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ECN Diatom Time-series from the Nant Teyrn, Snowdonia

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Report to the Countryside Council for Wales

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1 INTRODUCTION

Nant Teyrn is a small upland stream on Yr Wyddfa/Snowdon NNR. This ECN freshwater site is co-located with the Yr Wyddfa/Snowdon ECN terrestrial site which has been in existence since 1997. The study section (Figure 1) is on the out-flow from Llyn Teyrn. The geology of the catchment is nearly all highly acidic rhyolite and dolerite with a small amount of bedded pyroclastics. Water chemistry data for the stream has been collected since 1997, and discharge data collected from the weir since 2000 (ECN website, 2010).

Figure 1 Nant Teyrn Gauging Weir (photo CCW)

Since 2006 the ECRC at UCL has received three epilithic diatom samples per year from the Nant Teyrn. The samples were taken from 3 close-by but different sampling stations in the stream:

Location S01: SH 64268 54742. Water depth 1.5 m.
Location S02: SH 64277 54737. Water depth 0.5 m, smaller stones.
Location S03: SH 64304 54709. Water depth 0.25 m, riffle area.

The analyses presented in this report are for the 12 samples taken between 2006 and 2009 (Table 1).

Table 1 Diatom Sampling Dates

Sampling date	Number of Samples
25/09/2006	3
11/10/2007	3
29/09/2008	3
29/10/2009	3

2 DATA ANALYSIS AND PRESENTATION

Diatoms were collected from the Nant Teyrn ECN site and prepared for analysis following protocols described in the United Kingdom Environmental Change Network's "Protocols for Standard Measurements at Freshwater Sites" (Sykes *et al.,* 1999).

Diatoms were examined at x1000 using a Leitz Orthoplan microscope with phase contrast illumination. 300 valves were identified and counted for each slide. Taxa are coded according to the ECRC diatom database coding system DIATCODE and a full list of taxa observed is shown in Appendix 1.

The primary count data are held on a central Access database at the Environmental Change Research Centre (ECRC) and in this report they are presented as summary percentage data with accompanying summary statistics. The diatom diagrams were produced using the Program C2 (Juggins, 2007). Only data for species occurring with a minimum abundance of 1% are presented. Appendices 2 and 3 provide the diatom samples and data respectively, in a form ready for submission to the central ECN database.

3 RESULTS AND DISCUSSION

Figure 2 illustrates the epilithic diatom data for the three replicate annual samples amalgamated by year for the four sample years, 2006-2009, whereas Figure 3 shows data for each sample separately. Table 2 shows the most commonly

occurring taxa in rank order and Table 3 shows the number of species occurring in each sample as a measure of sample richness.

The amalgamated annual data (Figure 2) show little year on year change in the composition of the flora which is dominated by *Eunotia rhomboidea*, *Peronia fibula*, *Navicula leptostriata*, *Tabellaria flocculosa*, *Brachysira brebisonnii* and *Eunotia alpina* that occur in all 12 samples analysed and together account for over 60% of the total in any single year.

The data for the individual samples (Figure 3) shows considerably more variability with *Eunotia denticulata*, *Frustulia rhomboides* var. *saxonica* and *Achnanthes marginulata* in particular, being abundant in some samples. The taxon richness per sample (for counts of 300 valves) varies between 11 and 23 with a mean of 15, typical of richness values for upland streams. The total taxon pool (over 12 samples, four years and a count of 3,600 valves) is 43.

These results underline the value of the sampling strategy, especially the need to pool cobbles at a sampling point and take a minimum of three samples per site to overcome the inherent variability that occurs between cobbles within a stream reach.

The diatom flora at Nant Teyrn is indicative of acidic conditions. Although the time-series is as yet insufficiently long for trends in water quality to be identified, and there are no earlier data from this site for comparison, it is probable that the Nant Teyrn is not only an acid stream but also an acidified stream, now in the process of recovery. As such it is probably comparable to other acidified streams in Wales and the rest of the UK that have been monitored for over 20 years and are showing signs of recovery from acidification (cf. Kernan *et al*. 2010).

Continued recovery can be expected at lake and stream sites across the UK as acid deposition continues to be reduced. If Nant Teyrn is indeed in the process of recovery as suggested here this should be clearly reflected by future changes in diatom populations. We strongly recommend, therefore, that the regular diatom sampling at this site is maintained in order to track such expected long term changes.

A further and definitive test of this recovery hypothesis could be obtained from a palaeolimnological study of Llyn Teyrn, situated only ~100m upstream to the West of the current stream diatom sampling location. Standard techniques including lake sediment dating and diatom analysis can be used to reconstruct the past pH history of the lake. As the ECN site at Nant Teyrn is on the outflow of Llyn Teyrn, the lake history can be assumed to apply directly to the stream. The sediment record could at the same time be used to document trends in toxic substance pollution (including heavy metals) that may also have an influence on the biology of the lake and its outflow.

Figure 2 Nant Teyrn Diatom Time Series – S01, S02 and S03 Amalgamated By Date

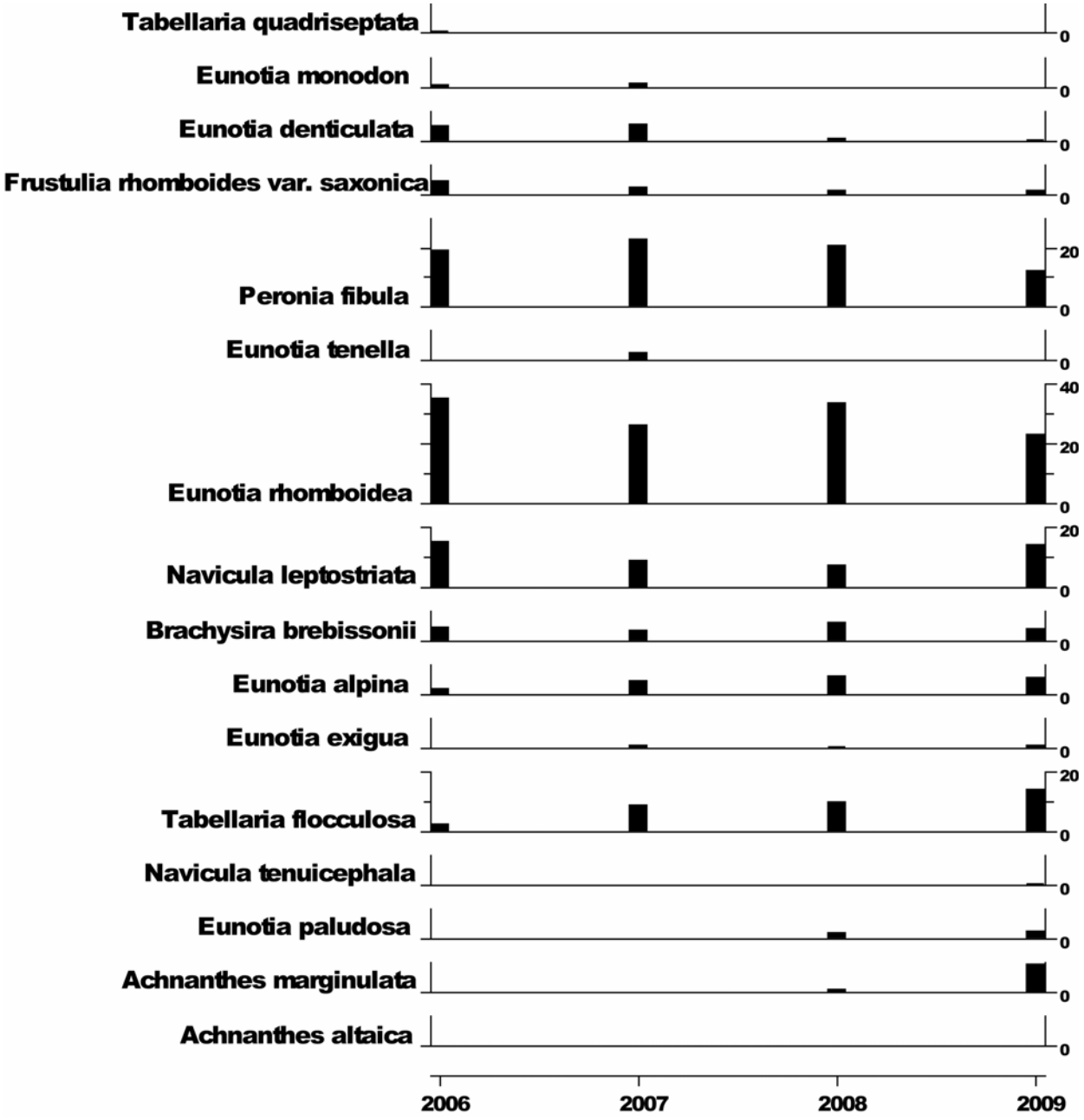

Figure 3 Nant Teyrn Diatom Percentage Abundances from S01, S02 and S03 Autumn Samples

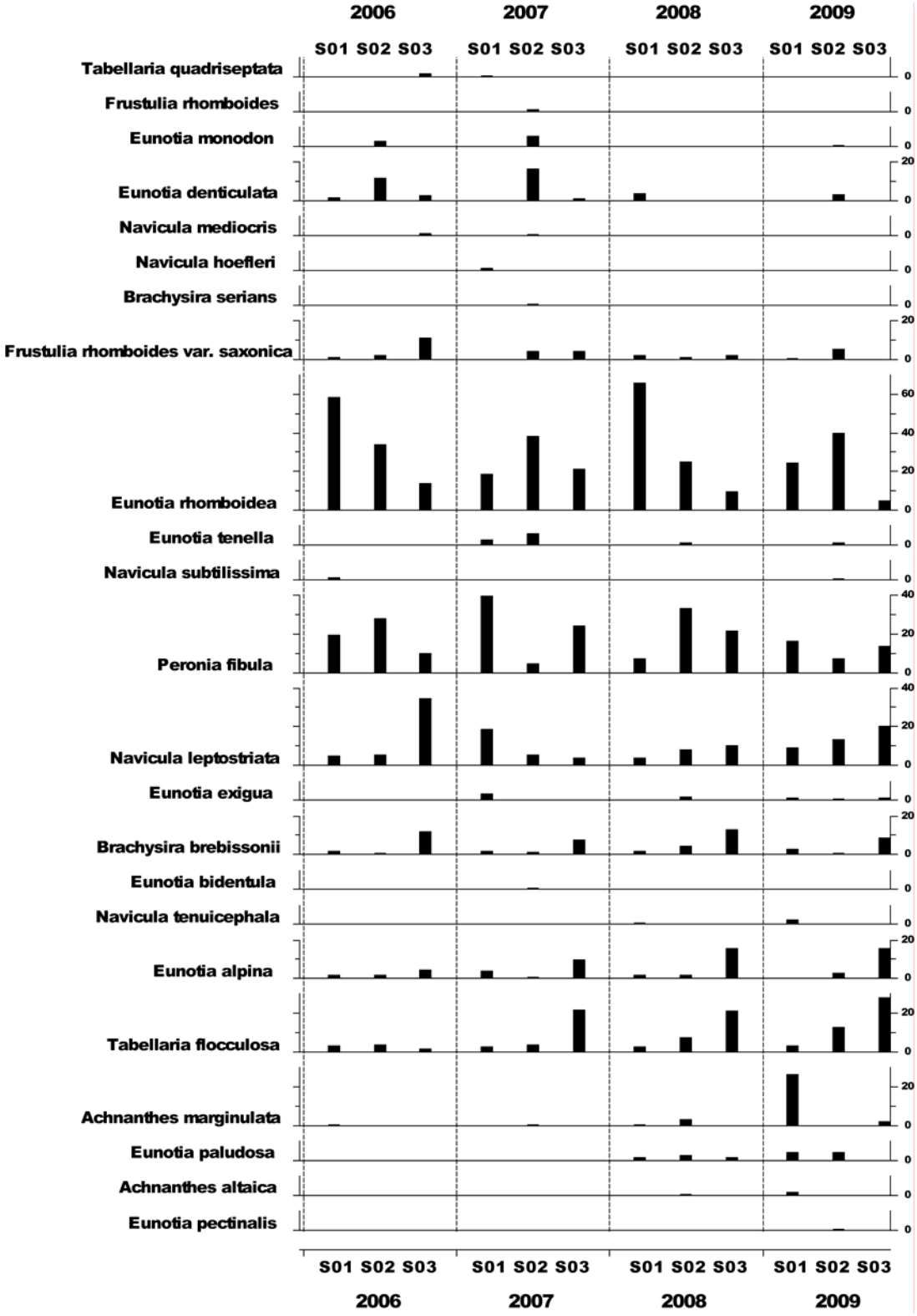

Table 2 Nant Teyrn Diatom Species in Order of Number of Occurrences

Taxon	Taxon Code	Number of Occurrences (Max 12)
Brachysira brebissonii	BR006A	12
Eunotia alpina	EU005A	12
Eunotia rhomboidea	EU011A	12
Navicula leptostriata	NA156A	12
Peronia fibula	PE002A	12
Tabellaria flocculosa	TA001A	12
Frustulia rhomboides var. saxonica	FU002B	11
Eunotia exigua	EU009A	10
Achnanthes marginulata	AC022A	9
Eunotia denticulata	EU015A	7
Navicula subtilissima	NA033A	7
Eunotia bidentula	EU007A	6
Eunotia paludosa	EU040A	6
Eunotia tenella	EU004A	6
Stenopterobia intermedia	SP001A	6
Navicula mediocris	NA006A	5
Navicula tenuicephala	NA135A	5
Tabellaria quadriseptata	TA004A	5
Eunotia monodon	EU008A	4
Eunotia nymanniana	EU045A	4
Navicula veneta	NA054A	4
Brachysira serians	BR003A	3
Cymbella perpusilla	CM010A	3
Navicula hoefleri	NA167A	3
Achnanthes altaica	AC046A	2
Cymbella aequalis	CM014A	2
Frustulia rhomboides	FU002A	2
Gomphonema gracile	GO004A	2
Neidium bisulcatum	NE004A	2
Nitzschia perminuta	NI005A	2
Achnanthes sp.	AC9999	1
Amphora pediculus	AM012A	1
Cocconeis placentula var. euglypta	CO001B	1
Cymbella gracilis	CM018A	1
Cymbella sinuata	CM003A	1
Cymbella ventricosa	CM001A	1
Eunotia paludosa var. trinacria	EU040B	1
Eunotia pectinalis	EU002A	1
Fragilaria virescens var. exigua	FR005D	1

Taxon	Taxon Code	Number of Occurrences (Max 12)
Navicula sp.	NA9999	1
Nitzschia bacillum	NI211A	1
Pinnularia gibba var. linearis	PI001B	1
Pinnularia interrupta	PI004A	1
Pinnularia subcapitata var. hilseana	PI022B	1

Table 3 Nant Teyrn Diatom Sample Diversities

Sampling Date	ECN_Sample Location	ECRC Sample Name	Number of Diatom Taxa Per Sample
25/09/2006	S01	NANTY001	16
25/09/2006	S02	NANTY002	19
25/09/2006	S03	NANTY003	13
11/10/2007	S01	NANTY004	16
11/10/2007	S02	NANTY005	23
11/10/2007	S03	NANTY006	15
29/09/2008	S01	NANTY007	19
29/09/2008	S02	NANTY008	20
29/09/2008	S03	NANTY009	11
29/10/2009	S01	NANTY010	18
29/10/2009	S02	NANTY011	18
29/10/2009	S03	NANTY012	14

4 ACKNOWLEDGEMENTS

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5 REFERENCES

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Sykes, J.M., Lane, A.M.J. & George, D.G. (1999). *The United Kingdom Environmental change Network: Protocols for Standard Measurements at Freshwater Sites*. Institute of Terrestrial Ecology. 134 pp.

6 APPENDICES

Appendix 1 Nant Teyrn Diatom Species and ECRC Database DIATCODES

Taxon	Taxon Code
Achnanthes altaica	AC046A
Achnanthes marginulata	AC022A
Achnanthes sp.	AC9999
Amphora pediculus	AM012A
Brachysira brebissonii	BR006A
Brachysira serians	BR003A
Cocconeis placentula var. euglypta	CO001B
Cymbella aequalis	CM014A
Cymbella gracilis	CM018A
Cymbella perpusilla	CM010A
Cymbella sinuata	CM003A
Cymbella ventricosa	CM001A
Eunotia alpina	EU005A
Eunotia bidentula	EU007A
Eunotia denticulata	EU015A
Eunotia exigua	EU009A
Eunotia monodon	EU008A
Eunotia nymanniana	EU045A
Eunotia paludosa	EU040A
Eunotia paludosa var. trinacria	EU040B
Eunotia pectinalis	EU002A
Eunotia rhomboidea	EU011A
Eunotia tenella	EU004A
Fragilaria virescens var. exigua	FR005D
Frustulia rhomboides	FU002A
Frustulia rhomboides var. saxonica	FU002B
Gomphonema gracile	GO004A
Navicula hoefleri	NA167A
Navicula leptostriata	NA156A
Navicula mediocris	NA006A
Navicula sp.	NA9999
Navicula subtilissima	NA033A
Navicula tenuicephala	NA135A
Navicula veneta	NA054A
Neidium bisulcatum	NE004A
Nitzschia bacillum	NI211A
Nitzschia perminuta	NI005A
Peronia fibula	PE002A
Pinnularia gibba var. linearis	PI001B
Pinnularia interrupta	PI004A

Taxon	Taxon Code
Pinnularia subcapitata var. hilseana	PI022B
Stenopterobia intermedia	SP001A
Tabellaria flocculosa	TA001A
Tabellaria quadriseptata	TA004A

Appendix 2 Nant Teyrn Diatom Samples, ECN Database Format

ECN FDT - SAMPLES
Nant Teyrn
R29,01,02,03,01,02,03,01,02,03,01,02,03
Dylan Lloyd
R29,01,25-Sep-2006,S,Q,000
R29,02,25-Sep-2006,S,Q,000
R29,03,25-Sep-2006,S,Q,000
R29,01,11-Oct-2007,S,Q,000
R29,02,11-Oct-2007,S,Q,000
R29,03,11-Oct-2007,S,Q,000
R29,01,29-Sep-2008,S,Q,000
R29,02,29-Sep-2008,S,Q,000
R29,03,29-Sep-2008,S,Q,000
R29,01,29-Oct-2009,S,Q,000
R29,02,29-Oct-2009,S,Q,000
R29,03,29-Oct-2009,S,Q,000

Appendix 3 Nant Teyrn Diatom Data, ECN Database Format

ECN FDT - SPECIES
Nant Teyrn
R29,01,02,03,01,02,03,01,02,03,01,02,03
Richard W. Battarbee
R29,01,25-Sep-2006,Achnanthes marginulata,AC022A,3,Q,000
R29,01,25-Sep-2006,Brachysira brebissonii,BR006A,7,Q,000
R29,01,25-Sep-2006,Eunotia alpina,EU005A,6,Q,000
R29,01,25-Sep-2006,Eunotia denticulata,EU015A,6,Q,000
R29,01,25-Sep-2006,Eunotia exigua,EU009A,2,Q,000
R29,01,25-Sep-2006,Eunotia rhomboidea,EU011A,177,Q,000
R29,01,25-Sep-2006,Frustulia rhomboides var. saxonica,FU002B,4,Q,000
R29,01,25-Sep-2006,Gomphonema gracile,GO004A,1,Q,000
R29,01,25-Sep-2006,Navicula leptostriata,NA156A,16,Q,000
R29,01,25-Sep-2006,Navicula mediocris,NA006A,1,Q,000
R29,01,25-Sep-2006,Navicula subtilissima,NA033A,4,Q,000
R29,01,25-Sep-2006,Navicula tenuicephala,NA135A,1,Q,000
R29,01,25-Sep-2006,Navicula veneta,NA054A,1,Q,000
R29,01,25-Sep-2006,Peronia fibula,PE002A,60,Q,000
R29,01,25-Sep-2006,Stenopterobia intermedia,SP001A,1,Q,000

R29,01,25-Sep-2006,Tabellaria flocculosa,TA001A,11,Q,000
R29,02,25-Sep-2006,Achnanthes marginulata,AC022A,2,Q,000
R29,02,25-Sep-2006,Brachysira brebissonii,BR006A,3,Q,000
R29,02,25-Sep-2006,Cocconeis placentula var. euglypta,CO001B,1,Q,000
R29,02,25-Sep-2006,Cymbella sinuata,CM003A,1,Q,000
R29,02,25-Sep-2006,Cymbella ventricosa,CM001A,1,Q,000
R29,02,25-Sep-2006,Eunotia alpina,EU005A,6,Q,000
R29,02,25-Sep-2006,Eunotia denticulata,EU015A,36,Q,000
R29,02,25-Sep-2006,Eunotia exigua,EU009A,2,Q,000
R29,02,25-Sep-2006,Eunotia monodon,EU008A,10,Q,000
R29,02,25-Sep-2006,Eunotia rhomboidea,EU011A,104,Q,000
R29,02,25-Sep-2006,Frustulia rhomboides,FU002A,1,Q,000
R29,02,25-Sep-2006,Frustulia rhomboides var. saxonica,FU002B,8,Q,000
R29,02,25-Sep-2006,Navicula leptostriata,NA156A,18,Q,000
R29,02,25-Sep-2006,Navicula sp.,NA9999,2,Q,000
R29,02,25-Sep-2006,Navicula veneta,NA054A,2,Q,000
R29,02,25-Sep-2006,Nitzschia bacillum,NI211A,2,Q,000
R29,02,25-Sep-2006,Peronia fibula,PE002A,86,Q,000
R29,02,25-Sep-2006,Tabellaria flocculosa,TA001A,13,Q,000
R29,02,25-Sep-2006,Tabellaria quadriseptata,TA004A,2,Q,000
R29,03,25-Sep-2006,Achnanthes sp.,AC9999,2,Q,000
R29,03,25-Sep-2006,Amphora pediculus,AM012A,2,Q,000
R29,03,25-Sep-2006,Brachysira brebissonii,BR006A,38,Q,000
R29,03,25-Sep-2006,Eunotia alpina,EU005A,14,Q,000
R29,03,25-Sep-2006,Eunotia denticulata,EU015A,10,Q,000
R29,03,25-Sep-2006,Eunotia monodon,EU008A,2,Q,000
R29,03,25-Sep-2006,Eunotia rhomboidea,EU011A,43,Q,000
R29,03,25-Sep-2006,Frustulia rhomboides var. saxonica,FU002B,35,Q,000
R29,03,25-Sep-2006,Navicula leptostriata,NA156A,106,Q,000
R29,03,25-Sep-2006,Navicula mediocris,NA006A,4,Q,000
R29,03,25-Sep-2006,Peronia fibula,PE002A,32,Q,000
R29,03,25-Sep-2006,Tabellaria flocculosa,TA001A,6,Q,000
R29,03,25-Sep-2006,Tabellaria quadriseptata,TA004A,6,Q,000
R29,01,11-Oct-2007,Achnanthes marginulata,AC022A,2,Q,000
R29,01,11-Oct-2007,Brachysira brebissonii,BR006A,7,Q,000
R29,01,11-Oct-2007,Eunotia alpina,EU005A,13,Q,000
R29,01,11-Oct-2007,Eunotia exigua,EU009A,12,Q,000
R29,01,11-Oct-2007,Eunotia nymanniana,EU045A,1,Q,000
R29,01,11-Oct-2007,Eunotia paludosa var. trinacria,EU040B,1,Q,000
R29,01,11-Oct-2007,Eunotia rhomboidea,EU011A,58,Q,000
R29,01,11-Oct-2007,Eunotia tenella,EU004A,9,Q,000
R29,01,11-Oct-2007,Navicula hoefleri,NA167A,4,Q,000
R29,01,11-Oct-2007,Navicula leptostriata,NA156A,57,Q,000
R29,01,11-Oct-2007,Navicula subtilissima,NA033A,1,Q,000
R29,01,11-Oct-2007,Navicula tenuicephala,NA135A,2,Q,000
R29,01,11-Oct-2007,Peronia fibula,PE002A,120,Q,000
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R29,02,11-Oct-2007,Brachysira serians,BR003A,3,Q,000
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R29,03,11-Oct-2007,Navicula veneta,NA054A,1,Q,000
R29,03,11-Oct-2007,Peronia fibula,PE002A,75,Q,000
R29,03,11-Oct-2007,Tabellaria flocculosa,TA001A,67,Q,000
R29,03,11-Oct-2007,Tabellaria quadriseptata,TA004A,1,Q,000
R29,01,29-Sep-2008,Achnanthes marginulata,AC022A,3,Q,000
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R29,01,29-Sep-2008,Eunotia exigua,EU009A,1,Q,000
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R29,01,29-Sep-2008,Eunotia rhomboidea,EU011A,200,Q,000
R29,01,29-Sep-2008,Frustulia rhomboides var. saxonica,FU002B,8,Q,000
R29,01,29-Sep-2008,Navicula hoefleri,NA167A,1,Q,000
R29,01,29-Sep-2008,Navicula leptostriata,NA156A,13,Q,000

R29,01,29-Sep-2008,Navicula subtilissima,NA033A,1,Q,000
R29,01,29-Sep-2008,Navicula tenuicephala,NA135A,3,Q,000
R29,01,29-Sep-2008,Neidium bisulcatum,NE004A,1,Q,000
R29,01,29-Sep-2008,Peronia fibula,PE002A,24,Q,000
R29,01,29-Sep-2008,Stenopterobia intermedia,SP001A,2,Q,000
R29,01,29-Sep-2008,Tabellaria flocculosa,TA001A,9,Q,000
R29,02,29-Sep-2008,Achnanthes altaica,AC046A,3,Q,000
R29,02,29-Sep-2008,Achnanthes marginulata,AC022A,11,Q,000
R29,02,29-Sep-2008,Brachysira brebissonii,BR006A,15,Q,000
R29,02,29-Sep-2008,Cymbella aequalis,CM014A,1,Q,000
R29,02,29-Sep-2008,Eunotia alpina,EU005A,6,Q,000
R29,02,29-Sep-2008,Eunotia bidentula,EU007A,1,Q,000
R29,02,29-Sep-2008,Eunotia exigua,EU009A,6,Q,000
R29,02,29-Sep-2008,Eunotia nymanniana,EU045A,1,Q,000
R29,02,29-Sep-2008,Eunotia paludosa,EU040A,10,Q,000
R29,02,29-Sep-2008,Eunotia rhomboidea,EU011A,77,Q,000
R29,02,29-Sep-2008,Eunotia tenella,EU004A,4,Q,000
R29,02,29-Sep-2008,Frustulia rhomboides var. saxonica,FU002B,5,Q,000
R29,02,29-Sep-2008,Navicula leptostriata,NA156A,26,Q,000
R29,02,29-Sep-2008,Navicula mediocris,NA006A,2,Q,000
R29,02,29-Sep-2008,Navicula subtilissima,NA033A,2,Q,000
R29,02,29-Sep-2008,Navicula tenuicephala,NA135A,2,Q,000
R29,02,29-Sep-2008,Nitzschia perminuta,NI005A,1,Q,000
R29,02,29-Sep-2008,Peronia fibula,PE002A,101,Q,000
R29,02,29-Sep-2008,Pinnularia subcapitata var. hilseana,PI022B,2,Q,000
R29,02,29-Sep-2008,Tabellaria flocculosa,TA001A,24,Q,000
R29,03,29-Sep-2008,Achnanthes marginulata,AC022A,1,Q,000
R29,03,29-Sep-2008,Brachysira brebissonii,BR006A,41,Q,000
R29,03,29-Sep-2008,Eunotia alpina,EU005A,48,Q,000
R29,03,29-Sep-2008,Eunotia exigua,EU009A,1,Q,000
R29,03,29-Sep-2008,Eunotia paludosa,EU040A,7,Q,000
R29,03,29-Sep-2008,Eunotia rhomboidea,EU011A,31,Q,000
R29,03,29-Sep-2008,Frustulia rhomboides var. saxonica,FU002B,8,Q,000
R29,03,29-Sep-2008,Navicula leptostriata,NA156A,32,Q,000
R29,03,29-Sep-2008,Navicula subtilissima,NA033A,1,Q,000
R29,03,29-Sep-2008,Peronia fibula,PE002A,66,Q,000
R29,03,29-Sep-2008,Tabellaria flocculosa,TA001A,64,Q,000
R29,01,29-Oct-2009,Achnanthes altaica,AC046A,7,Q,000
R29,01,29-Oct-2009,Achnanthes marginulata,AC022A,81,Q,000
R29,01,29-Oct-2009,Brachysira brebissonii,BR006A,10,Q,000
R29,01,29-Oct-2009,Cymbella perpusilla,CM010A,1,Q,000
R29,01,29-Oct-2009,Eunotia alpina,EU005A,1,Q,000
R29,01,29-Oct-2009,Eunotia bidentula,EU007A,1,Q,000
R29,01,29-Oct-2009,Eunotia exigua,EU009A,5,Q,000
R29,01,29-Oct-2009,Eunotia nymanniana,EU045A,1,Q,000
R29,01,29-Oct-2009,Eunotia paludosa,EU040A,14,Q,000
R29,01,29-Oct-2009,Eunotia rhomboidea,EU011A,75,Q,000
R29,01,29-Oct-2009,Frustulia rhomboides var. saxonica,FU002B,3,Q,000
R29,01,29-Oct-2009,Navicula hoefleri,NA167A,1,Q,000
R29,01,29-Oct-2009,Navicula leptostriata,NA156A,28,Q,000

R29,01,29-Oct-2009,Navicula tenuicephala,NA135A,8,Q,000
R29,01,29-Oct-2009,Nitzschia perminuta,NI005A,1,Q,000
R29,01,29-Oct-2009,Peronia fibula,PE002A,50,Q,000
R29,01,29-Oct-2009,Stenopterobia intermedia,SP001A,2,Q,000
R29,01,29-Oct-2009,Tabellaria flocculosa,TA001A,11,Q,000
R29,02,29-Oct-2009,Brachysira brebissonii,BR006A,4,Q,000
R29,02,29-Oct-2009,Eunotia alpina,EU005A,9,Q,000
R29,02,29-Oct-2009,Eunotia bidentula,EU007A,1,Q,000
R29,02,29-Oct-2009,Eunotia denticulata,EU015A,11,Q,000
R29,02,29-Oct-2009,Eunotia exigua,EU009A,3,Q,000
R29,02,29-Oct-2009,Eunotia monodon,EU008A,3,Q,000
R29,02,29-Oct-2009,Eunotia nymanniana,EU045A,2,Q,000
R29,02,29-Oct-2009,Eunotia paludosa,EU040A,14,Q,000
R29,02,29-Oct-2009,Eunotia pectinalis,EU002A,3,Q,000
R29,02,29-Oct-2009,Eunotia rhomboidea,EU011A,121,Q,000
R29,02,29-Oct-2009,Eunotia tenella,EU004A,4,Q,000
R29,02,29-Oct-2009,Frustulia rhomboides var. saxonica,FU002B,17,Q,000
R29,02,29-Oct-2009,Navicula leptostriata,NA156A,41,Q,000
R29,02,29-Oct-2009,Navicula subtilissima,NA033A,3,Q,000
R29,02,29-Oct-2009,Peronia fibula,PE002A,23,Q,000
R29,02,29-Oct-2009,Pinnularia interrupta,PI004A,1,Q,000
R29,02,29-Oct-2009,Stenopterobia intermedia,SP001A,1,Q,000
R29,02,29-Oct-2009,Tabellaria flocculosa,TA001A,39,Q,000
R29,03,29-Oct-2009,Achnanthes marginulata,AC022A,8,Q,000
R29,03,29-Oct-2009,Brachysira brebissonii,BR006A,27,Q,000
R29,03,29-Oct-2009,Cymbella perpusilla,CM010A,1,Q,000
R29,03,29-Oct-2009,Eunotia alpina,EU005A,49,Q,000
R29,03,29-Oct-2009,Eunotia bidentula,EU007A,1,Q,000
R29,03,29-Oct-2009,Eunotia exigua,EU009A,5,Q,000
R29,03,29-Oct-2009,Eunotia rhomboidea,EU011A,16,Q,000
R29,03,29-Oct-2009,Eunotia tenella,EU004A,1,Q,000
R29,03,29-Oct-2009,Frustulia rhomboides var. saxonica,FU002B,1,Q,000
R29,03,29-Oct-2009,Navicula leptostriata,NA156A,62,Q,000
R29,03,29-Oct-2009,Navicula mediocris,NA006A,1,Q,000
R29,03,29-Oct-2009,Peronia fibula,PE002A,43,Q,000
R29,03,29-Oct-2009,Stenopterobia intermedia,SP001A,1,Q,000
R29,03,29-Oct-2009,Tabellaria flocculosa,TA001A,85,Q,000