140
Llynnoedd Ieuan (West Lake)	SN 795815	12	525	4	8.7	3.9	156
Maes-Llyn	SN 693628	59	180	3	5.5	2.7	81
Upper Talley Lake	SN 632337	166	105	10	4.3	1.9	190
Lower Talley Lake	SN 633332	37	105	5	4.3	1.9	95

Table 1.1 Bugeilyn water chemistry

Determinand	Sample				
	26-7-94	23-9-94	1-12-94	3-95	mean
lab pH	5.42	5.14	5.44		
field pH	5.75		5.84		
Alkalinity 1 $\mu\text{eq l}^{-1}$	14	6	20		
Alkalinity 2 $\mu\text{eq l}^{-1}$	6	-2	16		
lab Conductivity $\mu\text{S cm}^{-1}$	30	30	30		
field conductivity $\mu\text{S cm}^{-1}$	32		28		
Sodium $\mu\text{eq l}^{-1}$	147	141	134		
Potassium $\mu\text{eq l}^{-1}$	7	4	5		
Magnesium $\mu\text{eq l}^{-1}$	62	56	58		
Calcium $\mu\text{eq l}^{-1}$	58	59	71		
Chloride $\mu\text{eq l}^{-1}$	136	122	113		
Aluminium total monomeric $\mu\text{g l}^{-1}$	62	100	86		
Aluminium non-labile $\mu\text{g l}^{-1}$	53	77	64		
Aluminium labile $\mu\text{g l}^{-1}$	9	23	22		
Absorbtion (250nm)	0.351	0.448	0.346		
Carbon total organic mg l^{-1}	4.1	5.8			
Phosphorus total $\mu\text{gP l}^{-1}$	26.3	13.1	19.5		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	16.2	7.9	14.6		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	7.9	4	10.8		
Nitrate $\mu\text{gN l}^{-1}$	35				
Silica total $\mu\text{g l}^{-1}$	0.58	1.78			
Silica soluble reactive mg l^{-1}	0.23	1.77	4.29		
Chlorophyll a $\mu\text{g l}^{-1}$	6.8	3.4	1.2		
Sulphate $\mu\text{eq l}^{-1}$	71	60	62		
Copper total soluble $\mu\text{g l}^{-1}$	154	0			
Iron total soluble $\mu\text{g l}^{-1}$	1535	358			
Lead total soluble $\mu\text{g l}^{-1}$	12	0			
Manganese total soluble $\mu\text{g l}^{-1}$	41	42			
Zinc total soluble $\mu\text{g l}^{-1}$	15	11			

Figure 1.1 Bugeilyn Temperature and oxygen profiles: 27-7-94

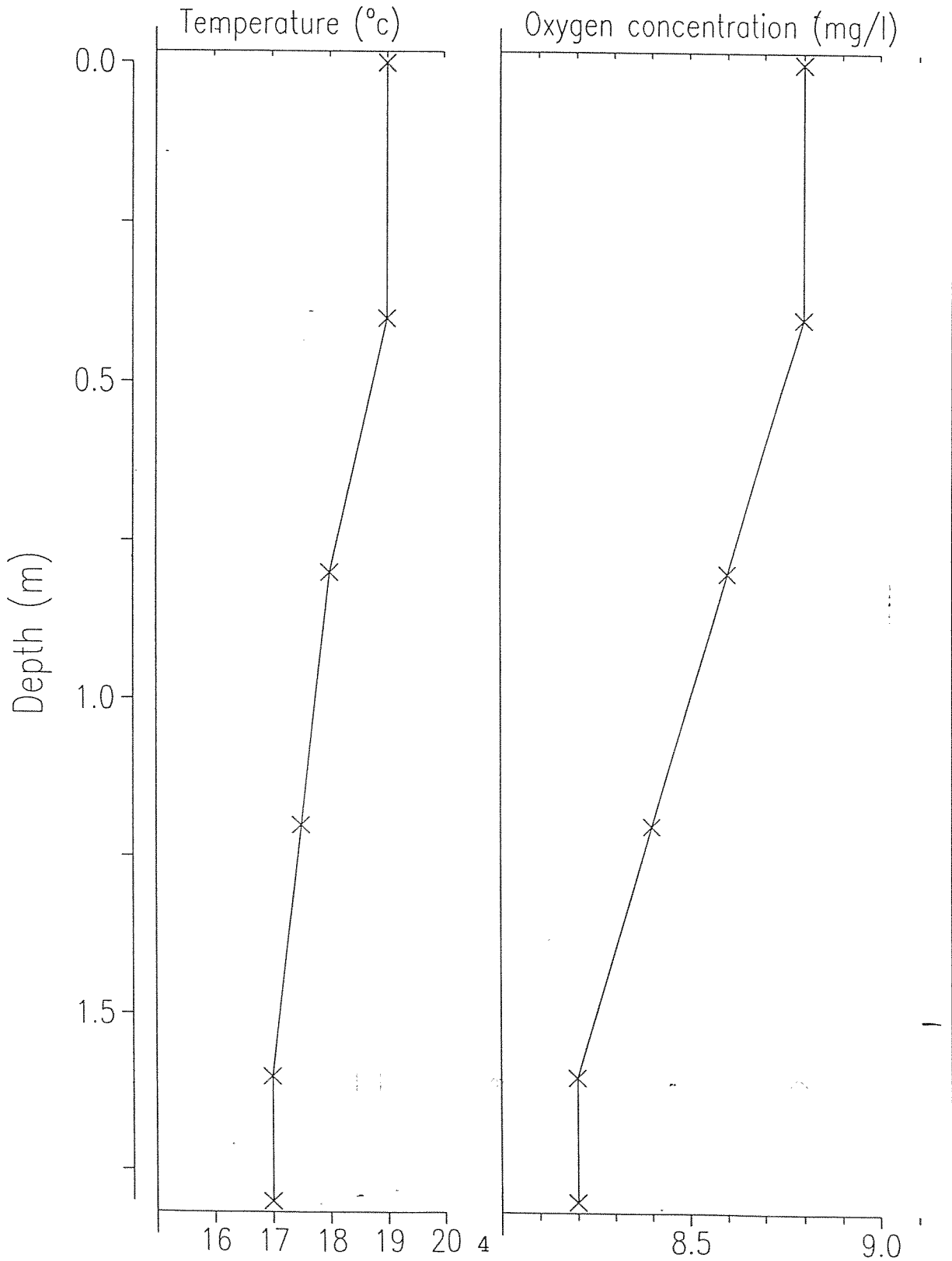


Table 1.2 Bugeilyn aquatic macrophyte abundance summary: 27-7-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Equisetum fluviatile</i>	350202	O	Locally frequent
<i>Menyanthes trifoliata</i>	364701	R	
<i>Carex rostrata</i>	381129	F	
Floating taxa			
<i>Nuphar lutea</i>	365501	F	
<i>Luronium natans</i>		O	
<i>Potamogeton polygonifolius</i>	384017	F	
<i>Callitriche (sp. 1 stagnalis?)</i>	361100	R	
<i>Sparganium angustifolium</i>	384601	A	
Submergent taxa			
Filamentous green algae 1	170000	R	
Filamentous green algae 2	170000	O	
<i>Nardia compressa</i>	343701	A	
<i>Utricularia minor</i>	369600	F	
<i>Callitriche hamulata</i>	361103	O	
<i>Littorella uniflora</i>	363901	A	
<i>Luronium natans</i>		O	
<i>Juncus bulbosus var. fluitans</i>	383006	O	
Fringing taxa			
<i>Hydrococotyle vulgaris</i>	363401	A	
<i>Juncus effusus</i>	383010	A	
<i>Juncus articulatus</i>	383003		
<i>Sphagnum sp.</i>	327400		

Figure 1.2 BUGEILYN: aquatic macrophyte distribution map 27/7/1994

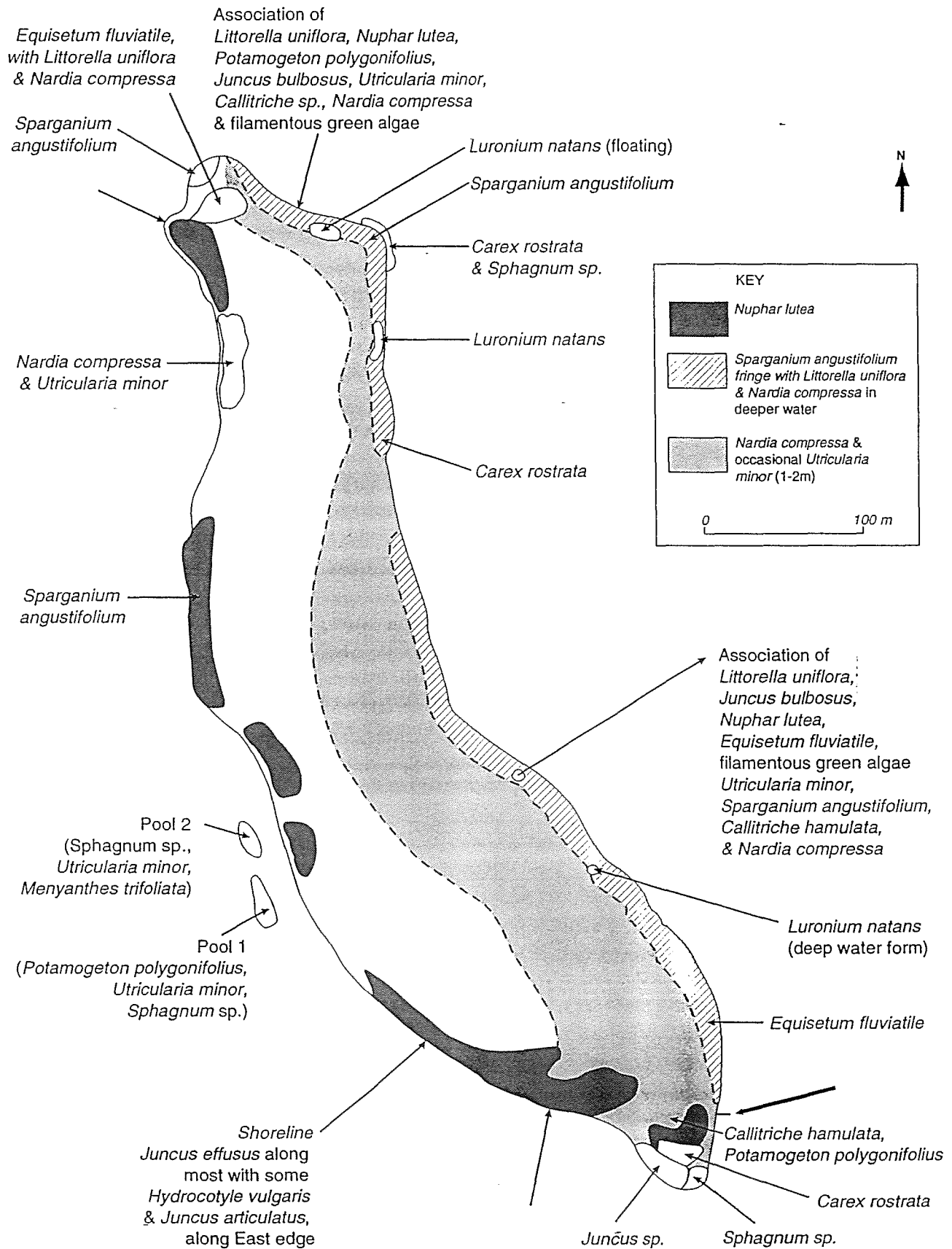


Table 1.3 Llyn Bugeilyn epilithic diatom summary
 Mean percentage taxon abundance of three samples

TAXON	Mean abundance
<i>Achnanthes</i> sp.	1.6
<i>Aulacoseira distans</i> var. <i>nivalis</i>	1.6
<i>Aulacoseira perglabra</i>	1.1
<i>Cymbella microcephala</i> var. <i>microcephala</i>	1.0
<i>Cymbella perpusilla</i>	2.8
<i>Eunotia exigua</i> var. <i>exigua</i>	1.4
<i>Eunotia incisa</i>	69.7
<i>Eunotia naegelii</i>	1.9
<i>Eunotia pectinalis</i> var. <i>minor</i>	1.2
<i>Eunotia rhomboidea</i>	3.2
<i>Fragilaria pinnata</i> var. <i>pinnata</i>	1.8
<i>Frustulia rhomboides</i> var. <i>saxonica</i>	1.9
<i>Frustulia rhomboides</i> var. <i>viridula</i>	2.7
<i>Navicula cumbriensis</i> var. <i>minor</i>	1.3
<i>Navicula mediocris</i>	1.7
<i>Navicula ventralis</i>	1.5
<i>Nitzschia gracilis</i>	1.5
<i>Nitzschia palea</i> var. <i>palea</i>	1.5
<i>Tabellaria flocculosa</i> var. <i>flocculosa</i>	2.3

Table 1.4 Bugeilyn zooplankton abundance summary: 27-7-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Diaphanosoma brachyurum</i>	2100
<i>Eubosmina longispina</i>	570
<i>Ceriodaphnia quadrangula</i>	X
<i>Eurycerus lamellatus</i>	X
<i>Polyphemus pediculus</i>	X
<i>Cyclops abyssorum</i>	X
<i>Holopedium gibberum</i>	140

X = rare species with relative abundance below 1%
 x = very rare species found at one site only

Table 1.5 Bugeilyn zooplankton characteristics

Site depth (m)	1.8
Total zooplankton biomass excluding Chaoborus larvae (g DW m ⁻²)	1.09
Chaoborus larvae biomass (g DW m ⁻²)	0
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	96
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	19
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	2

Table 1.6

Bugeilyn littoral macroinvertebrate summary
Mean number of individuals per sample

code	Taxon	mean count/ sample
	TURBELLARIA	
03120000	Tricladida	2.8
	HIRUDINAE	
17040102	<i>Erpobdella octoculata</i>	1.2
	EPHEMEROPTERA	
30040100	<i>Leptophlebia</i> sp.	398.4
	PLECOPTERA	
31020401	<i>Nemoura cinerea</i>	0.4
31030104	<i>Leuctra nigra</i>	0.4
	HEMIPTERA	
33110000	Corixidae sp.	6.8
33110801	<i>Sigara dorsalis</i>	0.4
33110807	<i>Sigara scotti</i>	0.8
	COLEOPTERA	
35030000	Dytiscidae undet. (larvae)	1.2
35110600	<i>Oulimnius</i> sp.	3.2
	MEGALOPTERA	
36010101	<i>Sialis lutaria</i>	23.6
	TRICHOPTERA	
38030301	<i>Polycentropus flavomacula</i>	40.8
38030401	<i>Holocentropus dubius</i>	0.8
38060600	<i>Oxyethira</i> sp.	0.4
38070400	<i>Agrypnia</i> sp.	2.4
38080500	<i>Limnephilus</i> sp.	6.8
38081901	<i>Chaetopteryx villosa</i>	1.2
38120203	<i>Mystacides longicornis</i>	54.4
38130201	<i>Silo pallipes</i>	2.4
38150101	<i>Sericostoma personatum</i>	10.4
	DIPTERA	
40090000	Chironomidae	656.8

Table 2.1 Llyn Eiddwen water chemistry

Determinand	Sample				
	27-7-94	21-9-94	2-12-94	3-95	mean
lab pH	6.41	6.73	6.76		
field pH	6.72		6.85		
Alkalinity 1 $\mu\text{eq l}^{-1}$	95	100	91		
Alkalinity 2 $\mu\text{eq l}^{-1}$	89	97	86		
lab Conductivity $\mu\text{S cm}^{-1}$	61	60	59		
field Conductivity $\mu\text{S cm}^{-1}$	58		60		
Sodium $\mu\text{eq l}^{-1}$	297	296	273		
Potassium $\mu\text{eq l}^{-1}$	14	14	18		
Magnesium $\mu\text{eq l}^{-1}$	131	131	120		
Calcium $\mu\text{eq l}^{-1}$	173	178	168		
Chloride $\mu\text{eq l}^{-1}$	316	307	284		
Aluminium total monomeric $\mu\text{g l}^{-1}$	1	2	8		
Aluminium non-labile $\mu\text{g l}^{-1}$	0	2	8		
Aluminium labile $\mu\text{g l}^{-1}$	1	0	0		
Absorbtion (250nm)	0.189	0.250	0.305		
Carbon total organic mg l^{-1}	4.3	5.5			
Phosphorus total $\mu\text{gP l}^{-1}$	22.7	14.9	19.8		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	11.9	9.2	13.3		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	2.2	3.4	1.9		
Nitrate $\mu\text{gN l}^{-1}$	28				
Silica total $\mu\text{g l}^{-1}$	1.43	1.71			
Silica soluble reactive mg l^{-1}					
Chlorophyll a $\mu\text{g l}^{-1}$	5.3	3.6	4.5		
Sulphate $\mu\text{eq l}^{-1}$	112	90	83		
Copper total soluble $\mu\text{g l}^{-1}$	0	0			
Iron total soluble $\mu\text{g l}^{-1}$	51	118			
Lead total soluble $\mu\text{g l}^{-1}$	0	4			
Manganese total soluble $\mu\text{g l}^{-1}$	22	19			
Zinc total soluble $\mu\text{g l}^{-1}$	9	9			

Figure 2.1 Llyn Eiddwen Temperature and oxygen profiles 31-7-94

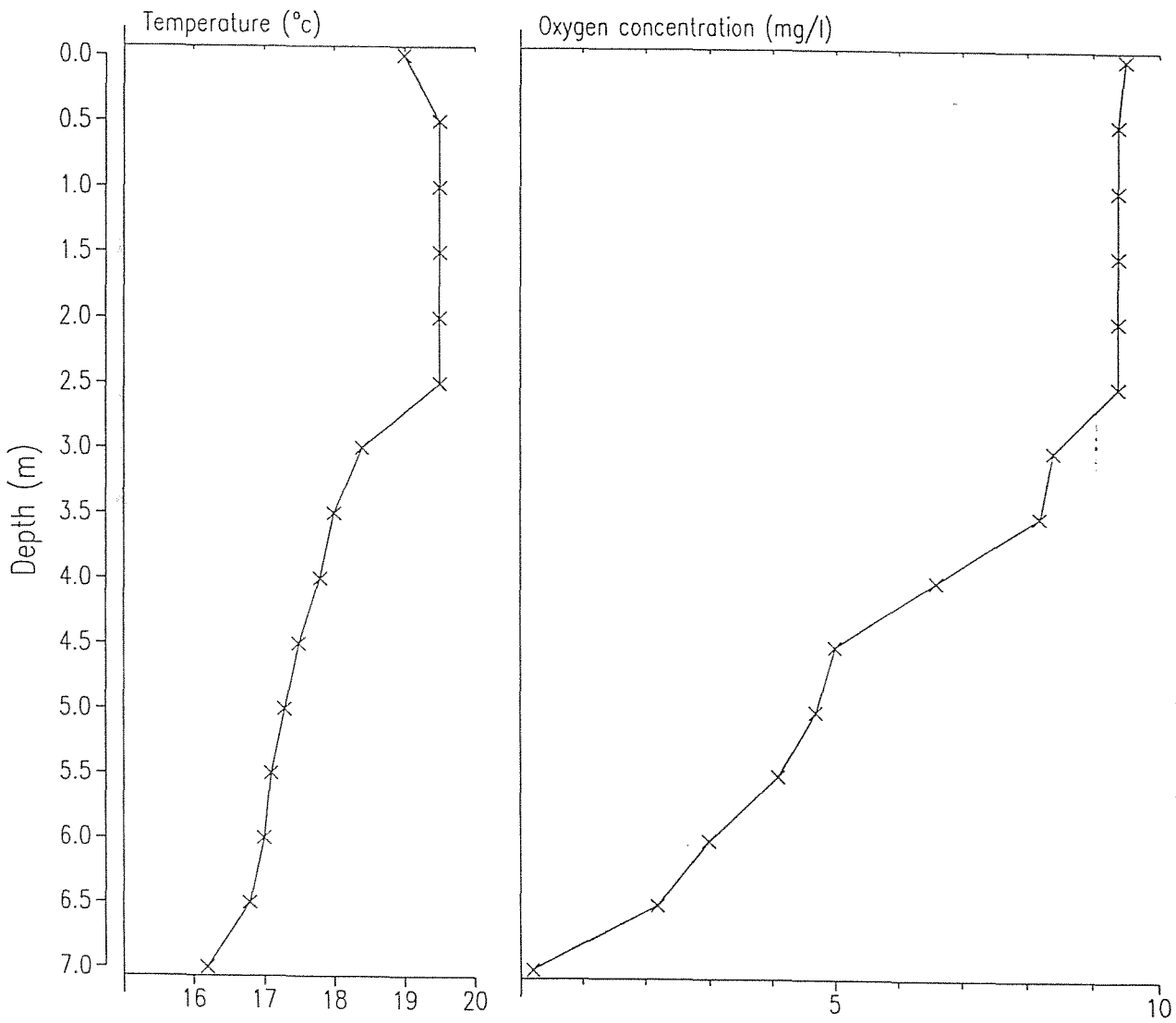


Table 2.2 Llyn Eiddwen aquatic macrophyte abundance summary: 31-7-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Equisetum fluviatile</i>	350202	F	locally abundant
<i>Menyanthes trifoliata</i>	364701	F	
<i>Carex rostrata</i>	381129	F	
<i>Equisetum palustre</i>	350200	R	
Floating taxa			
<i>Luronium natans</i>		O	
<i>Potamogeton natans</i>	384012	O	locally frequent
<i>Potamogeton polygonifolius</i>	384017	O	locally frequent
Submergent taxa			
Blue green alga (sp. 1)	100000	A	
<i>Nitella</i> sp.	220000	A	
<i>Fontinalis</i> sp.	234010	O	
<i>Luronium natans</i>		R	abundance perhaps underestimated
<i>Isoetes lacustris</i>	350302	F	
<i>Callitriche hamulata</i>	361103	A	
<i>Littorella uniflora</i>	363901	A	generally above the shoreline
<i>Lobelia dortmanna</i>	364001	A	
<i>Subularia aquatica</i>	368701	O	
Fringing taxa			
<i>Juncus articulatus</i>			
<i>Juncus effusus</i>			
<i>Eriophorum angustifolium</i>			
<i>Hydrocotyle vulgaris</i>			
<i>Hypericum elodes</i>			
<i>Myosotis secunda</i>			
<i>Potentilla palustris</i>			
<i>Galium palustre</i>			
<i>Sphagnum</i> sp.			
<i>Polytrichum</i> sp.			

Figure 2.2 EIDDWEN: aquatic macrophyte distribution map 31/7/1994

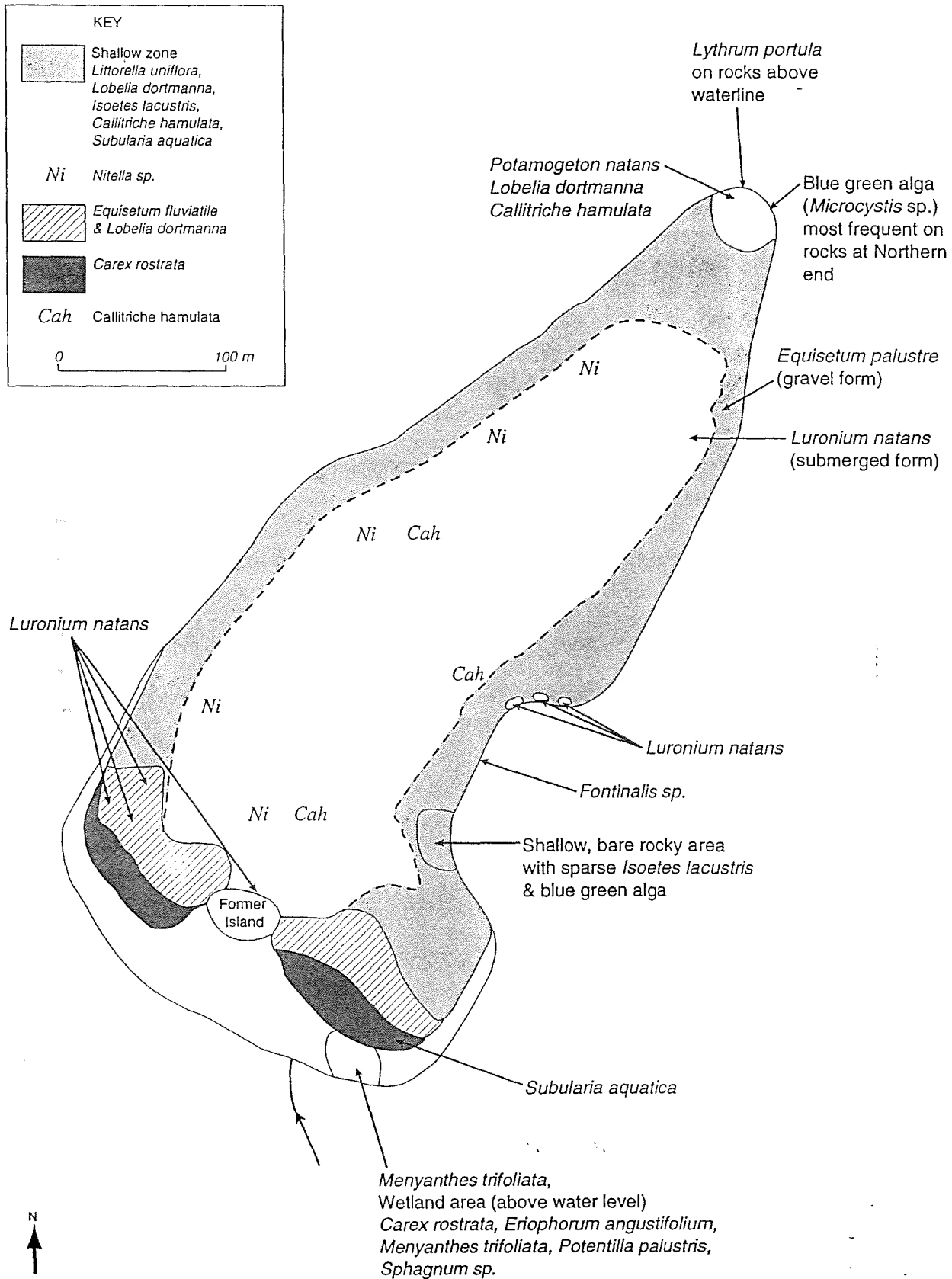


Table 2.3 Llyn Eiddwen epilithic diatom summary
 Mean percentage taxon abundance of three samples

TAXON	mean abundance
<i>Achnanthes didyma</i> var. <i>didyma</i>	1.8
<i>Achnanthes levanderi</i>	41.2
<i>Achnanthes minutissima</i> var. <i>minutissima</i>	5.7
<i>Achnanthes</i> sp.	1.3
<i>Cymbella lunata</i>	1.3
<i>Fragilaria construens</i> var. <i>venter</i>	4.8
<i>Fragilaria</i> sp.	1.9
<i>Fragilaria virescens</i> var. <i>exigua</i>	3.3
<i>Navicula pseudoscutiformis</i>	6.4
<i>Navicula radiosa</i> var. <i>radiosa</i>	2.3
<i>Navicula radiosa</i> var. <i>tenella</i>	3.1
<i>Nitzschia perminuta</i>	4.4
<i>Synedra acus</i> var. <i>acus</i>	7.7
<i>Synedra minuscula</i>	7.0
<i>Tabellaria flocculosa</i> var. <i>flocculosa</i>	5.4

Table 2.4 Llyn Eiddwen zooplankton abundance summary: 31-7-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Eudiaptomus gracilis</i>	640
<i>Eubosmina longispina</i>	19500
<i>Macrocyclops albidus</i>	x
<i>Cyclops abyssorum</i>	90
Other planktonic organisms (not quantitatively sampled)	
<i>Conochilus</i> sp.	2500
<i>Volvox</i> sp.	50
<i>Kellicottia longispina</i>	12500
<i>Nauplia</i>	50

X = rare species with relative abundance below 1%

x = very rare species found at one site only

Table 2.5 Zooplankton characteristics for Llyn Eiddwen

Site depth (m)	6.2
Total zooplankton biomass excluding Chaoborus larvae (g DW m ⁻²)	1.62
Chaoborus larvae biomass (g DW m ⁻²)	0
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	38
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	0
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	4

Table 2.6 Llyn Eiddwen littoral macroinvertebrate summary
Mean number of individuals per sample

code	Taxon	mean count/sample
	TURBELLARIA	
03120000	Tricladida	10.8
	MOLLUSCA	
13070107	<i>Lymnaea peregra</i>	4.8
13090312	<i>Planorbis laevis</i>	3.2
	BIVALVIA	
14030200	<i>Pisidium</i> sp.	356.8
	HIRUDINIA	
17020302	<i>Glossiphonia complanata</i>	0.8
17020501	<i>Helobdella stagnalis</i>	0.4
17030101	<i>Haemopsis sanguisuga</i>	0.4
17040102	<i>Erpobdella octoculata</i>	9.2
	EPHEMEROPTERA	
30020000	Baetidae	4.8
30020302	<i>Cloeon simile</i>	1.6
30040100	<i>Leptophlebia</i> sp.	44.4
30080204	<i>Caenis horaria</i>	130.8
30080206	<i>Caenis luctuosa</i>	121.2
	HEMIPTERA	
33110000	Corixidae sp.	6
33110801	<i>Sigara dorsalis</i>	5.2
33110807	<i>Sigara scotti</i>	19.2
	COLEOPTERA	
35030000	Dytiscidae undet. (larvae	0.4
35030706	<i>Stictotarsus duodecimpustulatus</i>	0.4
35110600	<i>Oulimnius</i> sp.	38
	MEGALOPTERA	
36010101	<i>Stalis lutaria</i>	1.2
	TRICHOPTERA	
38030301	<i>Polycentropus flavomaculatus</i>	63.6
38040201	<i>Tinodes waeneri</i>	22.4
38060300	<i>Hydroptila</i> sp.	24
38070400	<i>Agrypnia</i> sp.	1.2
38080500	<i>Limnephilus</i> sp.	8.4
38080510	<i>Limnephilus lanatus</i>	12.4
38080523	<i>Limnephilus vittatus</i>	23.2
38120000	Leptoceridae sp.	1.6
38150101	<i>Sericostoma personatum</i>	5.6
	DIPTERA	
40010000	Tipulidae	0.8
40080000	Ceratopogonidae	0.4
40090000	Chironomidae	503.6

Table 3.1 Llyn Fanod water chemistry

Determinand	Sample				
	27-7-94	21-9-94	2-12-94	3-95	mean
lab pH	6.69	6.81	6.80	-	
field pH	7.05		8.06		
Alkalinity 1 $\mu\text{eq l}^{-1}$	125	122	112		
Alkalinity 2 $\mu\text{eq l}^{-1}$	119	117	108		
lab Conductivity $\mu\text{S cm}^{-1}$	58	59	57		
field Conductivity $\mu\text{S cm}^{-1}$	58		54		
Sodium $\mu\text{eq l}^{-1}$	249	253	236		
Potassium $\mu\text{eq l}^{-1}$	13	12	16		
Magnesium $\mu\text{eq l}^{-1}$	129	134	126		
Calcium $\mu\text{eq l}^{-1}$	199	205	194		
Chloride $\mu\text{eq l}^{-1}$	272	262	248		
Aluminium total monomeric $\mu\text{g l}^{-1}$	0	5	10		
Aluminium non-labile $\mu\text{g l}^{-1}$	0	5	10		
Aluminium labile $\mu\text{g l}^{-1}$	0	0	0		
Absorbtion (250nm)	0.194	0.309	0.378		
Carbon total organic mg l^{-1}	4.2	5.6			
Phosphorus total $\mu\text{gP l}^{-1}$	14.5	14.7	27.8		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	9.8	10.1	14.8		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	1.4	4.1	4.0		
Nitrate $\mu\text{gN l}^{-1}$	21				
Silica total $\mu\text{g l}^{-1}$	0.9	2.3			
Silica soluble reactive mg l^{-1}	0.79	2.25	3.97		
Chlorophyll a $\mu\text{g l}^{-1}$	4.2	3.1	1.8		
Sulphate $\mu\text{eq l}^{-1}$	101	95	87		
Copper total soluble $\mu\text{g l}^{-1}$	0	0			
Iron total soluble $\mu\text{g l}^{-1}$	102	500			
Lead total soluble $\mu\text{g l}^{-1}$	0	0			
Manganese total soluble $\mu\text{g l}^{-1}$	160	149			
Zinc total soluble $\mu\text{g l}^{-1}$	9	3			

Figure 3.1 Llyn Fanod Temperature and oxygen profiles: 1-8-94

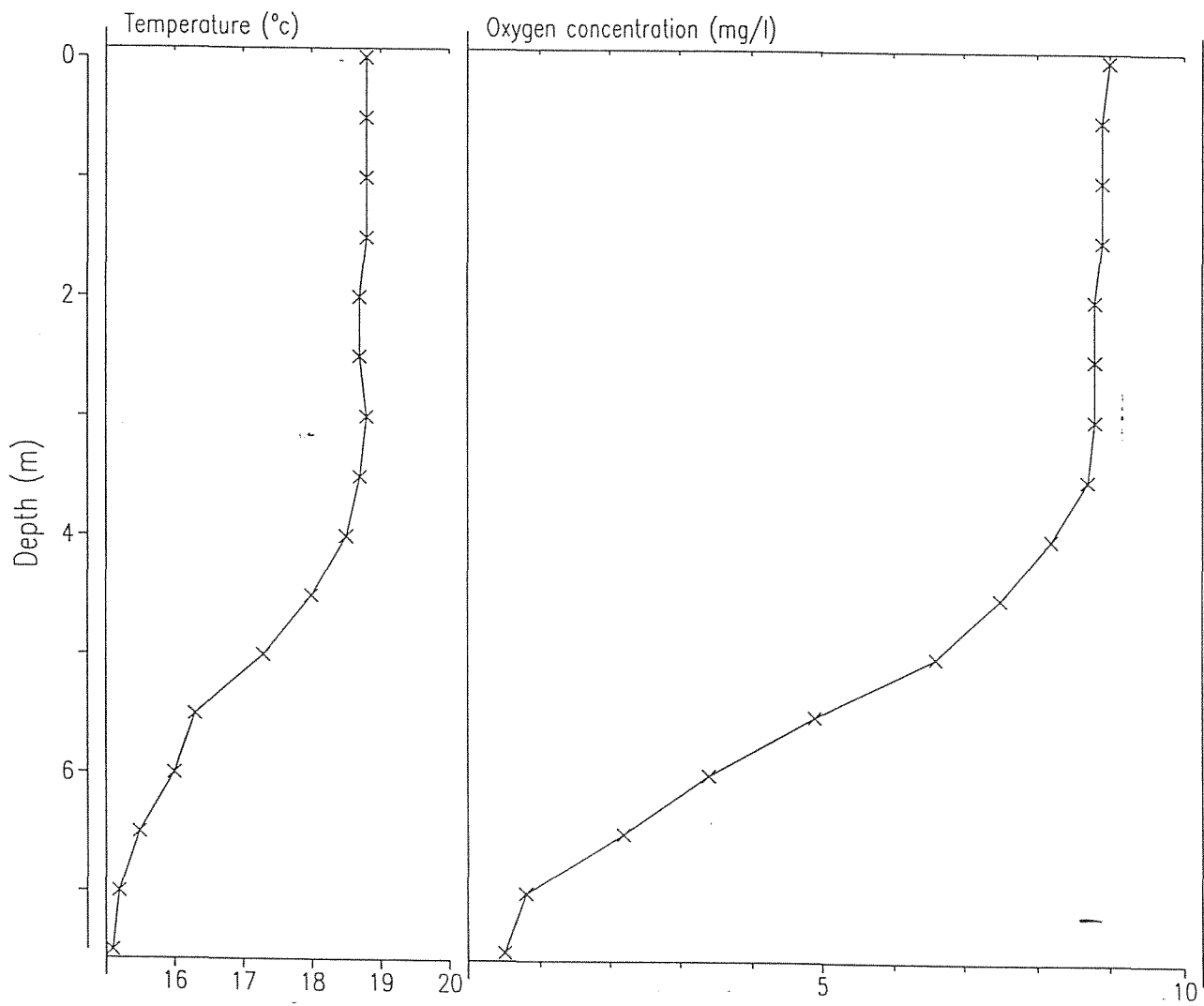


Table 3.2 Llyn Fanod aquatic macrophyte abundance summary: 1-8-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Eleocharis palustris</i>	382004	F	
<i>Equisetum fluviatile</i>	350202	F	
<i>Menyanthes trifoliata</i>	364701	O	
<i>Agrostis stolonifera</i>		R	
<i>Carex rostrata</i>	381129	F	
<i>Lythrum portula</i>	564500	R	
<i>Montia fontana</i>	365001	R	
<i>Potentilla palustris</i>	383801	O	
Floating taxa			
<i>Glyceria fluitans</i>	382502	O	
<i>Potamogeton natans</i>	384012	A	
<i>Callitriche stagnalis?</i>	361108	O	
<i>Nuphar lutea</i>	365501	F	locally abundant
<i>Nymphaea alba</i>	365601	F	locally abundant
<i>Luronium natans</i>		R	shallow water only
<i>Sparganium angustifolium</i>	384601	O	
Submergent taxa			
Blue green alga	100000	R	gelatinous agglomerations
Nitella (sp. 1)	220000	A	
Nitella (sp. 2)	220000	A	
<i>Fontinalis antipyretica</i>	323401	O	
Moss B		R	
<i>Isoetes lacustris</i>	350302	A	
<i>Callitriche hamulata</i>	361103	F	
<i>Littorella uniflora</i>	363901	F	
<i>Lobelia dortmanna</i>	364001	F	
<i>Subularia aquatica</i>	368701	O	
<i>Utricularia minor</i>	369600	R	in the bog area
<i>Luronium natans</i>		R	
<i>Elatine hexandra</i>	362401	F	
Fringing taxa			
<i>Juncus acutiflorus/articulatus</i>			
<i>Juncus effusus</i>			
<i>Carex nigra</i>			
<i>Carex echinata</i>			
<i>Carex curta</i>			
<i>Hydrocotyle vulgaris</i>			
<i>Myosotis secunda</i>			
<i>Eriophorum angustifolium</i>			
<i>Sphagnum</i> sp.			
<i>Polytrichum</i> sp.			
<i>Veronica scutellata</i>			
<i>Dryopteris dilatata</i>			
<i>Cardamine pratense</i>			
<i>Drosera rotundiflora</i>			

Table 3.3 Llyn Fanod epilithic diatom summary
 Mean percentage taxon abundance of three samples

TAXON	mean abundance
<i>Achnanthes didyma</i> var. <i>didyma</i>	5.3
<i>Achnanthes levanderi</i>	24.0
<i>Achnanthes minutissima</i> var. <i>minutissima</i>	21.4
<i>Achnanthes subatomoides</i>	1.2
<i>Anomoeoneis vitrea</i>	4.4
<i>Cyclotella stelligera</i>	1.4
<i>Cymbella cistula</i> var. <i>cistula</i>	11.0
<i>Cymbella gracilis</i>	1.3
<i>Cymbella microcephala</i> var. <i>microcephala</i>	1.5
<i>Eunotia incisa</i>	2.5
<i>Eunotia</i> sp.	1.1
<i>Fragilaria brevistriata</i> var. <i>brevistriata</i>	1.7
<i>Fragilaria construens</i> var. <i>construens</i>	1.4
<i>Fragilaria construens</i> var. <i>venter</i>	2.9
<i>Fragilaria intermedia</i>	4.0
<i>Navicula schassmannii</i>	1.6
<i>Nitzschia fonticola</i>	1.2
<i>Nitzschia frustulum</i>	5.8
<i>Nitzschia</i> sp.	1.8
<i>Synedra rumpens</i> var. <i>rumpens</i>	3.5
<i>Tabellaria flocculosa</i> (short)	10.3

Table 3.4

Llyn Fanod zooplankton abundance summary: 1-8-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Eudiaptomus gracilis</i>	1700
<i>Diaphanosoma brachyurum</i>	110
<i>Chaoborus</i> sp. larvae	20
<i>Daphnia longispina</i>	1300
Other planktonic organisms (not quantitatively sampled)	
<i>Conochilus</i> sp.	1400
<i>Volvox</i> sp.	300
<i>Keratella cochlearis</i>	20
<i>Kellicottia longispina</i>	360

X = rare species with relative abundance below 1%
 x = very rare species found at one site only

Table 3.5 Llyn Fanod zooplankton characteristics

Site depth (m)	7.5
Total zooplankton biomass excluding Chaoborus larvae (g DW m ⁻²)	1.20
Chaoborus larvae biomass (g DW m ⁻²)	0.28
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	54
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	5
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	4

Table 3.6 Llyn Fanod littoral macroinvertebrate summary
Mean number of individuals per sample

code	Taxon	Mean count/sample
	TURBELLARIA	
03120000	Tricladida	39.2
	BIVALVIA	
14030200	<i>Pisidium</i> sp.	158
	HIRUDINIA	
17020101	<i>Theromyzon tessalatum</i>	1.2
17020302	<i>Glossiphonia complanata</i>	0.8
17040102	<i>Erpobdella octoculata</i>	9.2
	EPHEMEROPTERA	
30020302	<i>Cloeon simile</i>	21.6
30040100	Leptophlebia sp.	45.2
30080204	<i>Caenis horaria</i>	94
30080206	<i>Caenis luctuosa</i>	204.8
	ODONATA	
32020301	<i>Enallagma cyathigerum</i>	0.4
	HEMIPTERA	
33110000	Corixidae sp.	6.8
33110501	<i>Corixa dentipes</i>	0.8
33110803	<i>Sigara distincta</i>	6.4
33110807	<i>Sigara scotti</i>	0.8
	COLEOPTERA	
35030000	Dytiscidae undet. (larvae)	0.4
35030706	<i>Stictotarsus duodecimpustulatus</i>	2.4
35030804	<i>Oreodytes sanmarkii</i>	0.4
35110600	<i>Oulimnius</i> sp.	16
	MEGALOPTERA	
36010101	<i>Sialis lutaria</i>	3.2
	TRICHOPTERA	
38030301	<i>Polycentropus flavomacula</i>	244
38030401	<i>Holocentropus dubius</i>	1.2
38040201	<i>Tinodes waeneri</i>	39.6
38070400	<i>Agrypnia</i> sp.	0.4
38080500	<i>Limnephilus</i> sp.	9.6
38120000	Leptoceridae sp.	2.8
	DIPTERA	
40010000	Tipulidae	0.4
40080000	Ceratopogonidae	1.2
40090000	Chironomidae	957.2

Table 4.1 Llyn Glanmerin water chemistry

Determinand	Sample				
	26-7-94	23-9-94	1-12-94	3-95	mean
lab pH	6.47	6.53	6.56	-	
field pH	6.90		7.67		
Alkalinity 1 $\mu\text{eq l}^{-1}$	114	113	102		
Alkalinity 2 $\mu\text{eq l}^{-1}$	109	107	96		
lab Conductivity $\mu\text{S cm}^{-1}$	63	62	67		
field Conductivity $\mu\text{S cm}^{-1}$	63		65		
Sodium $\mu\text{eq l}^{-1}$	302	294	325		
Potassium $\mu\text{eq l}^{-1}$	5	2	10		
Magnesium $\mu\text{eq l}^{-1}$	142	133	124		
Calcium $\mu\text{eq l}^{-1}$	187	187	178		
Chloride $\mu\text{eq l}^{-1}$	327	280	305		
Aluminium total monomeric $\mu\text{g l}^{-1}$	11	10	21		
Aluminium non-labile $\mu\text{g l}^{-1}$	11	10	21		
Aluminium labile $\mu\text{g l}^{-1}$	0	0	0		
Absorbtion (250nm)	0.174	0.140	0.125		
Carbon total organic mg l^{-1}	3.5	3.3			
Phosphorus total $\mu\text{gP l}^{-1}$	26.2	9.2	12.7		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	11.2	6.5	6.8		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	1.8	1.4	1.1		
Nitrate $\mu\text{gN l}^{-1}$	28				
Silica total $\mu\text{g l}^{-1}$	0.43	1.52			
Silica soluble reactive mg l^{-1}	0.35	1.49	3.18		
Chlorophyll a $\mu\text{g l}^{-1}$	6.0	2.4	1.8		
Sulphate $\mu\text{eq l}^{-1}$	105	129	144		
Copper total soluble $\mu\text{g l}^{-1}$	0	0			
Iron total soluble $\mu\text{g l}^{-1}$	690	310			
Lead total soluble $\mu\text{g l}^{-1}$	7	0			
Manganese total soluble $\mu\text{g l}^{-1}$	121	27			
Zinc total soluble $\mu\text{g l}^{-1}$	112	6	-		

Figure 4.1 Llyn Glanmerin Temperature and oxygen profiles: 26-7-94

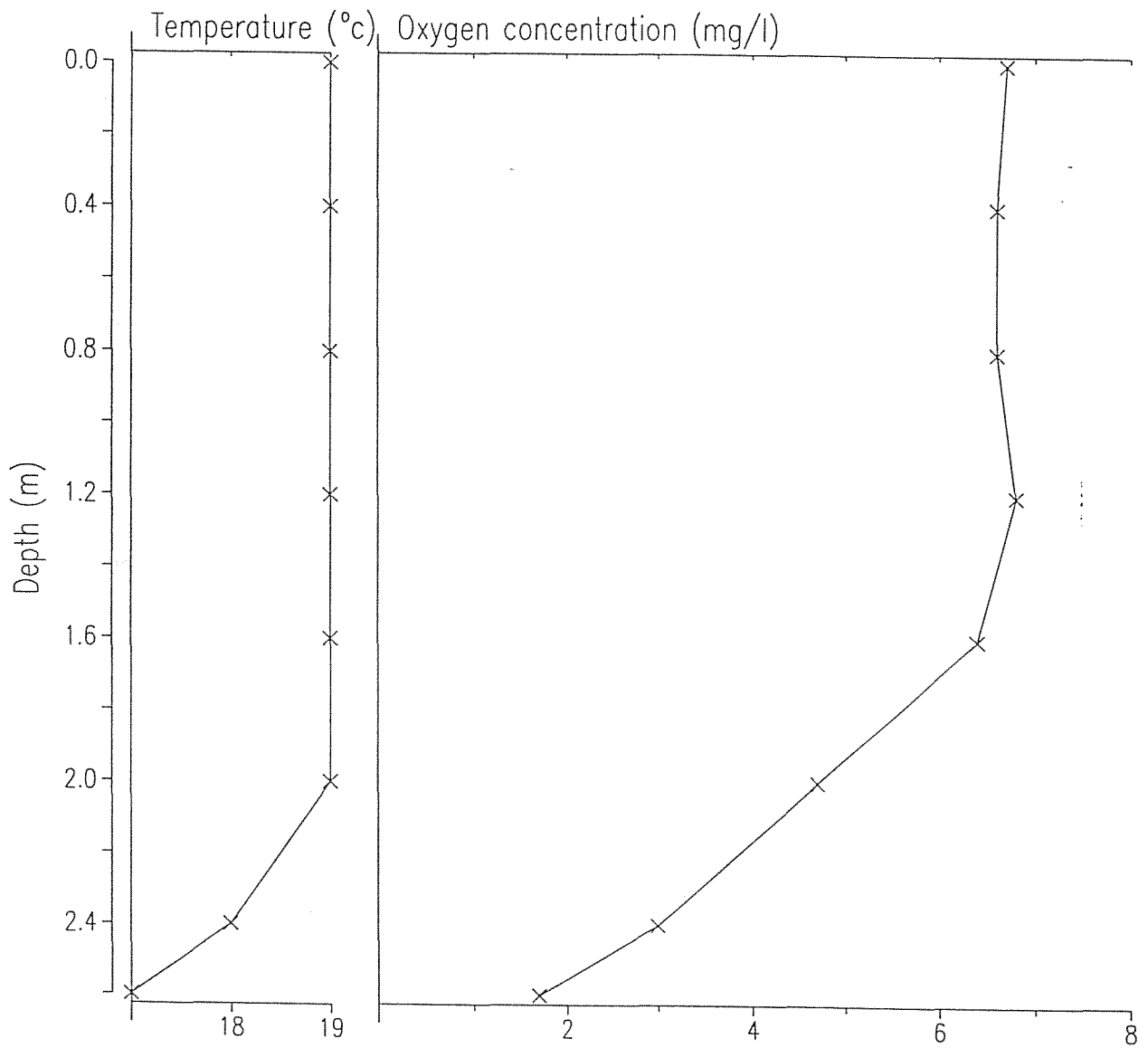


Table 4.2 Llyn Glanmerin aquatic macrophyte abundance summary: 26-7-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Equisetum fluviatile</i>	350202	O	
<i>Menyanthes trifoliata</i>	364701	R	
<i>Juncus effusus</i>	383010	F	
<i>Typha latifolia</i>	384902	O	
<i>Phalaris arundinacea</i>	383701	F	locally abundant
<i>Eleocharis palustris</i>	382004	O	
Floating taxa			
<i>Potamogeton natans</i>	384012	R	
<i>Nuphar lutea</i>	365501	A	
<i>Nymphaea alba</i>	365601	O	
<i>Sparganium angustifolium</i>	384601	O	
Submergent taxa			
<i>Nitella spp.</i>	220000	O	
<i>Sphagnum auriculatum</i>	327401	O	
<i>Isoetes lacustris</i>	350302	A	
<i>Callitriche hamulata</i>	361103	F	
<i>Myriophyllum alterniflorum</i>	365401	F	
<i>Juncus bulbosus var. fluitans</i>	383006	F	
<i>Elodea canadensis</i>	382101	F	
Fringing taxa			
<i>Hydrocotyle vulgaris</i>			
<i>Iris sp. (pseudacorus?)</i>			
<i>Salix sp.</i>			
<i>Alnus glutinosa</i>			
<i>Ranunculus flammula</i>			
<i>Viola palustris</i>			
<i>Juncus effusus</i>			
<i>Juncus articulatus</i>			
<i>Hypericum elodes</i>			

Table 4.3 Llyn Glanmerin epilithic diatom summary
 Mean percentage taxon abundance of three samples

TAXON	mean abundance
<i>Achnanthes altaica</i>	1.6
<i>Achnanthes austriaca</i> var. <i>helvetica</i>	3.3
<i>Achnanthes detha</i>	8.8
<i>Achnanthes levanderi</i>	1.0
<i>Achnanthes marginulata</i>	2.5
<i>Achnanthes minutissima</i> var. <i>minutissima</i>	30.3
<i>Achnanthes nodosa</i>	1.0
<i>Achnanthes</i> sp.	2.7
<i>Achnanthes</i> [<i>altaica</i> var. <i>minor</i>]	4.5
<i>Brachysira vitrea</i>	4.1
<i>Cymbella lunata</i>	1.2
<i>Cymbella microcephala</i> var. <i>microcephala</i>	1.7
<i>Cymbella perpusilla</i>	1.5
<i>Eunotia incisa</i>	2.8
<i>Eunotia naegelii</i>	1.4
<i>Eunotia pectinalis</i> var. <i>minor</i>	2.5
<i>Eunotia pectinalis</i> var. <i>minor</i> fo. <i>impressa</i>	2.1
<i>Eunotia rhomboidea</i>	3.2
<i>Eunotia vanheurckii</i> var. <i>vanheurckii</i>	1.2
<i>Fragilaria virescens</i> var. <i>exigua</i>	6.6
<i>Frustulia rhomboides</i> var. <i>saxonica</i>	1.2
<i>Navicula jaernefeltii</i>	4.9
<i>Navicula mediocris</i>	1.0
<i>Navicula radiosa</i> var. <i>tenella</i>	1.3
<i>Nitzschia gracilis</i>	3.0
<i>Peronia fibula</i>	3.1
<i>Tabellaria flocculosa</i> var. <i>flocculosa</i>	4.0

Table 4.4 Llyn Glanmerin zooplankton abundance summary: 26-7-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Eudiaptomus gracilis</i>	1100
<i>Diaphanosoma brachyurum</i>	460
<i>Chaoborus</i> sp. larvae	
<i>Ceriodaphnia quadrangula</i>	1300
<i>Daphnia longispina</i>	X
<i>Macrocyclus albidus</i>	30
<i>Bosmina longirostris</i>	60
<i>Simocephalus vetulus</i>	X
<i>Alona affinis</i>	X
Other planktonic organisms (not quantitatively sampled)	
<i>Conochilus</i> sp.	2300
<i>Volvox</i> sp.	60
<i>Keratella cochlearis</i>	30
<i>Nauplia</i>	30

X = rare species with relative abundance below 1%
x = very rare species found at one site only

Table 4.5 Llyn Glanmerin zooplankton characteristics

Site depth (m)	2.4
Total zooplankton biomass excluding <i>Chaoborus</i> larvae (g DW m ⁻²)	1.52
<i>Chaoborus</i> larvae biomass (g DW m ⁻²)	0.01
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	28
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	0
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	7

Table 4.6 Llyn Glanmerin littoral macroinvertebrate summary
Mean number of individuals per sample.

code	Taxon	Mean count/sample
	TURBELLARIA	
03120000	Tricladida	6.4
	BIVALVIA	
14030200	<i>Pisidium</i> sp.	38
	HIRUDINIA	
17020501	<i>Helobdella stagnalis</i>	8
17040102	<i>Erpobdella octoculata</i>	13.6
	MALACOSTRACA	
28030101	<i>Asellus aquaticus</i>	704.8
	EPHEMEROPTERA	
30020000	Baetidae	12
30020302	<i>Cloeon simile</i>	10.8
30040100	<i>Leptophlebia</i> sp.	5.2
	ODONATA	
32020000	<i>Zygoptera</i> sp.	10
32020301	<i>Enallagma cyathigerum</i>	15.2
32070205	<i>Aeshna juncea</i>	1.6
	HEMIPTERA	
33110000	Corixidae sp.	20.8
33110201	<i>Cymatia bondsdorffi</i>	19.2
33110601	<i>Hesperocorixa linnaei</i>	5.2
33110803	<i>Sigara distincta</i>	39.6
33110806	<i>Sigara fossarum</i>	3.6
33110807	<i>Sigara scotti</i>	167.2
	COLEOPTERA	
35010311	<i>Haliplus fluvus</i>	2.8
35030000	Dytiscidae undet. (larvae)	2
35030702	<i>Potamonectes assimilis</i>	0.4
35031101	<i>Agabus guttatus</i>	1.6
35110600	<i>Qulimnius</i> sp.	2
	MEGALOPTERA	
36010101	<i>Sialis lutaria</i>	2.4
37000000	LEPIDOPTERA	0.4
38030301	<i>Polycentropus flavomacula</i>	0.8
38030401	<i>Holocentropus dubius</i>	42.4
38030402	<i>Holocentropus picicornis</i>	22.8
38070201	<i>Phryganea grandis</i>	1.6
38070400	<i>Agrypnia</i> sp.	17.6
38080501	<i>Limnephilus rhombicus</i>	20.4
38081901	<i>Chaetopteryx villosa</i>	0.4
38120106	<i>Athripsodes aterrimus</i>	3.2
38120701	<i>Triaenodes bicolor</i>	3.2
	DIPTERA	
40010000	Tipulidae	0.4
40090000	Chironomidae	232.4

Table 5.1 Llyn Gynon water chemistry

Determinand	Sample				
	27-7-94	22-9-94	2-12-94	3-95	mean
lab pH	5.80	5.41	5.53	-	
field pH	5.75		5.67		
Alkalinity 1 $\mu\text{eq l}^{-1}$	19	11	14		
Alkalinity 2 $\mu\text{eq l}^{-1}$	10	3	7		
lab Conductivity $\mu\text{S cm}^{-1}$	32	34	31		
field Conductivity $\mu\text{S cm}^{-1}$	30		29		
Sodium $\mu\text{eq l}^{-1}$	168	165	139		
Potassium $\mu\text{eq l}^{-1}$	4	5	5		
Magnesium $\mu\text{eq l}^{-1}$	75	77	67		
Calcium $\mu\text{eq l}^{-1}$	66	72	67		
Chloride $\mu\text{eq l}^{-1}$	166	159	128		
Aluminium total monomeric $\mu\text{g l}^{-1}$	8	25	30		
Aluminium non-labile $\mu\text{g l}^{-1}$	8	11	21		
Aluminium labile $\mu\text{g l}^{-1}$	0	14	9		
Absorbtion (250nm)	0.130	0.184	0.279		
Carbon total organic mg l^{-1}	2.8	3.7			
Phosphorus total $\mu\text{gP l}^{-1}$	6.2	7.0	9.1		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	5.5	4.4	6.9		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	2.1	3.6	1.8		
Nitrate $\mu\text{gN l}^{-1}$	14				
Silica total $\mu\text{g l}^{-1}$	0.33	0.75			
Silica soluble reactive mg l^{-1}	0.13	0.73	1.89		
Chlorophyll a $\mu\text{g l}^{-1}$	2.6	1.4	0.8		
Sulphate $\mu\text{eq l}^{-1}$	70	75	63		
Copper total soluble $\mu\text{g l}^{-1}$	39	0			
Iron total soluble $\mu\text{g l}^{-1}$	211	148			
Lead total soluble $\mu\text{g l}^{-1}$	9	0			
Manganese total soluble $\mu\text{g l}^{-1}$	14	19			
Zinc total soluble $\mu\text{g l}^{-1}$	5	0			

Figure 5.1 Llyn Gynon Temperature and oxygen profiles: 30-7-94

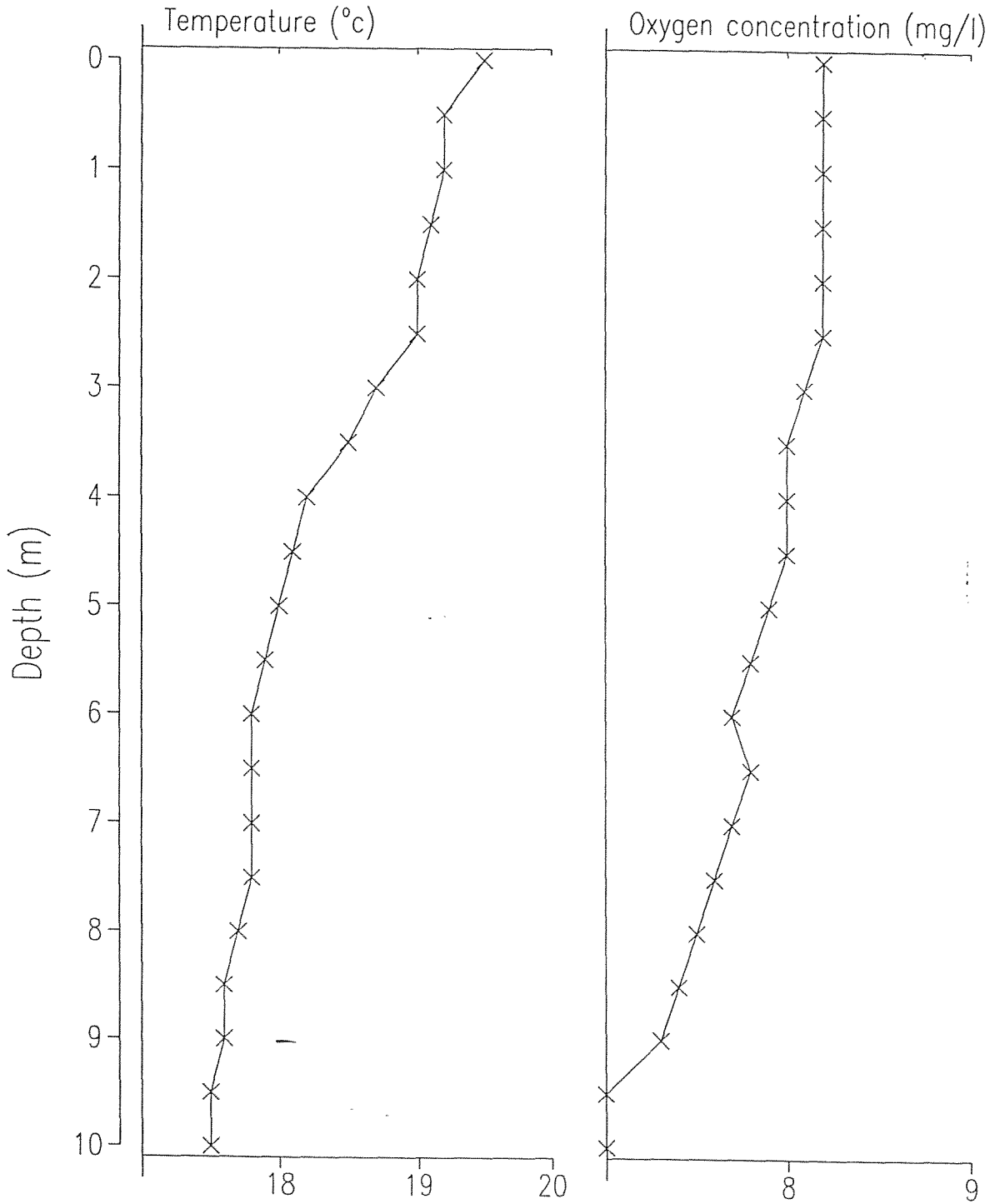


Table 5.2 Llyn Gynon aquatic macrophyte abundance summary: 30-7-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Carex rostrata</i>	381129	R	
(<i>Equisetum palustre</i>)	350200	O	dessicated, on shoreline
Floating taxa			
<i>Glyceria fluitans</i>	382502	R	
<i>Potamogeton polygonifolius</i>	384017	O	
<i>Sparganium angustifolium</i>	384601	O	
<i>Luronium natans</i>		O	floating form
<i>Nuphar lutea</i>	365501	R	in outflow, locally frequent
Submergent taxa			
Filamentous green algae	170000	A	
<i>Fontinalis antipyretica</i>	323401	O	
<i>Isoetes lacustris</i>	350302	F	
<i>Callitriche hamulata</i>	361103	O	
<i>Littorella uniflora</i>	363901	A	
<i>Lobelia dortmanna</i>	364001	A	
<i>Myriophyllum alterniflorum</i>	365401	F	
<i>Subularia aquatica</i>	368701	R	dessicated, on shoreline
<i>Juncus bulbosus</i> var. <i>fluitans</i>	383006	A	
<i>Luronium natans</i>		A	deep water form

Figure 5.2 LLYN GYNON: aquatic macrophyte distribution map 30/7/1994

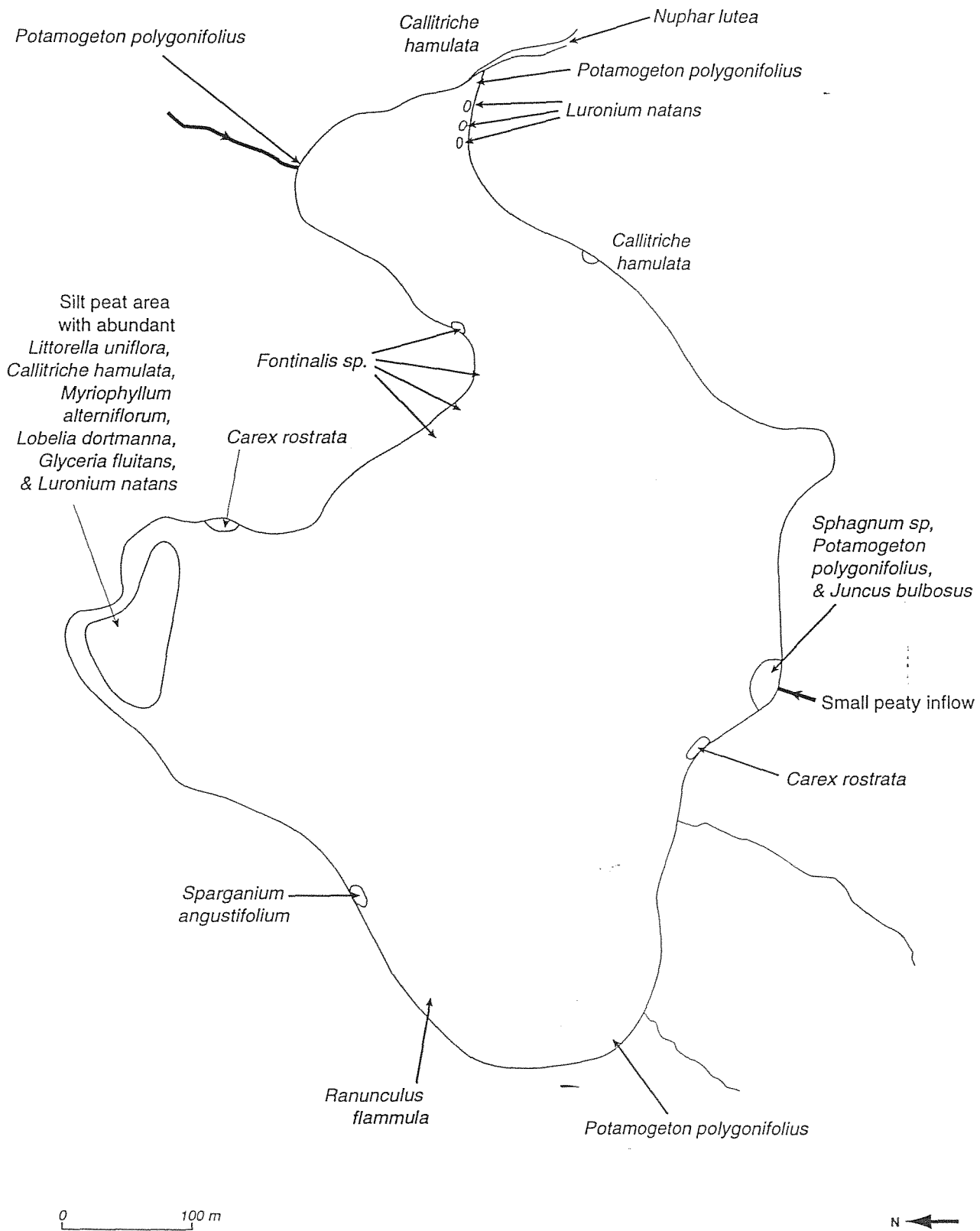


Table 5.3 Llyn Gynon epilithic diatom summary
 Mean percentage taxon abundance of three samples

TAXON	mean abundance
<i>Brachysira vitrea</i>	2.6
<i>Cymbella perpusilla</i>	1.9
<i>Eunotia incisa</i>	23.1
<i>Eunotia rhomboidea</i>	4.8
<i>Fragilaria virescens</i> var. <i>exigua</i>	6.5
<i>Frustulia rhomboides</i> var. <i>saxonica</i>	3.7
<i>Navicula leptostriata</i>	2.4
<i>Nitzschia perminuta</i>	4.4
<i>Nitzschia</i> sp.	1.0
<i>Pinnularia viridis</i> var. <i>viridis</i>	1.1
<i>Tabellaria flocculosa</i> var. <i>flocculosa</i>	37.0

Table 5.4 Llyn Gynon zooplankton abundance summary: 30-7-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Eudiaptomus gracilis</i>	2500
<i>Diaphanosoma brachyurum</i>	1400
<i>Eubosmina longispina</i>	40
<i>Ceriodaphnia quadrangula</i>	910
<i>Macrocyclops albidus</i>	X
<i>Eurycerus lamellatus</i>	x
<i>Drepanothrix dentata</i>	X
<i>Acroperus elongatus</i>	x
<i>Acroperus harpae</i>	x
<i>Megacyclops viridis</i>	X
Other planktonic organisms (not quantitatively sampled)	
<i>Conochilus</i> sp.	

X = rare species with relative abundance below 1%
x = very rare species found at one site only

Table 5.5 Llyn Gynon zooplankton characteristics

Site depth (m)	10.0
Total zooplankton biomass excluding Chaoborus larvae (g DW m ⁻²)	1.58
Chaoborus larvae biomass (g DW m ⁻²)	0
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	24
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	0
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	1

Table 5.6

Llyn Gynon littoral macroinvertebrate summary.
Mean number of individuals per sample.

code	Taxon	Mean count/sample
	BIVALVIA	-
14030200	<i>Pisidium</i> sp.	0.8
	HIRUDINIA	
17040102	<i>Erpobdella octoculata</i>	8
	EPHEMEROPTERA	
30040100	<i>Leptophlebia</i> sp.	1.6
	HEMIPTERA	
33110000	Corixidae sp.	0.8
35030000	Dytiscidae undet. (larvae	0.4
35030703	<i>Potamonectes depressus</i>	2
35110600	<i>Oulimnius</i> sp.	86.4
36010101	<i>Sialis lutaria</i>	0.8
38030301	<i>Polycentropus flavomacula</i>	13.6
38060600	<i>Oxyethira</i> sp.	2
38070400	<i>Agrypnia</i> sp.	1.2
38080500	<i>Limnephilus</i> sp.	1.2
38081901	<i>Chaetopteryx villosa</i>	0.4
38150101	<i>Sericostoma personatum</i>	4.8
40010000	Tipulidae	14.4
40090000	Chironomidae	137.6

Table 6.1 Llyn Hir water chemistry

Determinand	Sample				
	27-7-94	22-9-94	1-12-94	3-95	mean
lab pH	5.60	5.60	5.47		
field pH	5.68		5.59		
Alkalinity 1 $\mu\text{eq l}^{-1}$	13	15	12		
Alkalinity 2 $\mu\text{eq l}^{-1}$	4	8	4		
lab Conductivity $\mu\text{S cm}^{-1}$	35	38	36		
field Conductivity $\mu\text{S cm}^{-1}$	35		34		
Sodium $\mu\text{eq l}^{-1}$	175	184	163		
Potassium $\mu\text{eq l}^{-1}$	6	6	5		
Magnesium $\mu\text{eq l}^{-1}$	77	55			
Calcium $\mu\text{eq l}^{-1}$	69	91	75		
Chloride $\mu\text{eq l}^{-1}$	193	189	166		
Aluminium total monomeric $\mu\text{g l}^{-1}$	7	15	42		
Aluminium non-labile $\mu\text{g l}^{-1}$	3	8	27		
Aluminium labile $\mu\text{g l}^{-1}$	4	7	15		
Absorbtion (250nm)	0.040	0.094	0.137		
Carbon total organic mg l^{-1}	1.4	2.6			
Phosphorus total $\mu\text{gP l}^{-1}$	4.5	5.9	10.1		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	3.5	4.1	7.3		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	0.8	1.0	1.6		
Nitrate $\mu\text{gN l}^{-1}$	28				
Silica total $\mu\text{g l}^{-1}$	0.24	0.36			
Silica soluble reactive mg l^{-1}	0.06	0.34	0.83		
Chlorophyll a $\mu\text{g l}^{-1}$	1.9	2.1	1.5		
Sulphate $\mu\text{eq l}^{-1}$	82	80	78		
Copper total soluble $\mu\text{g l}^{-1}$	0	0			
Iron total soluble $\mu\text{g l}^{-1}$	690	310			
Lead total soluble $\mu\text{g l}^{-1}$	7	0			
Manganese total soluble $\mu\text{g l}^{-1}$	121	27			
Zinc total soluble $\mu\text{g l}^{-1}$	112	6			

Figure 6.1 Llyn Hir Temperature and oxygen profiles: 29-7-94

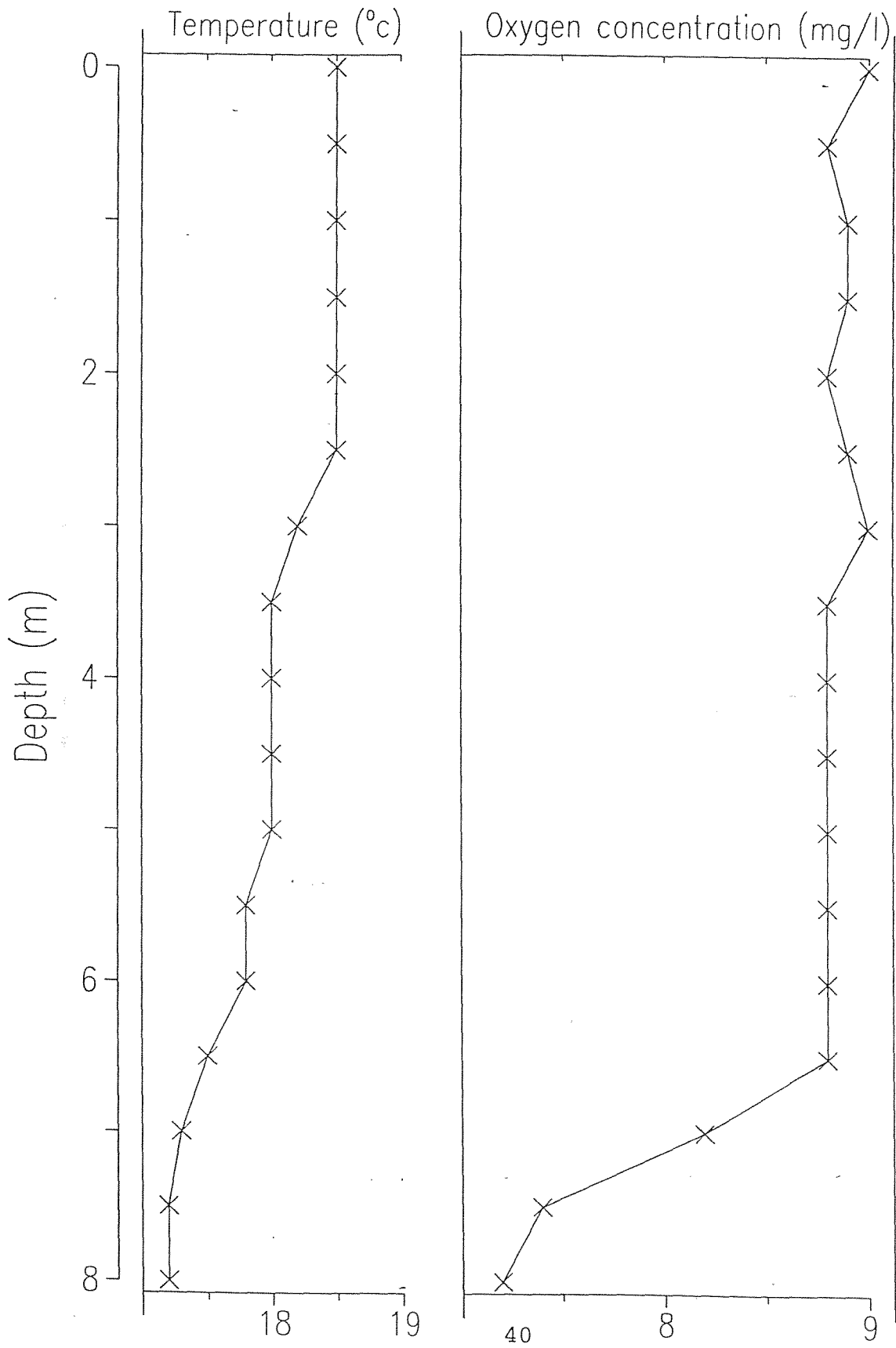


Table 6.2 Llyn Hir aquatic macrophyte abundance summary: 29-7-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Agrostis stolonifera</i>		R	
<i>Menyanthes trifoliata</i>	364701	R	
Floating taxa			
<i>Glyceria fluitans</i>	382502	R	
<i>Luronium natans</i>		R	
<i>Potamogeton polygonifolius</i>	384017	O	
<i>Sparganium angustifolium</i>	384601	O	locally frequent
Submergent taxa			
Filamentous green algae	170000	A	
<i>Isoetes</i> sp.	350300	F	
<i>Callitriche hamulata</i>	361103	R	
<i>Littorella uniflora</i>	363901	O	
<i>Lobelia dortmanna</i>	364001	A	
<i>Myriophyllum alterniflorum</i>	365401	O	
<i>Subularia aquatica</i>	368701	F	
<i>Juncus bulbosus</i> var. <i>fluitans</i>	383006	A	
<i>Luronium natans</i>		A	deep water form
Fringing taxa			
<i>Molinia caerulea</i>			
<i>Eriophorum angustifolium</i>			
<i>Sphagnum</i> sp.			
<i>Polytrichum</i> sp.			
<i>Vaccinium</i> sp.			
<i>Carex echinata</i>			
<i>Juncus effusus</i>			
<i>Juncus bulbosus</i>			
<i>Drosera rotundifolia</i>			
<i>Potentilla</i> sp.			
<i>Narthecium ossifragum</i>			

Figure 6.2 LLYN HIR: aquatic macrophyte distribution map 29/7/1994

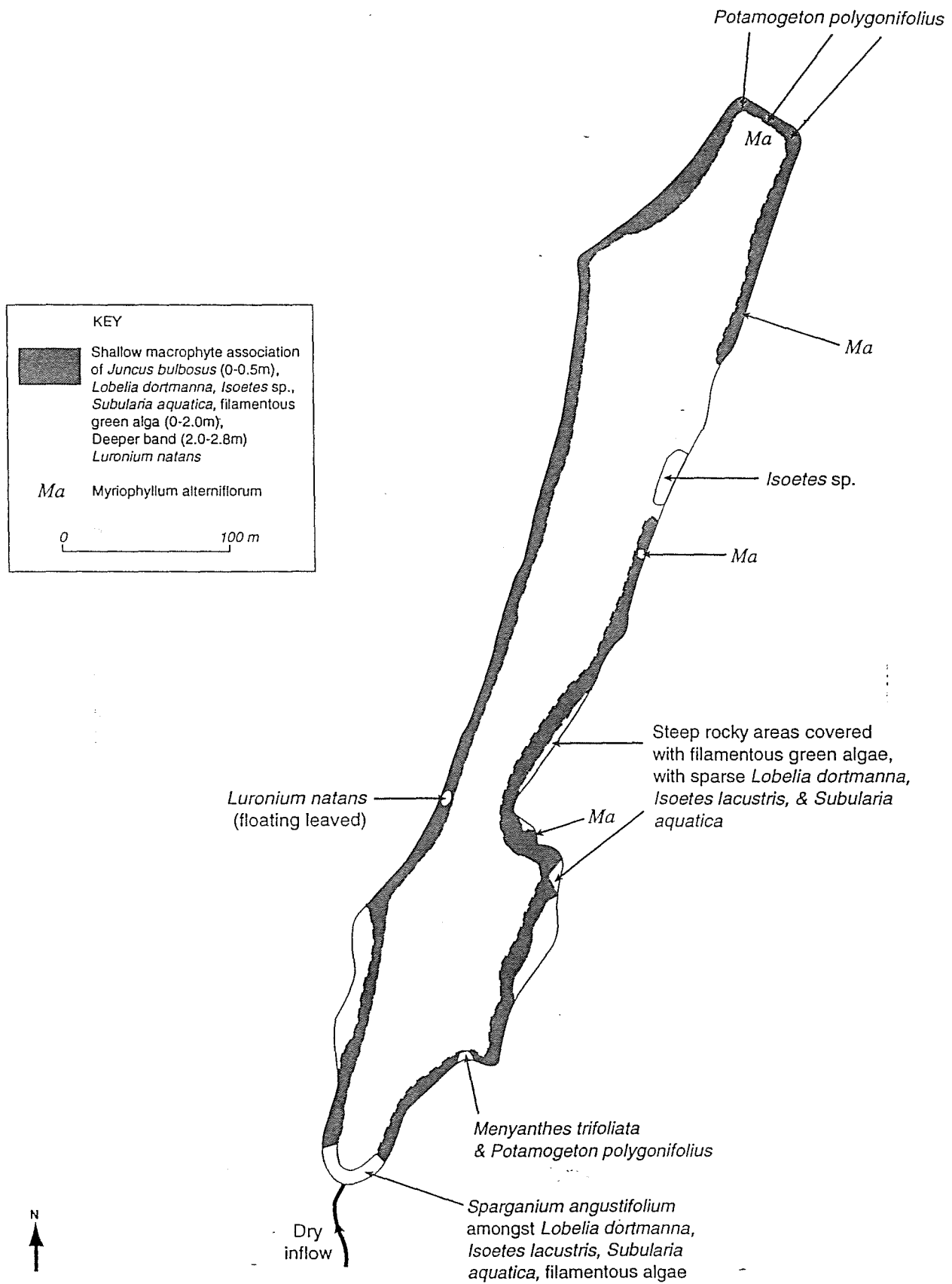


Table 6.3 Llyn Hir epilithic diatom summary.
Mean percentage taxon abundance of three samples.

TAXON	mean abundance
<i>Achnanthes altaica</i>	1.0
<i>Achnanthes levanderi</i>	1.8
<i>Brachysira brebissonii</i> var. <i>brebissonii</i>	1.1
<i>Brachysira vitrea</i>	2.1
<i>Cymbella microcephala</i> var. <i>microcephala</i>	2.7
<i>Cymbella minuta</i> var. <i>minuta</i>	1.1
<i>Cymbella perpusilla</i>	4.7
<i>Cymbella</i> sp.	1.4
<i>Eunotia exigua</i> var. <i>exigua</i>	1.2
<i>Eunotia incisa</i>	33.5
<i>Eunotia naegeli</i>	1.1
<i>Eunotia pectinalis</i> var. <i>minor</i>	1.4
<i>Eunotia rhomboidea</i>	22.1
<i>Eunotia</i> sp.	1.6
<i>Eunotia vanheurckii</i> var. <i>intermedia</i>	2.0
<i>Eunotia vanheurckii</i> var. <i>vanheurckii</i>	2.9
<i>Navicula jaernefeltii</i>	1.4
<i>Navicula leptostriata</i>	3.3
<i>Pinnularia irrorata</i>	2.1
<i>Surirella delicatissima</i> var. <i>delicatissima</i>	1.5
<i>Tabellaria flocculosa</i> var. <i>flocculosa</i>	10.3

Table 6.4

Llyn Hir zooplankton abundance summary: 29-7-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Eudiaptomus gracilis</i>	980
<i>Diaphanosoma brachyurum</i>	180
<i>Ceriodaphnia quadrangula</i>	30
<i>Daphnia longispina</i>	X
<i>Polyphemus pediculus</i>	X
Other planktonic organisms (not quantitatively sampled)	
<i>Conochilus</i> sp.	

X = rare species with relative abundance below 1%

x = very rare species found at one site only

Table 6.5 Llyn Hir zooplankton characteristics

Site depth (m)	6.8
Total zooplankton biomass excluding Chaoborus larvae (g DW m ⁻²)	0.85
Chaoborus larvae biomass (g DW m ⁻²)	0
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	14
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	0
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	1

Table 11.6

Llyn Hir littoral macroinvertebrate summary
 Mean number of individuals per sample

code	Taxon	Mean count/sample
	TURBELLARIA	
03120000	Tricladida	17.2
	BIVALVIA	
14030200	<i>Pisidium</i> sp.	14.8
	EPHEMEROPTERA	
30040100	<i>Leptophlebia</i> sp.	3.2
	ODONATA	
32020301	<i>Enallagma cyathigerum</i>	0.4
	HEMIPTERA	
33110000	Corixidae sp.	0.8
33110807	<i>Sigara scotti</i>	6.0
	COLEOPTERA	
35030703	<i>Potamonectes depressus</i>	3.2
35110600	<i>Oulimnius</i> sp.	1.6
	TRICHOPTERA	
38030301	<i>Polycentropus flavomaculatus</i>	88.8
38030401	<i>Holocentropus dubius</i>	1.2
38070400	<i>Agrypnia</i> sp.	5.2
38080500	<i>Limnephilus</i> sp.	1.6
	DIPTERA	
40090000	Chironomidae	278.4

Table 7.1

Llynnoedd Ieuan (West Lake) water chemistry

Determinand	Sample				
	28-7-94	22-9-94	1-12-94	3-95	mean
lab pH	4.87	4.86	5.04		
field pH	4.92		5.04		
Alkalinity 1 $\mu\text{eq l}^{-1}$	-13	-14	3		
Alkalinity 2 $\mu\text{eq l}^{-1}$	-13	-12	-7		
lab Conductivity $\mu\text{S cm}^{-1}$	34	34	33		
field Conductivity $\mu\text{S cm}^{-1}$	30		29		
Sodium $\mu\text{eq l}^{-1}$	156	151	134		
Potassium $\mu\text{eq l}^{-1}$	4	3	5		
Magnesium $\mu\text{eq l}^{-1}$	50	51	43		
Calcium $\mu\text{eq l}^{-1}$	35	36	58		
Chloride $\mu\text{eq l}^{-1}$	174	153	117		
Aluminium total monomeric $\mu\text{g l}^{-1}$	65	71	95		
Aluminium non-labile $\mu\text{g l}^{-1}$	0	8	48		
Aluminium labile $\mu\text{g l}^{-1}$	65	63	47		
Absorbtion (250nm)	0.003	0.015	0.173		
Carbon total organic mg l^{-1}	0.3	0.8			
Phosphorus total $\mu\text{gP l}^{-1}$	2.4	2.5	9.2		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	1.3	1.2	5.5		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	0.4	1.1	0.4		
Nitrate $\mu\text{gN l}^{-1}$	56				
Silica total $\mu\text{g l}^{-1}$	0.19	0.33			
Silica soluble reactive mg l^{-1}	0.06	0.21	1.25		
Chlorophyll a $\mu\text{g l}^{-1}$	0.5	1.1	1.0		
Sulphate $\mu\text{eq l}^{-1}$	83	74	75		
Copper total soluble $\mu\text{g l}^{-1}$	0	0			
Iron total soluble $\mu\text{g l}^{-1}$	49	24			
Lead total soluble $\mu\text{g l}^{-1}$	6	0			
Manganese total soluble $\mu\text{g l}^{-1}$	159	140			
Zinc total soluble $\mu\text{g l}^{-1}$	12	8			

Figure 7.1 Llynoedd Ieuan (West Lake)
Temperature and oxygen profiles 28-7-94

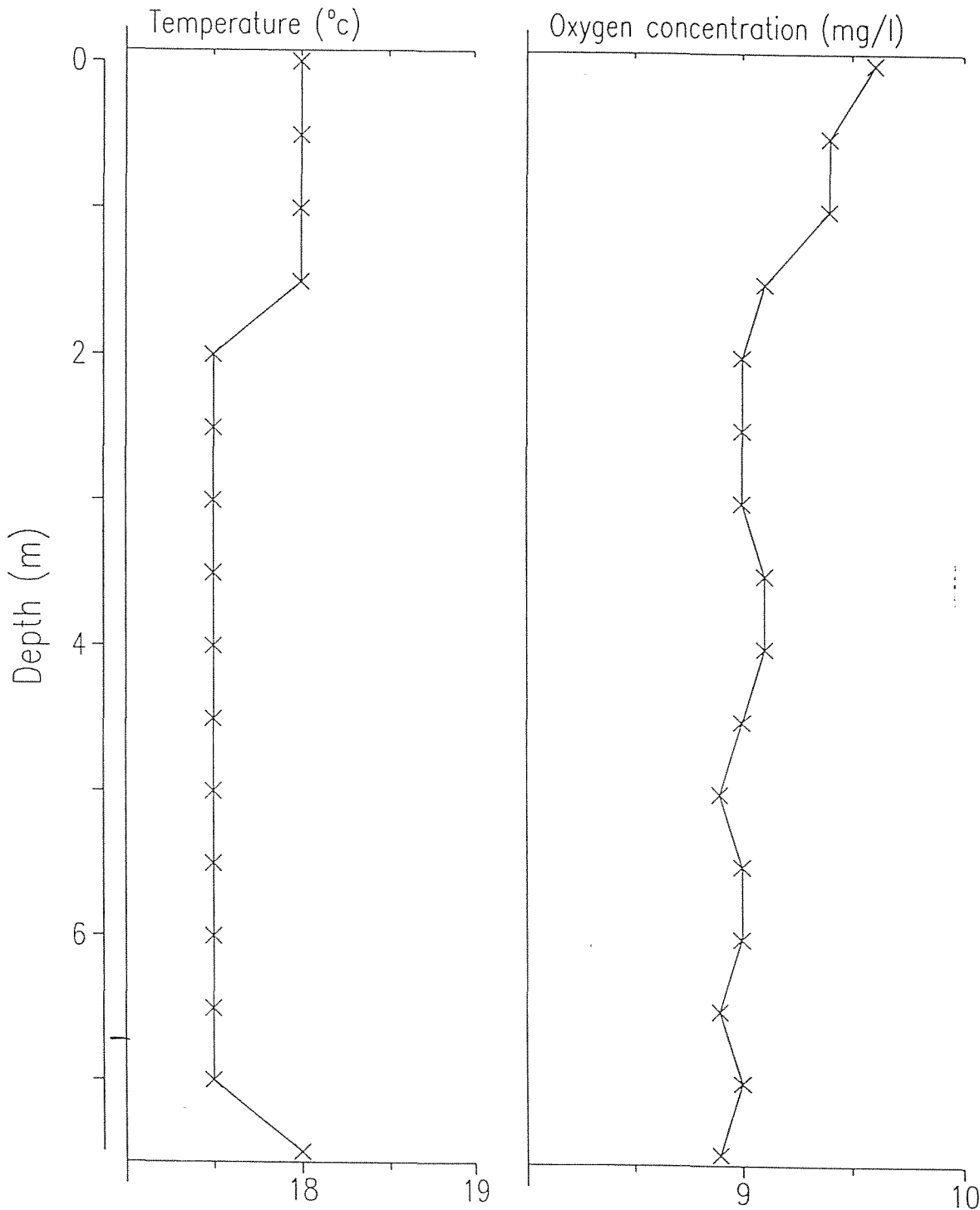


Table 7.2 Llynnoedd Ieuan (West Lake)
aquatic macrophyte abundance summary: 28-7-94

Taxon	code	Abun	comments
Submergent taxa			
<i>Cladophora</i> sp.		R	
Filamentous green alga (1)	170000	A	
Filamentous green alga (2)	170000	A	
<i>Nardia compressa</i>	343701	A	
<i>Isoetes lacustris</i>	350302	F	
<i>Littorella uniflora</i>	363901	F	
<i>Lobelia dortmanna</i>	364001	A	
<i>Juncus bulbosus</i> var. <i>fluitans</i>	383006	F	
Fringing taxa			
<i>Juncus effusus</i>			
<i>Juncus articulatus</i>			
<i>Polytrichum</i> sp.			
<i>Sphagnum</i> sp.			
<i>Carex echinata</i>			
<i>Molinia caerulea</i>			
<i>Vaccinium myrtillus</i>			
<i>Eriophorum angustifolium</i>			

Figure 7.2 LLYNNOEDD IEUAN: aquatic macrophyte distribution map 28/7/1994

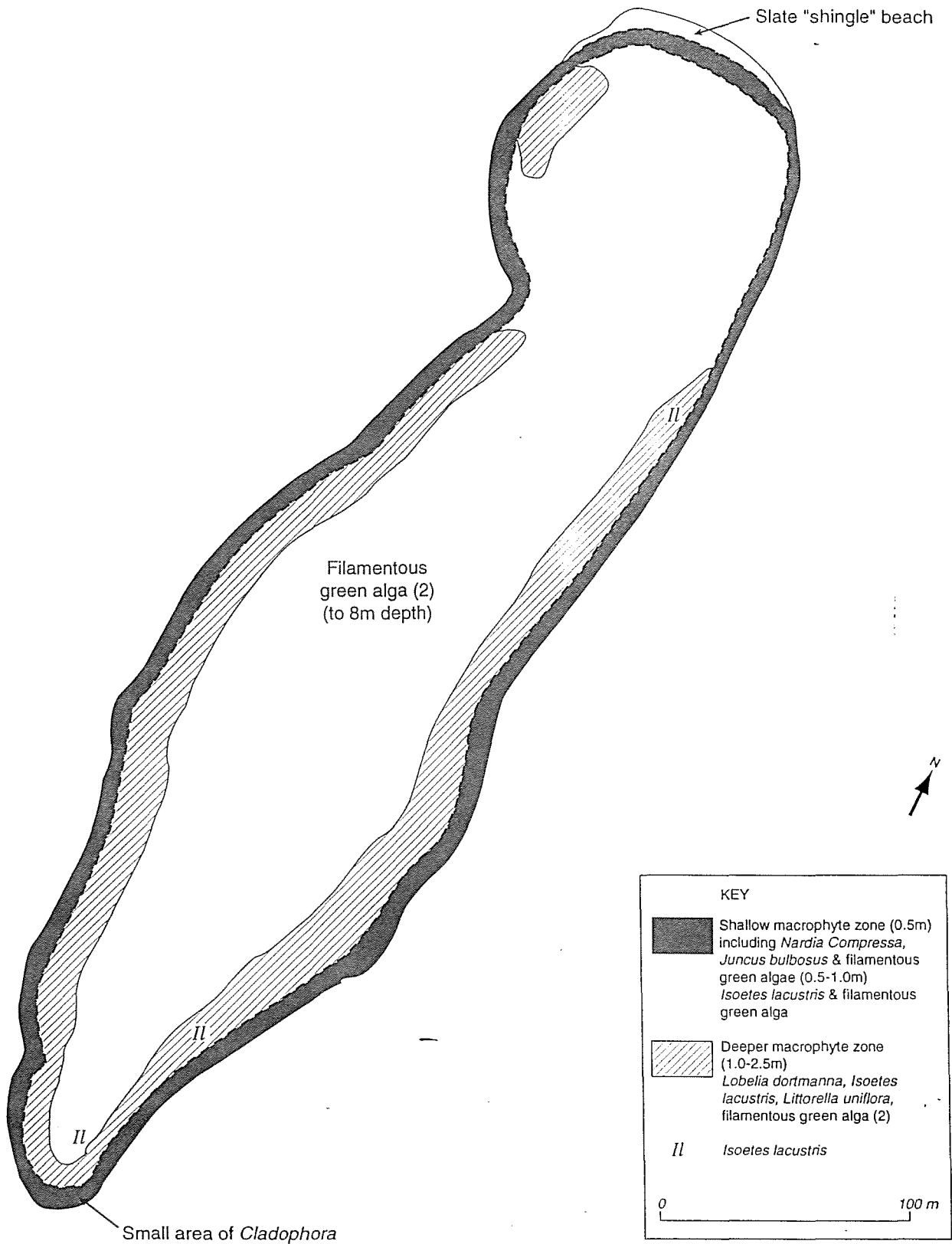


Table 7.3 Llynnoedd Ieuan (West Lake) epilithic diatom summary.
 Mean percentage taxon abundance of three samples.

TAXON	mean abundance
<i>Achnanthes marginulata</i>	1.1
<i>Achnanthes minutissima</i> var. <i>minutissima</i>	2.2
<i>Brachysira brebissonii</i> var. <i>brebissonii</i>	7.1
<i>Brachysira vitrea</i>	2.1
<i>Cymbella microcephala</i> var. <i>microcephala</i>	7.0
<i>Eunotia denticulata</i> var. <i>denticulata</i>	2.0
<i>Eunotia exigua</i> var. <i>exigua</i>	2.7
<i>Eunotia incisa</i>	23.8
<i>Eunotia rhomboidea</i>	5.6
<i>Frustulia rhomboides</i> var. <i>saxonica</i>	1.5
<i>Navicula hoefleri</i>	3.3
<i>Navicula leptostriata</i>	1.2
<i>Navicula radiosa</i> var. <i>tenella</i>	1.5
<i>Tabellaria flocculosa</i> var. <i>flocculosa</i>	2.3
<i>Tabellaria quadrisepata</i>	34.8

**Table 7.4 Llynnoedd Ieuan (West Lake) zooplankton abundance summary:
28-7-94 Abundance in vertical net hauls (number of individuals 0.01m⁻²)**

TAXON	Abun
<i>Eudiaptomus gracilis</i>	640
<i>Diaphanosoma brachyurum</i>	- 50
<i>Eubosmina longispina</i>	210
<i>Drepanothrix dentata</i>	X
<i>Acroperus elongatus</i>	X
<i>Chydorus sphaericus</i>	X

X = rare species with relative abundance below 1%
x = very rare species found at one site only

Table 7.5 Llynnoedd Ieuan (West Lake) zooplankton characteristics

Site depth (m)	8.2
Total zooplankton biomass excluding Chaoborus larvae (g DW m ⁻²)	0.52
Chaoborus larvae biomass (g DW m ⁻²)	0
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	17
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	0
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	11

Table 7.6 Llynnoedd Ieuan (West Lake) littoral macroinvertebrate summary.
 Mean number of individuals per sample.

code	Taxon	Mean count/sample
	TURBELLARIA	
03120000	Tricladida	33.6
	PLECOPTERA	
31080101	<i>Siphonoperla torrentium</i>	1.2
	ODONATA	
32020301	<i>Enallagma cyathigerum</i>	0.4
	HEMIPTERA	
33110000	Corixidae sp.	24.0
33110301	<i>Glaenocoris propinqua</i>	4.8
33110401	<i>Callicorixa praeusta</i>	0.4
33110702	<i>Arctocoris germari</i>	1.2
	COLEOPTERA	
35030000	Dytiscidae undet. (larvae)	10.4
35030702	<i>Potamonectes assimilis</i>	5.6
35030900	<i>Hydroporus</i> sp.	0.4
	TRICHOPTERA	
38030301	<i>Polycentropus flavomaculatus</i>	37.6
38060600	<i>Oxyethira</i> sp.	10.0
38070400	<i>Agrypnia</i> sp.	3.6
	DIPTERA	
40090000	Chironomidae	653.2

Table 8.1 Maes-Ilyn water chemistry

Determinand	Sample				
	27-7-94	21-9-94	2-12-94	3-95	mean
lab pH	7.53	7.20	7.28		
field pH	7.76		7.65		
Alkalinity 1 $\mu\text{eq l}^{-1}$	581	616	523		
Alkalinity 2 $\mu\text{eq l}^{-1}$	582	621	524		
lab Conductivity $\mu\text{S cm}^{-1}$	106	115	115		
field Conductivity $\mu\text{S cm}^{-1}$	104		110		
Sodium $\mu\text{eq l}^{-1}$	275	284	277		
Potassium $\mu\text{eq l}^{-1}$	20	15	39		
Magnesium $\mu\text{eq l}^{-1}$	261	274	258		
Calcium $\mu\text{eq l}^{-1}$	579	820	598		
Chloride $\mu\text{eq l}^{-1}$	293	269	269		
Aluminium total monomeric $\mu\text{g l}^{-1}$	0	3	5		
Aluminium non-labile $\mu\text{g l}^{-1}$	0	1	5		
Aluminium labile $\mu\text{g l}^{-1}$	1	2	0		
Absorbtion (250nm)	0.166	0.188	0.205		
Carbon total organic mg l^{-1}	4.4	5.8			
Phosphorus total $\mu\text{gP l}^{-1}$	38.4	93.6	31.1		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	22.3	18.2	23.0		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	2.5	5.0	9.0		
Nitrate $\mu\text{gN l}^{-1}$	28				
Silica total $\mu\text{g l}^{-1}$	1.31	2.62			
Silica soluble reactive mg l^{-1}	1.17	2.52	4.64		
Chlorophyll a $\mu\text{g l}^{-1}$	13.1	66.6	1.8		
Sulphate $\mu\text{eq l}^{-1}$	137	165	196		
Copper total soluble $\mu\text{g l}^{-1}$	0	18			
Iron total soluble $\mu\text{g l}^{-1}$	33	900			
Lead total soluble $\mu\text{g l}^{-1}$	8	6			
Manganese total soluble $\mu\text{g l}^{-1}$	3	40			
Zinc total soluble $\mu\text{g l}^{-1}$	6	8			

Figure 8.1 Maes-Llyn Temperature and oxygen profiles: 2-8-94

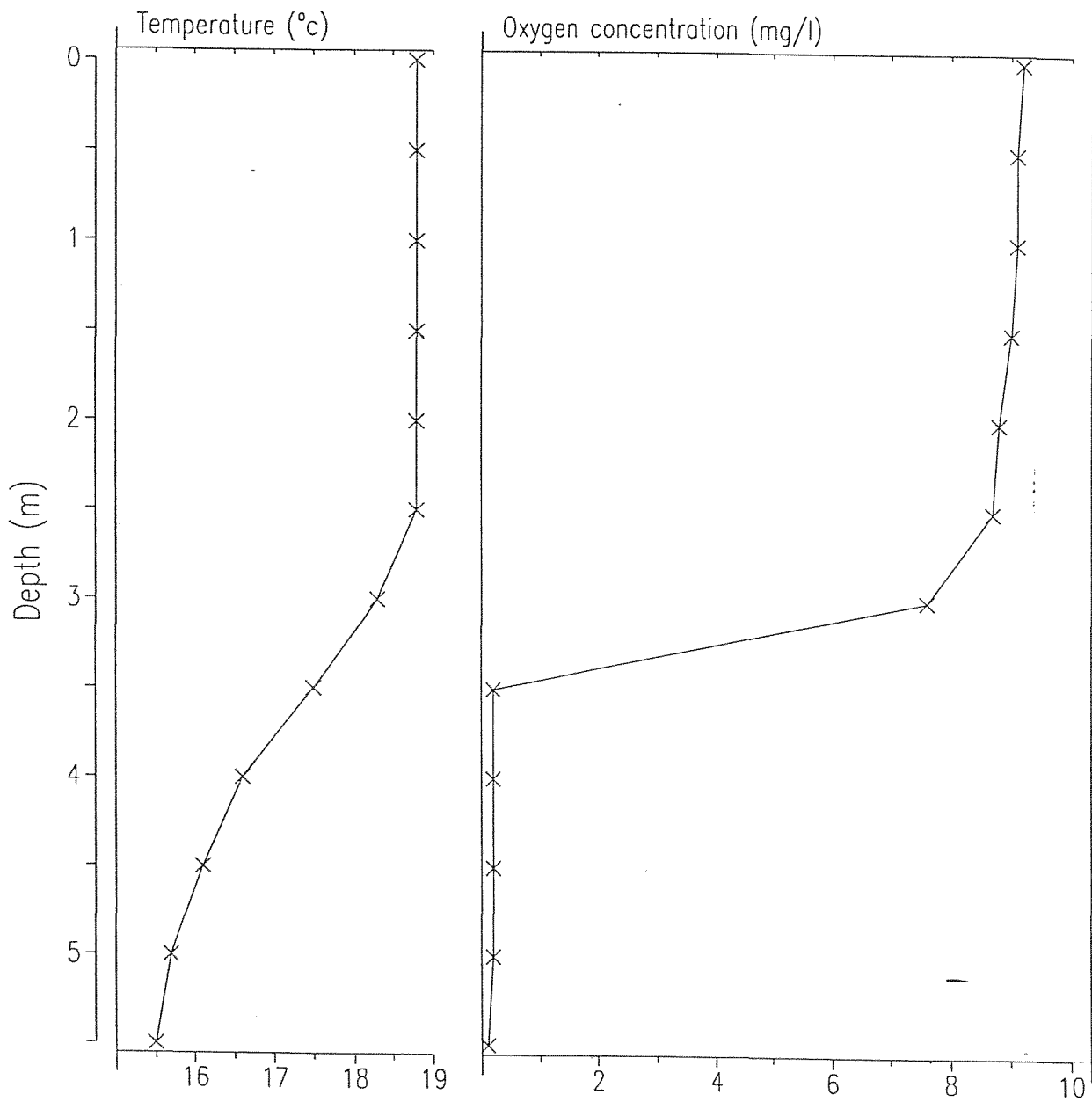


Table 8.2 Maes-llyn aquatic macrophyte abundance summary: 2-8-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Equisetum fluviatile</i>	350202	O	
<i>Menyanthes trifoliata</i>	364701	F	
<i>Carex rostrata</i>	381129	F	
<i>Typha latifolia</i>	384902	O	locally frequent
<i>Eleocharis palustris</i>	382004	O	
Floating taxa			
<i>Nuphar lutea</i>	365501	A	
Submergent taxa			
<i>Ceratophyllum demersum</i>	361401	A	
<i>Littorella uniflora</i>	363901	A	
<i>Myriophyllum alterniflorum</i>	365401	A	
<i>Potamogeton berchtoldii</i>	384003	A	
<i>Potamogeton obtusifolius</i>	384000	R	
<i>Elatine hexandra</i>	362401	A	
Fringing taxa			
<i>Salix</i> sp.		F	
<i>Iris pseudacorus</i>		O	locally frequent
<i>Lythrum salicaria</i>		O	
<i>Lythrum portula</i>		R	
<i>Ranunculus omiophyllus</i>		R	
<i>Callitriche stagnalis</i>		R	
<i>Phalaris arundinacea</i>		O	
<i>Rorippa nasturtium-aquaticum</i>		R	
<i>Potentilla palustre</i>		O	
<i>Carex</i> sp.		R	

Figure 8.2 MAES-LLYN: aquatic macrophyte distribution map 2/8/1994

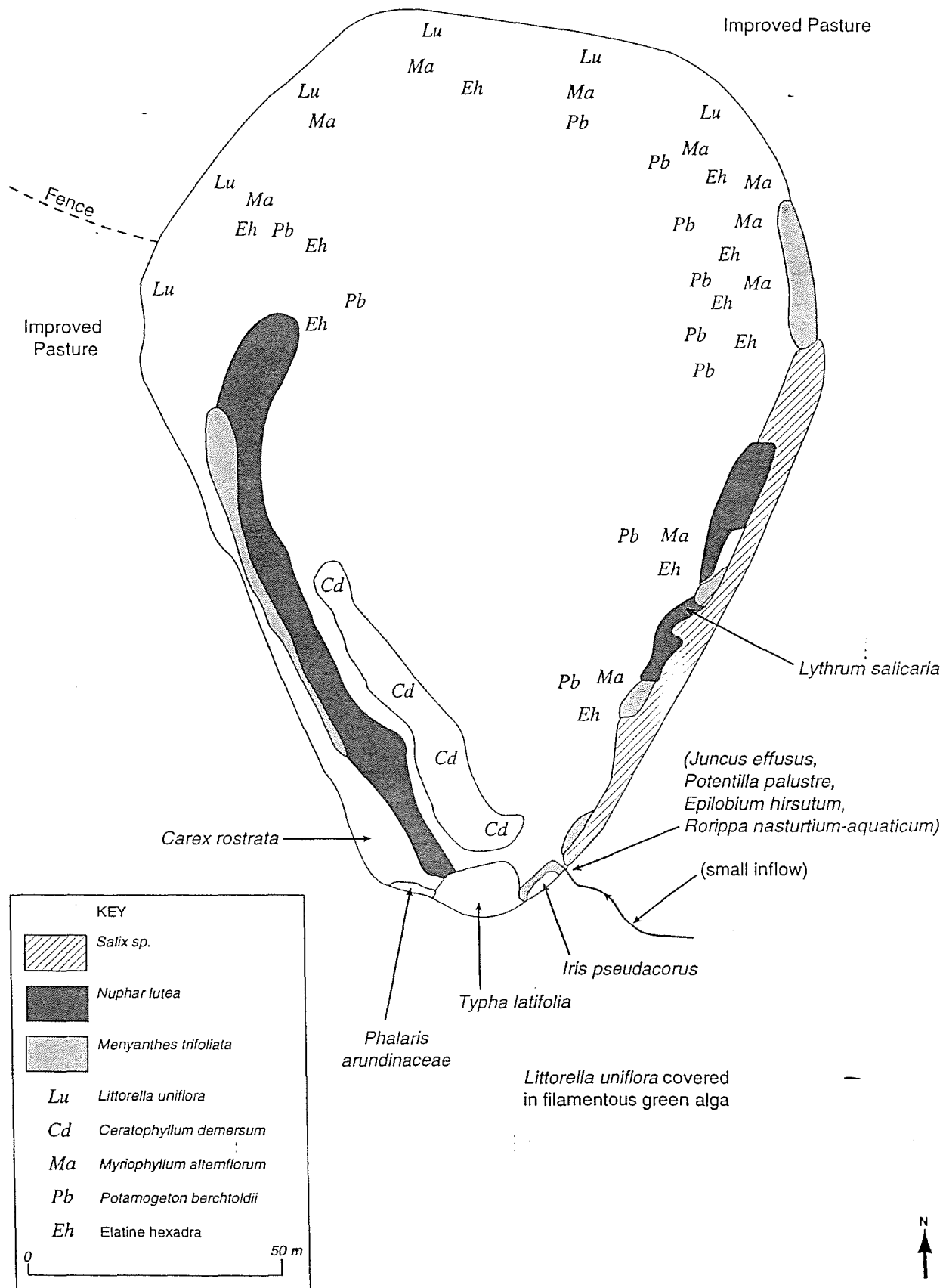


Table 8.3

Maes-lyn epilithic diatom summary
Mean percentage taxon abundance of three samples

TAXON	mean abundance
<i>Achnanthes minutissima</i> var. <i>minutissima</i>	21.9
<i>Cymbella microcephala</i> var. <i>microcephala</i>	38.0
<i>Cymbella minuta</i> var. <i>minuta</i>	1.4
<i>Epithemia adnata</i> var. <i>adnata</i>	1.2
<i>Fragilaria construens</i> var. <i>venter</i>	17.6
<i>Fragilaria elliptica</i>	2.0
<i>Fragilaria intermedia</i>	17.5
<i>Navicula seminulum</i>	1.8
<i>Nitzschia frustulum</i>	1.8
<i>Nitzschia lacuum</i>	4.3
<i>Nitzschia perminuta</i>	1.1
<i>Rhoicosphenia curvata</i>	2.0
<i>Synedra delicatissima</i> var. <i>delicatissima</i>	4.9
<i>Synedra tenera</i>	2.1

Table 8.4

Maes-llyn zooplankton abundance summary: 2-8-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Eudiaptomus gracilis</i>	1100
<i>Diaphanosoma brachyurum</i>	540
<i>Daphnia longispina</i>	370
<i>Ceriodaphnia pulchella</i>	x
<i>Eucyclops serrulatus</i>	X
Other planktonic organisms (not quantitatively sampled)	
<i>Volvox</i> sp.	2300
<i>Keratella cochlearis</i>	110
<i>Keratella quadrata</i>	60
<i>Kellicottia longispina</i>	60
<i>Nauplia</i>	230
<i>Asplanchna</i> sp.	110
Rotifera sp.	20000
Trichocerca	510

X = rare species with relative abundance below 1%
x = very rare species found at one site only

Table 8.5 Maes-llyn zooplankton characteristics

Site depth (m)	5.0
Total zooplankton biomass excluding Chaoborus larvae (g DW m ⁻²)	0.90
Chaoborus larvae biomass (g DW m ⁻²)	0.05
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	48
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	3
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	1

Table 8.6 Maes-Llyn littoral macroinvertebrate summary.

Table 8.6

Maes-Llyn littoral macroinvertebrate summary.
Mean number of individuals per sample.

code	Taxon	Mean
	TURBELLARIA	
03120000	Tricladida	316.0
	MOLLUSCA	
13070107	<i>Lymnaea peregra</i>	1.2
13090307	<i>Planorbis albus</i>	109.6
13090310	<i>Planorbis contortus</i>	23.6
	BIVALVIA	
14030200	<i>Pisidium</i> sp.	30.4
	HIRUDINIA	
17020101	<i>Theromyzon tessalatum</i>	2.4
17020302	<i>Glossiphonia complanata</i>	1.6
17020501	<i>Helobdella stagnalis</i>	2.0
17040102	<i>Erpobdella octoculata</i>	62.4
	MALACOSTRACA	
28030104	<i>Asellus meridianus</i>	1250.8
28070305	<i>Gammarus pulex</i>	510.0
30020302	<i>Cloeon simile</i>	218.0
30080204	<i>Caenis horaria</i>	632.0
30080206	<i>Caenis luctuosa</i>	14.0
	ODONATA	
32020000	Zygoptera sp.	28.0
	HEMIPTERA	
33110000	Corixidae sp.	12.4
33110401	<i>Callicorixa praeusta</i>	0.4
33110801	<i>Sigara dorsalis</i>	17.2
33110803	<i>Sigara distincta</i>	1.2
33110804	<i>Sigara falleni</i>	3.6
33110807	<i>Sigara scotti</i>	0.8
	COLEOPTERA	
35010301	<i>Haliphus confinis</i>	0.4
35010304	<i>Haliphus ruficollis</i> group	0.4
35010312	<i>Haliphus flavicollis</i>	0.4
35030000	Dytiscidae undet. (larvae)	1.6
35030703	<i>Potamonectes depressus</i>	32.4
35030706	<i>Stictotarsus duodecimpustulatus</i>	0.4
35110600	<i>Oulimnius</i> sp.	19.0
	MEGALOPTERA	
36010101	<i>Sialis lutaria</i>	0.8
	TRICHOPTERA	
38040201	<i>Tinodes waeneri</i>	11.6
38080500	<i>Limnephilus</i> sp.	95.6
38120203	<i>Mystacides longicornis</i>	53.6
38150101	<i>Sericostoma personatum</i>	2.4
	DIPTERA	
40090000	Chironomidae	35.2

Table 9.1 Upper Talley Lake water chemistry

Determinand	Sample				
	27-7-94	21-9-94	2-12-94	3-95	mean
lab pH	7.19	7.12	7.06	-	
field pH	7.30		7.40		
Alkalinity 1 $\mu\text{eq l}^{-1}$	532	533	459		
Alkalinity 2 $\mu\text{eq l}^{-1}$	532	536	462		
lab Conductivity $\mu\text{S cm}^{-1}$	109	109	107		
field Conductivity $\mu\text{S cm}^{-1}$			105		
Sodium $\mu\text{eq l}^{-1}$	347	354	327		
Potassium $\mu\text{eq l}^{-1}$	15	18	30		
Magnesium $\mu\text{eq l}^{-1}$	198	194	170		
Calcium $\mu\text{eq l}^{-1}$	555	544	507		
Chloride $\mu\text{eq l}^{-1}$	376	351	331		
Aluminium total monomeric $\mu\text{g l}^{-1}$	0	1	10		
Aluminium non-labile $\mu\text{g l}^{-1}$	0	1	7		
Aluminium labile $\mu\text{g l}^{-1}$	0	0	3		
Absorbtion (250nm)	0.117	0.122	0.116		
Carbon total organic mg l^{-1}	3.2	3.9			
Phosphorus total $\mu\text{gP l}^{-1}$	63.2	33.0	46.4		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	38.9	18.7	32.6		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	12.1	5.9	16.0		
Nitrate $\mu\text{gN l}^{-1}$	42				
Silica total $\mu\text{g l}^{-1}$	1.03	1.83			
Silica soluble reactive mg l^{-1}	0.85	1.79	5.58		
Chlorophyll a $\mu\text{g l}^{-1}$	7.9	10.2	9.9		
Sulphate $\mu\text{eq l}^{-1}$	119	114	149		
Copper total soluble $\mu\text{g l}^{-1}$	0	15			
Iron total soluble $\mu\text{g l}^{-1}$	196	320			
Lead total soluble $\mu\text{g l}^{-1}$	8	5			
Manganese total soluble $\mu\text{g l}^{-1}$	213	61			
Zinc total soluble $\mu\text{g l}^{-1}$	0	13			

Figure 9.1 Upper Talley Lake Temperature and oxygen profiles: 2-8-94

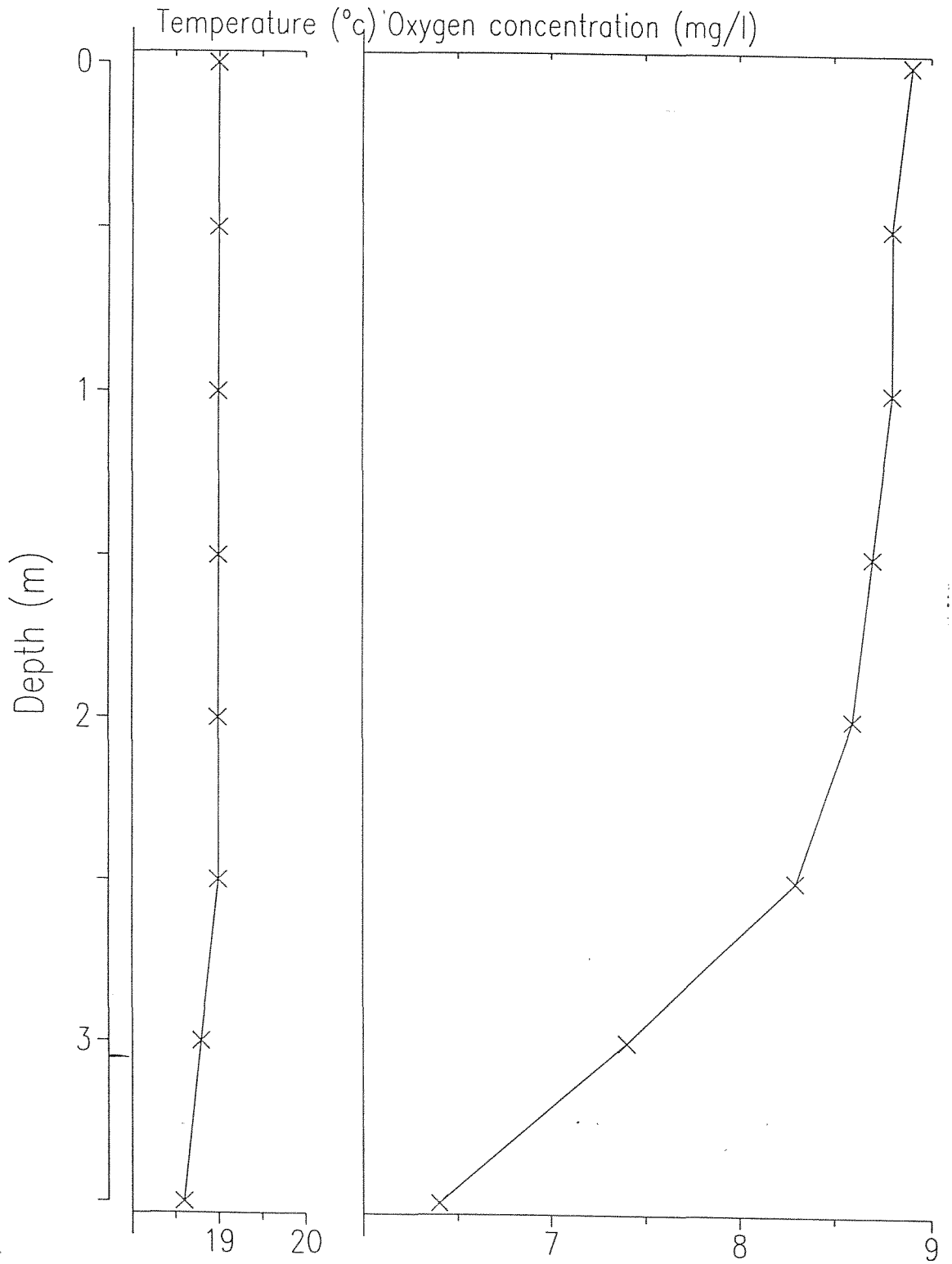


Table 9.2 Upper Talley Lake aquatic macrophyte abundance summary: 2-8-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Equisetum fluviatile</i>	350202	O	
<i>Menyanthes trifoliata</i>	364701	O	
<i>Carex rostrata</i>	381129	F	
<i>Typha latifolia</i>	384902	F	
<i>Eleocharis palustris</i>	382004	F	
<i>Polygonum amphibium</i>	366501	O	locally frequent
<i>Alisma plantago-aquatica</i>	380303	R	
<i>Montia fontana?</i>	365001	R	to be verified
<i>Iris pseudacorus</i>	382901	O	locally frequent
Floating taxa			
<i>Potamogeton natans</i>	384012	F	
<i>Sparganium angustifolium</i>	384601	R	
<i>Nymphaea alba</i>	365601	A	
<i>Nuphar lutea</i>	365501	F	
<i>Lemna minor</i>	383302	R	
Submergent taxa			
<i>Nitella spp.</i>	220000	A	
<i>Myriophyllum alterniflorum</i>	365401	O	
<i>Potamogeton berchtoldii</i>	384003	A	
<i>Potamogeton obtusifolius</i>	384000	O	
<i>Ceratophyllum demersum</i>	361401	O	
Fringing taxa			
<i>Oenanthe crocata</i>			
<i>Lysimachia vulgaris</i>			
<i>Hydrocotyle vulgaris</i>			
<i>Mentha aquatica</i>			
<i>Potentilla palustris</i>			
<i>Rorippa nasturtium</i>			
<i>Phalaris arundinacea</i>			
<i>Lotus corniculatus</i>			
<i>Carex sp.</i>			
<i>Myosotis secunda</i>			
<i>Juncus articulatus</i>			
<i>Juncus effusus</i>			
<i>Callitriche stagnalis</i>			
<i>Ranunculus omiophyllous</i>			

Figure 9.2 UPPER TALLEY LAKE: aquatic macrophyte distribution map 2/8/1994

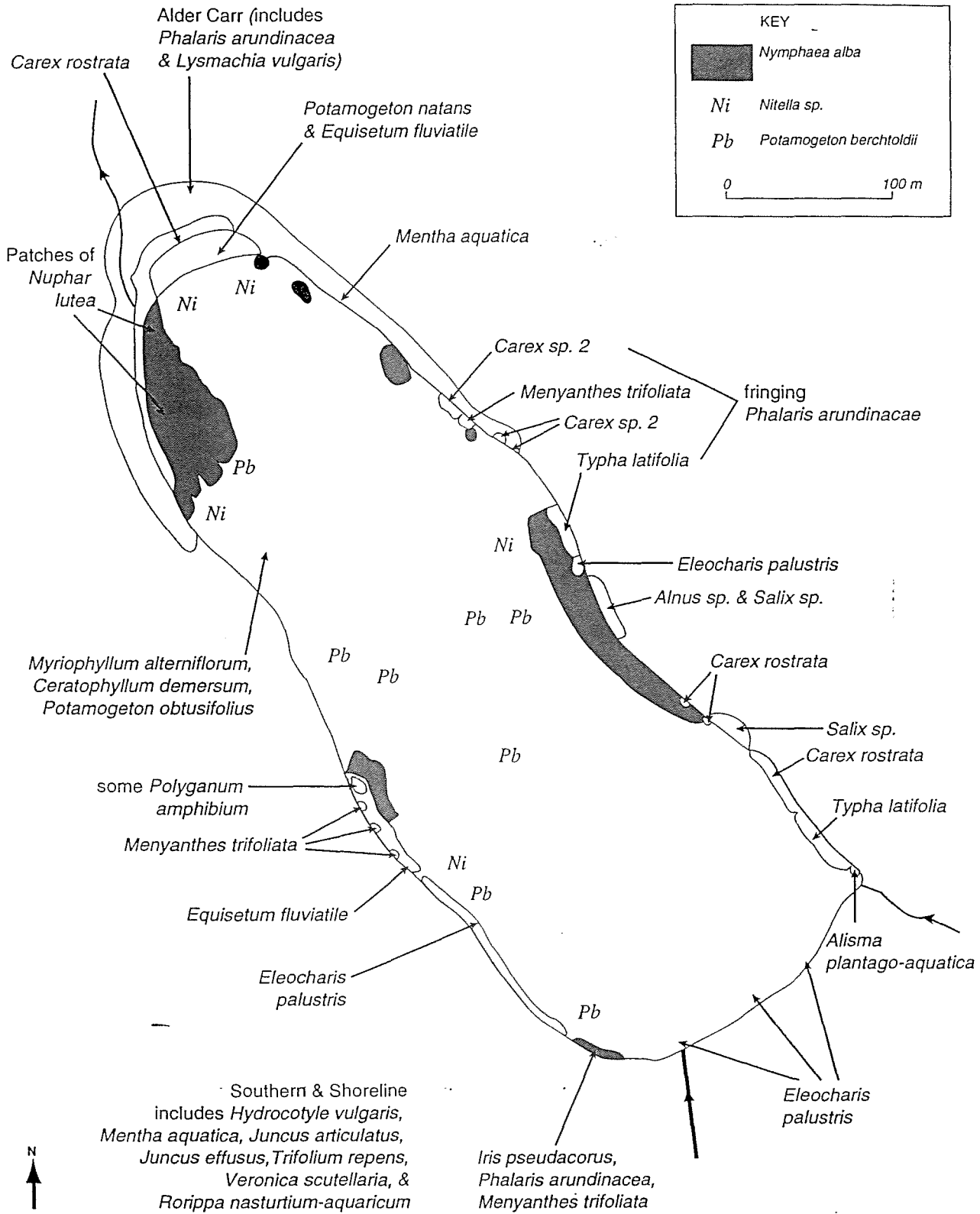


Table 9.3 Upper Talley Lake epilithic diatom summary.
 Mean percentage taxon abundance of three samples.

TAXON	mean abundance
<i>Achnanthes hungarica</i>	1.7
<i>Achnanthes lanceolata</i>	5.9
<i>Achnanthes linearis</i>	4.8
<i>Achnanthes minutissima</i> var. <i>minutissima</i>	4.8
<i>Aulacoseira ambigua</i>	1.9
<i>Aulacoseira granulata</i> var. <i>angustissima</i>	13.9
<i>Cocconeis placentula</i> var. <i>placentula</i>	1.8
<i>Cyclotella stelligera</i>	1.9
<i>Cymbella microcephala</i> var. <i>microcephala</i>	1.2
<i>Epithemia adnata</i> var. <i>adnata</i>	6.0
<i>Fragilaria construens</i> var. <i>venter</i>	8.9
<i>Fragilaria elliptica</i>	4.8
<i>Fragilaria intermedia</i>	1.4
<i>Fragilaria pinnata</i> var. <i>pinnata</i>	16.1
<i>Gomphonema clevei</i>	1.4
<i>Navicula minima</i> var. <i>minima</i>	2.3
<i>Navicula pseudoscutiformis</i>	7.5
<i>Navicula rhyncocephala</i> var. <i>rhyncocephala</i>	1.1
<i>Navicula seminulum</i>	1.5
<i>Navicula subrotundata</i>	1.7
<i>Nitzschia elegantula</i>	2.2
<i>Nitzschia inconspicua</i>	11.4
<i>Nitzschia palea</i> var. <i>palea</i>	1.7
<i>Rhoicosphenia curvata</i>	15.5

Table 9.4 Upper Talley Lake zooplankton abundance summary: 2-8-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Eudiaptomus gracilis</i>	300
<i>Diaphanosoma brachyurum</i>	X
<i>Chaoborus</i> sp. larvae	20
<i>Daphnia galeata</i>	210
<i>Macrocyclus albidus</i>	x
<i>Eurycerus lamellatus</i>	X
<i>Daphnia pulex</i>	X
<i>Paracyclops affinis</i>	x
Other planktonic organisms (not quantitatively sampled)	
<i>Conochilus</i> sp.	
<i>Volvox</i> sp.	
<i>Keratella cochlearis</i>	
<i>Nauplia</i>	
<i>Asplanchna</i> sp.	
<i>Trichocerca</i> sp.	
<i>Brachyonus</i> sp.	
<i>Polyarthra</i> sp.	

X = rare species with relative abundance below 1%
x = very rare species found at one site only

Table 9.5 Upper Talley Lake zooplankton characteristics

Site depth (m)	5.0
Total zooplankton biomass excluding Chaoborus larvae (g DW m ⁻²)	0.9
Chaoborus larvae biomass (g DW m ⁻²)	0.05
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	48
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	3
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	1

Table 9.6 Upper Talley Lake littoral macroinvertebrate summary
 Mean number of individuals per sample

code	Taxon	Mean count/sample
	TURBELLARIA	
03120000	Tricladida	70.4
	MOLLUSCA	
13070101	<i>Lymnaea truncatula</i>	4.8
13070107	<i>Lymnaea peregra</i>	1.2
13080201	<i>Physa fontinalis</i>	13.6
13090307	<i>Planorbis albus</i>	8.4
13090401	<i>Segmentina complanata</i>	0.4
	BIVALVIA	
14030200	<i>Pisidium</i> sp.	183.2
	HIRUDINIA	
17020101	<i>Theromyzon tessalatum</i>	4.8
17020301	<i>Glossiphonia heteroclita</i>	2.4
17020302	<i>Glossiphonia complanata</i>	2.0
17020401	<i>Bratrachobdella paludosa</i>	0.4
17020501	<i>Helobdella stagnalis</i>	10.0
17040102	<i>Erpobdella octoculata</i>	64.4
	MALACOSTRACA	
28070305	<i>Gammarus pulex</i>	12.8
	EPHEMEROPTERA	
30020301	<i>Cloeon dipterum</i>	123.2
30020302	<i>Cloeon simile</i>	14.0
30040100	<i>Leptophlebia</i> sp.	8.0
30080204	<i>Caenis horaria</i>	66.8
30080206	<i>Caenis luctuosa</i>	3.6
	ODONATA	
32020000	Zygoptera sp.	7.6
32020101	<i>Pyrrhosoma nymphula</i>	2.0
32020301	<i>Enallagma cyathigerum</i>	6.4
32020400	<i>Coenagrion</i> sp.	8.4
	HEMIPTERA	

33110000	Corixidae sp.	2.8
33110201	<i>Cymatia bondsdorffi</i>	3.6
33110401	<i>Callicorixa praeusta</i>	1.2
33110501	<i>Corixa dentipes</i>	2.0
33110803	<i>Sigara distincta</i>	115.2
33110806	<i>Sigara fossarum</i>	0.8
	COLEOPTERA	
35010304	<i>Haliphus ruficollis</i> group	2.0
35010311	<i>Haliphus fluvus</i>	0.4
35010312	<i>Haliphus flavicollis</i>	18.8
35030000	Dytiscidae undet. (larvae)	0.8
35030101	<i>Noterus clavicornis</i>	6.4
35030102	<i>Noterus crassicornis</i>	7.2
35030401	<i>Hyphydrus ovatus</i>	30.8
35031101	<i>Agabus guttatus</i>	1.6
35110600	<i>Oulimnius</i> sp.	3.2
	MEGALOPTERA	
36010101	<i>Sialis lutaria</i>	3.2
37000000	LEPIDOPTERA	0.8
	TRICHOPTERA	
38030401	<i>Holocentropus dubius</i>	0.8
38030402	<i>Holocentropus picicornis</i>	0.8
38040301	<i>Lype phaeopa</i>	1.2
38070200	<i>Phryganea</i> sp.	7.2
38070201	<i>Phryganea grandis</i>	0.8
38080500	<i>Limnephilus</i> sp.	2.4
38100301	<i>Beraeodes minutus</i>	6.0
38120203	<i>Mystacides longicornis</i>	76.0
38120701	<i>Triaenodes bicolor</i>	8.4
38150101	<i>Sericostoma personatum</i>	3.2
	DIPTERA	
40010000	Tipulidae	1.6
40080000	Ceratopogonidae	2.8
40090000	Chironomidae	648.4

Table 10.1 Lower Talley lake water chemistry

Determinand	Sample				
	27-7-94	21-9-94	2-12-94	3-95	mean
lab pH	6.98	6.83	6.76		
field pH	7.20		7.32		
Alkalinity 1 $\mu\text{eq l}^{-1}$	479	436	196		
Alkalinity 2 $\mu\text{eq l}^{-1}$	479	438	192		
lab Conductivity $\mu\text{S cm}^{-1}$	102	102	89		
field Conductivity $\mu\text{S cm}^{-1}$	100		90		
Sodium $\mu\text{eq l}^{-1}$	316	306	330		
Potassium $\mu\text{eq l}^{-1}$	29	35	23		
Magnesium $\mu\text{eq l}^{-1}$	200	193	185		
Calcium $\mu\text{eq l}^{-1}$	509	483	314		
Chloride $\mu\text{eq l}^{-1}$	338	326	360		
Aluminium total monomeric $\mu\text{g l}^{-1}$	4	8	13		
Aluminium non-labile $\mu\text{g l}^{-1}$	0	7	12		
Aluminium labile $\mu\text{g l}^{-1}$	4	1	1		
Absorbion (250nm)	0.185	0.244	0.108		
Carbon total organic mg l^{-1}	4.4	5.6			
Phosphorus total $\mu\text{gP l}^{-1}$	54.5	85.4	81.1		
Phosphorus total soluble $\mu\text{gP l}^{-1}$	38.9	18.7	32.6		
Phosphorus soluble reactive $\mu\text{gP l}^{-1}$	12.1	5.9	16		
Nitrate $\mu\text{gN l}^{-1}$	42				
Silica total $\mu\text{g l}^{-1}$	1.03	1.83			
Silica soluble reactive mg l^{-1}	0.85	1.79	5.58		
Chlorophyll a $\mu\text{g l}^{-1}$	7.9	10.2	9.9		
Sulphate $\mu\text{eq l}^{-1}$	119	114	149		
Copper total soluble $\mu\text{g l}^{-1}$	0	15			
Iron total soluble $\mu\text{g l}^{-1}$	196	320			
Lead total soluble $\mu\text{g l}^{-1}$	8	5			
Manganese total soluble $\mu\text{g l}^{-1}$	213	61			
Zinc total soluble $\mu\text{g l}^{-1}$	0	13			

Figure 10.1 Lower Talley Lake Temperature and oxygen profiles: 3-8-94

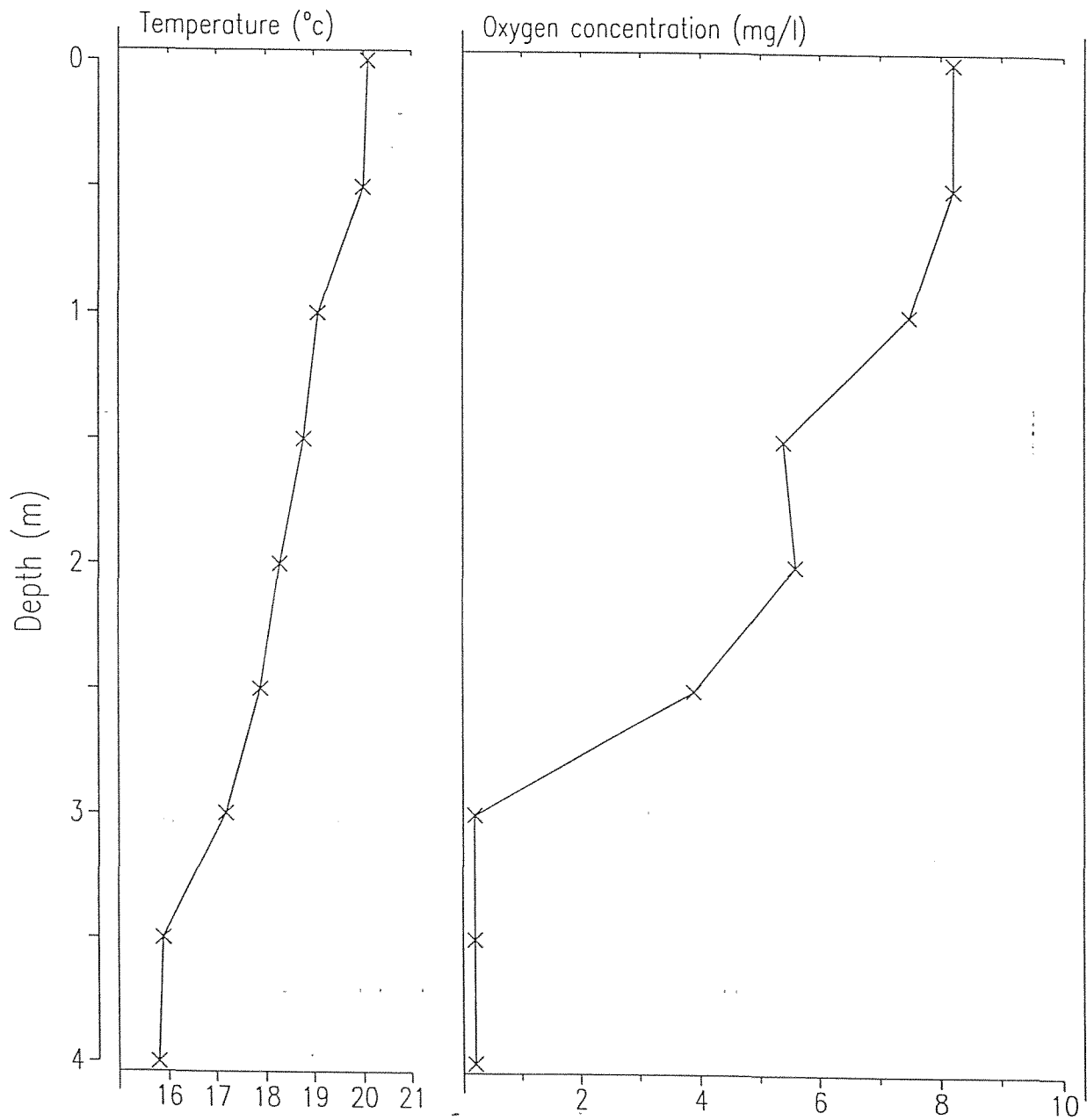


Table 10.2 Lower Talley Lake aquatic macrophyte abundance summary: 3-8-94

Taxon	code	Abun	comments
Emergent taxa			
<i>Equisetum fluviatile</i>	350202	O	
<i>Menyanthes trifoliata</i>	364701	R	
<i>Carex rostrata</i>	381129	A	
<i>Typha latifolia</i>	384902	A	
<i>Alisma plantago-aquatica</i>	380303	R	
Floating taxa			
<i>Nymphaea alba</i>	365601	F	
<i>Nuphar lutea</i>	365501	O	
<i>Lemna minor</i>	383302	O	
Submergent taxa			
<i>Nitella spp.</i>	220000	O	
<i>Myriophyllum alterniflorum</i>	365401	R	
<i>Elatine hexandra</i>	362401	O	
<i>Potamogeton obtusifolius</i>	384000	F	
<i>Potamogeton berchtoldii</i>	384003	A	
Fringing taxa			
<i>Phalaris arundinacea</i>			
<i>Oenanthe crocata</i>			
<i>Lysmachis vulgaris</i>			
<i>Epilobium hirsutum</i>			
<i>Lycopus europaeus</i>			
<i>Stachys palustris</i>			
<i>Scutellaria galericulata</i>			
<i>Mentha aquatica</i>			
<i>Potentilla palustris</i>			
<i>Myosotis (secunda?)</i>			
<i>Salix sp.</i>			
<i>Alnus glutinosa</i>			
<i>Hydrocotyle vulgaris</i>			
<i>Sphagnum sp.</i>			

Figure 10.2 LOWER TALLEY LAKE: aquatic macrophyte distribution map 3/8/1994

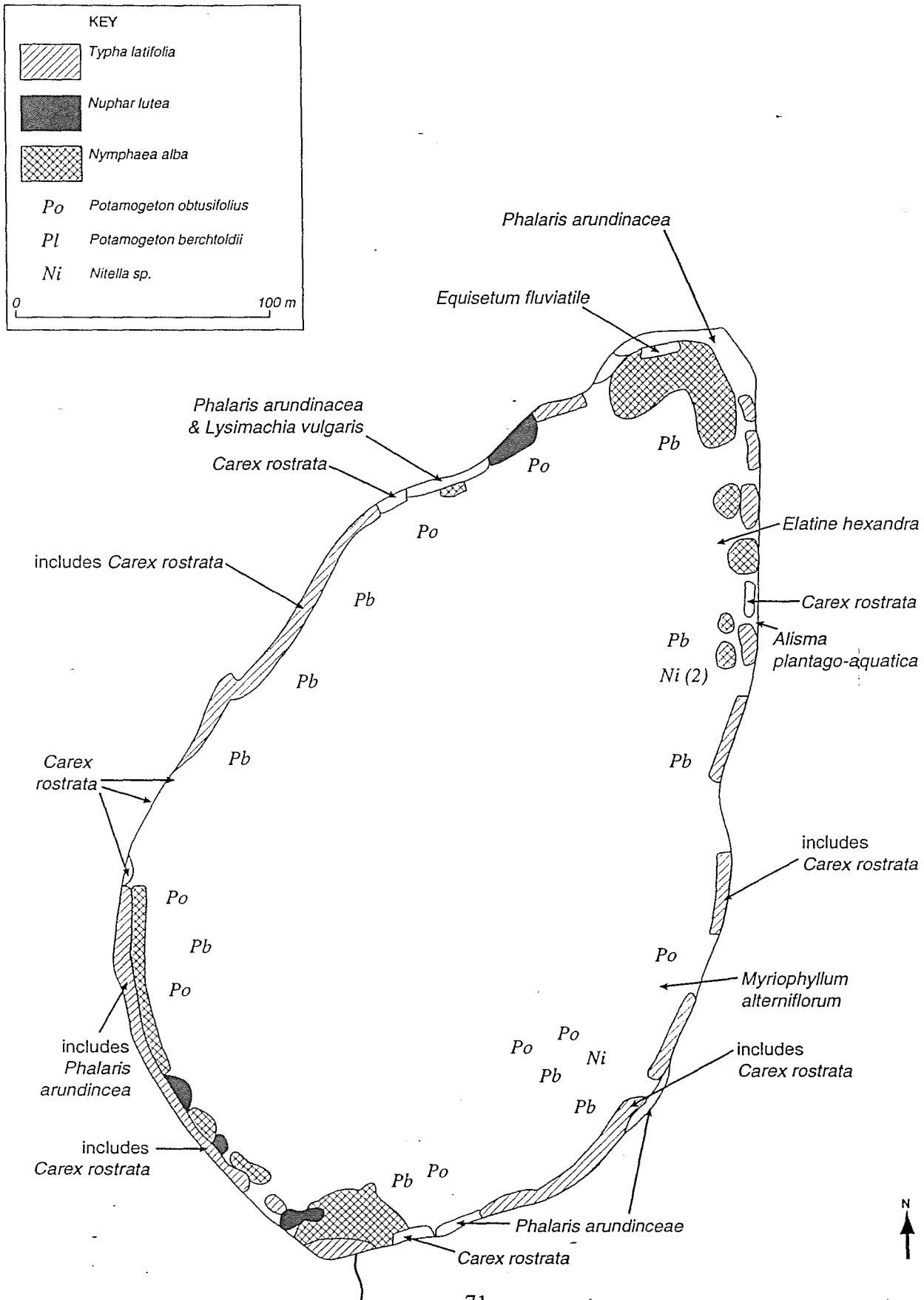


Table 10.3 Lower Talley Lake epilithic diatom summary
Mean percentage taxon abundance of three samples

TAXON	mean abundance
<i>Achnanthes levanderi</i>	4.3
<i>Achnanthes linearis</i>	8.6
<i>Achnanthes minutissima</i> var. <i>minutissima</i>	40.2
<i>Aulacoseira granulata</i> var. <i>angustissima</i>	3.1
<i>Cocconeis placentula</i> var. <i>euglypta</i>	1.8
<i>Cocconeis placentula</i> var. <i>placentula</i>	3.1
<i>Cymbella microcephala</i> var. <i>microcephala</i>	1.8
<i>Eunotia implicata</i>	3.3
<i>Eunotia</i> sp.	2.4
<i>Fragilaria elliptica</i>	15.4
<i>Gomphonema angustatum</i> var. <i>angustatum</i>	2.1
<i>Gomphonema parvulum</i> var. <i>parvulum</i>	1.8
<i>Navicula cryptocephala</i> var. <i>cryptocephala</i>	1.6
<i>Navicula lanceolata</i>	1.3
<i>Navicula minima</i> var. <i>minima</i>	3.0
<i>Navicula</i> sp.	1.3
<i>Nitzschia frustulum</i>	3.4
<i>Nitzschia gracilis</i>	1.1

Table 10.4 Lower Talley Lake zooplankton abundance summary: 3-8-94
Abundance in vertical net hauls (number of individuals 0.01m⁻²)

TAXON	Abun
<i>Eudiaptomus gracilis</i>	1300
<i>Diaphanosoma brachyurum</i>	X
<i>Chaoborus</i> sp. larvae	30
<i>Daphnia galeata</i>	x
<i>Macrocyclus albidus</i>	x
<i>Ceriodaphnia pulchella</i>	140
<i>Acanthocyclops robustus</i>	x
<i>Thermocyclops dybowskii</i>	X
Other planktonic organisms (not quantitatively sampled)	
<i>Volvox</i> sp.	70
<i>Keratella cochlearis</i>	20
<i>Nauplia</i>	20
<i>Asplanchna</i> sp.	20

X = rare species with relative abundance below 1%
x = very rare species found at one site only

Table 10.5 Lower Talley Lake zooplankton characteristics

Site depth (m)	3.7
Total zooplankton biomass excluding <i>Chaoborus</i> larvae (g DW m ⁻²)	0.83
<i>Chaoborus</i> larvae biomass (g DW m ⁻²)	0.11
Net algal biomass (g DW m ⁻²)	0
Cladoceran biomass as proportion of total zooplankton biomass (%)	7
Large cladoceran (>710µm) as proportion of total zooplankton biomass (%)	0
Large Copepoda (>420µm) as proportion of total zooplankton biomass (%)	6

**Table 10.6 Lower Talley Lake littoral macroinvertebrate summary.
Mean number of individuals per sample.**

code	Taxon	Mean count/sample
	TURBELLARIA	
03120000	Tricladida	23.4
	MOLLUSCA	
13070107	<i>Lymnaea peregra</i>	3.4
13080201	<i>Physa fontinalis</i>	16.0
13090307	<i>Planorbis albus</i>	23.4
13090401	<i>Segmentina complanata</i>	10.0
	BIVALVIA	
14030200	<i>Pisidium</i> sp.	45.4
	HIRUDINIA	
17020101	<i>Theromyzon tessalatum</i>	0.6
17020301	<i>Glossiphonia heteroclita</i>	2.0
17020302	<i>Glossiphonia complanata</i>	1.4
17020501	<i>Helobdella stagnalis</i>	12.0
17040102	<i>Erpobdella octoculata</i>	16.0
	EPHEMEROPTERA	
30020301	<i>Cloeon dipterum</i>	23.4
30080204	<i>Caenis horaria</i>	8.0
	ODONATA	
32020000	<i>Zygoptera</i> sp.	5.4
32020400	<i>Coenagrion</i> sp.	3.4
	HEMIPTERA	
33090101	<i>Notonecta glauca</i>	0.6
33110803	<i>Sigara distincta</i>	0.6
	COLEOPTERA	
35010000	<i>Haliplidae</i> sp.	2.0
35010304	<i>Halipus ruficollis</i> group	0.6
35010312	<i>Halipus flavicollis</i>	2.6
35030000	Dytiscidae undet. (larvae)	0.6
35030101	<i>Noterus clavicornis</i>	0.6
35030102	<i>Noterus crassicornis</i>	0.6
35030401	<i>Hyphydrus ovatus</i>	2.6
37000000	LEPIDOPTERA	0.6
	TRICHOPTERA	
38030401	<i>Holocentropus dubius</i>	2.0
38030402	<i>Holocentropus picicornis</i>	178.0
38070200	<i>Phryganea</i> sp.	3.4
38080500	<i>Limnephilus</i> sp.	4.0
38120701	<i>Triaenodes bicolor</i>	2.0
	DIPTERA	
40010000	Tipulidae	1.4
40080000	Ceratopogonidae	9.4
40090000	Chironomidae	567.4