



# UCL



**Land-Use Experiments in the Loch Laidon Catchment  
2010 Data Report on Stream Water Quality to the Rannoch Trust**

**ECRC Research Report Number 147**

**E. M. Shilland, P. Collen, R. J. Flower, J. Keay, A. McCartney, K. Roe, N. L. Rose & H. Yang**

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**2010**

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# 1 INTRODUCTION

In 1992 the Rannoch Trust established the Loch Laidon catchment land-use experiment, which is investigating the effects of summer cattle grazing on the terrestrial and aquatic upland environment. Situated in Perthshire, Scotland, the study area falls within a number of designations, including the Rannoch Moor Special Area of Conservation and Site of Special Scientific Interest, the Rannoch Lochs Special Protection Area and the Tayside Local Biodiversity Action Plan.

The project presented and summarised here comprises the aquatic monitoring element of the experiment. Allott *et al* (1994) described the project rationale and background whilst progress reports (Monteith *et al.* 1995; Monteith *et al.* 1996; Monteith *et al.* 1997; Monteith *et al.* 1999; Shilland *et al.* 2001; Shilland *et al.* 2003; Shilland *et al.* 2004; Shilland *et al.* 2005; Shilland *et al.* 2006; Shilland *et al.* 2007) as well as a conference proceeding (Shilland *et al.* 2008) have provided reviews of the accumulating chemical and biological datasets.

Results are presented for the entire monitoring period from 1992 to April 2010 and take the form of a data report. Further statistical analysis and interpretation will follow in a report due in December 2010.

# 2 DATA PRESENTATION

Data are held on a central Access database at the Environmental Change Research Centre (ECRC) and in this report are presented as raw data, graphs and summary statistics.

Selected water chemistry variables are presented as time series with values for two or three burns superimposed. Where appropriate, time series of the ratios of values for the Experimental and Control Burns are also overlaid. Common (natural) variability is thus controlled for. Any impact of grazing on water chemistry should be detected as a progressive departure from the normal distribution of the ratio (i.e. any deviation away from a horizontal line). Data are also presented for physical measurements of rainfall, stream temperature and stream height that commenced in November 2007.

The following biotic and diversity indices have been used for macroinvertebrates:

**Hill's N1** approximates to the number of abundant species.

**Hill's N2** approximates to the number of very abundant species in the sample.

**Hill's E5** is a measure of the evenness of species occurrences in a sample. E5 approaches zero as a single species becomes more dominant in the community.

**Richness (rareftn 100)** predicts the expected number of taxa in a sample of 100 individuals.

**BMWP** is a scoring system for macroinvertebrates based on a scale of 1 to 10 given to each taxonomic family. It provides an indication of water quality by assigning families very sensitive to organic pollution a score of 10, whilst those that

thrive in organically polluted systems, such as bloodworms, are assigned a score of 0.

**ASPT** is the Average Score Per Taxon, based on the BMWP score divided by the number of taxa in the sample. A range of 6.3 to 6.7 is typical for a diverse fauna.

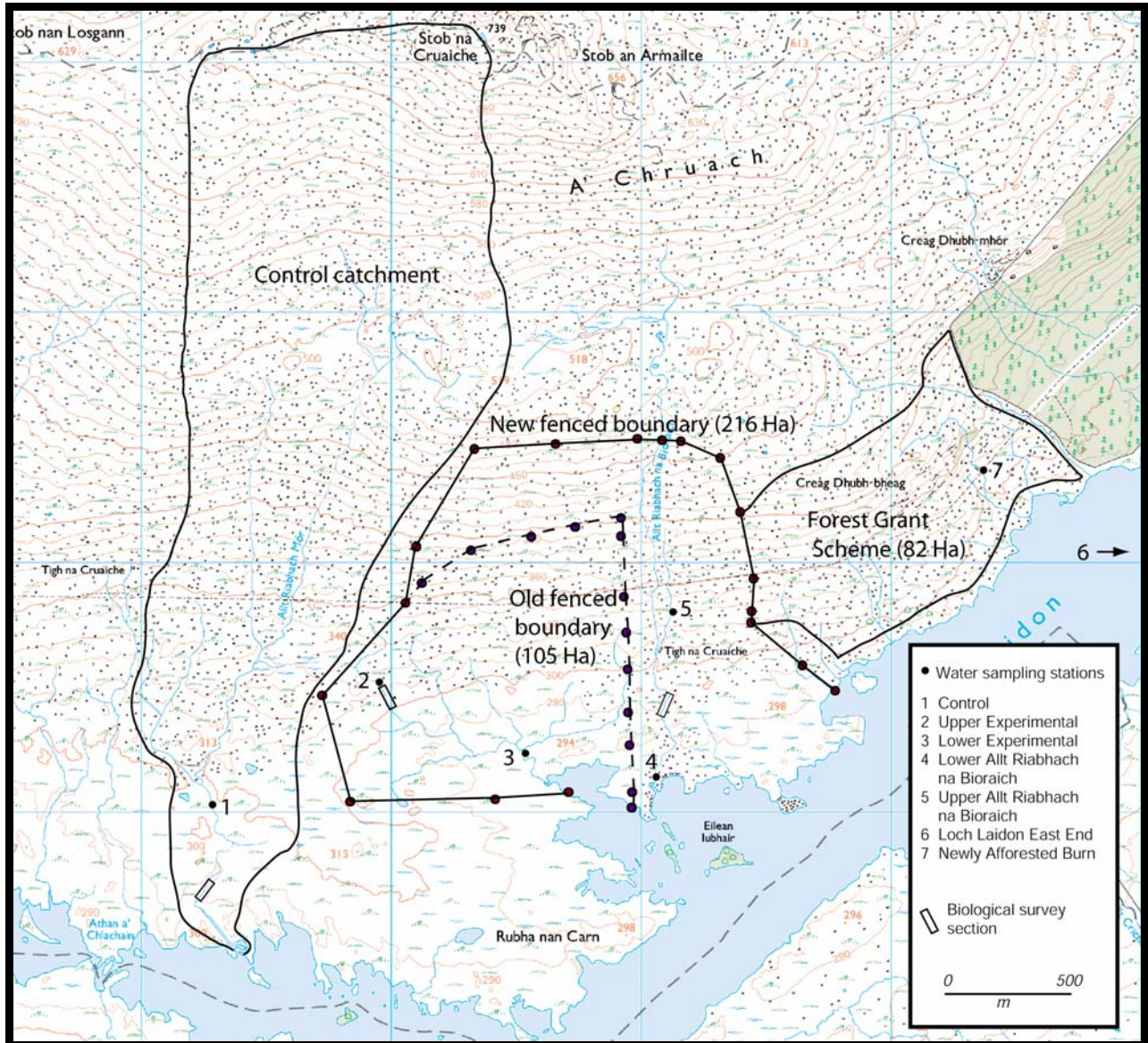
Diatom and aquatic macroinvertebrate diagrams show percentage abundances of individual species for each year of sampling. Macroinvertebrate species occurring with a minimum abundance of 1.5% are presented whereas the diatom graphs show species with a minimum abundance of 1%.

Fish densities for the three experimental streams are shown for both fry and parr, and are displayed as fish numbers per meter square.

In August 2009 a sediment core was taken from the bay of Loch Liadon into which the Experimental Burn flows. Core data presented include lithostratigraphic analyses of dry weight and loss on ignition, sediment spheroidal carbonaceous particle concentrations and a sediment diatom stratigraphy.

### 3 FIGURES

Figure 3.1 Loch Laidon study area.



Background map © Crown Copyright/database right 2010. An Ordnance Survey/EDINA supplied service.

Figure 3.2 The ratio of alkalinity and its temporal variability in spot samples between the Experimental and Control Burns, August 1992 – April 2010.

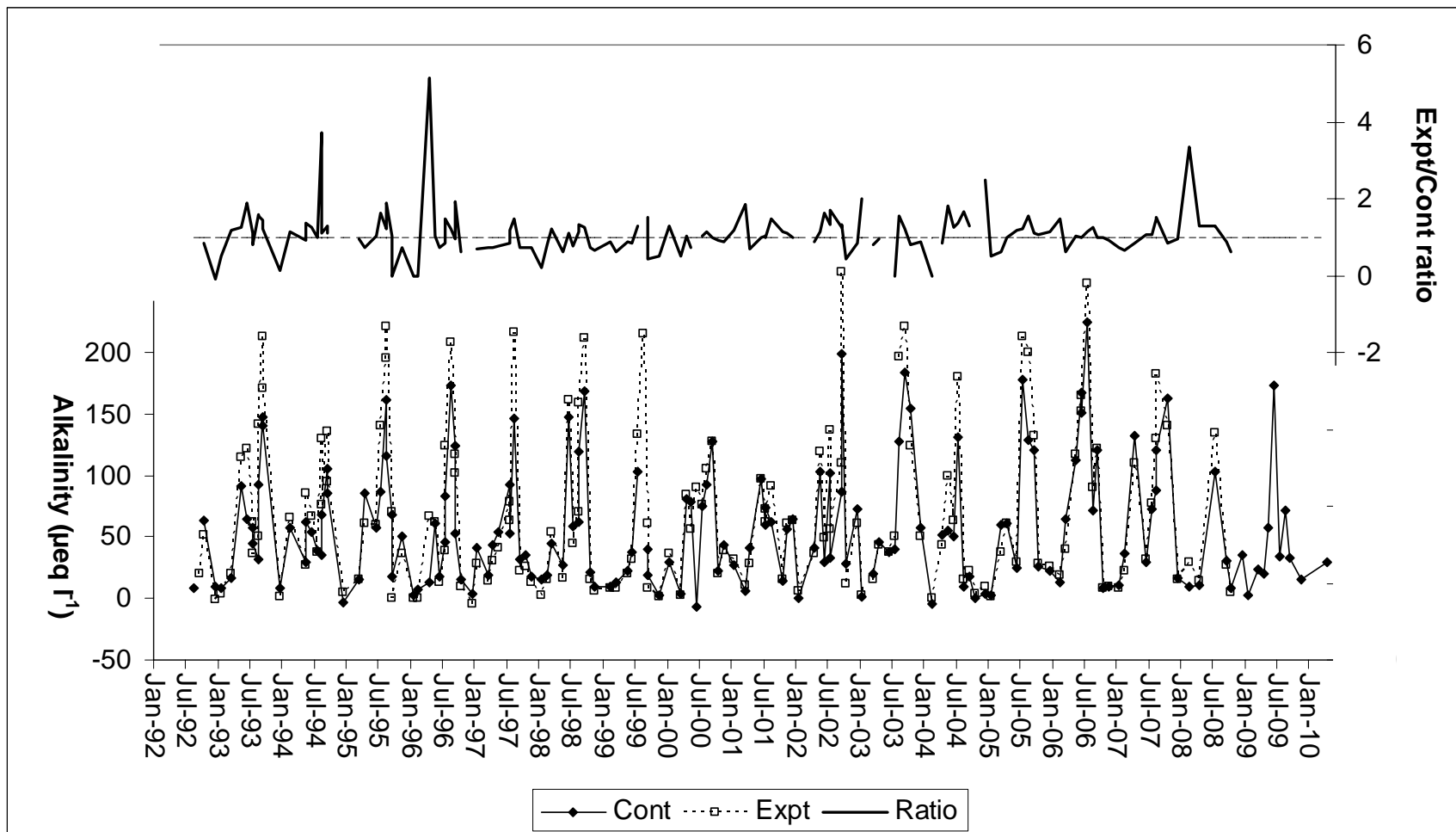




Figure 3.3 The ratio of conductivity and its temporal variability in spot samples between the Experimental and Control Burns, August 1992 – April 2010.

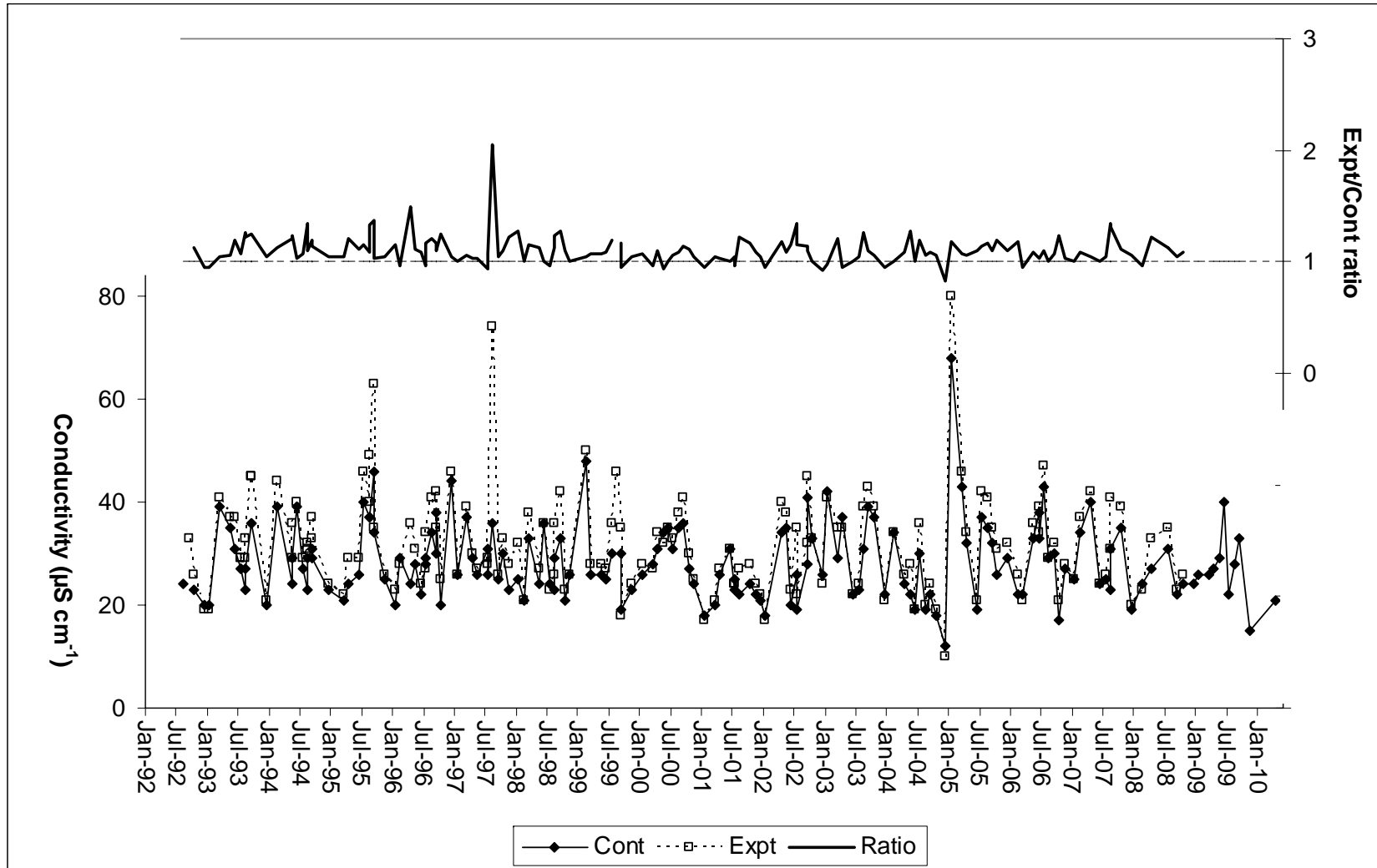


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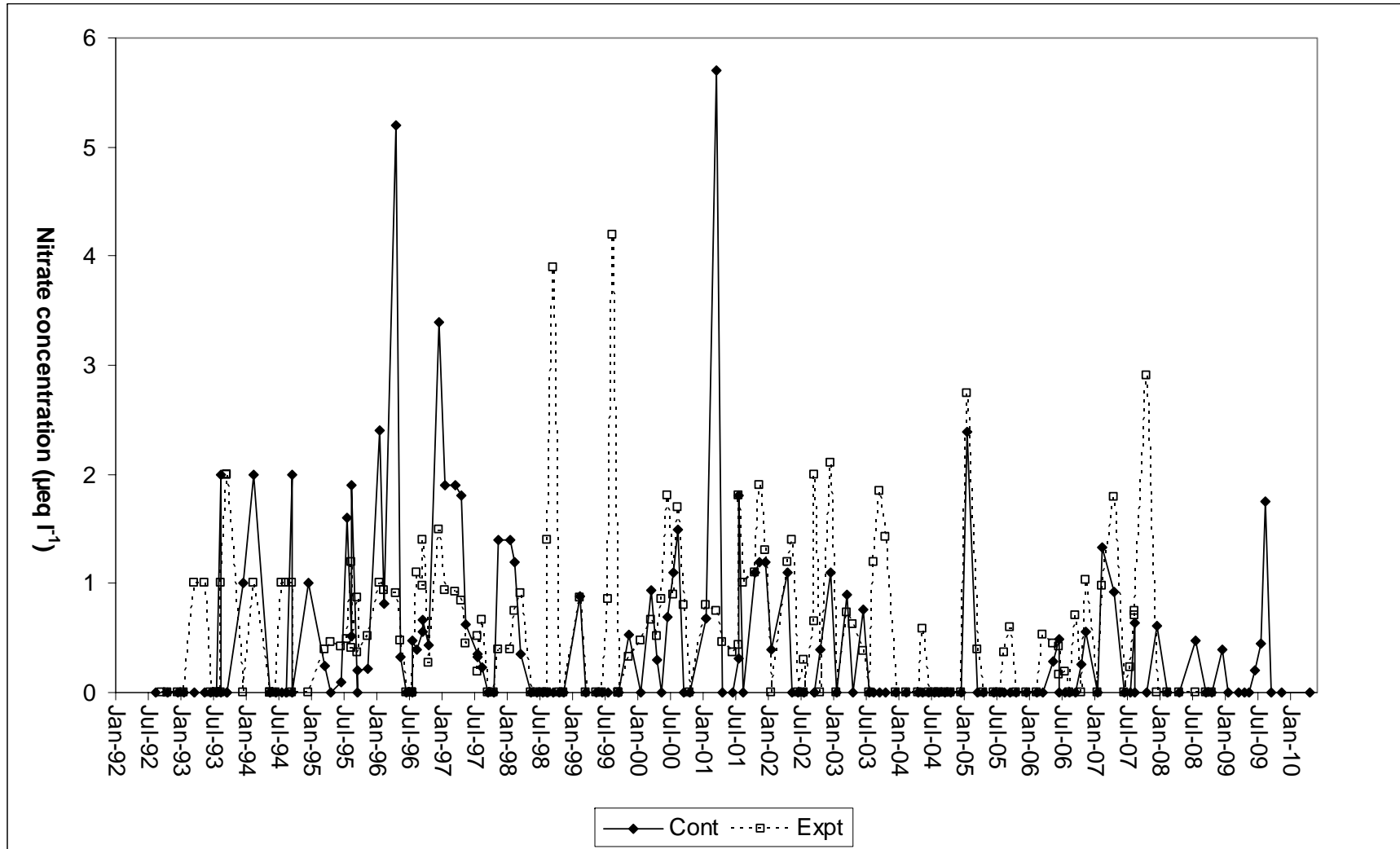


Figure 3.5 Temporal variability of soluble reactive phosphorus in spot samples from the Experimental and Control Burns, August 1992- April 2010.

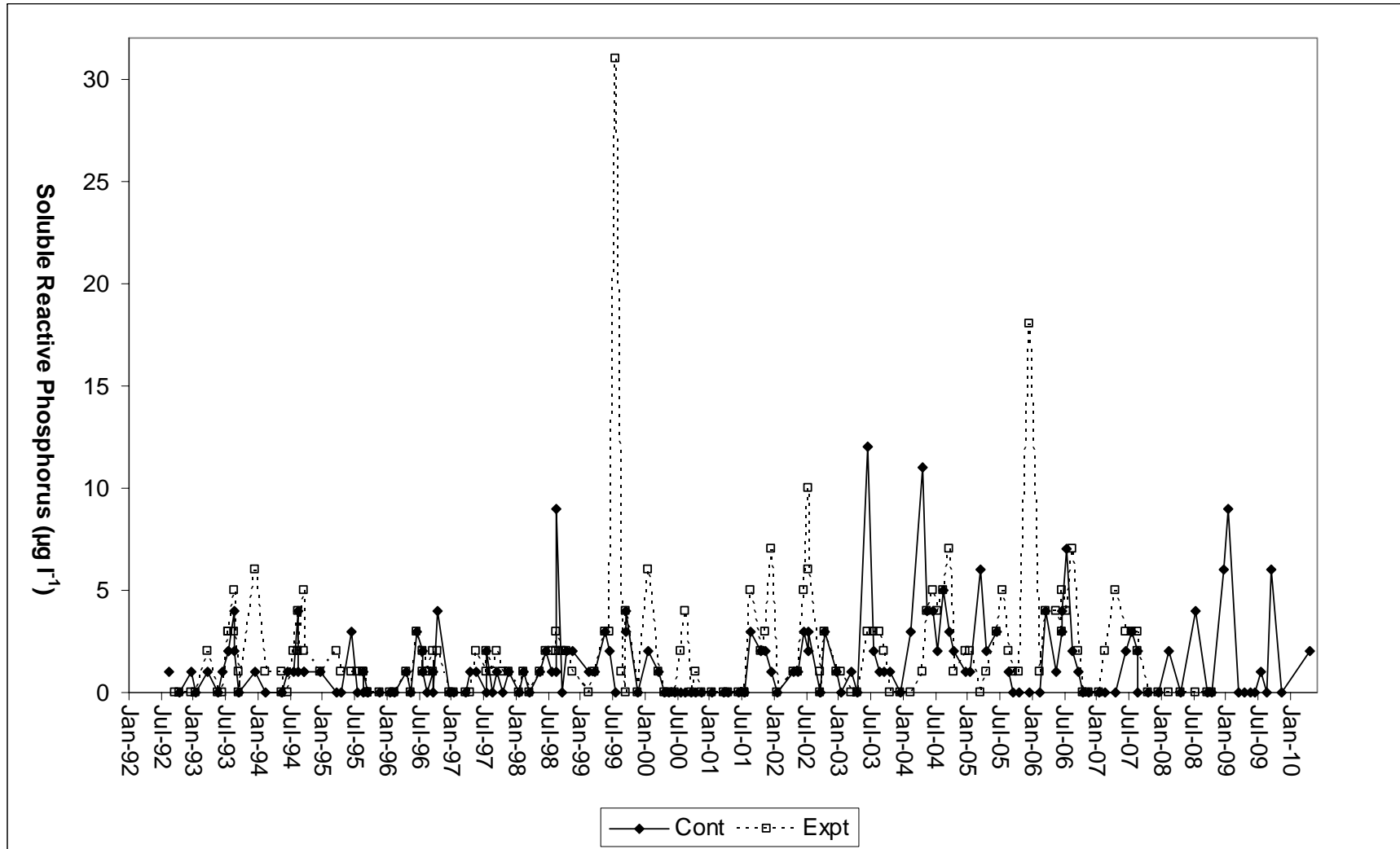
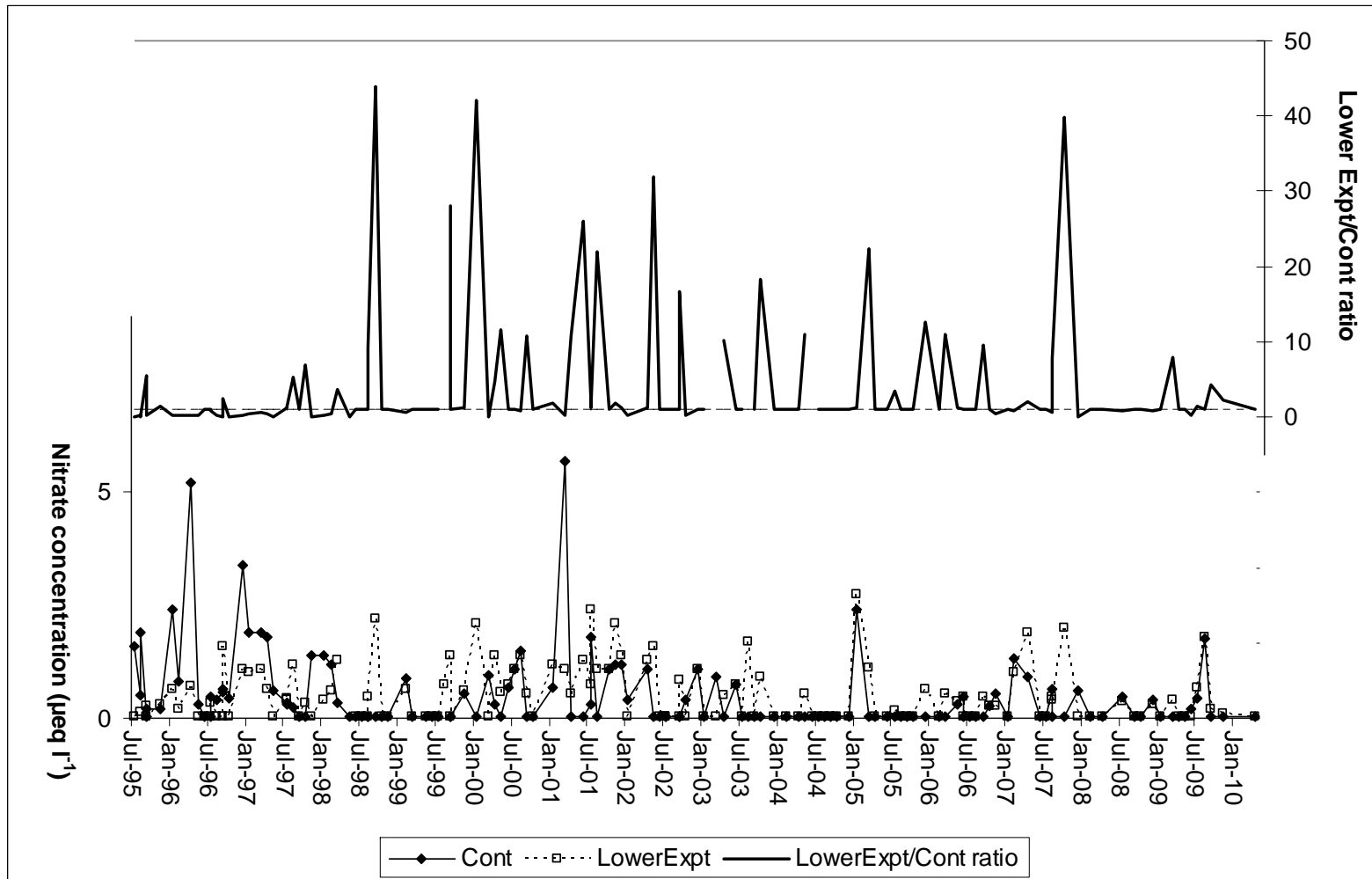


Figure 3.6 The ratio of nitrate and its temporal variability in spot samples between the Control and Experimental Burn (Lower site) June 1995 – April 2010.



N.B. 0 values converted to half nitrate detection limit for ratio calculations.

Figure 3.7 The temporal variability of nitrate in spot samples and the difference between the Control and Experimental Burn (Lower site) June 1995 – April 2010.

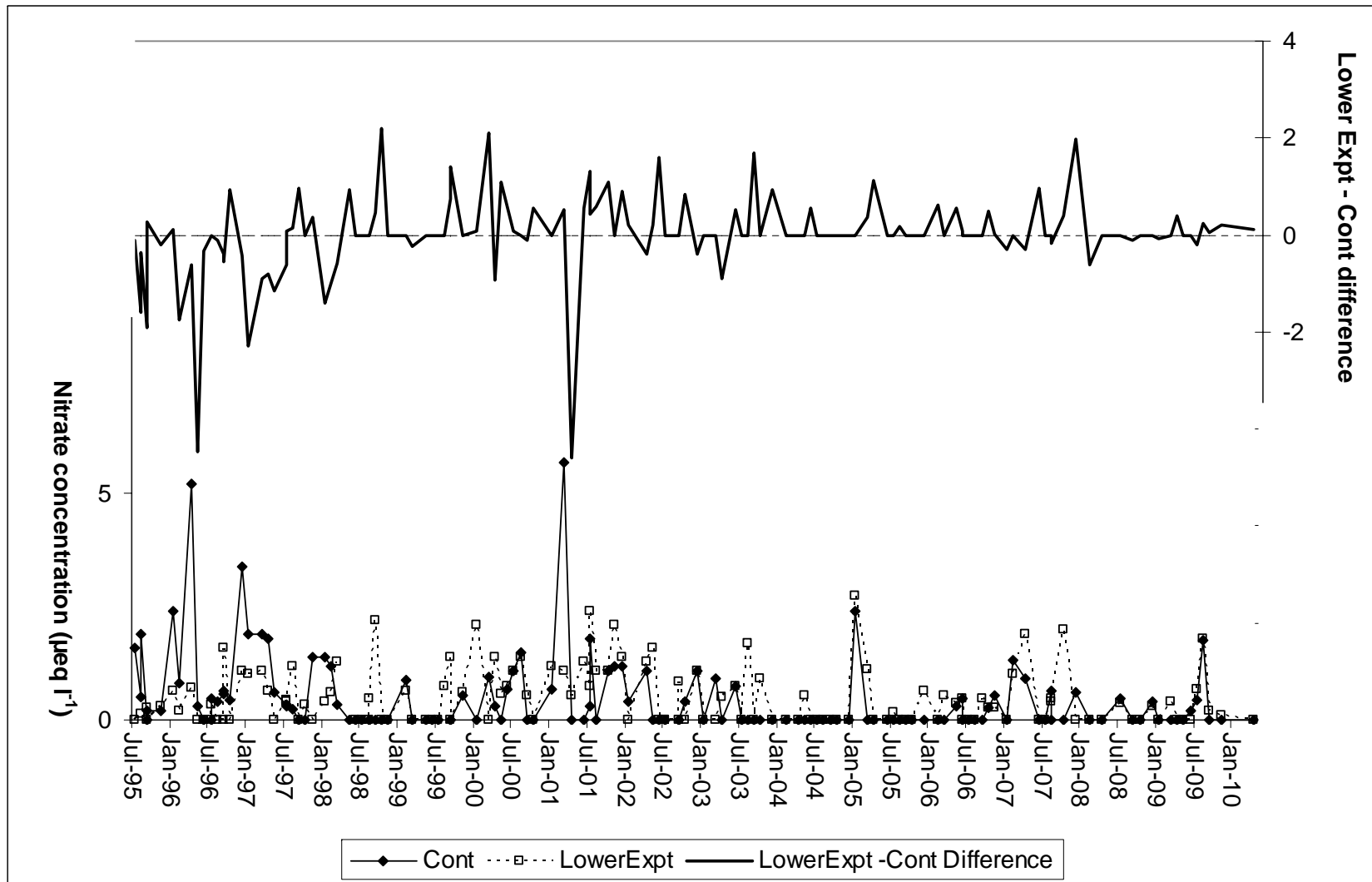


Figure 3.8 The ratio of alkalinity and its temporal variability in spot samples between the Control and Experimental Burn (Lower site) June 1995 – April 2010.

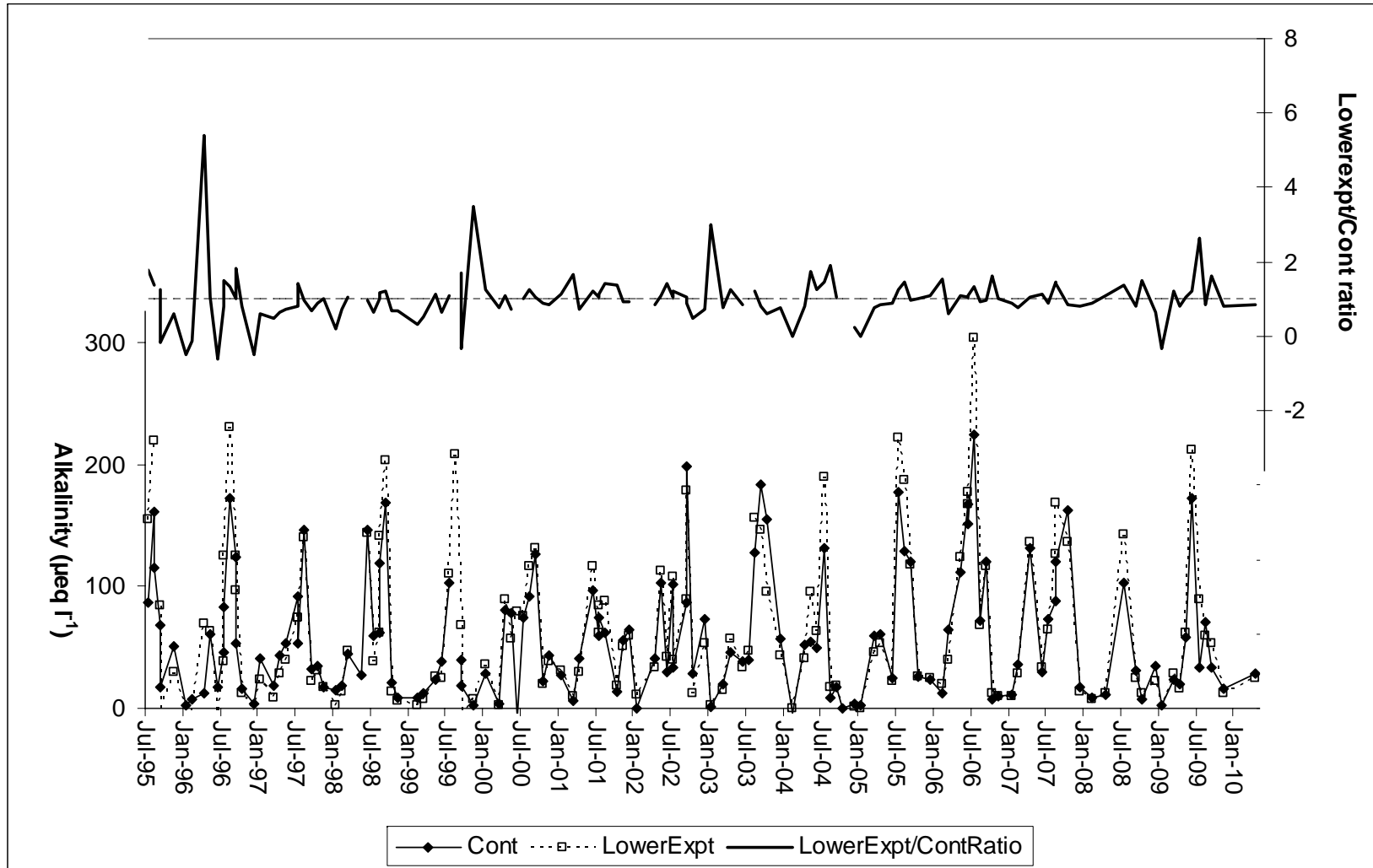


Figure 3.9 The ratio of calcium and its temporal variability in spot samples between the Control and Experimental Burn (Lower site) June 1995 – April 2010.

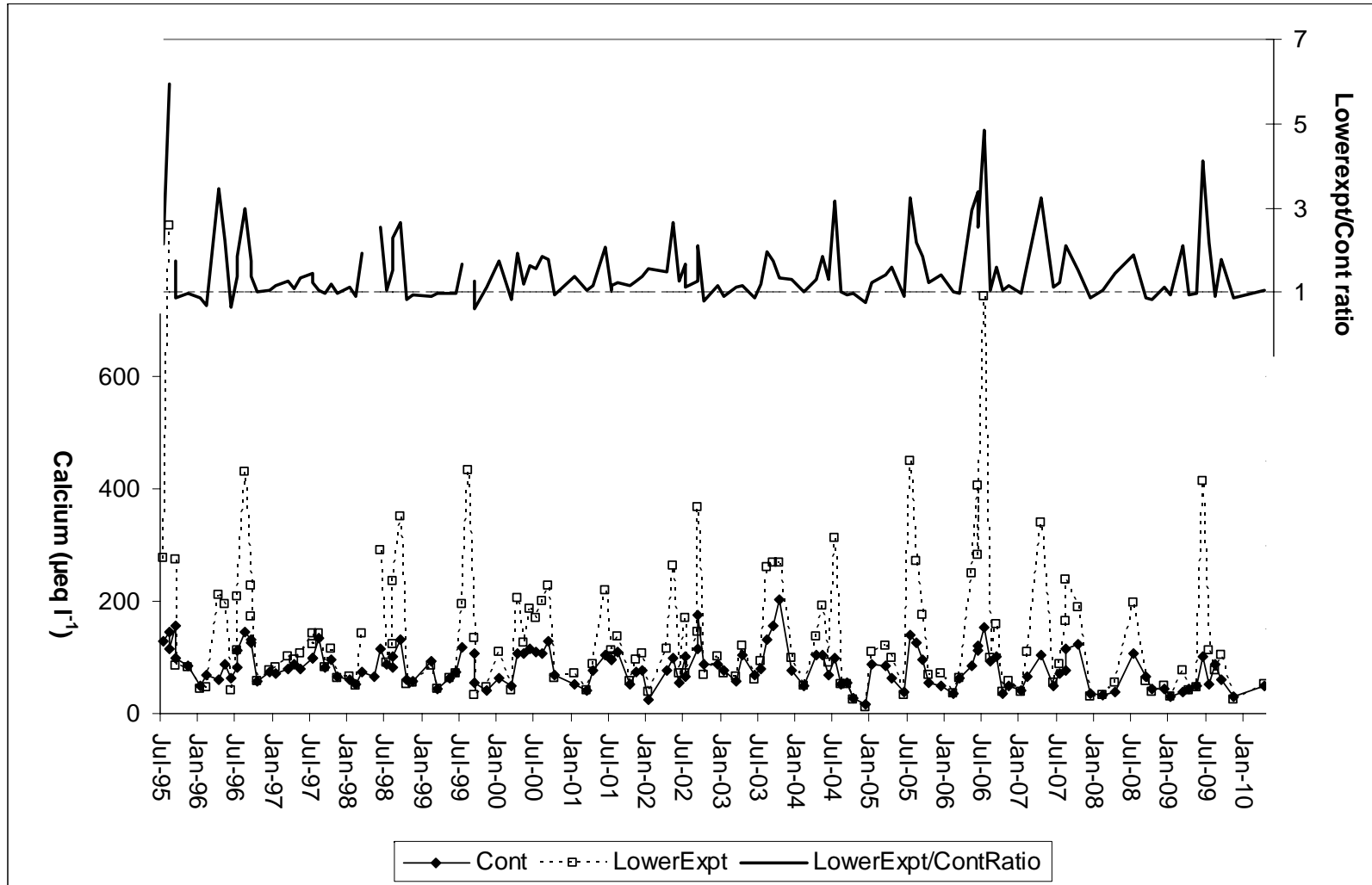


Figure 3.10 The ratio of magnesium and its temporal variability in spot samples between the Control and Experimental Burn (Lower site) June 1995 – April 2010.

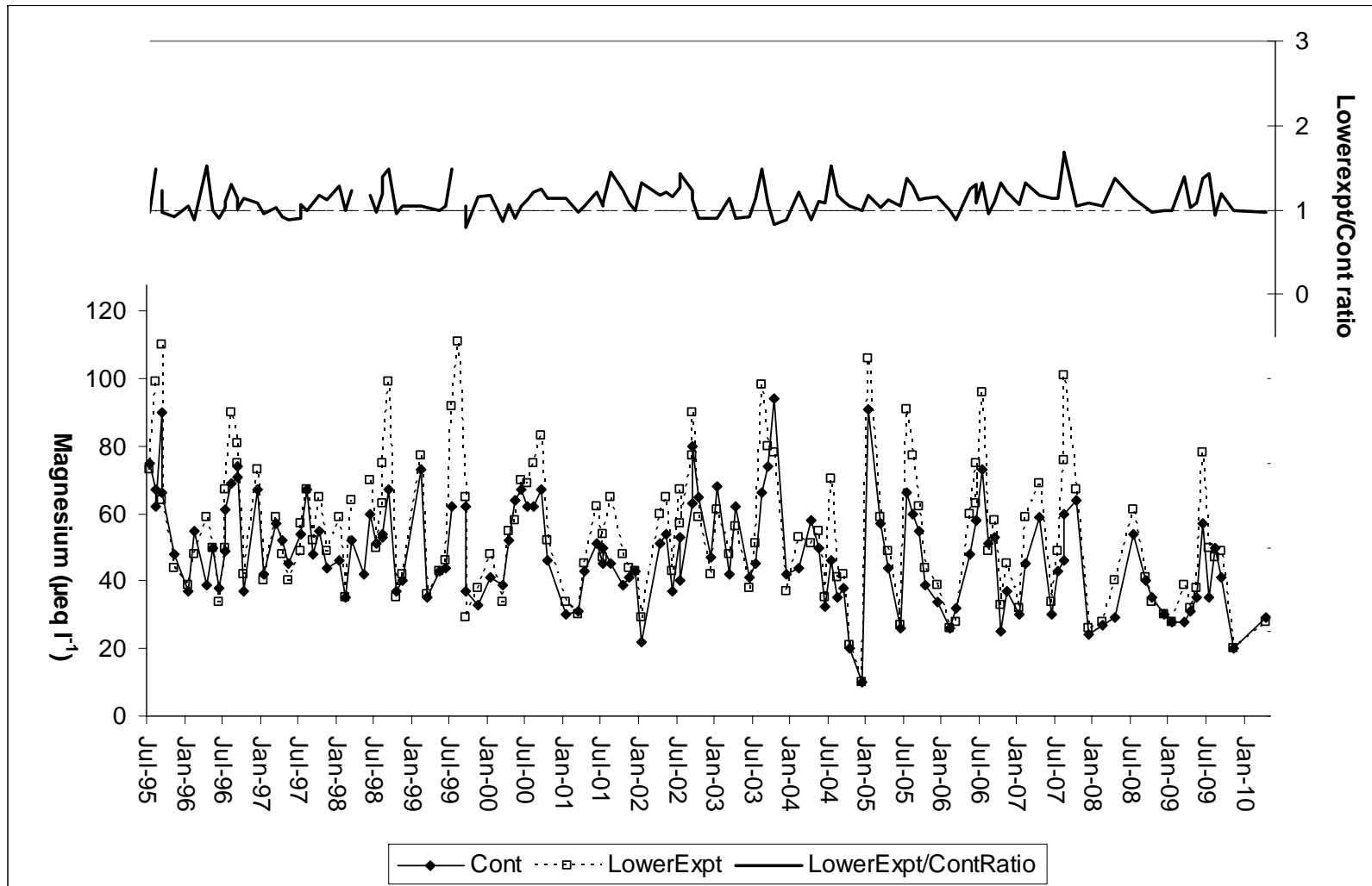




Figure 3.11 The ratio of potassium and its temporal variability in spot samples between the Control and Experimental Burn (Lower site) June 1995 – April 2010.

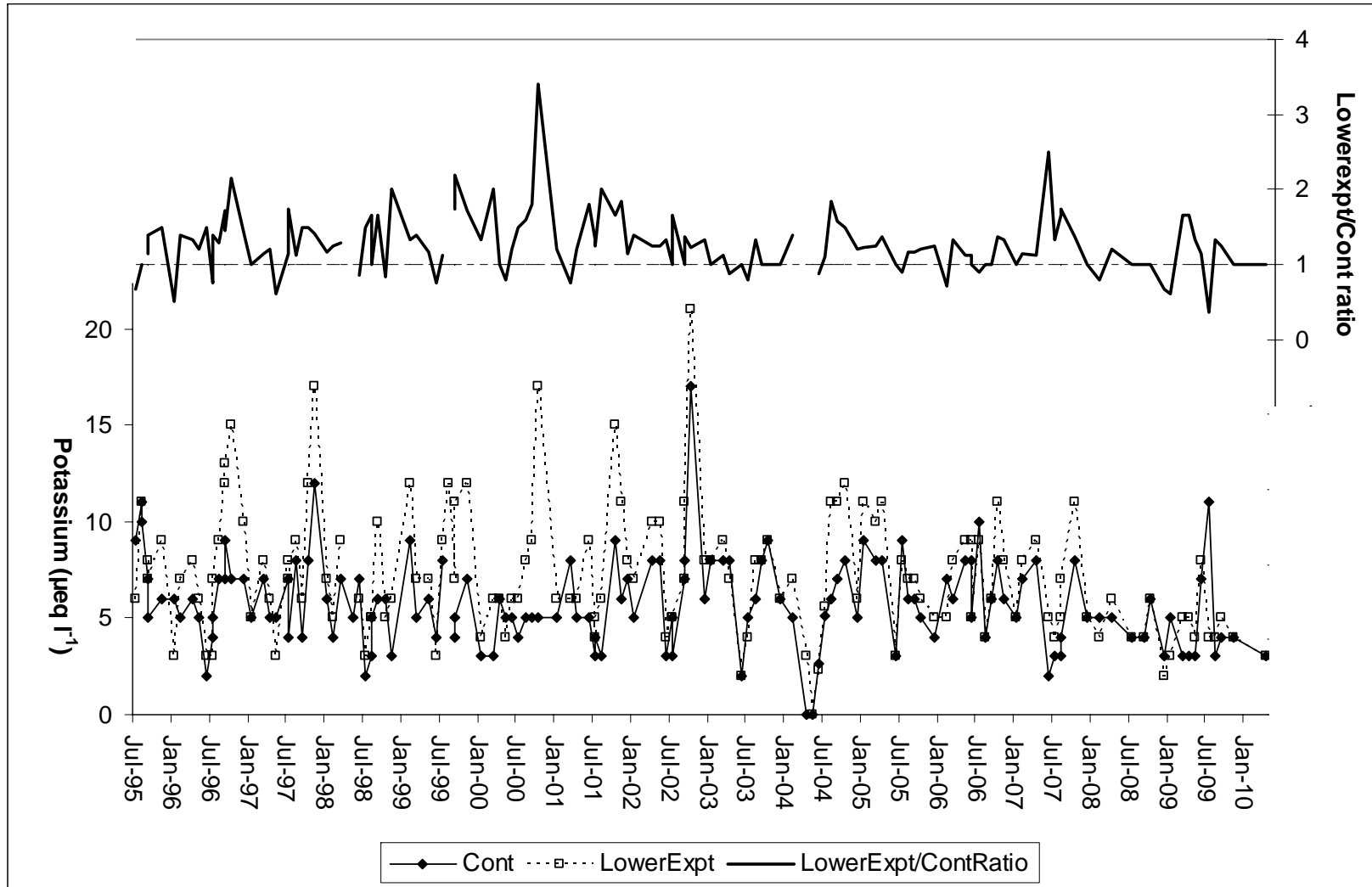


Figure 3.12 The ratio of conductivity and its temporal variability in spot samples between the Control and Experimental Burn (Lower site) June 1995 – April 2010.

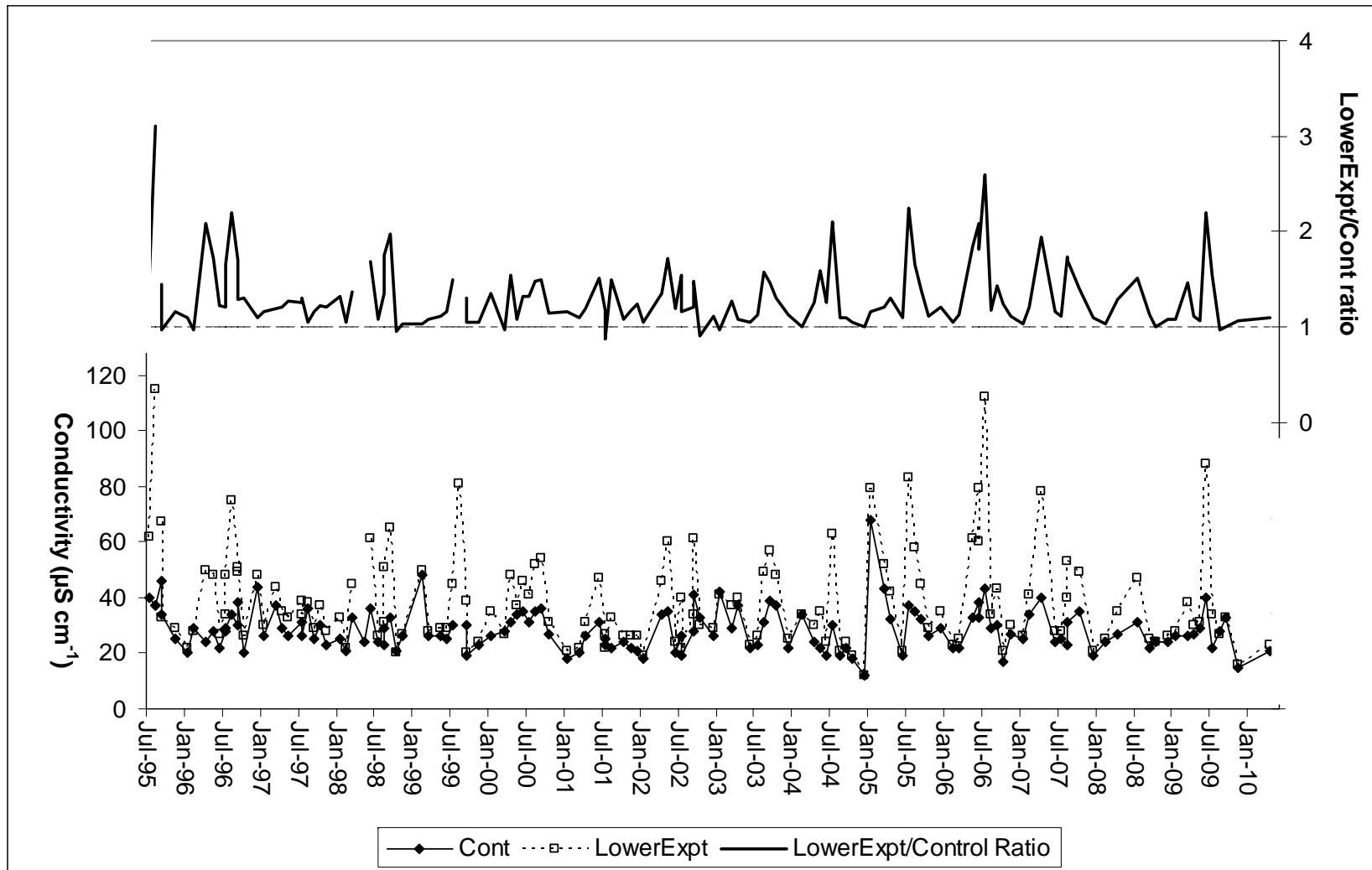
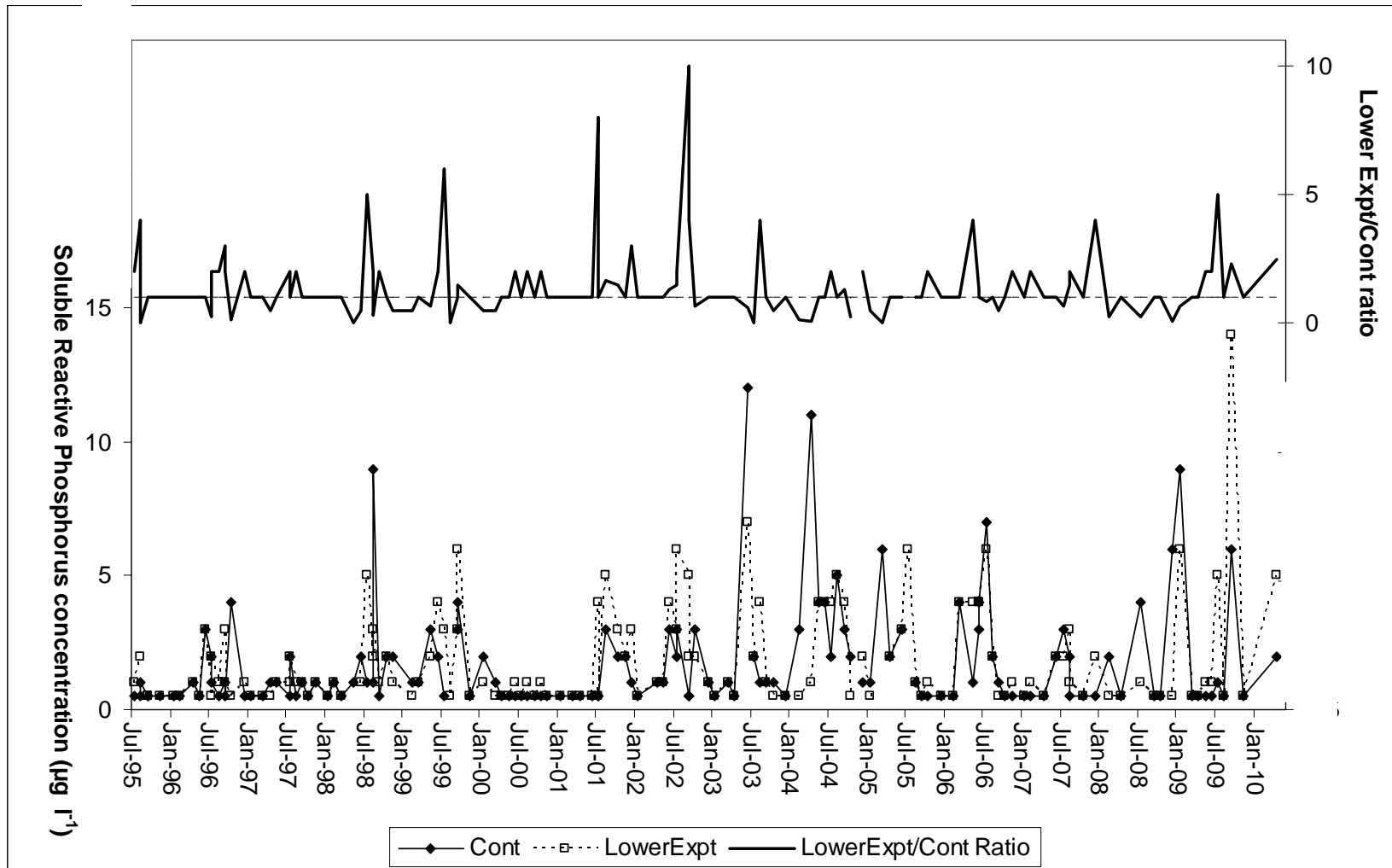


Figure 3.13 The ratio of soluble reactive phosphorus and its temporal variability in spot samples between the Control and Experimental Burn (Lower site) June 1995 – April 2010.



N.B. "0" values converted to half SRP detection limit for ratio calculations.

Figure 3.14 A comparison of alkalinity in spot samples from the Control Burn, Experimental Burn (Lower site) and the Allt Riabhach na Bioraich, June 1995 – April 2010.

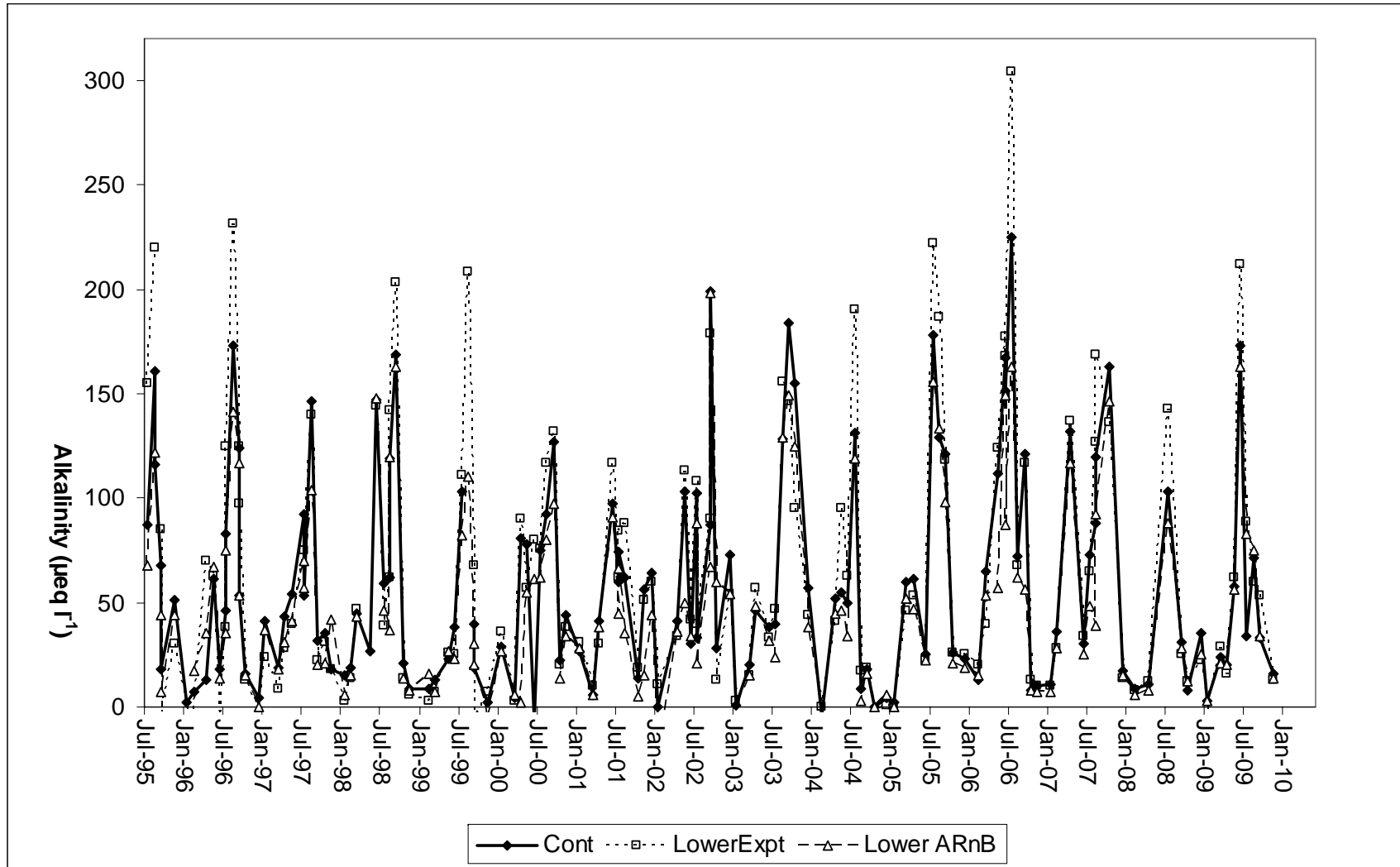


Figure 3.15 A comparison of conductivity of spot samples from the Control Burn, Experimental Burn (Lower site) and the Allt Riabhach na Bioraich, June 1995 – April 2010.

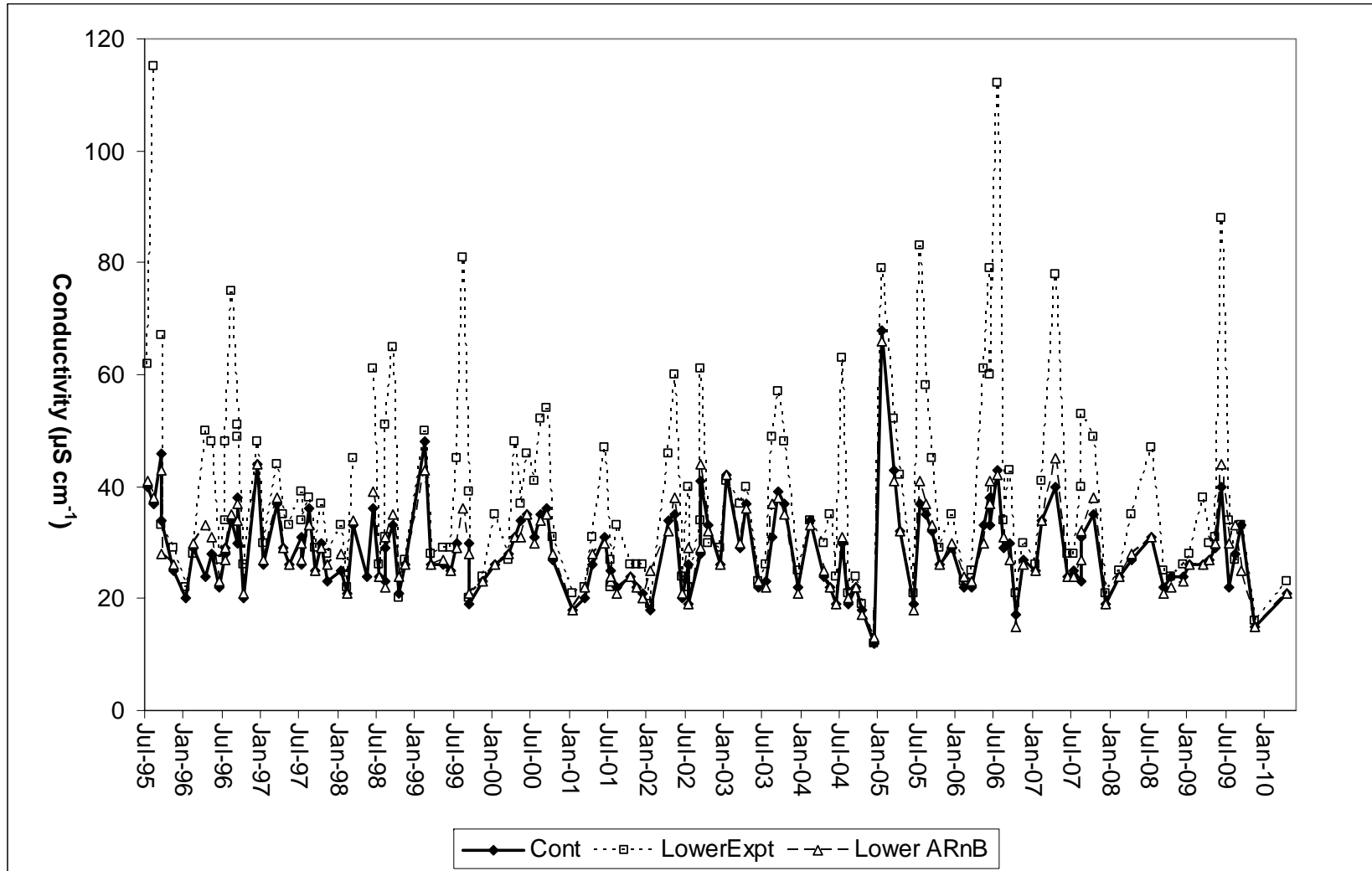


Figure 3.16 A comparison of nitrate concentrations of spot samples from the Control Burn, Experimental Burn (Lower site) and the Allt Riabhach na Bioraich, June 1995 – April 2010.

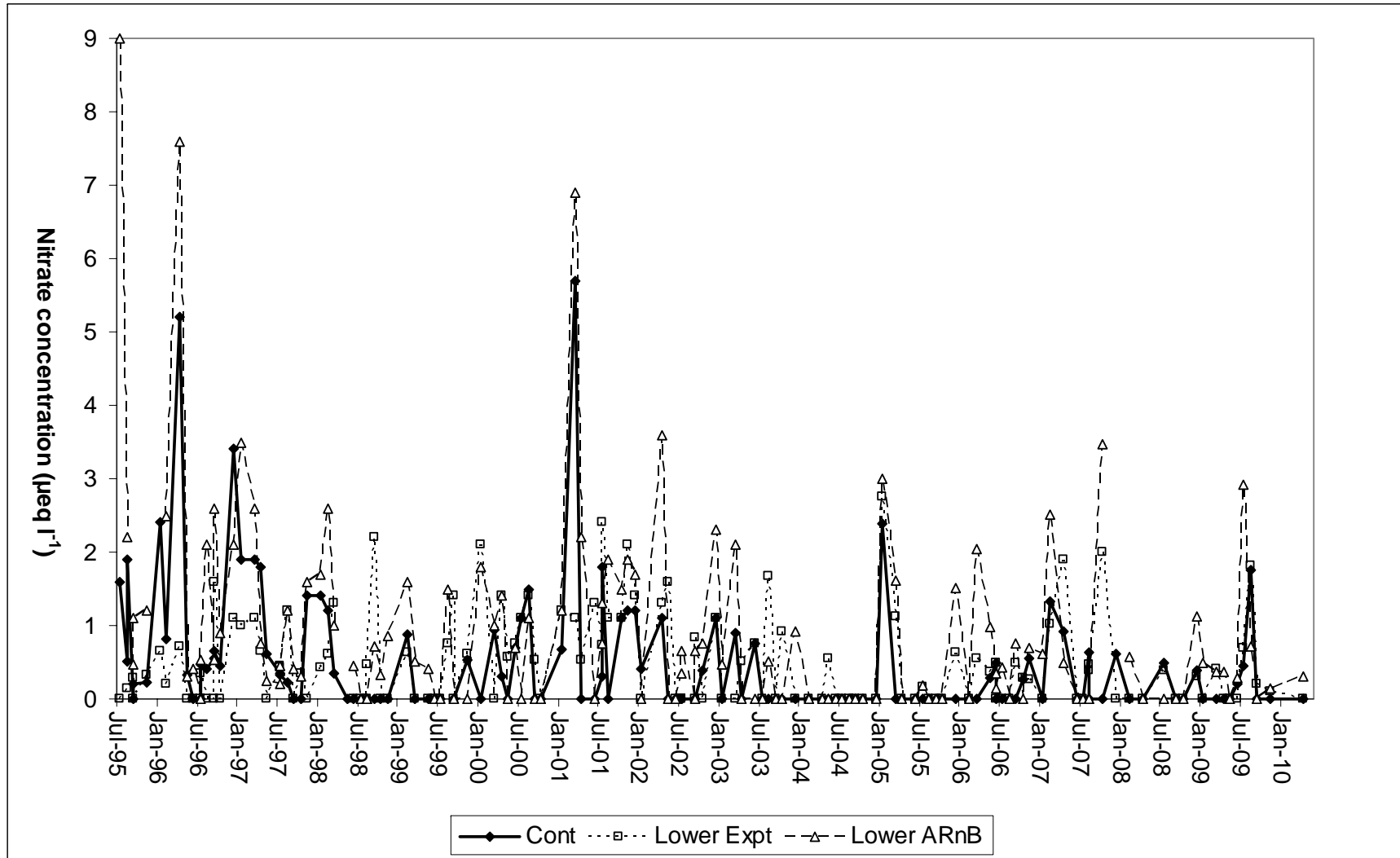


Figure 3.17 A comparison of soluble reactive phosphorus concentrations of spot samples from the Control Burn, Experimental Burn (Lower site) and the Allt Riabhach na Bioraich, June 1995 – April 2010.

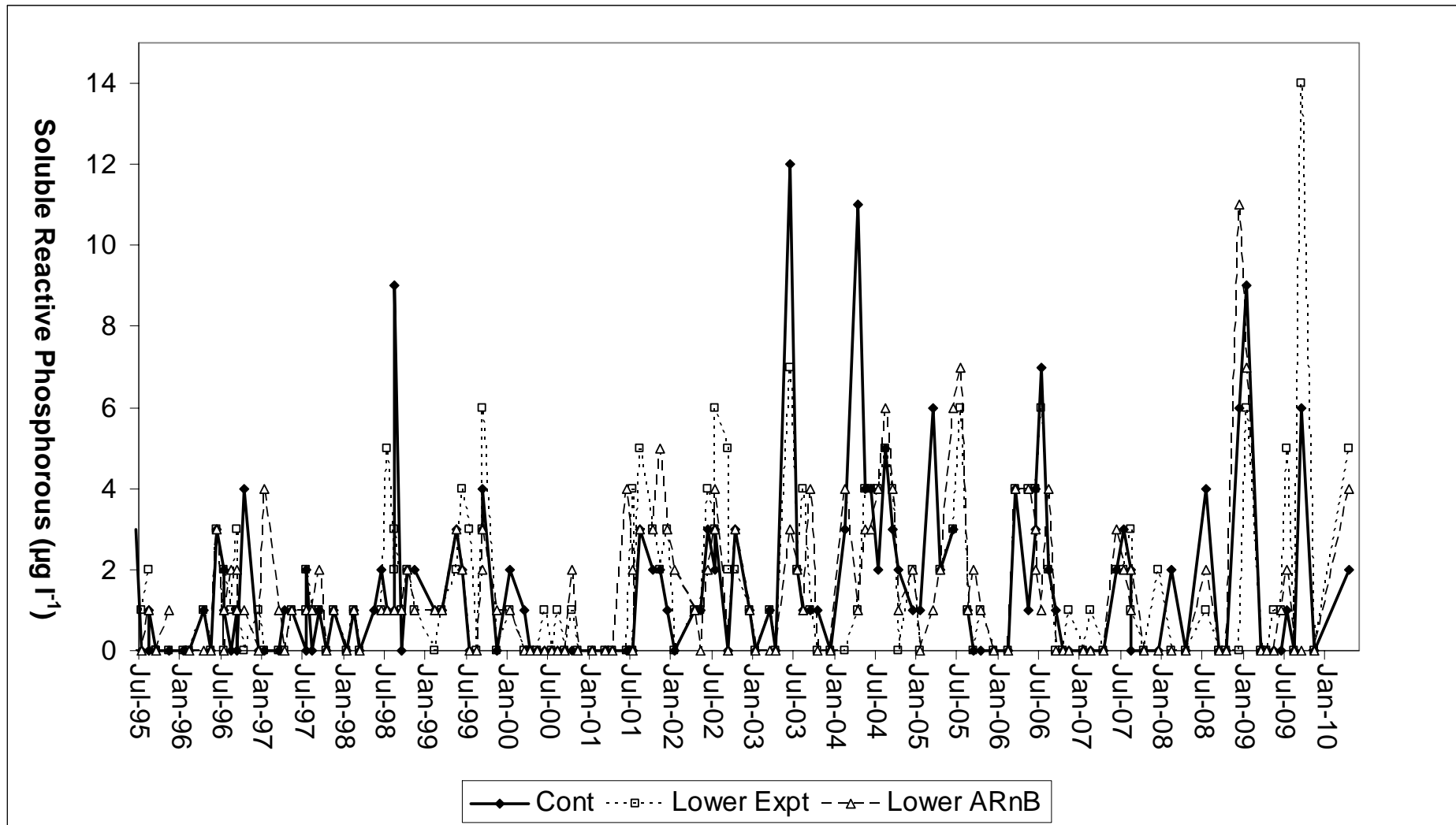


Figure 3.18 A comparison of total organic carbon concentrations of spot samples from the Control Burn, Experimental Burn (Lower site) and the Allt Riabhach na Bioraich, June 1995 – April 2010.

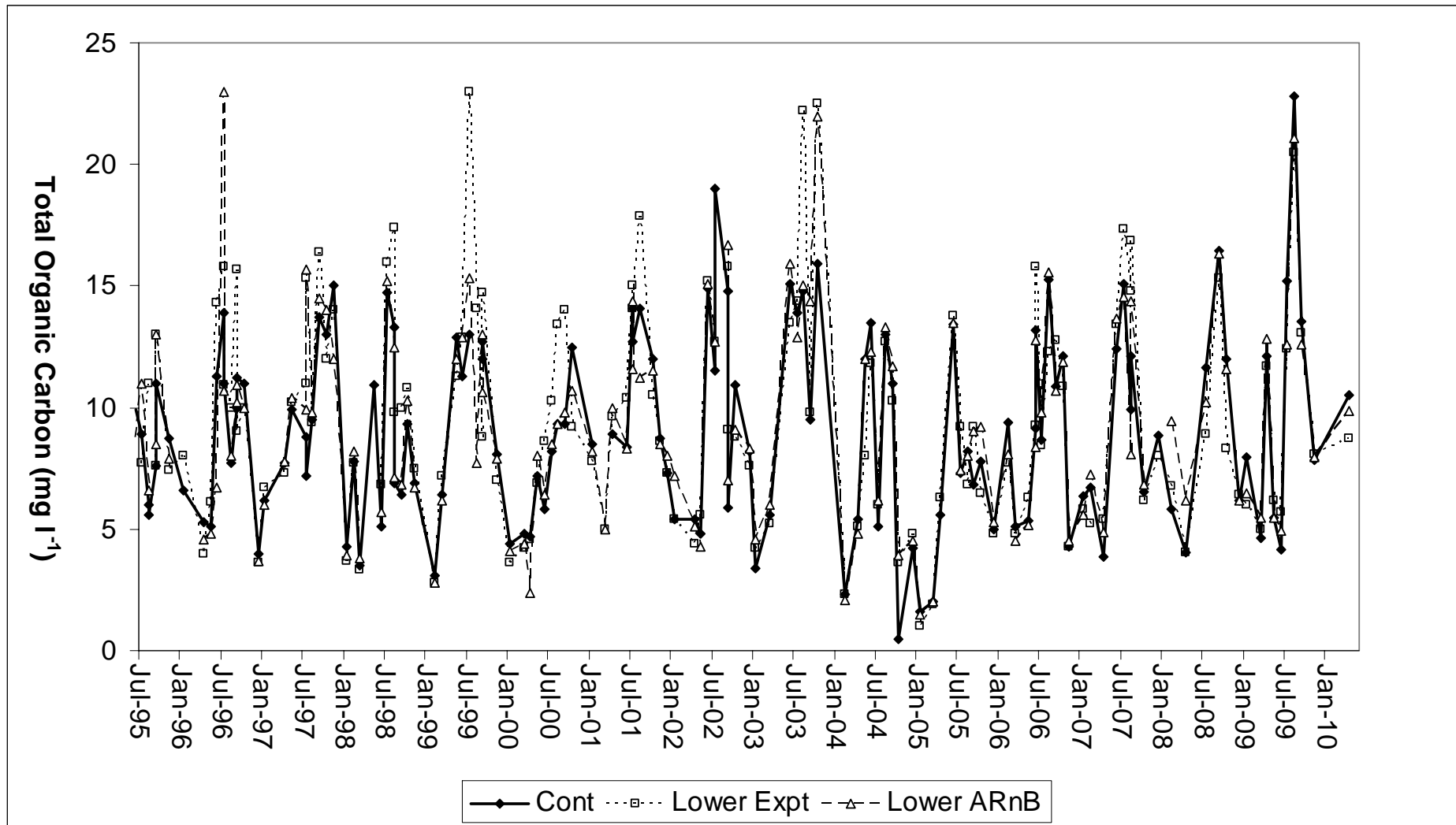
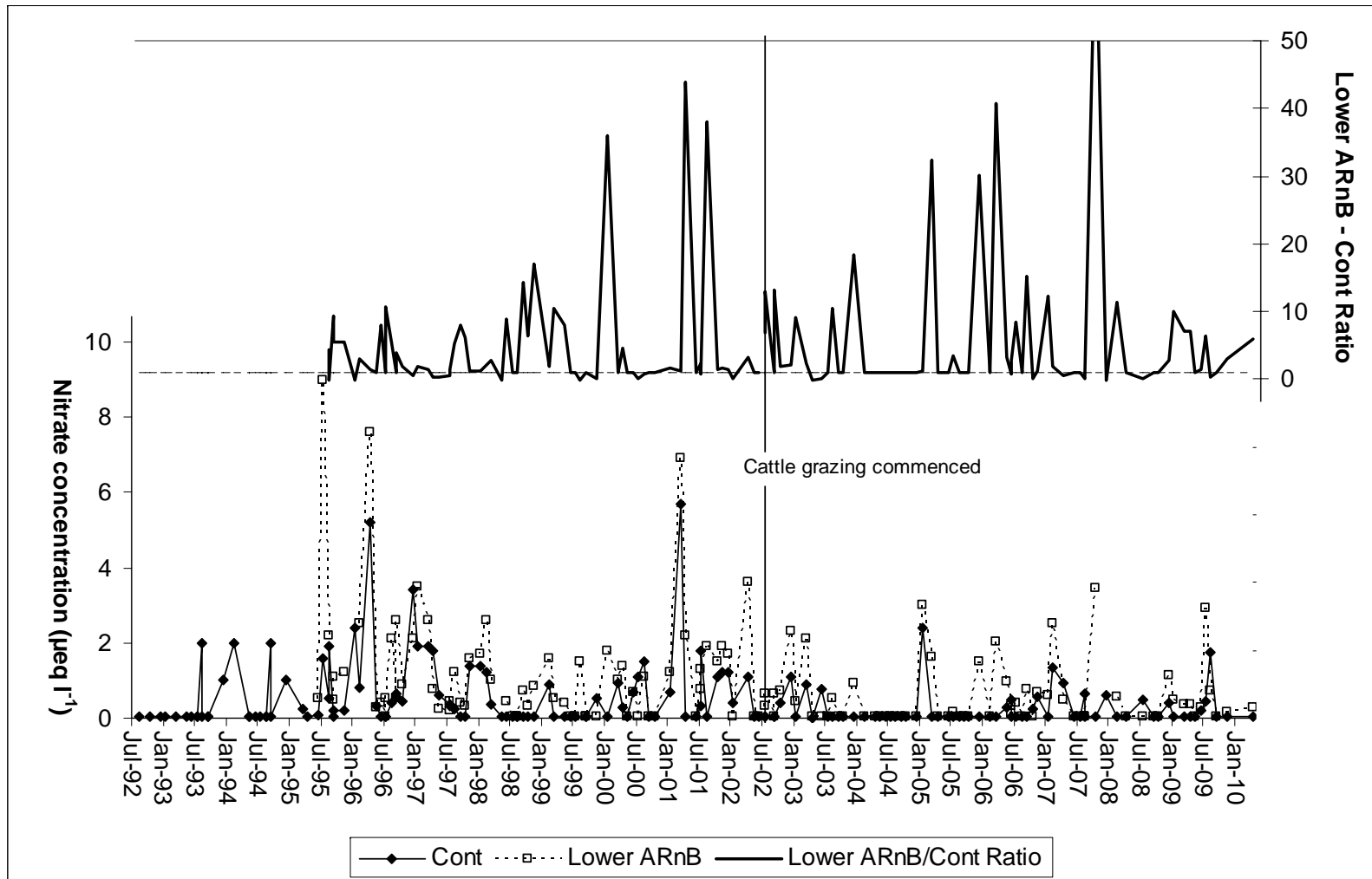




Figure 3.19 The ratio of nitrate and its temporal variability in spot samples between the Control and Allt Riabhach na Bioraich (Lower site) June 1995 – April 2010.



N.B. 0 values converted to half nitrate detection limit for ratio calculations.

Figure 3.20 The temporal variability of nitrate in spot samples and the difference between the Control and Allt Riabhach na Bioraich (Lower site) June 1995 – April 2010.

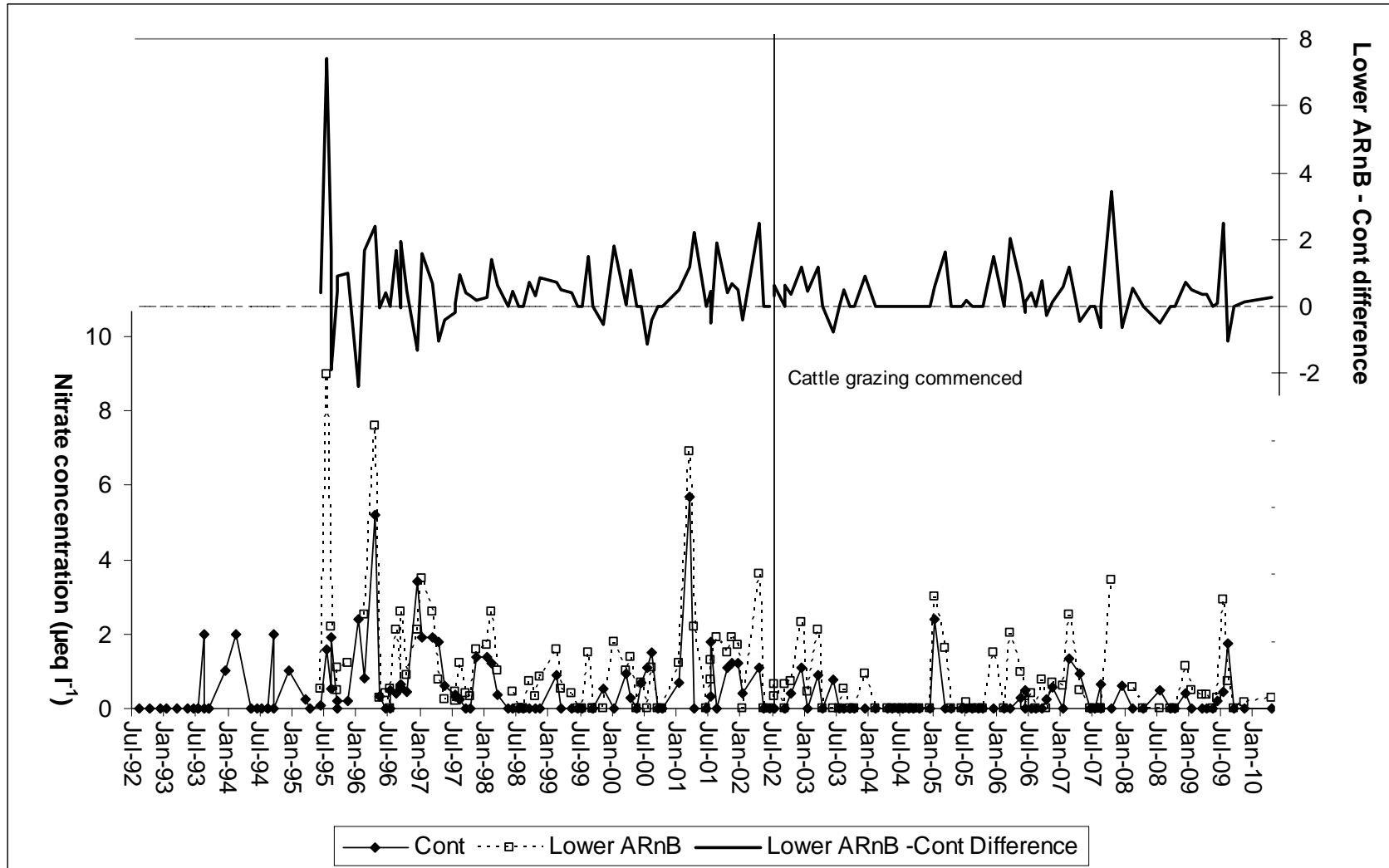


Figure 3.21 The ratio of alkalinity and its temporal variability in spot samples between the Control and Allt Riabhach na Bioraich (Lower site) June 1995 – April 2010.

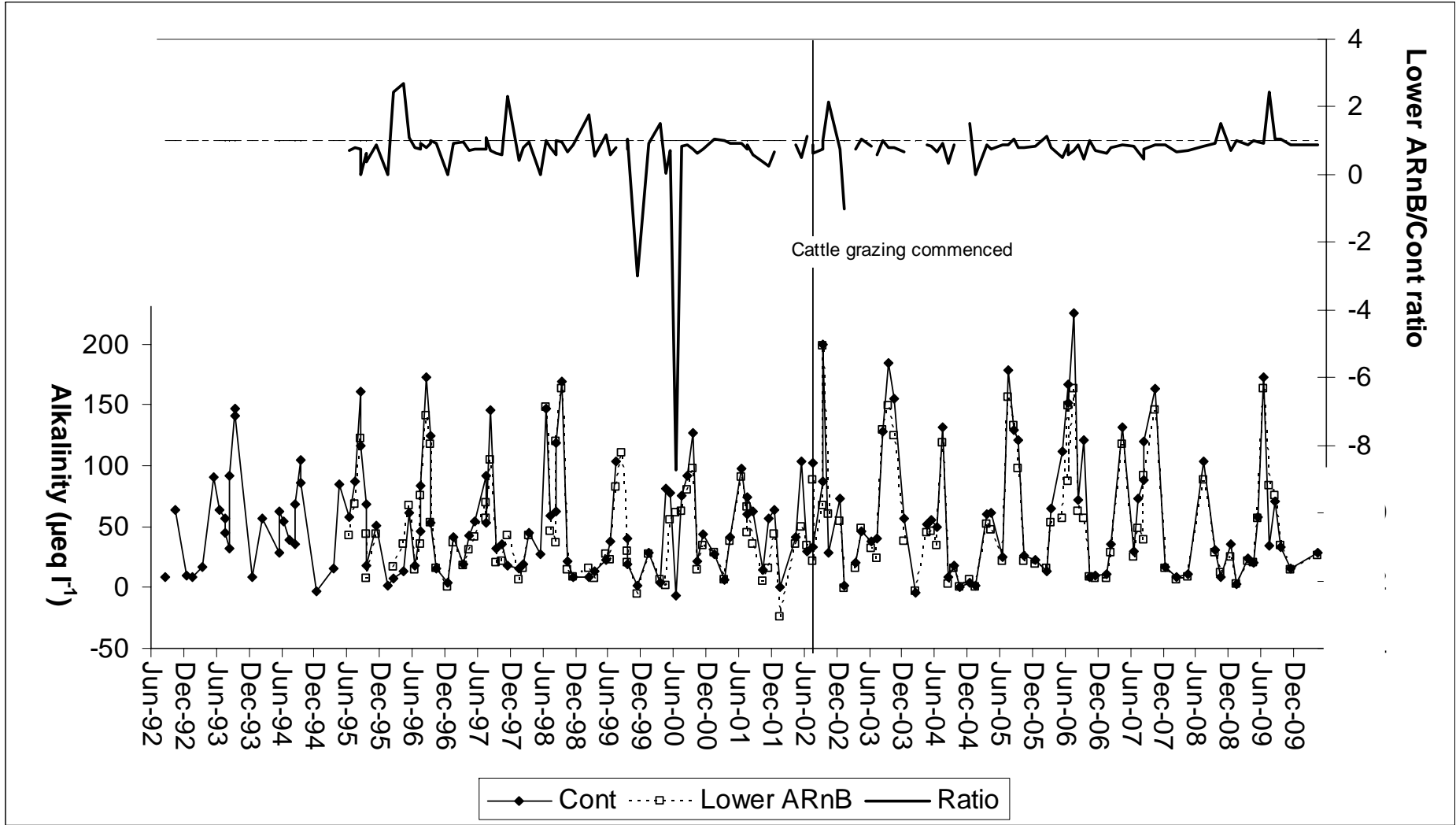


Figure 3.22 The ratio of calcium and its temporal variability in spot samples between the Control and Allt Riabhach na Bioraich (Lower site) June 1995 – April 2010.

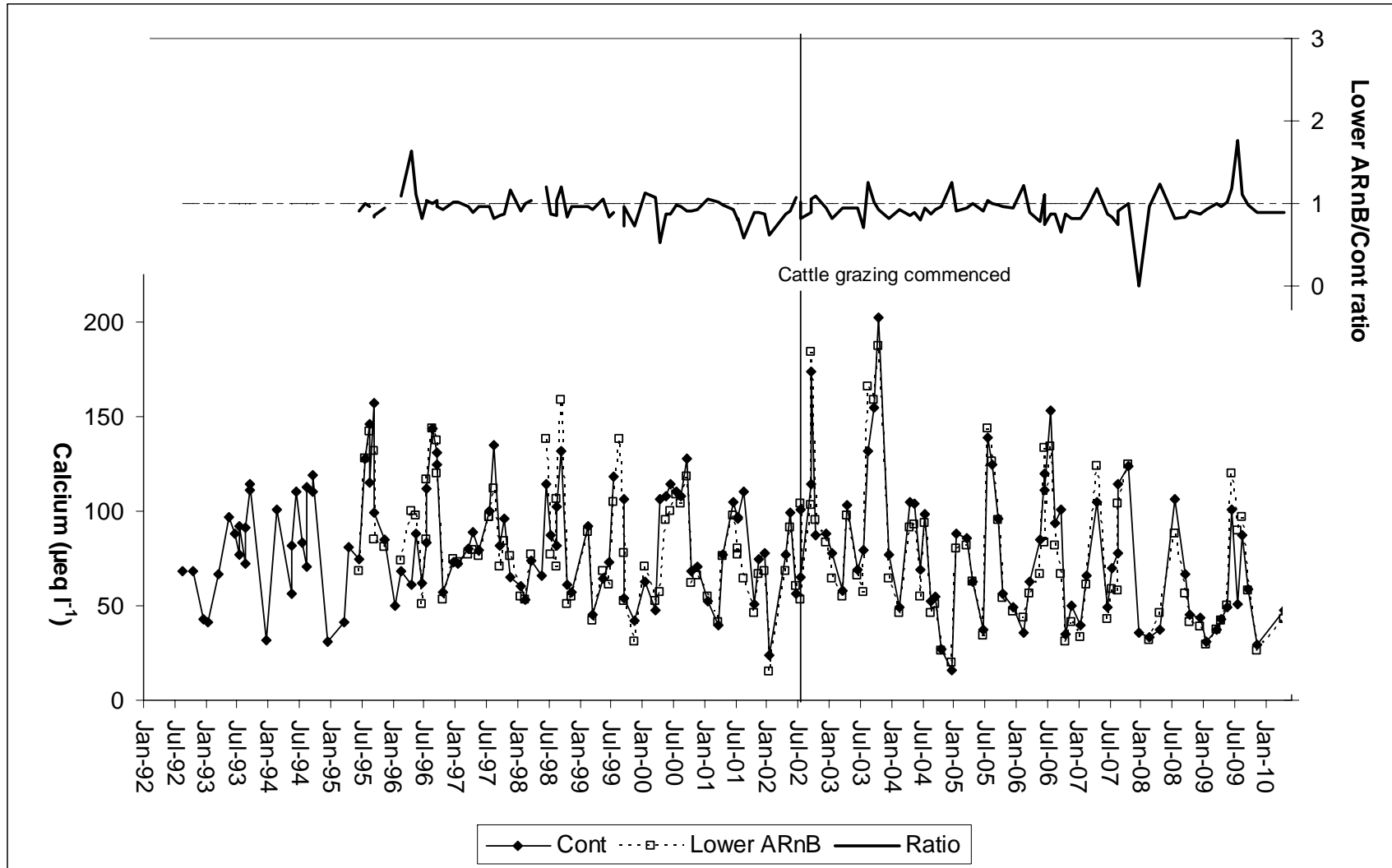


Figure 3.23 The ratio of magnesium and its temporal variability in spot samples between the Control and Allt Riabhach na Bioraich (Lower site) June 1995 – April 2010.

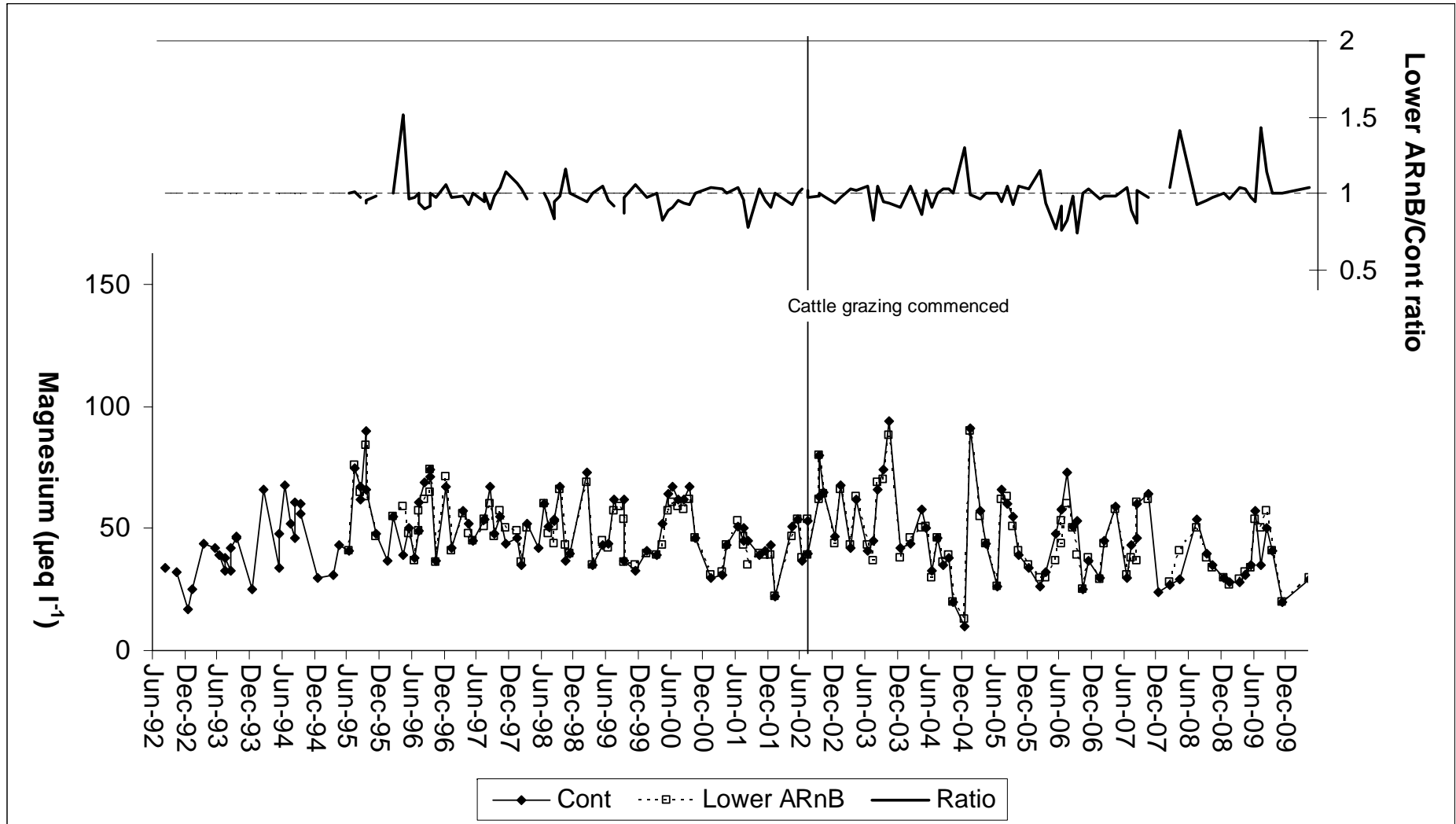


Figure 3.24 The ratio of potassium and its temporal variability in spot samples between the Control and Allt Riabhach na Bioraich (Lower site) June 1995 – April 2010.

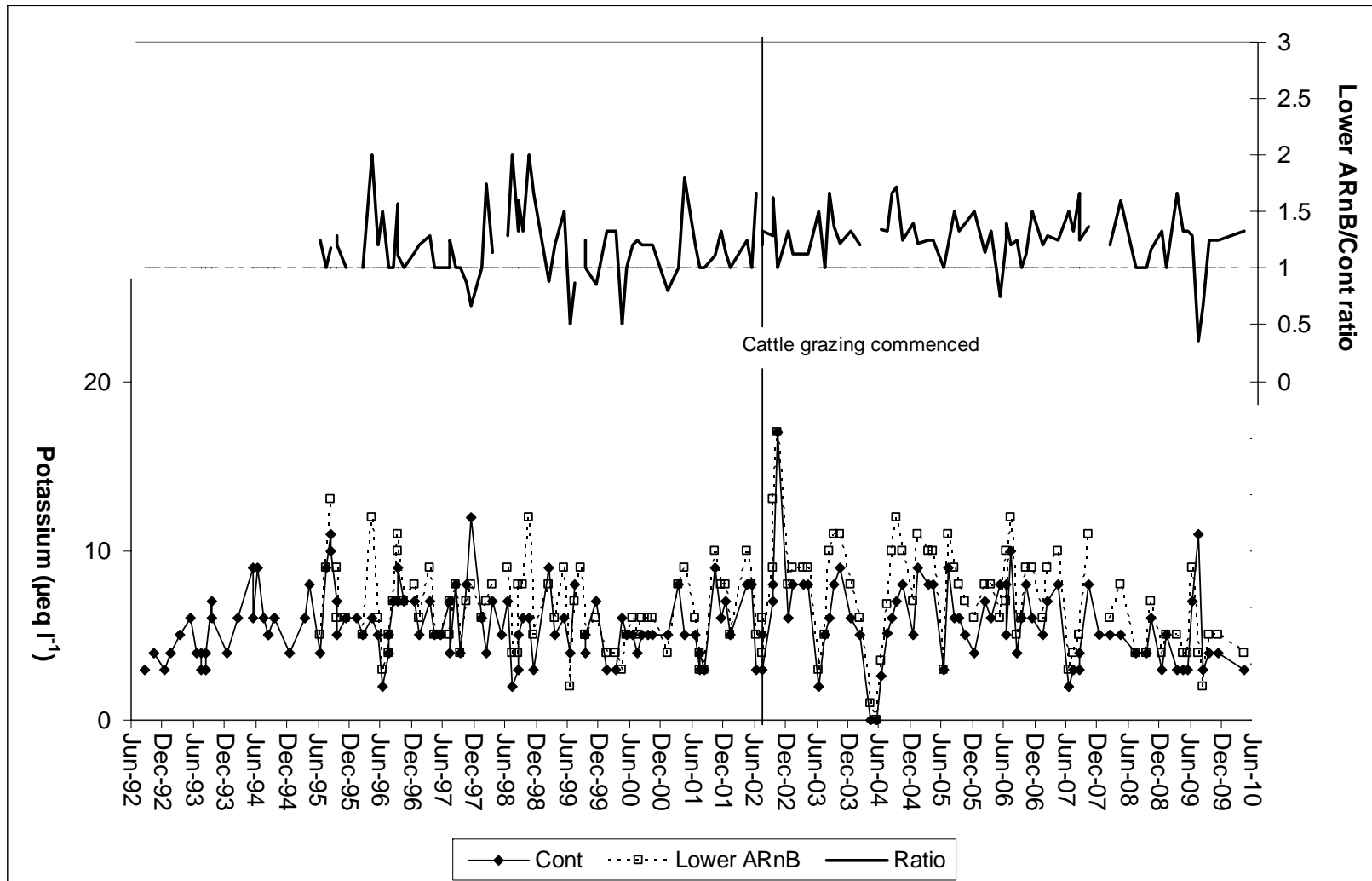


Figure 3.25 The ratio of conductivity and its temporal variability in spot samples between the Control and Allt Riabhach na Bioraich (Lower site) June 1995 – April 2010.

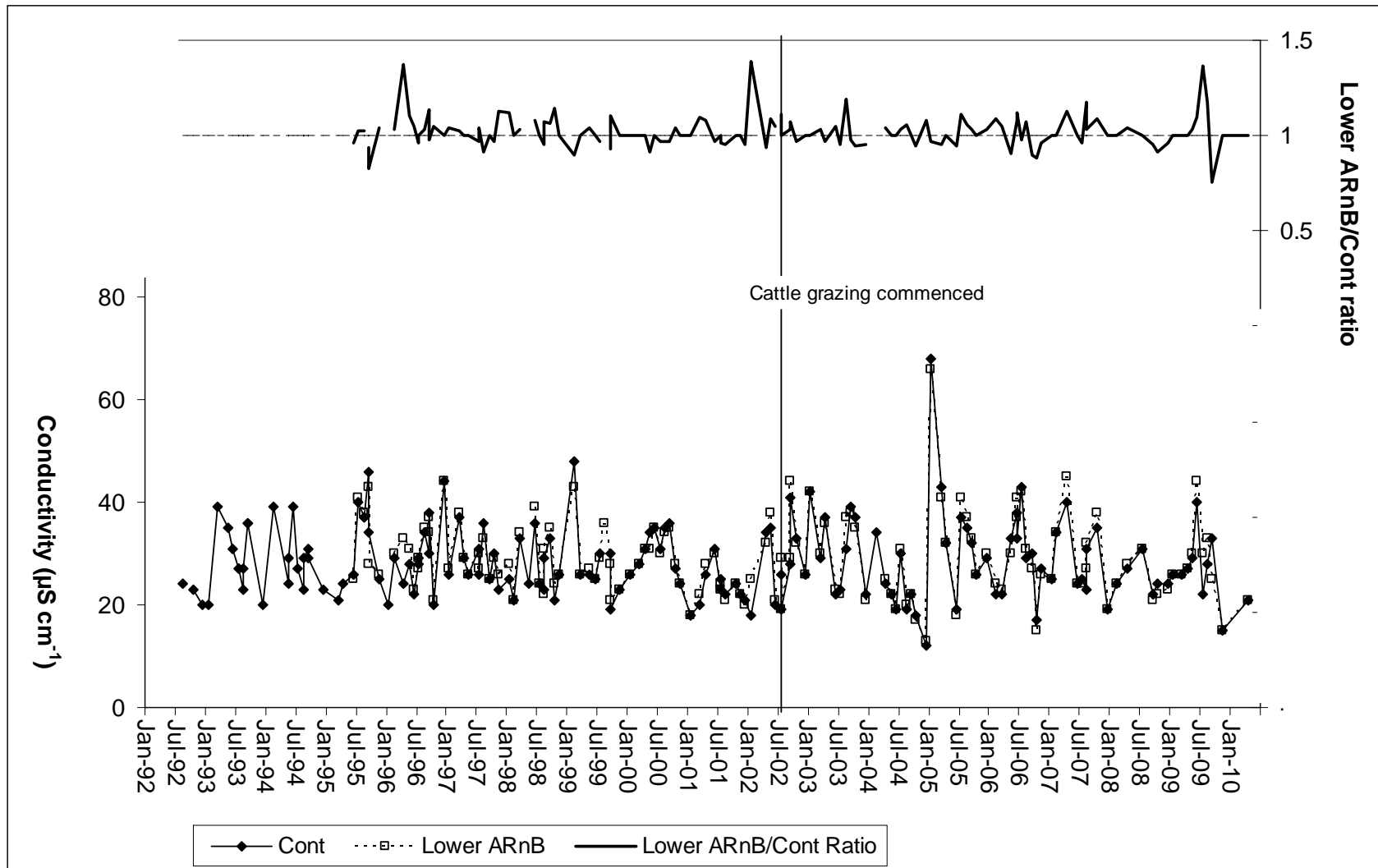
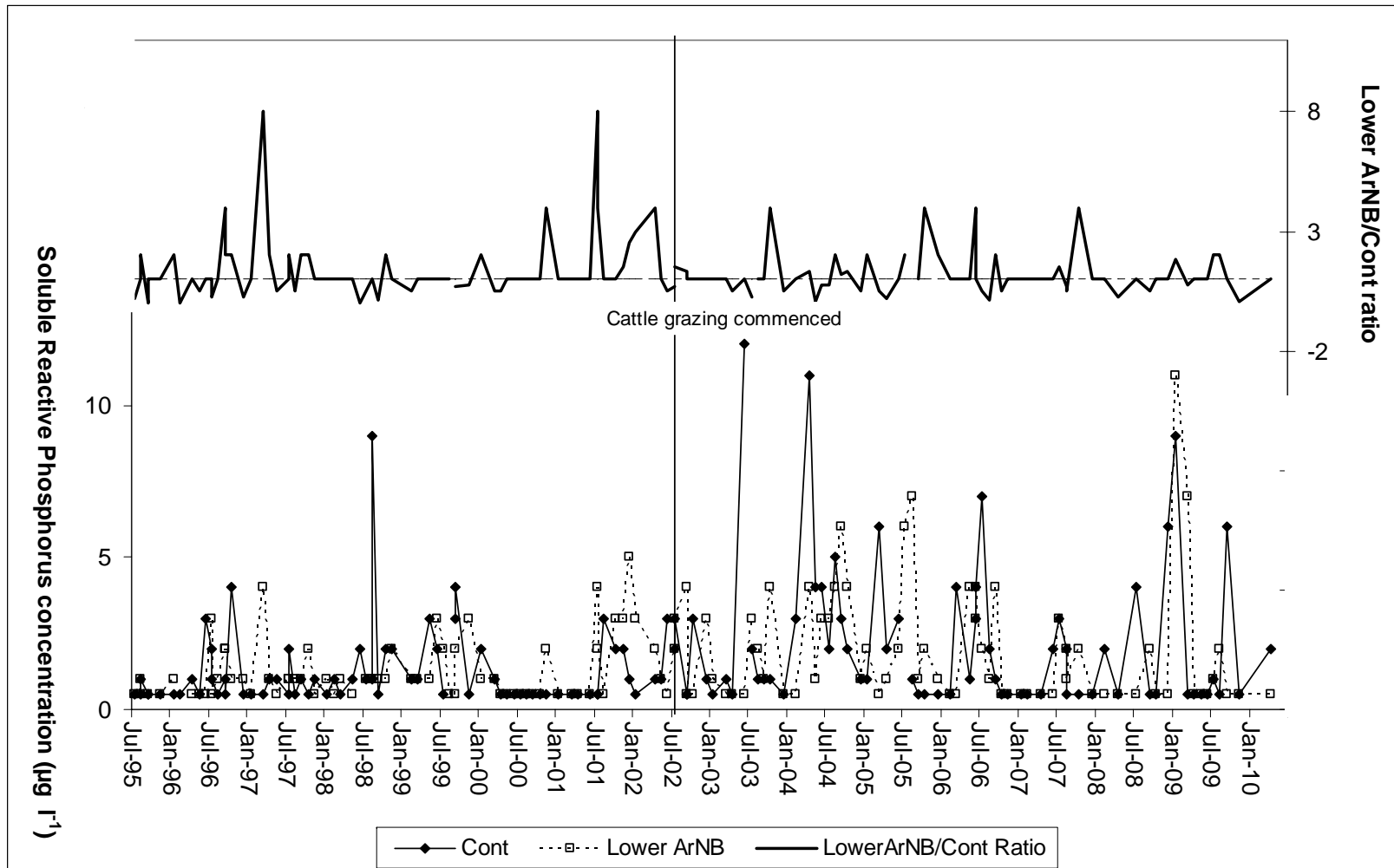


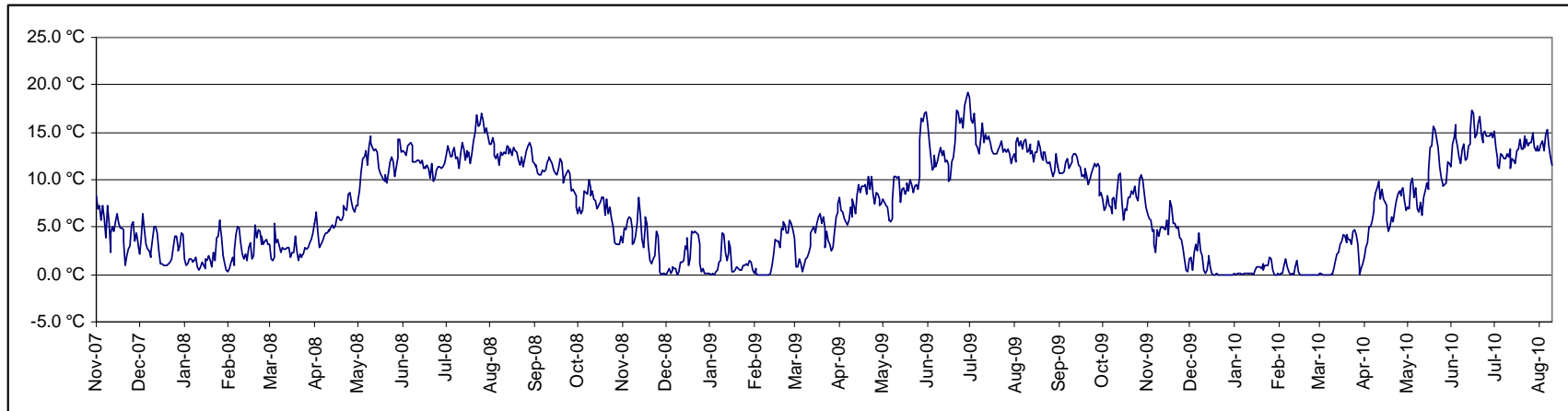
Figure 3.26 The ratio of soluble reactive phosphorus and its temporal variability in spot samples between the Control and Allt Riabhach na Bioraich (Lower site) June 1995 – April 2010.



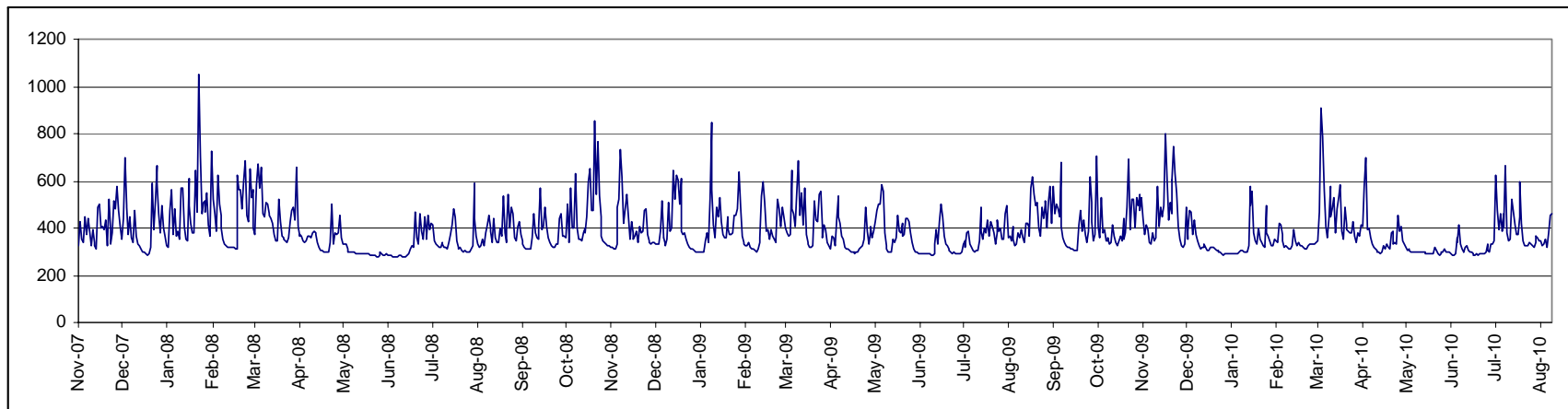
N.B. 0 values converted to half nitrate detection limit for ratio calculations.



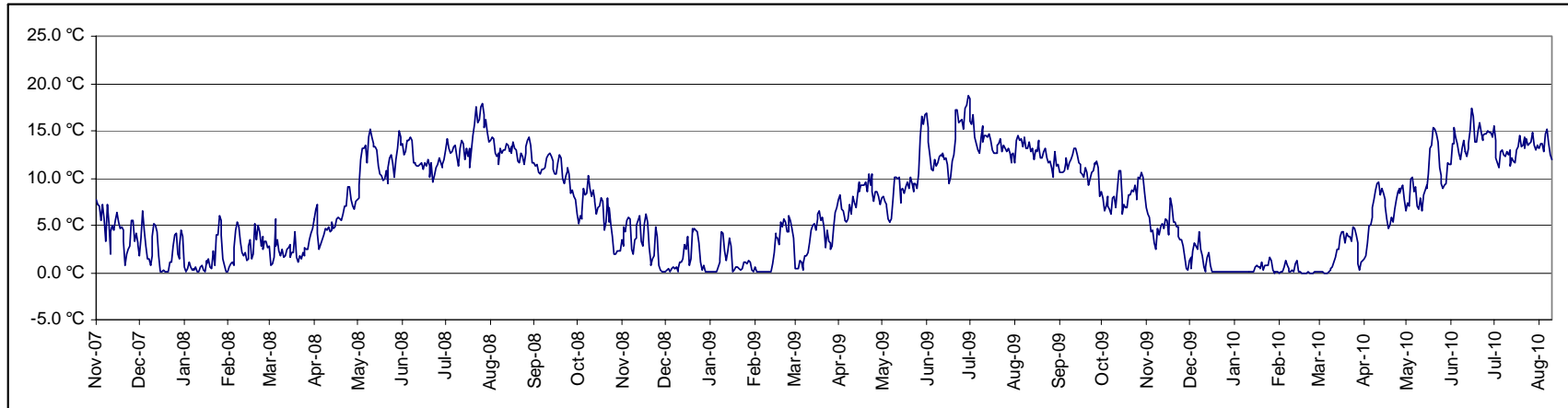
**Figure 3.27 Control Stream Average Daily Temperature (°C) November 2007 – August 2010**



**Figure 3.28 Control Stream Average Daily Height (mm) November 2007 – August 2010**



**Figure 3.29 Allt Riabhach na Bioraich Stream Average Daily Temperature (°C) November 2007 – August 2010**



**Figure 3.30 Allt Riabhach na Bioraich Stream Average Daily Height (mm) November 2007 – August 2010**

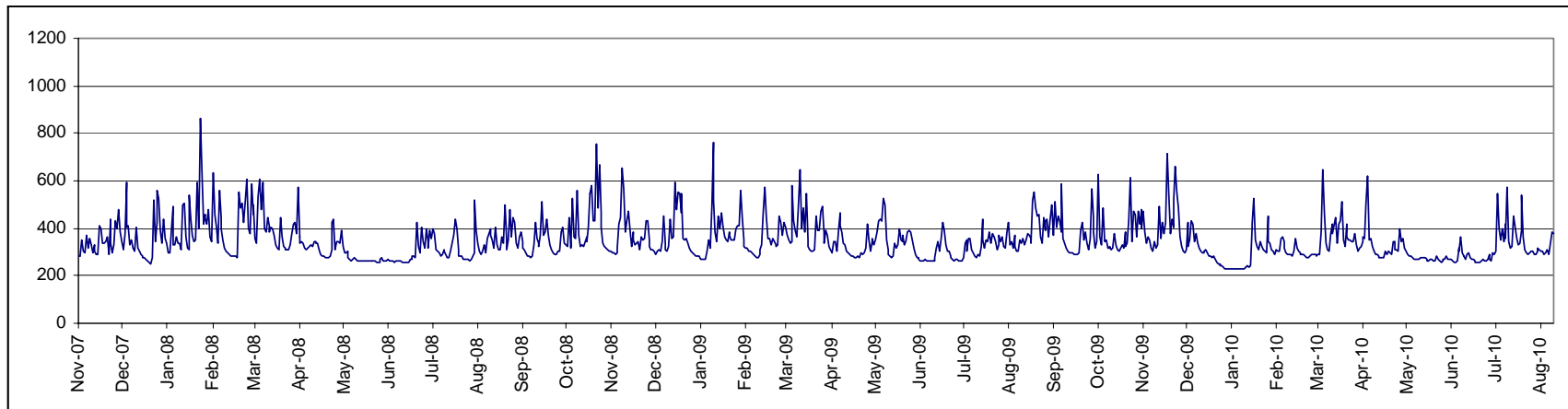
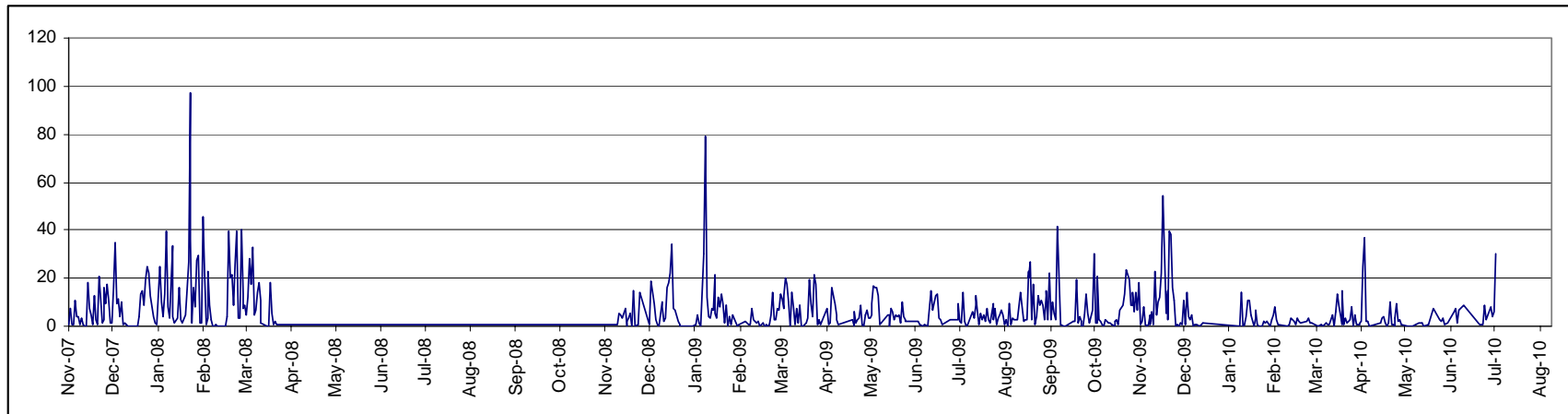
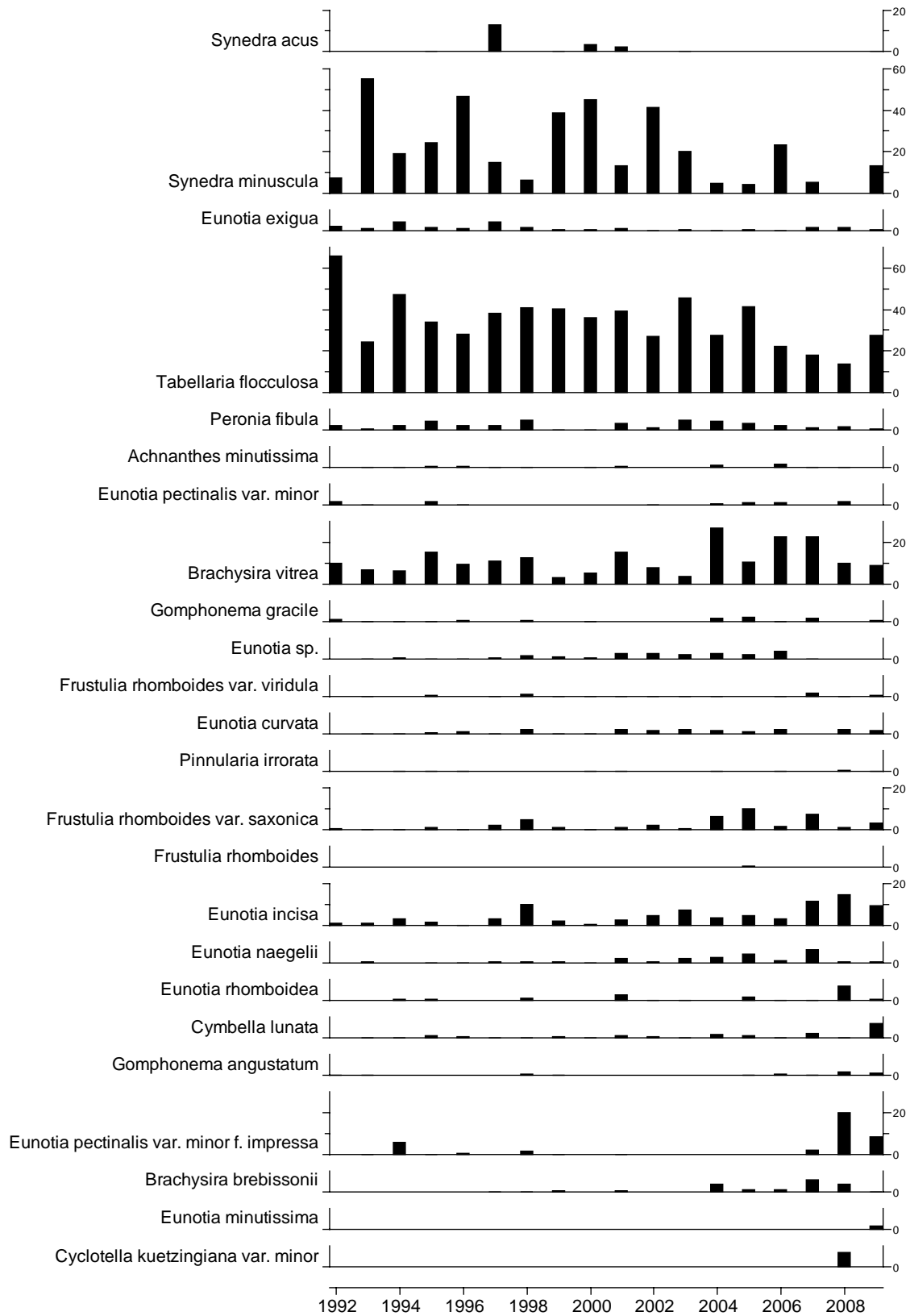


Figure 3.31 Laidon Experimental Area Daily Rainfall Totals (mm) November 2007 – August 2010



**Figure 3.32 Control Burn diatom percentage abundances**



**Figure 3.33 Experimental Burn diatom percentage abundances**

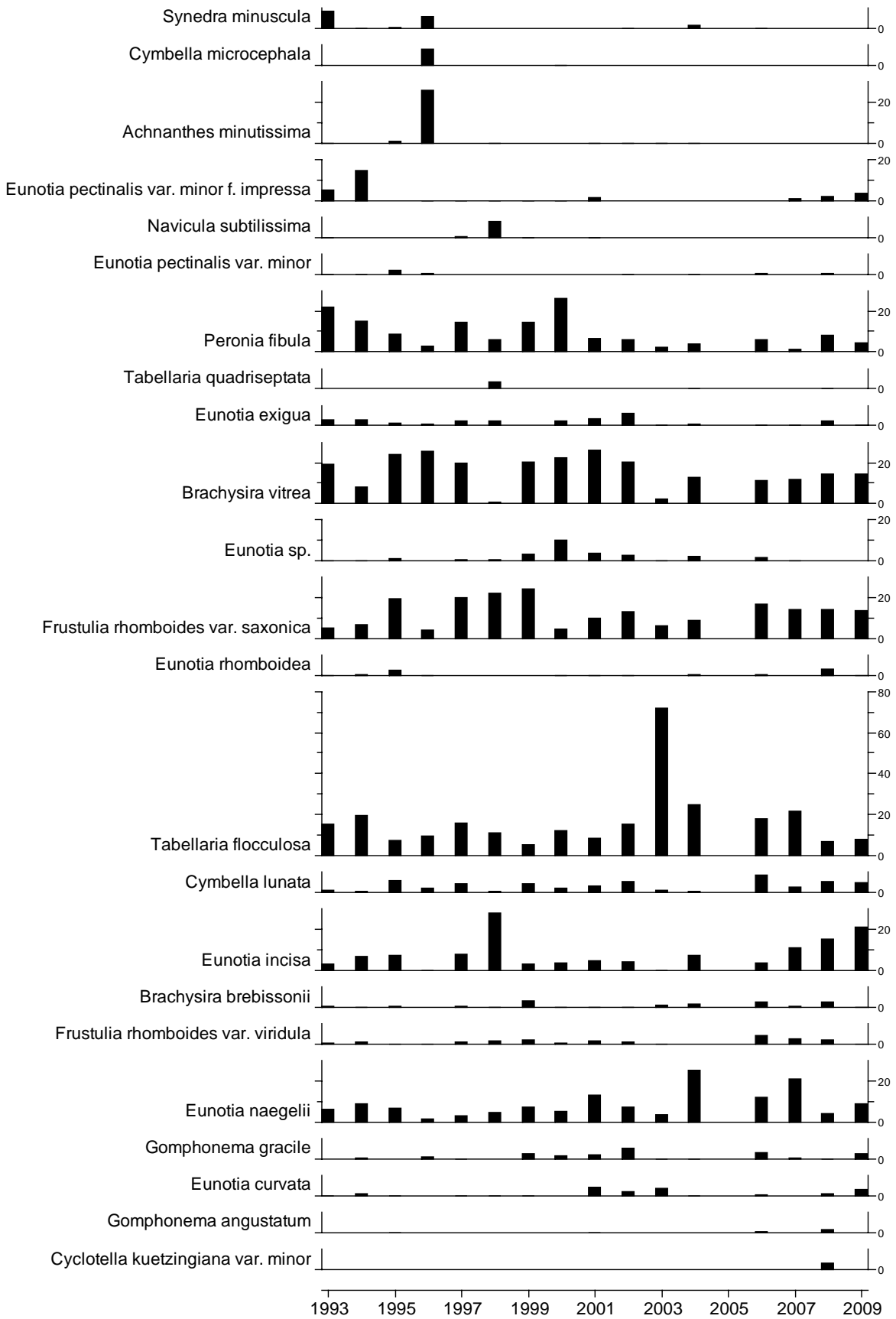
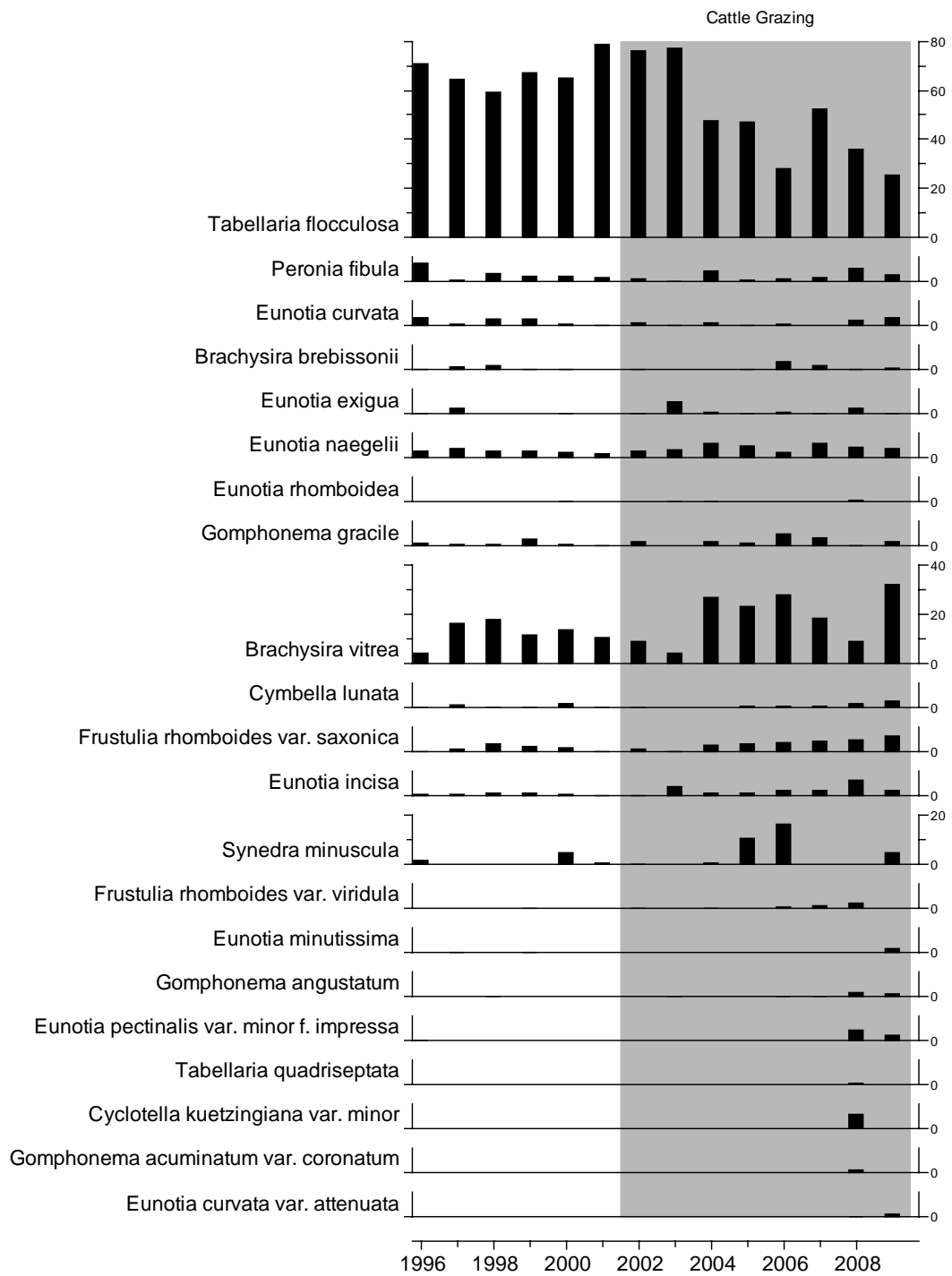
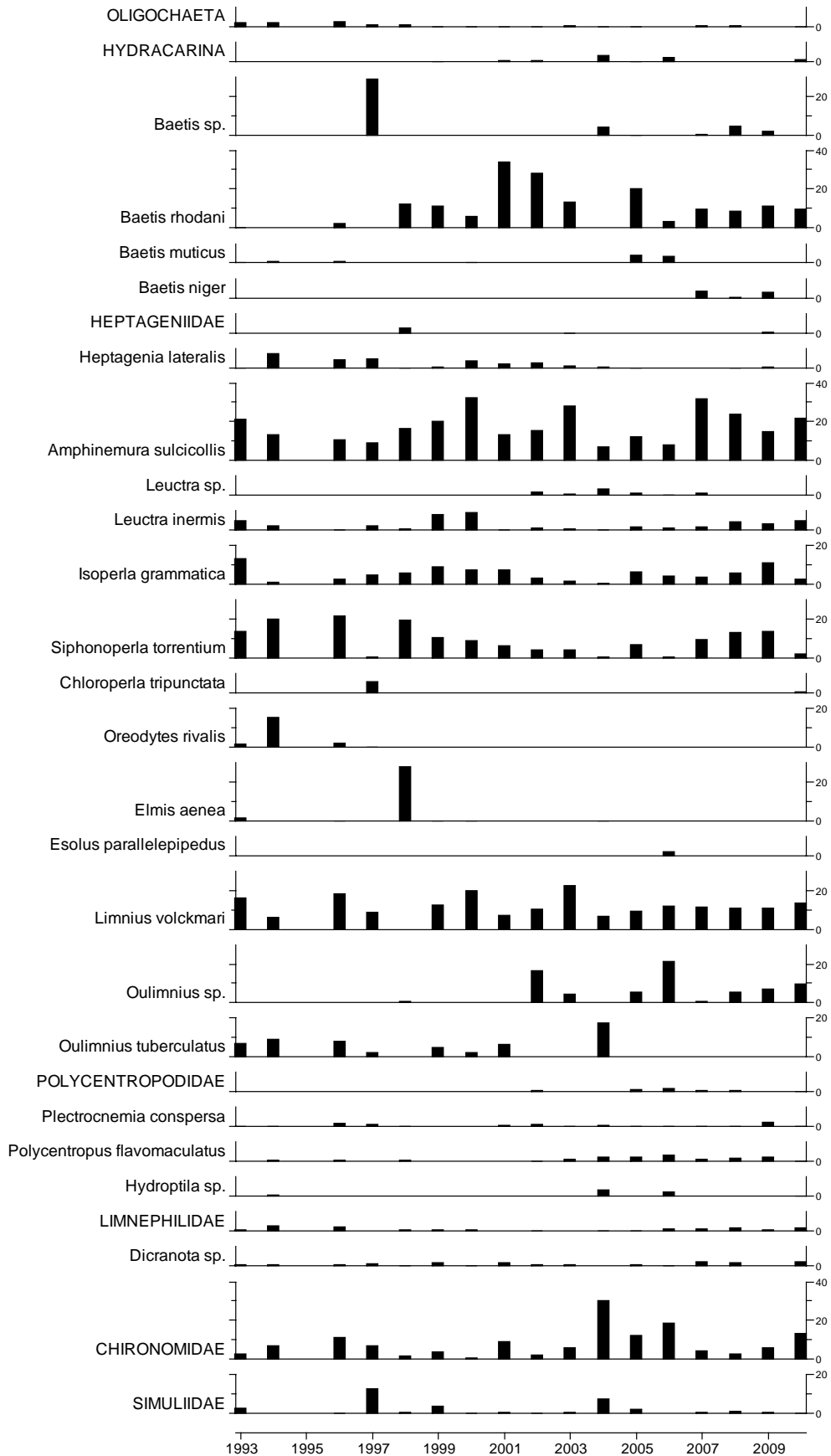


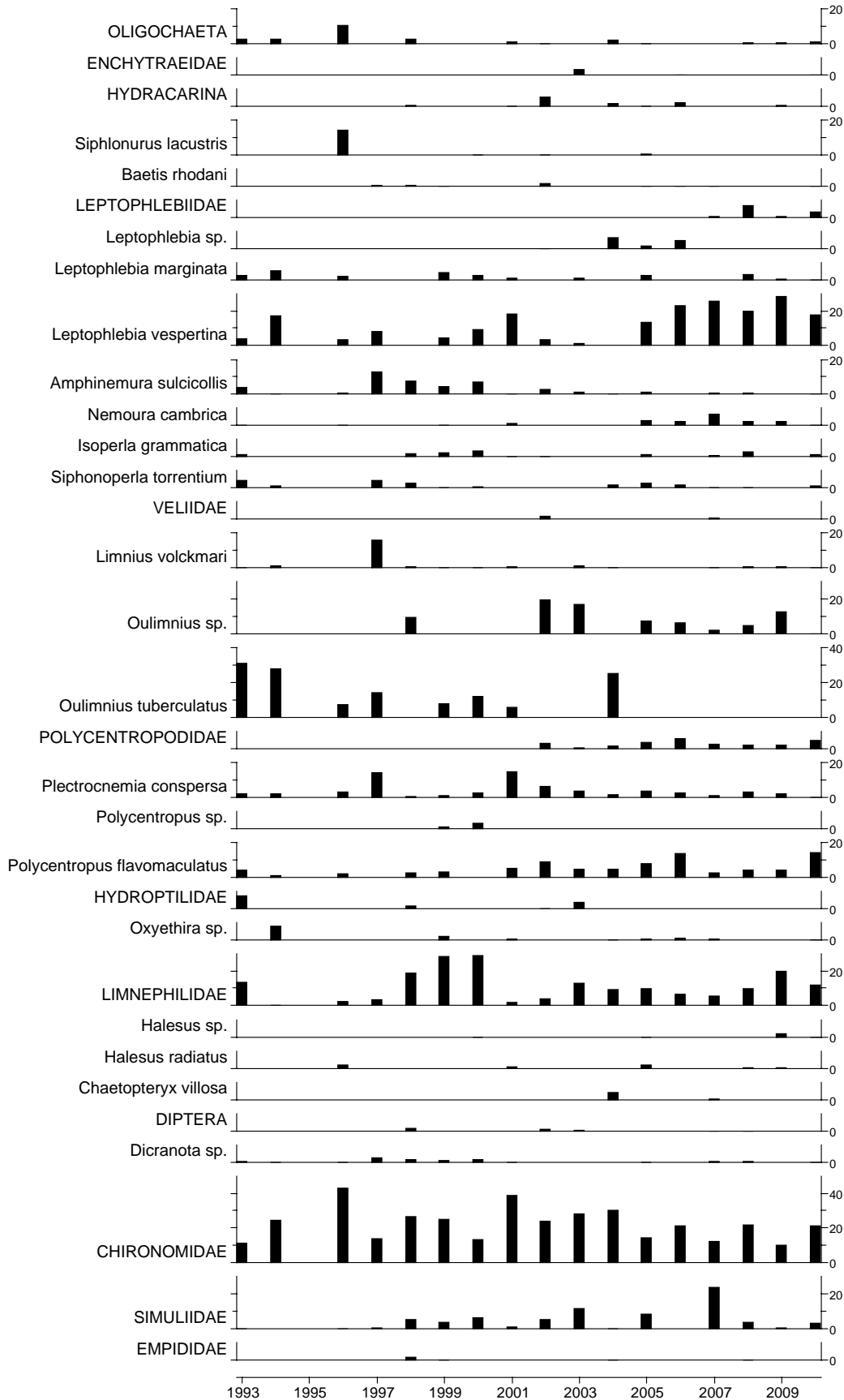
Figure 3.34 Allt Riabhach na Bioraich diatom percentage abundances



**Figure 3.35 Control Burn macroinvertebrate percentage abundances**

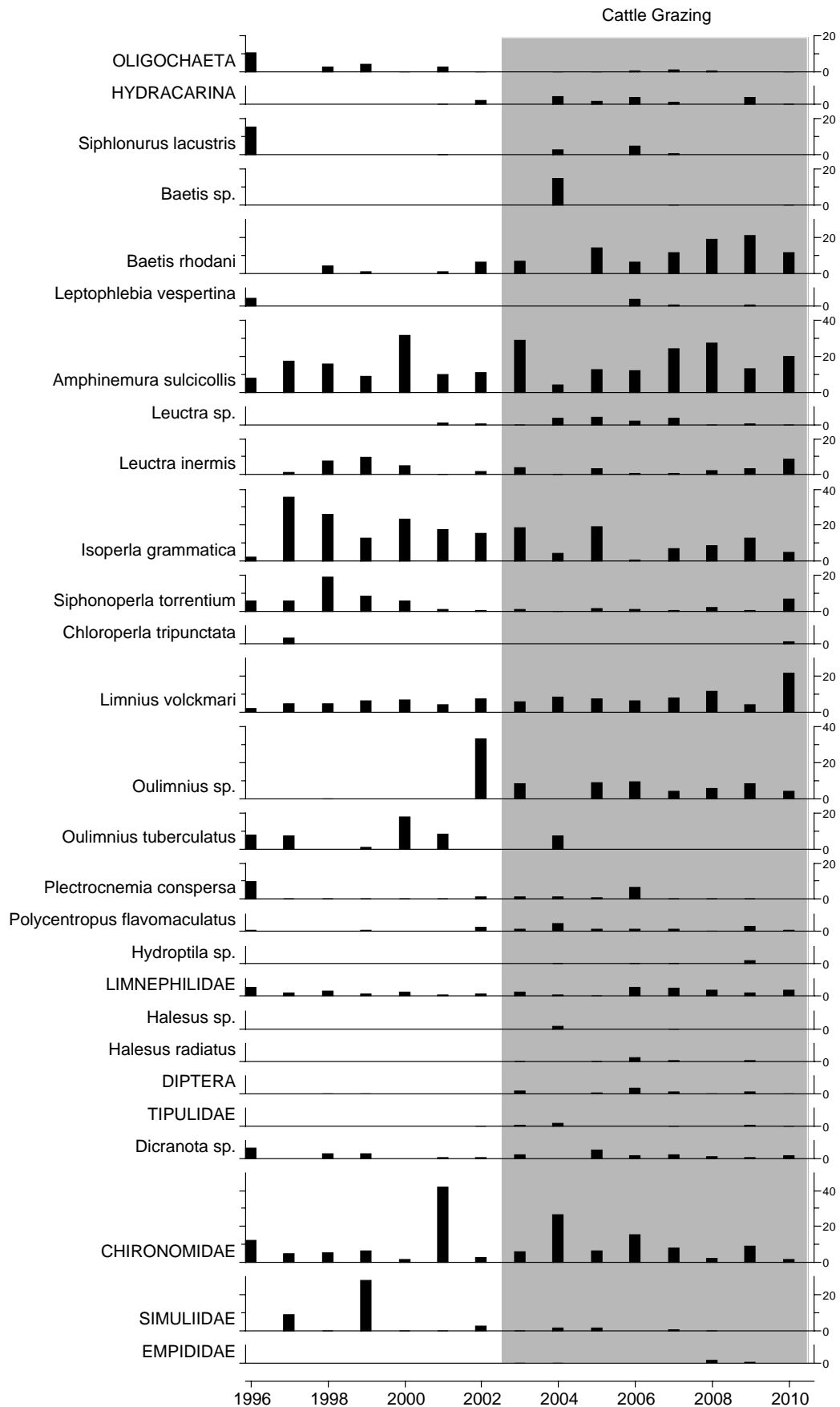


**Figure 3.36 Experimental Burn macroinvertebrate percentage abundances**

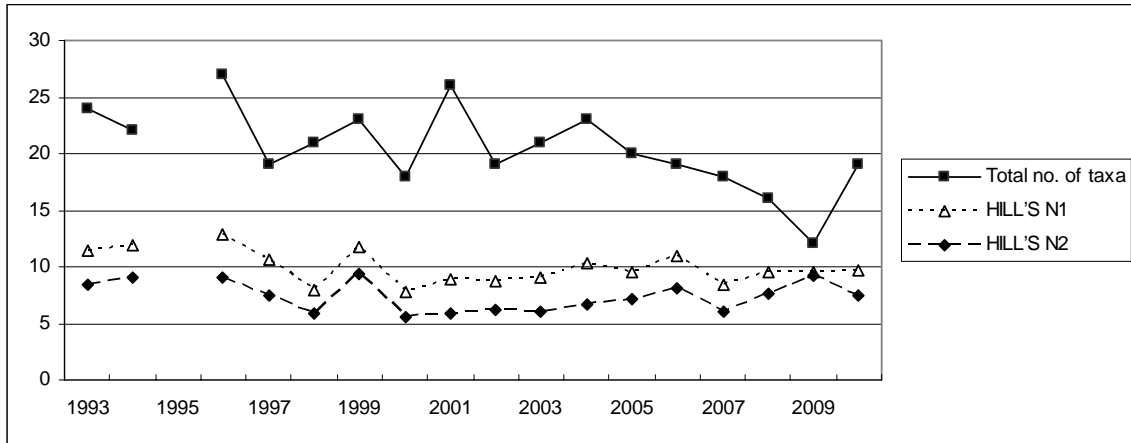




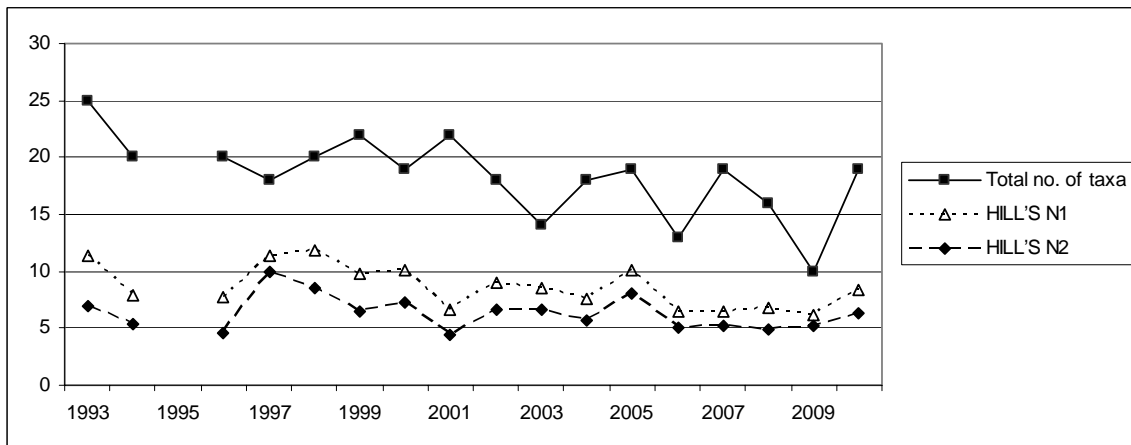
**Figure 3.37 Allt Riabhach na Bioraich Burn macroinvertebrate percentage abundances**



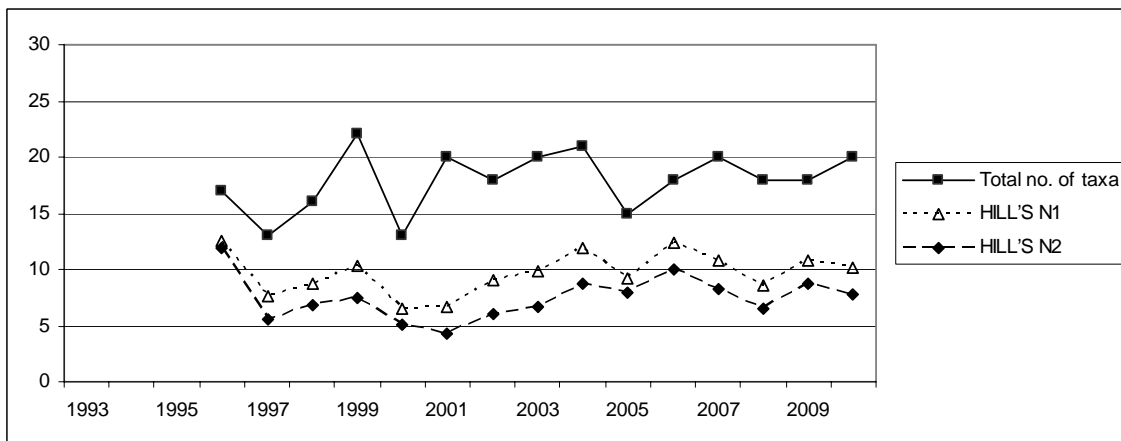
**Figure 3.38 Selected Control Burn macroinvertebrate summary statistics**



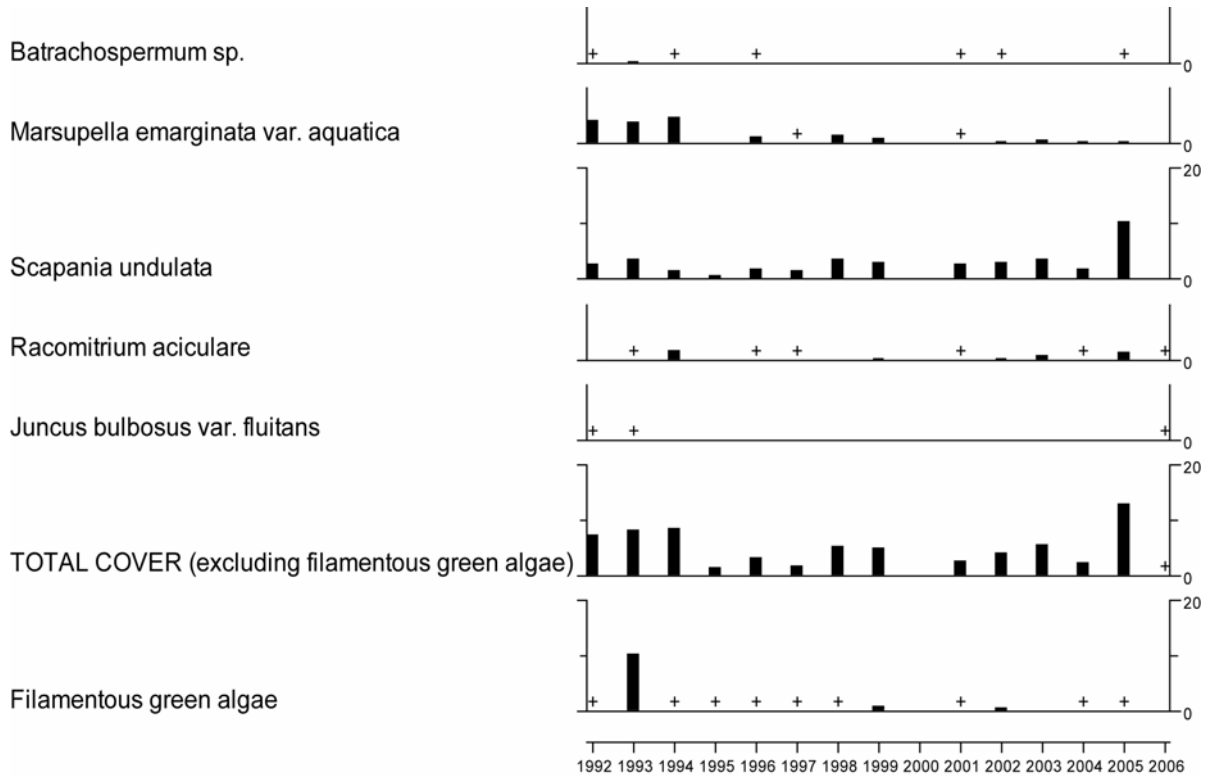
**Figure 3.39 Selected Experimental Burn macroinvertebrate summary statistics**



**Figure 3.40 Selected Allt Riabhach na Bioraich macroinvertebrate summary statistics**



**Figure 3.41 Control Burn Macrophyte percentage Abundances**

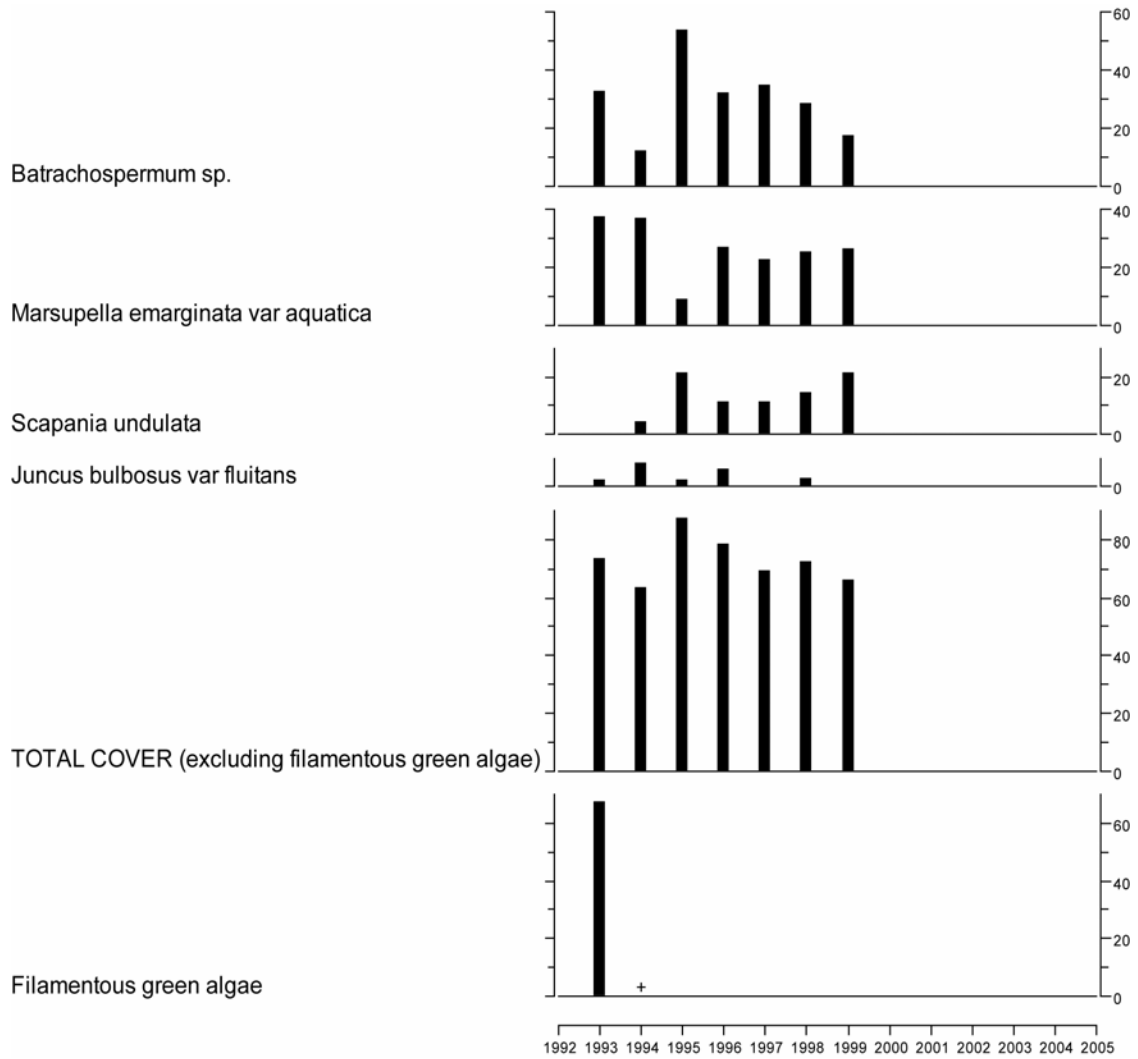


Sampling stretch 50m long.

+ represents <1% abundance

Recent data pending; Awaiting expert voucher confirmation.

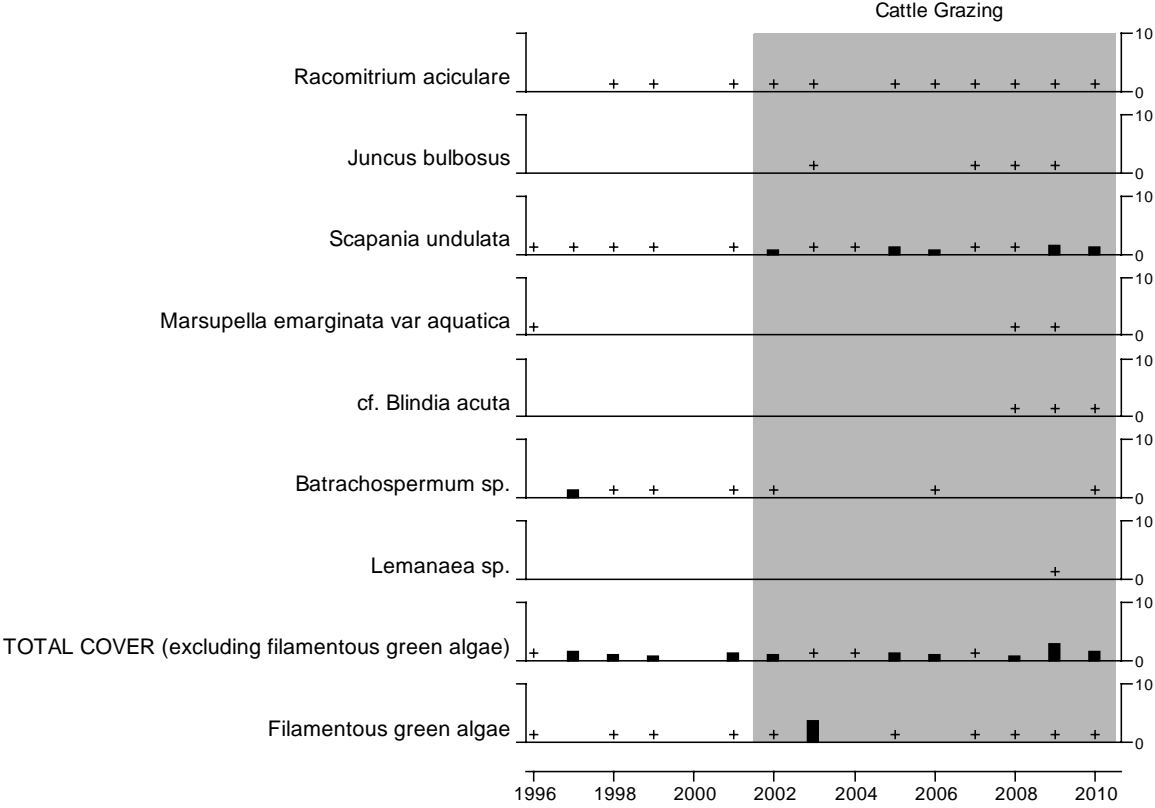
**Figure 3.42 Experimental Burn Macrophyte percentage Abundances**



Sampling stretch 20m long. Sampling ceased in 1999.

+ represents <1% abundance

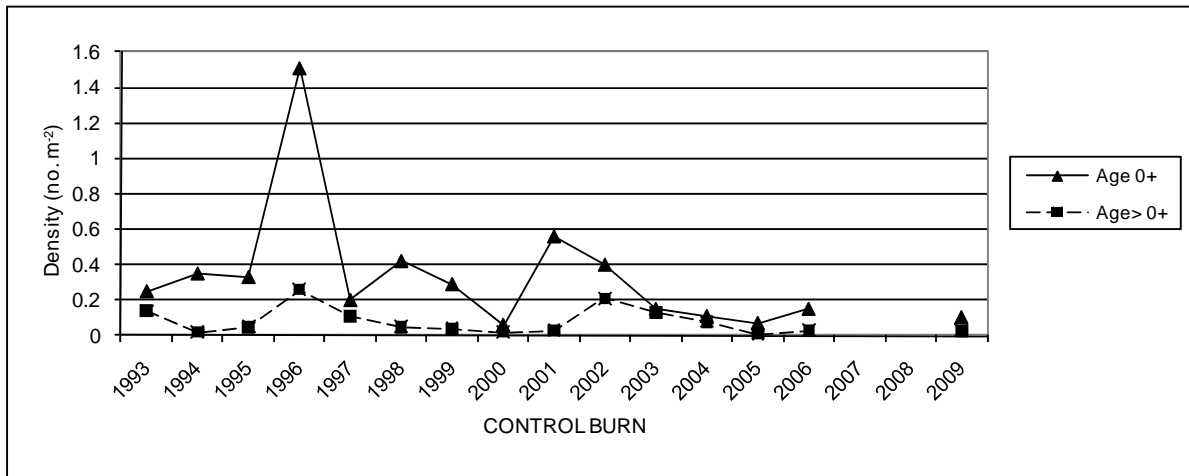
**Figure 3.43 Allt Riabhach na Bioraich Burn Macrophyte percentage Abundances**



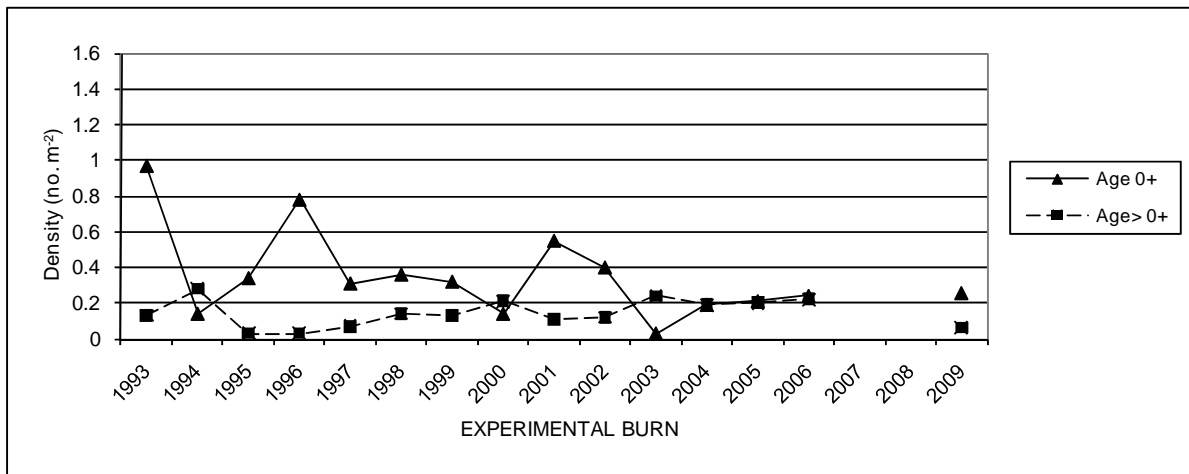
Sampling stretch 50m long.

+ represents <1% abundance

**Figure 3.44 Control Burn fish densities**



**Figure 3.45 Experimental Burn fish densities**



**Figure 3.46 Allt Riabhach na Bioraich fish densities**

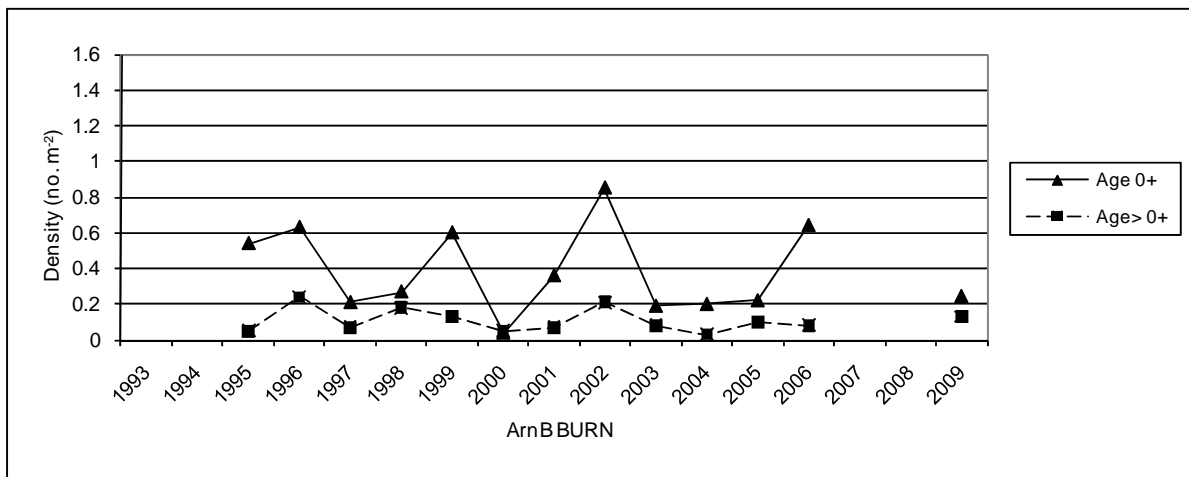


Figure 3.47 Loch Laidon 2009 Core LAI6 Percentage Dry Weight

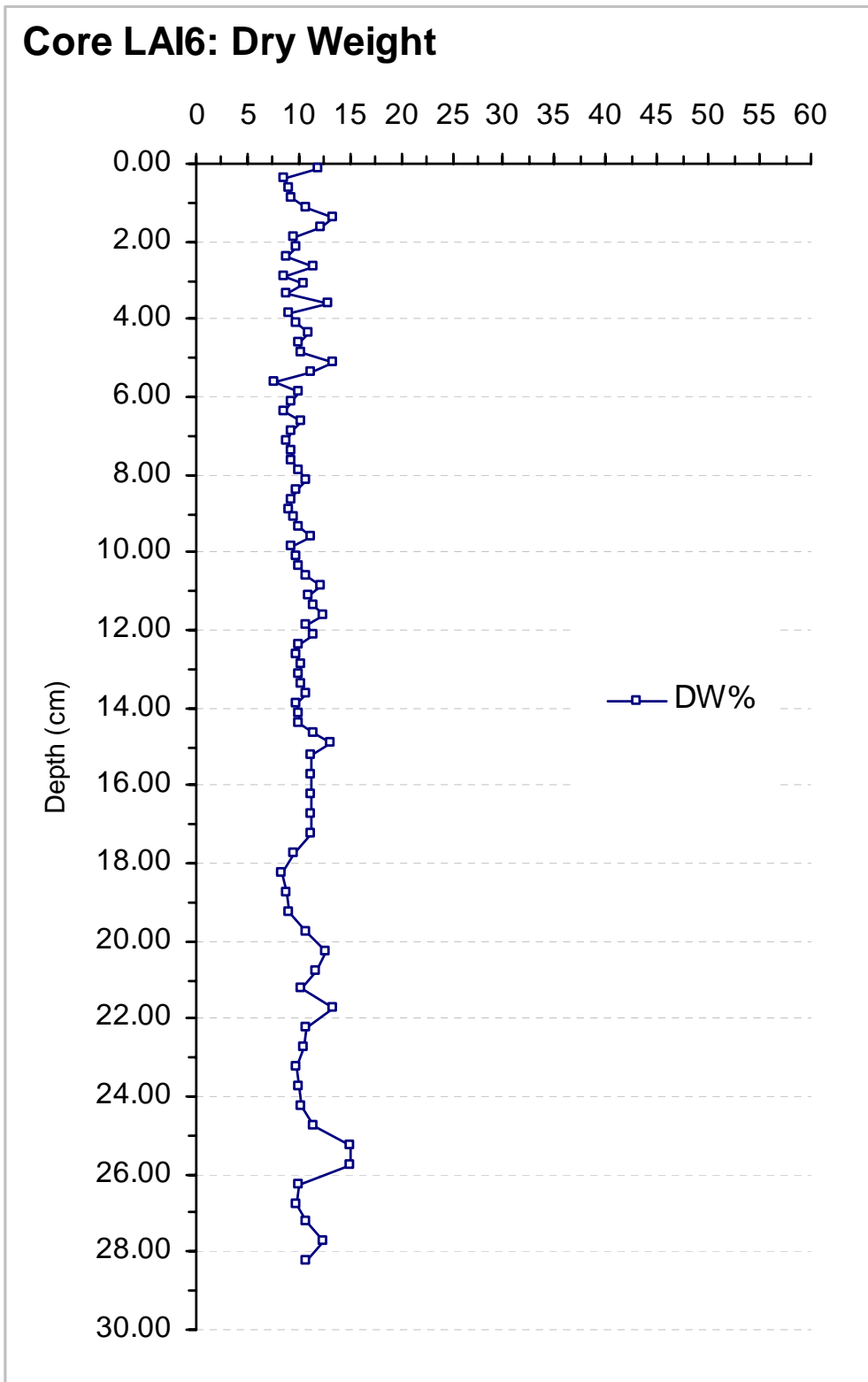


Figure 3.48 Loch Laidon 2009 Core LAI6 Percentage Loss On Ignition 550

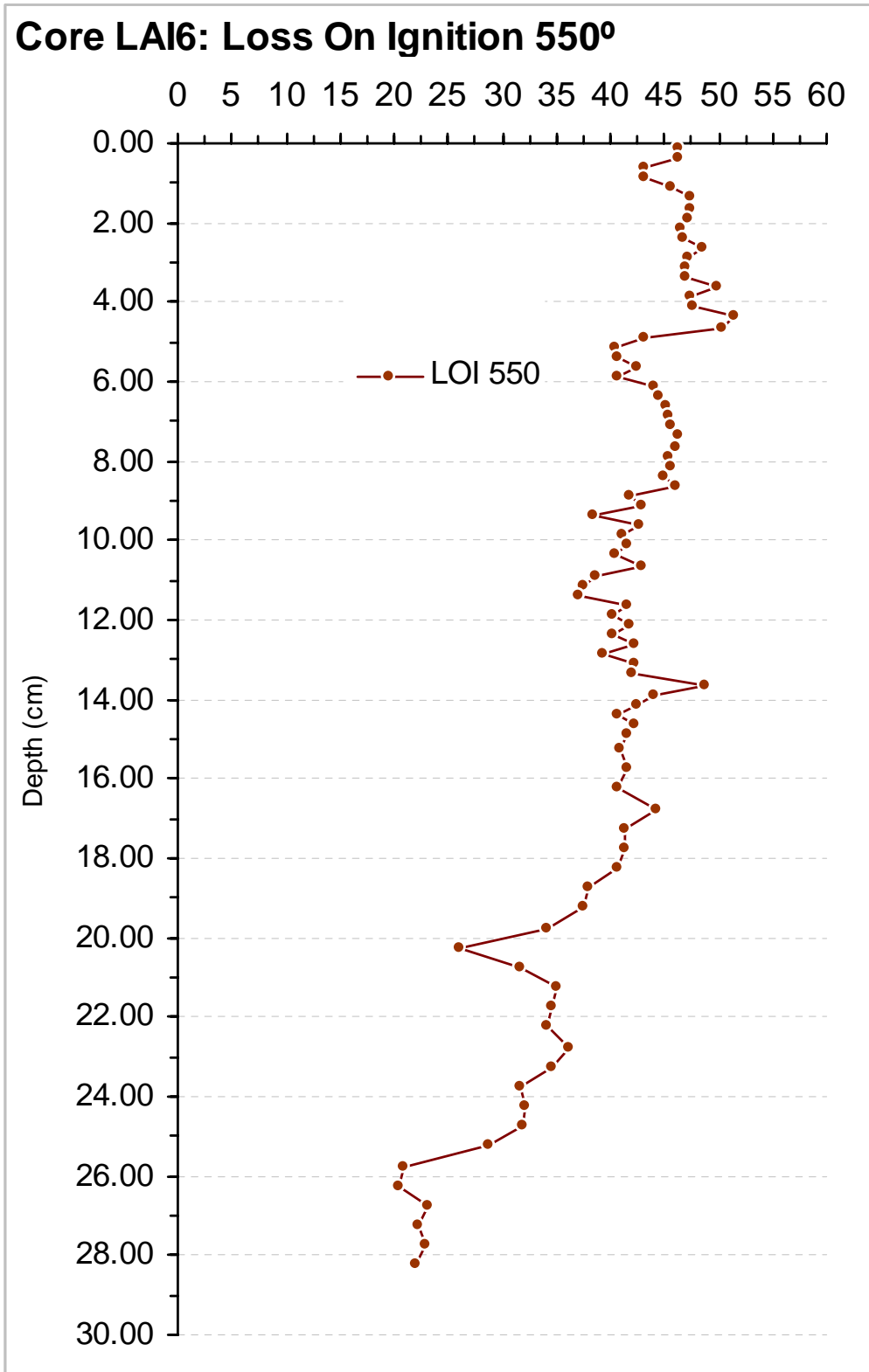
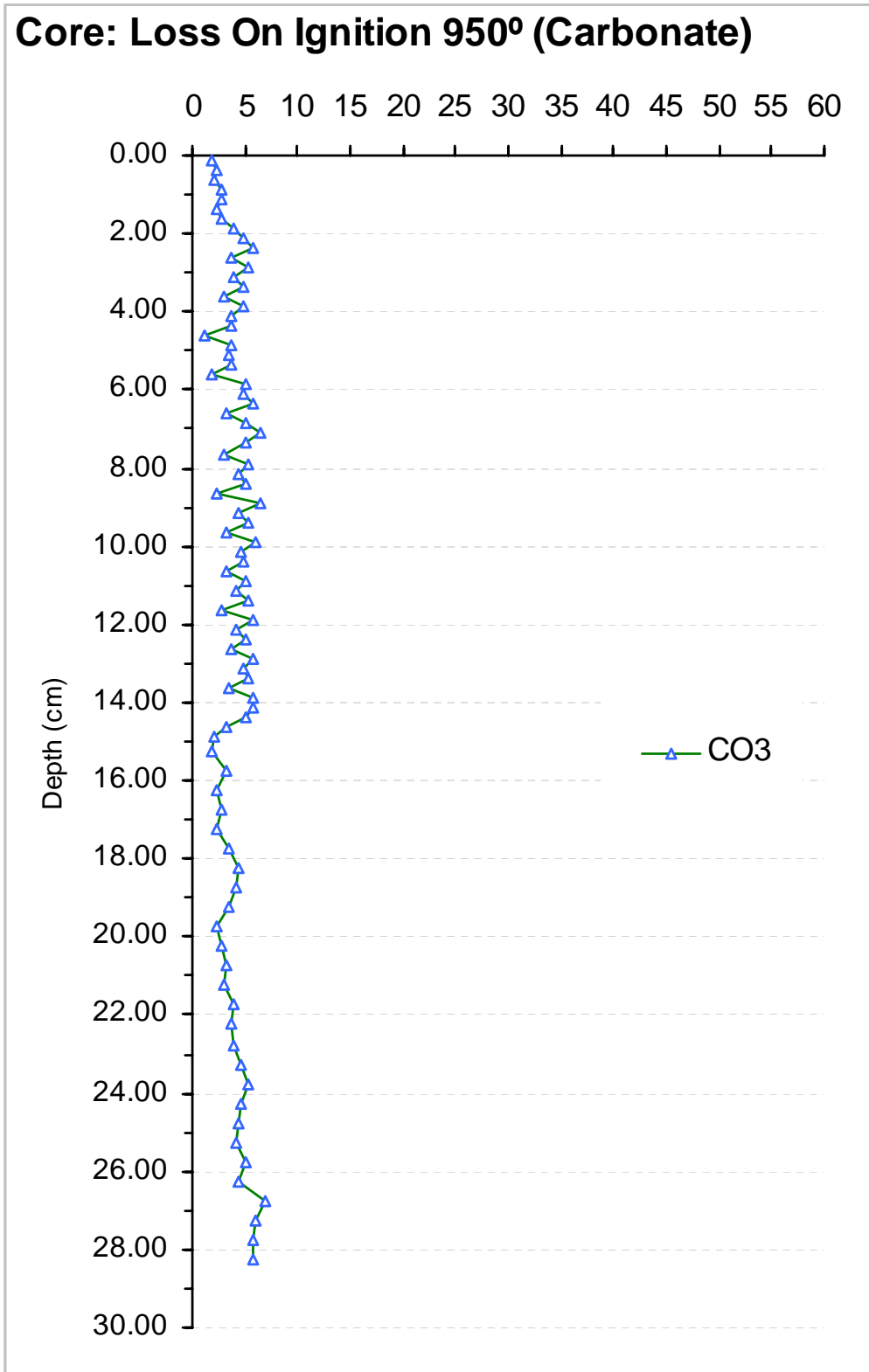




Figure 3.49 Loch Laidon 2009 Core LAI6 Percentage Loss On Ignition 950



**Figure 3.50 Loch Laidon 2009 Core LAI6 Spheroidal Carbonaceous Particle Profile**

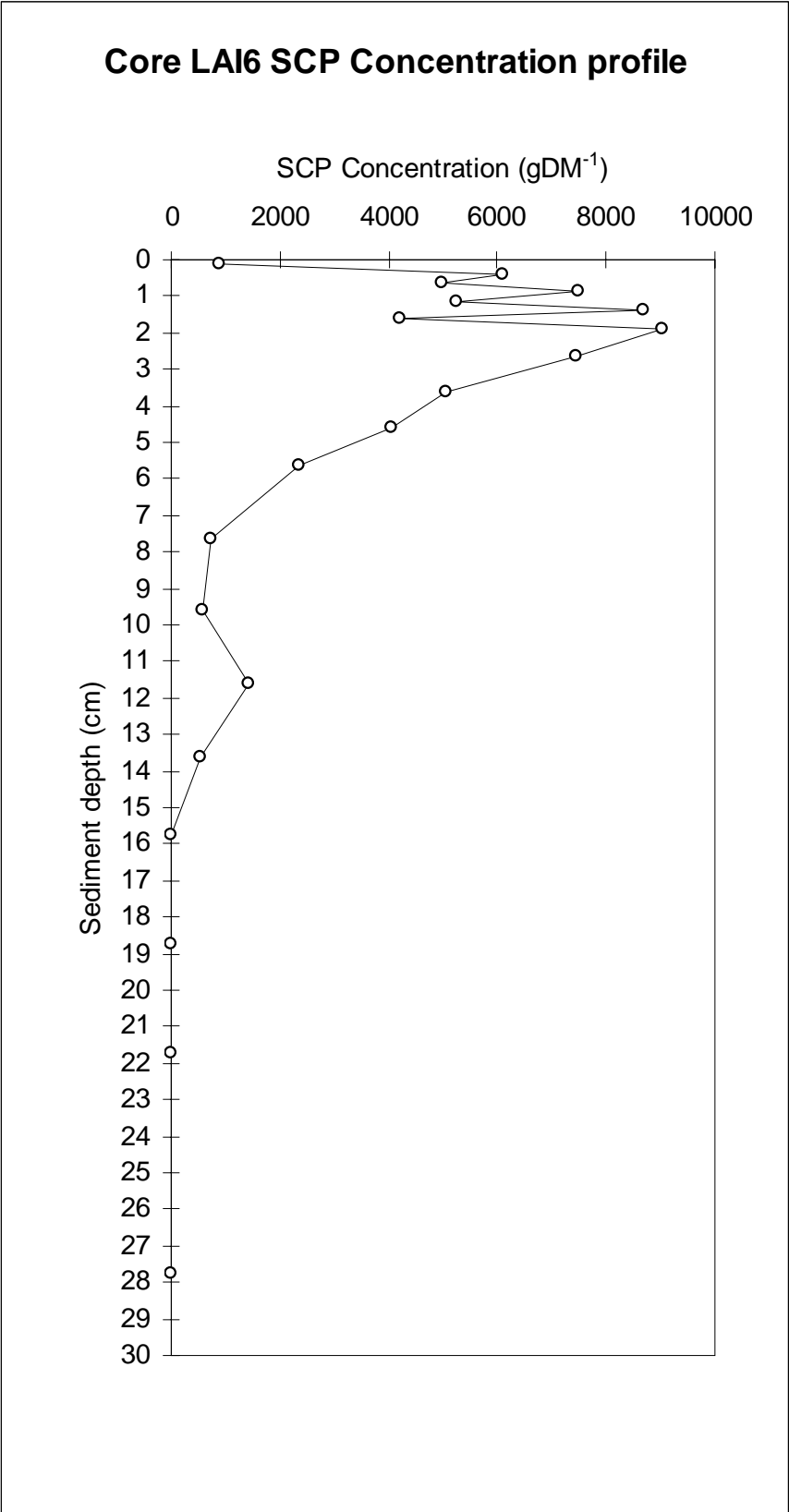
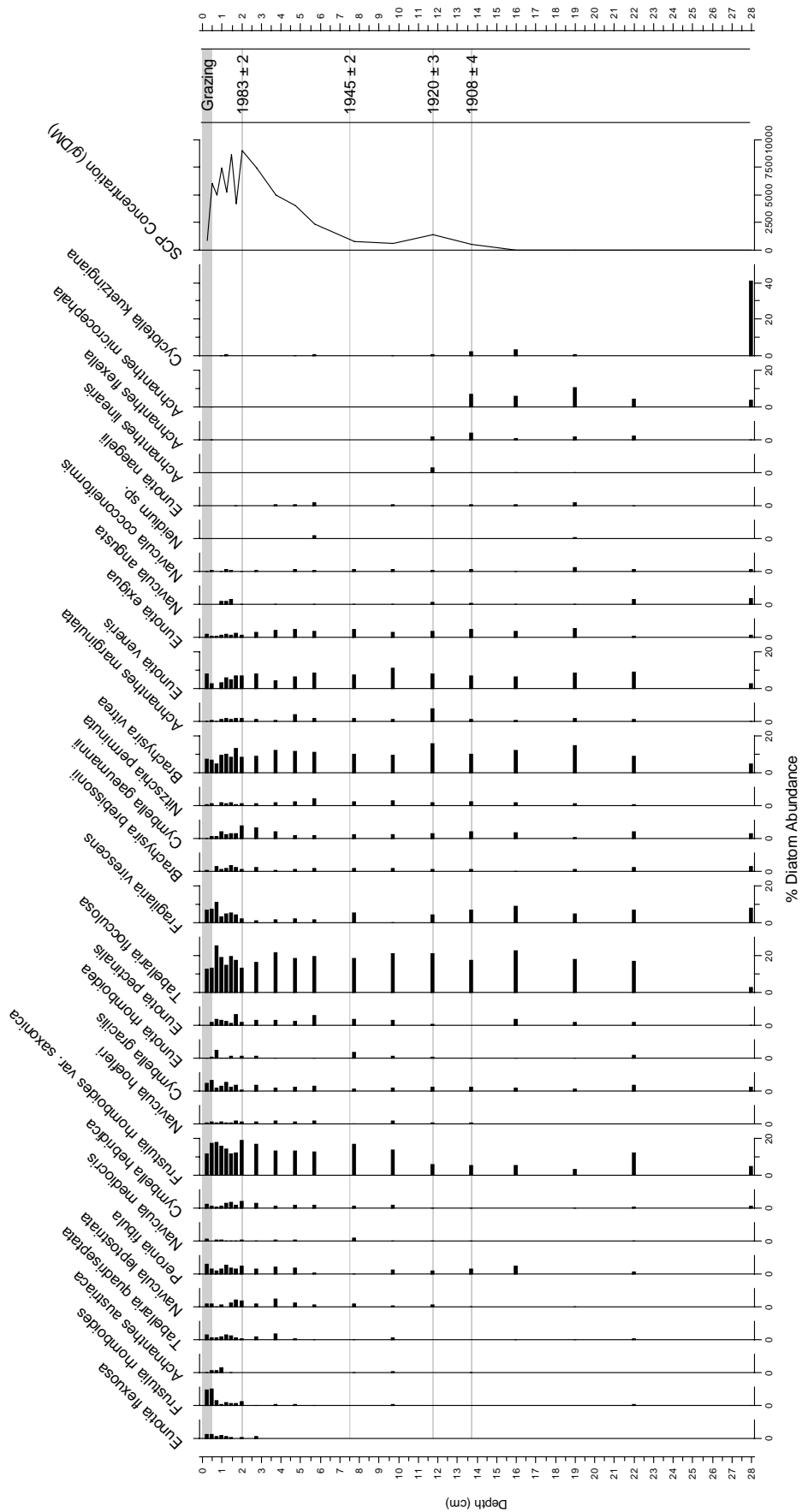


Figure 3.51 Loch Laidon 2009 Core LAI6 Diatom Stratigraphy



# 4 TABLES

**Table 1 Summary statistics of selected chemical determinands for individual years at all sampling stations**

Site Name	Year	pH			Alkalinity (µeq l-1)			Conductivity (µS cm-1)			Nitrate (µeq l-1)			Sulphate (µeq l-1)			Total Phosphorus (µg l-1)			Labile Aluminium (µeq l-1)		
		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	1992	5.87	5.44	6.46	27.0	8	63	22.3	20	24	0.0	0	0	26.3	25	28				8.0	2	18
Control	1993	6.23	5.59	6.91	63.8	8	147	29.2	20	39	0.3	0	2	28.1	11	44	22.5	19.0	26.0	6.3	0	29
Control	1994	6.22	5.18	6.68	53.2	-3	105	29.3	23	39	0.5	0	2	33.9	23	85	18.9	2.5	58.0	4.4	0	17
Control	1995	6.42	5.72	7.02	73.3	16	161	32.2	21	46	0.6	0	2	62.0	18	175	3.1	2.5	6.0	4.6	0	28
Control	1996	6.03	5.39	6.9	50.0	2	173	28.8	20	44	1.1	0	5	40.5	18	62	3.3	2.5	10.0	3.8	0	10
Control	1997	6.32	5.65	6.94	53.3	18	146	28.9	23	37	0.8	0	2	25.9	13	43	2.9	2.5	6.0	5.3	0	10
Control	1998	6.19	5.61	6.82	62.9	9	169	26.8	21	36	0.2	0	1	22.3	13	35	3.3	2.5	11.0	4.9	0	16
Control	1999	5.86	5.29	6.53	30.9	2	103	28.4	19	48	0.3	0	1	25.4	10	54	5.0	2.5	6.0	4.0	2	7
Control	2000	6.33	5.46	6.75	54.5	-7	127	30.7	24	36	0.6	0	2	28.1	16	59	2.9	2.5	6.0	5.0	0	13
Control	2001	6.18	5.56	6.63	50.1	6	97	23.2	18	31	1.2	0	6	22.1	13	34	6.9	2.5	21.0	9.2	1	24
Control	2002	6.22	5.32	6.84	69.6	0	199	28.0	18	41	0.2	0	1	20.7	9	33	10.5	2.5	27.0	3.4	0	21
Control	2003	6.24	5.34	6.93	74.3	1	184	31.3	22	42	0.1	0	1	30.8	11	63	11.6	6.0	19.0	2.9	0	10
Control	2004	5.83	5.22	6.89	35.0	-4	131	22.2	12	34	0.0	0	0	14.6	9	26	8.8	4.0	12.0	8.0	0	16
Control	2005	6.27	5.48	6.81	69.4	2	178	35.7	19	68	0.2	0	2	22.8	7	47	6.6	2.0	10.0	3.9	0	8
Control	2006	6.34	5.39	6.93	94.4	8	225	29.4	17	43	0.1	0	1	22.5	11	29	5.4	0	12	3.7	1	10
Upper Experiment	1992	5.71	5.23	6.19	23.7	-1	52	26.0	19	33	0.0	0	0	43.7	23	82				0.3	0	1
Upper Experiment	1993	6.04	5.29	6.6	85.2	1	213	33.2	19	45	0.6	0	2	24.2	8	45	20.5	19.0	22.0	2.7	0	9
Upper Experiment	1994	6.19	5.47	6.78	72.5	5	136	33.5	24	44	0.5	0	1	26.8	13	51	18.9	0.0	60.0	2.9	0	7
Upper Experiment	1995	6.14	5.21	6.81	88.8	0	221	37.7	22	63	0.3	0	1	74.2	13	302	3.0	2.5	6.0	2.6	0	7
Upper Experiment	1996	5.86	5.16	6.75	61.5	-4	208	32.7	23	46	0.7	0	2	37.4	16	75	2.6	2.5	3.0	4.0	0	13
Upper Experiment	1997	5.90	5.46	6.5	53.4	13	216	34.0	26	74	0.5	0	1	42.0	9	233	2.5	2.5	2.5	2.3	0	10
Upper Experiment	1998	5.92	5.44	6.46	68.8	3	212	30.0	21	42	0.6	0	4	18.6	9	29	2.8	2.5	6.0	1.9	0	5
Upper Experiment	1999	5.79	5.29	6.49	54.0	1	215	32.4	18	50	0.7	0	4	21.1	7	46	4.7	2.5	6.0	3.1	0	10
Upper Experiment	2000	6.09	5.33	6.43	63.7	2	128	32.3	25	41	1.0	0	2	21.0	10	32	4.3	2.5	6.0	5.0	0	9
Upper Experiment	2001	6.03	5.58	6.31	53.4	11	97	24.5	17	31	0.9	0	2	18.7	10	39	6.4	2.5	11.0	4.0	0	12
Upper Experiment	2002	6.08	5.5	6.51	85.2	6	266	30.9	17	45	0.7	0	2	16.5	6	26	12.2	2.5	21.0	3.7	0	10
Upper Experiment	2003	6.06	5.36	6.6	82.4	2	221	33.2	21	43	0.7	0	2	25.1	10	48	14.5	6.0	35.0	1.8	0	5
Upper Experiment	2004	5.89	5.33	6.66	48.8	0	180	24.0	10	36	0.0	0	0	12.7	8	24	10.4	6.0	18.0	4.0	0	14
Upper Experiment	2005	6.13	5.42	6.64	80.9	1	213	40.2	21	80	0.4	0	3	20.6	6	49	8.6	3.0	15.0	1.8	0	3
Upper Experiment	2006	6.14	5.39	6.64	97.8	8	256	31.3	21	47	0.3	0	1	19	11	30	5.8	1	11	3.1	1	6
Lower Experiment	1995	6.13	5.13	6.77	97.4	-3	220	61.2	29	115	0.0	0	0	291.2	55	749	5.3	2.5	11.0	1.8	0	4
Lower Experiment	1996	5.82	4.98	6.67	62.3	-11	231	42.2	22	75	0.4	0	2	105.1	21	278	3.1	2.5	6.0	4.6	0	12
Lower Experiment	1997	5.91	5.54	6.67	46.2	9	140	34.7	28	44	0.4	0	1	51.8	28	80	5.6	2.5	17.0	2.4	0	7
Lower Experiment	1998	5.85	5.44	6.34	67.4	3	203	38.1	20	65	0.4	0	2	88.4	20	232	3.2	2.5	6.0	7.5	0	42
Lower Experiment	1999	5.70	4.97	6.29	49.9	-6	208	38.3	20	81	0.4	0	1	67.0	10	312	5.4	2.5	8.0	4.2	0	9
Lower Experiment	2000	6.15	5.63	6.39	64.9	3	132	39.9	27	54	0.9	0	2	77.8	18	128	4.3	2.5	6.0	3.9	0	13
Lower Experiment	2001	6.03	5.6	6.37	55.2	10	117	28.1	21	47	1.2	1	2	52.4	19	133	5.3	2.5	6.0	5.4	0	16
Lower Experiment	2002	6.02	5.65	6.37	68.4	11	179	36.5	19	61	0.5	0	2	72.5	13	199	12.4	2.5	24.0	3.2	0	11
Lower Experiment	2003	5.92	5.4	6.21	66.2	3	156	38.4	23	57	0.4	0	2	78.2	20	178	11.9	6.0	18.0	6.4	0	16
Lower Experiment	2004	5.80	5.2	6.76	47.1	-2	190	29.1	12	63	0.0	0	0	50.1	9	210	10.8	7.0	18.0	5.7	2	11
Lower Experiment	2005	6.05	5.38	6.57	77.7	0	222	49.3	21	83	0.6	0	3	102.9	10	351	7.8	3.0	10.0	2.6	0	6
Lower Experiment	2006	6.18	5.47	6.87	104.1	10	304	48.8	21	112	0.1	0	1	155.1	13	546	5.8	0	11	3.4	0	12
Lower ARnB	1995	6.16	5.41	6.8	54.5	7	122	33.5	25	43	2.3	0	9	84.2	26	156	3.4	2.5	6.0	3.2	0	8
Lower ARnB	1996	5.97	5.26	6.69	51.7	0	141	31.3	21	44	1.8	0	8	46.8	22	88	2.7	2.5	4.0	7.4	1	29
Lower ARnB	1997	6.02	5.64	6.63	41.1	18	104	29.0	25	38	1.1	0	4	30.5	20	49	2.9	2.5	6.0	4.0	0	10
Lower ARnB	1998	5.95	5.46	6.52	60.0	6	163	28.4	21	39	0.8	0	3	33.2	18	62	2.5	2.5	2.5	3.2	0	12
Lower ARnB	1999	5.79	5.02	6.56	34.3	-6	110	28.7	21	43	0.6	0	2	29.3	14	51	3.8	2.5	6.0	4.3	0	20
Lower ARnB	2000	6.02	5.47	6.59	43.8	2	97	30.2	24	35	0.7	0	2	32.4	20	47	4.3	2.5	6.0	5.8	2	15
Lower ARnB	2001	5.97	5.3	6.45	37.3	5	91	23.2	18	30	2.0	0	7	27.1	18	37	5.2	2.5	6.0	7.3	0	15
Lower ARnB	2002	5.97	4.59	6.6	58.4	-24	198	29.5	19	44	0.9	0	4	27.6	10	45	12.8	2.5	25.0	6.2	0	22
Lower ARnB	2003	5.99	5.25	6.62	62.1	-1	149	31.6	21	42	0.4	0	2	39.3	14	59	11.3	5.0	19.0	14.6	2	76
Lower ARnB	2004	5.71	5.17	6.66	29.6	-3	119	22.4	13	33	0.0	0	0	17.4	10	27	13.6	8.0	35.0	6.9	1	23
Lower ARnB	2005	6.06	5.36	6.63	60.9	0	156	36.0	18	66	0.8	0	3	30.9	9	48	7.7	3.0	10.0	4.8	0	14
Lower ARnB	2006	6.16	5.37	6.94	65.7	7	163	29.6	15	42	0.5	0	2	31.9	12	52	5.8	0	13	2.6	0	6
Upper ARnB	1995	6.19	5.56	6.59	44.3	9	84	30.8	23	41	2.8	0	8	76.8	20	158	3.4	2.5	6.0	2.3	0	8
Upper ARnB	1996	5.94	5.28	6.67	37.8	-1	114	28.4	20	43	1.7	0	7	42.6	21	82	2.8	2.5	4.0	5.0	1	11
Upper ARnB	1997	6.05	5.63	6.51	48.6	7	202	29.4	24	46	1.1	0	4	25.6	17	44	2.9	2.5	6.0	7.3	0	28
Upper ARnB	1998	6.02	5.54	6.68	44.5	6	130	25.3	20	32	0.6	0	2	23.0	14	33	3.1	2.5	6.0	6.8	0	27
Upper ARnB	1999	5.82	5.22	6.46	27.1	-2	85	27.9	19	45	0.4	0	2	24.8	15	39	4.1	1.0	10.0	3.7	0	13
Upper ARnB	2000	6.14	5.54	6.51	40.0	5	79	28.4	23	32	0.7	0	2	26.7	17	46	4.3	2.5	6.0	2.2	0	6
Upper ARnB	2001	6.02	5.44	6.38	36.9	4	71	21.9	18	27	1.7	0	7	23.3	14	36	9.7	2.5	35.0	8.5	0	22
Upper ARnB	2002	6.13	5.32	6.91	52.8	0	152	25.9	17	36	0.6	0	3	19.7	10	33	12.9	2.5	28.0	6.2	0	14
Upper ARnB	2003	6.03	5.23	6.57	49.0	-2	119	28.8	20	41	0.4	0	2	29.1	14	55	13.8	6.0	25.0	6.0	1	18
Upper ARnB	2004	5.75	5.17	6.67	26.4	-5	94	21.7	13	32	0.0	0	0	14.9	9	24	11.0	7.0	19.0	7.4	1	20
Upper ARnB	2005	6.07	5.24	6.6	45.0	-3	106	33.3	18	67	0.8	0	3	28.1	8	79	7.3	3.0	11.0	3.9	1	7
Upper ARnB	2006	6.16	5.38	6.58	62.1	8	143	27.4														

**Table 2 Water chemistry for the Control Burn August 1992 – April 2010**

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
12/08/1992	5.44	8	24	106		3	34	68	94	0	26	1		70	18	0.74	
30/10/1992	6.46	63	23	112		4	32	68	99	0	28	0		29	4	0.32	5
30/10/1992	6.46	63	23	112		4	32	68	99	0	28	0		29	4	0.323	5
06/12/1992	5.7	10	20	104		3	17	43	103	0	25	1		33	2	0.246	3.5
04/01/1993	5.63	8	20	105		4	25	41	101	0	44	0		21	3	0.269	3.8
30/03/1993	5.91	17	39	203		5	44	67	278	0	41	1		20	3	0.174	3.1
03/05/1993	6.57	91	35	177		6	42	97	186	0	35	0		9	5	0.167	3.3
18/06/1993	6.38	64	31	145		4	39	88	130	0	30	1	19	15	29	0.549	9.4
10/07/1993	6.31	57	27	141		4	33	77	129	0	19	2	26	71	1	0.61	9.1
25/07/1993	6.06	45	27	134		3	38	92	117	0	16	2		72	0	0.782	11
09/08/1993	5.91	32	23	114		3	33	72	98	2	11	4		92	13	0.884	12
22/08/1993	6.54	92	27	148		4	42	91	141	0	18	2		39	4	0.479	6.2
04/09/1993	6.76	147	36	168		7	46	111	151	0	26	0		17	1	0.288	4.3
29/09/1993	6.91	141	36	161		6	47	114	155	0	31	0		26	5	0.289	4.4
06/12/1993	5.59	8	20	99		4	25	32	86	1	38	1		37	5	0.459	6.7
18/02/1994	6.34	57	39	210	0	6	66	101	211	2	41	0	5	14	0	0.132	
01/05/1994	6.03	29	24	141	0	9	34	56	123	0	25	0	10	36	8	0.309	4.4
12/05/1994	6.48	62	29	161	0	6	48	82	143	0	30	0		22	5	0.213	3.2
10/06/1994	6.39	54	39	201	0	9	68	110	174	0	85	1		30	4	0.283	5.2
08/07/1994	5.98	39	27	151	0	6	52	83	111	0	35	1		80	0	0.632	11
07/08/1994	6.12	35	23	140	0	5	46	71	109	0	26	4	58	60	2	0.555	8.4
25/08/1994	6.47	68	29	152	0	5	61	113	118	0	27	1	2.5	41	1	0.564	9.1
03/09/1994	6.68	105	31	163	0	6	60	110	125	2	24	1	2.5	28	7	0.339	5.5
22/09/1994	6.5	86	29	152	0	6	56	119	123	0	23	1		26	17	0.385	7.5
29/12/1994	5.18	-3	23	108	0	4	30	31	126	1	23	1		24	0	0.198	4
27/03/1995	5.86	16	21	121	0	6	31	41	122	0	22	0	2.5	29	2	0.239	4.8
27/04/1995	6.61	85	24	133	0	8	43	81	107	0	20	0	2.5	16	0	0.204	4.8
02/06/1995	6.38	58	26	137	0	4	41	75	103	0	18	3	3	29	28	0.49	9.9
15/07/1995	6.65	87	40	178	0	9	75	128	127	2	96	0	2.5	29	1	0.34	8.9
06/08/1995	7.02	161	37	195	0	11	67	146	143	1	44	0		21	0	0.285	6
25/08/1995	6.77	116	37	186	0	10	62	115	144	2	37	1	2.5	20	1	0.262	5.6
04/09/1995	6.51	68	46	188	0	7	90	157	118	0	175	0	6	34	3	0.313	7.6
24/09/1995	5.72	18	34	156	0	5	66	99	108	0	107	0		62	4	0.469	11
11/11/1995	6.27	51	25	124	0	6	48	85	95	0	39	0	2.5	65	2	0.43	8.7
10/01/1996	5.39	2	20	100	3	6	37	50	78	2	59	0	2.5	44	5	0.297	6.6
27/02/1996	5.49	7	29	152	0	5	55	68	166	1	60	0	2.5	28	2	0.238	4.7
03/04/1996	5.72	13	24	124	3	6	39	61	112	5	49	1	2.5	28	0	0.243	5.3
02/05/1996	6.26	61	28	136	0	5	50	88	113	0	49	0	2.5	30	4	0.251	5.1
12/06/1996	5.68	18	22	109	0	2	38	62	88	0	21	3	10	70	2	0.586	11.3
04/07/1996	6.21	46	28	131	0	4	49	83	93	0	47	2	2.5	48	10	0.513	13.9
27/07/1996	6.54	83	29	143	0	5	61	112	102	0	31	1	2.5	48	2	0.551	11
18/08/1996	6.9	173	34	160	0	7	69	144	110	0	26	0	2.5	24	0	0.386	7.7
07/09/1996	6.61	124	30	159	0	7	71	131	114	1	24	1	2.5	31	5	0.496	10
28/09/1996	6.34	53	38	164	0	9	74	125	163	1	62	0	2.5	58	5	0.486	11.2
30/10/1996	5.69	16	20	94	0	7	37	57	79	0	18	4		69	10	0.564	11
03/12/1996	5.49	4	44	219	3	7	67	73	296	3	40	0	2.5	38	1	0.165	4
28/01/1997	6.25	41	26	128	2	5	42	72	102	2	43	0	2.5	40	0	0.301	6.2
10/03/1997	6.93	19	37	190	0	7	57	80	228	2	41	0	2.5	23	0	0.141	3.1
30/04/1997	6.2	43	29	170	0	5	52	89	162	2	25	1	2.5	46	0	0.384	7.7
21/05/1997	6.35	54	26	142	1	5	45	79	118	1	19	1	2.5	52	4	0.487	9.9
05/07/1997	6.55	92	31	160	4	7	54	100	121	0	29	0	2.5	29	10	0.41	8.8
30/07/1997	6.2	53	26	135	0	4	54	100	104	0	13	2	2.5	86	4	0.87	7.2

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
19/08/1997	6.94	146	36	169	0	8	67	135	122	0	24	0	2.5	32	9	0.447	9.5
07/09/1997	6.02	32	25	130	0	4	48	82	106	0	17	1	2.5	88	4	0.708	13.7
05/10/1997	6.06	35	30	143	0	8	55	96	145	0	20	0	2.5	58	10	0.607	13
14/11/1997	5.65	18	23	119	1	12	44	65	101	1	28	1	6	73	7	0.64	15
05/01/1998	5.91	15	25	139	0	6	46	60	159	1	29	0	2.5	34	2	0.213	4.3
05/02/1998	5.86	19	21	105	0	4	35	53	94	1	27	1	2.5	44	0	0.313	7.8
21/03/1998	6.31	45	33	174	0	7	52	74	192	0	29	0	2.5	20	5	0.161	3.5
07/05/1998	5.94	27	24	137	0	5	42	66	115	0	15	1	2.5	45	8	0.525	10.9
20/06/1998	6.75	147	36	177	0	7	60	114	120	0	35	2	2.5	1	13	0.204	5.1
20/07/1998	6.24	59	24	125	0	2	51	87	82	0	13	1	2.5	66	1	0.716	14.7
09/08/1998	6.23	62	23	129	0	3	53	82	79	0	13	1	2.5	59	16	0.704	13.3
29/08/1998	6.63	119	29	143	0	5	54	102	92	0	19	9	11	29	2	0.365	6.9
27/09/1998	6.82	169	33	151	0	6	67	132	108	0	23	0	2.5	21	2		6.4
25/10/1998	5.82	21	21	101	0	6	37	61	89	0	18	2	2.5	51	3	0.49	9.3
25/11/1998	5.61	9	26	129	0	3	40	57	146	0	24	2	2.5	34	2	0.327	6.9
12/02/1999	5.76	9	48	258	0	9	73	92	337	1	37	1	6	15	2	0.112	3.1
25/03/1999	5.74	13	26	147	1	5	35	45	161	0	20	1	2.5	28	4	0.289	6.4
10/05/1999	5.81	23	26	149	0	6	43	64	133	0	27	3	6	53	4	0.58	12.9
17/06/1999	6.09	38	25	146	0	4	44	73	134	0	10	2	6	63	4	0.552	11.3
12/07/1999	6.53	103	30	168	0	8	62	118	127	0	18	0		57	2	0.617	13
01/09/1999	6.04	40	30	146	0	4	62	106	120	0	54	3	6	59	7	0.581	12
26/09/1999	5.62	19	19	104	0	5	37	54	81	0	16	4	6	50	3	0.612	12.7
06/11/1999	5.29	2	23	115	0	7	33	42	126	1	21	0	2.5	30	6	0.357	8.1
20/01/2000	6.11	29	26	141	0	3	41	63	145	0	26	2	2.5	33	0	0.197	4.4
05/03/2000	5.46	4	28	168	0	3	39	48	185	1	27	1	2.5	26	1	0.192	4.8
14/04/2000	6.59	81	31	166	0	6	52	106	158	0	21	0	2.5	16	7	0.209	4.7
31/05/2000	6.53	78	34	188	0	5	64	108	149	0	59	0	2.5	26	13	0.336	7.2
17/06/2000	6.56	-7	35	190	0	5	67	114	181	1	31	0	2.5	32	0	0.25	5.8
12/07/2000	6.7	75	31	169	0	4	62	110	147	1	26	0	2.5	25	11	0.354	8.2
05/08/2000	6.6	92	35	175	2	5	62	108	146	2	38	0	2.5	30	3	0.391	9.3
04/09/2000	6.75	127	36	170	0	5	67	128	154	0	18	0	6	20	6	0.425	9.3
08/10/2000	5.75	22	27	142	0	5	46	68	144	0	16	0	2.5	67	9	0.613	12.5
21/11/2000	6.24	44	24	132	0	3	43	71	116	1	19	0	2.5	44	0	0.407	8.2
09/01/2001	6.01	27	18	102	0	5	30	52	75	1	22	0	21	50	1	0.413	8.5
08/03/2001	5.56	6	20	95	1	8	31	40	92	6	32	0	10	41	1	0.227	
26/04/2001	6.23	41	26	130	1	5	43	77	115	0	32	0	6	26	24	0.416	8.9
06/06/2001	6.63	97	31	150	0	5	51	105	103	0	34	0	2.5	18	9	0.387	8.4
03/07/2001	6.3	60	23	125	0	3	45	96	75	0	17	0	6	86	4	0.769	14.1
23/07/2001	6.39	74	25	123	3	4	50	97	90	2	15	0	2.5	40	14	0.645	12.7
19/08/2001	6.31	62	22	108	0	3	45	110	70	0	13	3	6	37	23	0.725	14.1
07/10/2001	5.58	14	24	111	0	9	39	51	112	1	15	2	6	44	9	0.548	12
14/11/2001	6.32	56	22	107	0	6	41	75	88	1	19	2	2.5	32	3	0.379	8.7
10/12/2001	6.42	64	21	113	0	7	43	78	86	1	22	1	6	33	4	0.356	7.3
22/01/2002	5.32	0	18	94	0	5	22	24	99	0	15	0	2.5	25	0	0.237	5.4
04/04/2002	6.25	41	34	201	0	8	51	77	215	1	32	1	2.5	16	0	0.252	5.4
07/05/2002	6.65	103	35	194	0	8	54	99	164	0	26	1	6	11	0	0.204	4.8
12/06/2002	5.87	30	20	121	0	3	37	56	78	0	13	3	6	64	0	0.755	14.9
14/07/2002	6.56	102	26	144	0	5	53	101	100	0	13	2	11	22	8	0.541	11.5
31/07/2002	5.81	33	19	99	0	3	40	65	57	0	9	3	17	53	21	0.933	19
01/09/2002	6.49	87	28	148	0	7	63	114	116	0	17	0	27			0.635	14.8
29/09/2002	6.84	199	41	170	0	8	80	174	126	0	21	0	6	17	0	0.276	5.9
21/10/2002	5.94	28	33	141	0	17	65	87	182	0	33	3	6	25	1	0.42	10.9
08/12/2002	6.42	73	26	122	0	6	47	88	99	1	28	1	21	30	1	0.375	8.2
26/01/2003	5.34	1	42	203	0	8	68	78	272	0	36	0	17	28	0	0.184	3.4
03/03/2003	5.99	20	29	154	2	8	42	58	157	1	46	1	6	32	5	0.261	5.6
28/04/2003	6.31	46	37	191	4	8	62	103	183	0	63	0	10	30	2	0.368	

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
11/06/2003	5.95	38	22	118	0	2	41	69	85	1	11	12	19	47	10	0.792	15.1
24/07/2003	5.9	40	23	122	2	5	45	79	89	0	24	2	11	51	3	0.621	13.9
10/08/2003	6.69	128	31	161	0	6	66	132	116	0	21	1	9	27	1	0.472	14.8
08/09/2003	6.93	184	39	170	0	8	74	155	128	0	27	1	13	12	1	0.249	9.5
27/10/2003	6.74	155	37	174	0	9	94	202	159	0	24	1	8	7	2	0.191	15.9
16/12/2003	6.35	57	22	119	0	6	42	77	97	0	25	0	11	26	2	0.298	5.5
11/02/2004	5.22	-4	34	171	0	5	44	49	219	0	26	3	7	20	3	0.143	2.3
09/04/2004	6.42	52	24		0	0	58	105	124	0	21	11	8	34	10	0.314	5.4
20/05/2004	6.24	55	22	112	0	0	50	104	88	0	9	4	9	51	14	0.664	12
16/06/2004	6.16	50	19	103		2.6	32.5	68.8	62	0	11	4	10	61	12	0.762	13.5
14/07/2004	6.89	131	30	141.2		5.1	46.3	98.2	88	0	18	2	10	19	7	0.1	5.1
10/08/2004	5.29	9	19	80	0	6	35	52	58	0	12	5		41	16	0.836	13
13/09/2004	5.6	18	22	90.5	0	7	38	55	86	0	10	3	12	41	8	0.635	11
05/10/2004	5.26	0	18	67	0	8	20	27	86	0	10	2	4	18	2	0.285	0.5
14/12/2004	5.37	4	12	50	0	5	10	16	47	0	14	1	10	10	0	0.31	4.2
26/01/2005	5.48	2	68	349	0	9	91	88	489	2	47	1	8	7	6	0.077	1.6
02/03/2005	6.43	60	43	216	1	8	57	86	259	0	29	6	10	6	5	0.119	2
20/04/2005	6.47	61	32	173	0	8	44	63	164	0	21	2	4	24	6	0.301	5.6
06/06/2005	5.68	25	19	101	0	3	26	37	66	0	7	3	5	47	5	0.744	13.4
14/07/2005	6.81	178	37	181	0	9	66	139	136	0	22		6	16	2	0.353	7.3
15/08/2005	6.77	129	35	154	0	6	60	125	137	0	24	1	8	10	1	0.411	8.2
07/09/2005	6.73	121	32	147	0	6	55	96	126	0	18	0	9	5	2	0.377	6.8
04/10/2005	5.99	26	26	127	0	5	39	56	148	0	13	0	7	35	0	0.357	7.8
06/12/2005	6.03	23	29	142	0	4	34	49	167	0	24	0	2	23	8	0.212	5
08/02/2006	5.57	13	22	105	0	7	26	36	96	0	28	1	0	40	6	0.377	9.4
26/03/2006	6.45	65	22	110	0	6	32	63	90	0	29	12	4.13	21	2	0.262	5.1
11/05/2006	6.67	112	33	155	0	8	48	85	130	0	24	1	2.55	8	3	0.209	5.35
07/06/2006	6.81	167	38	167	0	8	58	120	128	0	24	4	3.23	9	1	0.244	9.15
29/06/2006	6.75	151	33	156	26	5	58	111	120	0	25	4	5.59	18	1	0.288	13.2
27/07/2006	6.93	225	43	189	0	10	73	153	129	0	26	7	10.09	13	3	0.306	8.68
21/08/2006	6.36	72	29	138	1	4	51	94	115	0	20	2	11.86	40	5	0.686	15.24
13/09/2006	6.72	121	30	144	0	6	53	101	113	0	15	1	5.65	21	4	0.46	10.89
26/10/2006	5.39	8	17	78	0	8	25	35	63	0	11	0		29	10	0.519	12.09
23/11/2006	5.73	10	27	136	0	6	37	50	166	1	23	0	5.4	18	2	0.204	4.26
10/01/2007	5.7	11	25	129	0	5	30	40	146	0	18	0	4.66	14	1	0.223	6.36
21/02/2007	6.23	36	34	185	3	7	45	66	206	1	28	0	6.41	20	0	0.252	6.69
05/04/2007	6.71	132	40	191	3	8	59	105	190	1	26	0	5.41	3	0	0.15	3.87
04/06/2007	5.9	30	24	134	0	2	30	49	110	0	7	2	10.1	42	1	0.672	12.43
03/07/2007	6.27	73	25	134	6	3	43	70	93	0	9	3	12.87	45	3	0.831	15.08
09/08/2007	6.45	88	23	132	0	3	46	78	97	1	12	2	8.21	29	3	0.538	9.89
30/08/2007	6.85	120	31	141	0	4	60	114	117	0	11	0	11.76	30	6	0.646	12.1
25/10/2007	6.76	163	35	152	0	8	64	124	132	0	16	0	7.38	12	2	0.36	6.55
05/12/2007	5.76	17	19	90	1	5	24	36	91	1	11	0	6.29	12	4	0.434	8.85
05/02/2008	5.65	9	24	119	0	5	27	33	143	0	19	2	5.82	17	6	0.167	5.82
02/04/2008	5.76	11	27	149	0	5	29	37	170	0	21	0	5.87	8	0	0.215	4.02
16/07/2008	6.53	103	31	146	0	4	54	106	110	0	19	4	10.25	33	0	0.643	11.66
01/09/2008	5.82	31	22	114	0	4	40	67	87	0	7	0	8.23	59	5	0.842	16.47
03/10/2008	5.37	8	24	104	0	6	35	45	108	0	10	0	5.76	22	9	0.611	11.99
09/12/2008	6.14	35	24	118	0	3	30	44	117	0	19	6	3.02	18	2	0.28	6.16
12/01/2009	5.38	3	26	131	1	5	28	31	153	0	20	9	6.54	16	3	0.216	7.93
18/03/2009	6.03	24	26	136	0	3	28	37	140	0	19	0	2.62	23	5	0.223	4.65
27/04/2009	5.72	20	27	143	1	3	31	43	121	0	13	0	4.81	18	16		12.09
12/05/2009	6.37	58	29	147	0	3	35	49	138	0	16	0	2.51	17	1		5.48
12/06/2009	6.84	173	40	176	2	7	57	101	141	0	24	0	7.33	9	1	0.049	4.16
15/07/2009	5.52	34	22	102	0	11	35	51	77	0	13	1	6.01	32	5	0.738	15.22
11/08/2009	6.36	71	28	129	2	3	50	87	107	2	7	0	6.98	50	2	0.793	22.82

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
28/09/2009	6	33	33	111	1	4	41	59	116	0	9	6	7.3	47	8	0.458	13.54
16/11/2009	5.73	16	15	72	0	4	20	29	56	0	10	0	9.04	29	4	0.493	7.86
30/04/2010	5.98	29	21	104	0	3	29	48	85	0	11	2	3.7	36	0	0.544	10.49

**Table 3 Water chemistry for the Experimental Burn (Upper site) September 1992 - October 2008**

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
18/09/1992	5.71	20	33	136		3	36	113	152	0	82	0		21	1	0.412	
30/10/1992	6.19	52	26	130		3	32	61	128	0	26	0		15	0	0.271	4.4
06/12/1992	5.23	-1	19	93		2	14	27	88	0	23	0		27	0	0.261	3.4
04/01/1993	5.43	4	19	98		2	21	31	86	0	35	0		12	0	0.273	3.8
30/03/1993	5.86	20	41	230		5	44	64	296	1	45	2		9	3	0.165	2.9
03/05/1993	6.42	115	37	204		7	44	95	192	1	29	0		5	2	0.262	4.2
18/06/1993	6.33	122	37	202		4	44	100	156	0	16	0	19	19	9	0.509	8.2
10/07/1993	6.05	62	29	164		4	35	76	139	0	18	3	22	46	1	0.701	9.5
25/07/1993	5.71	36	29	156		2	42	73	130	0	12	3		48	9	0.858	13
09/08/1993	5.93	51	29	151		4	42	76	131	0	8	5		54	0	0.878	13
22/08/1993	6.36	142	33	186		6	60	108	159	1	14	3		28	2	0.654	8.7
04/09/1993	6.47	213	45	210		7	68	159	171	2	22	1		10	2	0.409	6.4
29/09/1993	6.6	171	45	209		15	64	135	207	2	28	0		20	0	0.35	5.6
06/12/1993	5.29	1	21	105		3	24	26	87	0	39	6		24	2	0.492	6.8
18/02/1994	6.3	66	44	243	0	6	75	109	246	1	49	1	0	5	0	0.096	
01/05/1994	5.88	27	29	183	0	4	44	58	159	0	28	1	13	26	7	0.414	5.4
12/05/1994	6.36	85	36	202	7	7	58	90	176	0	26	0		19	4	0.279	5
10/06/1994	6.25	67	40	224	0	5	62	100	200	0	51	0		22	2	0.292	5.2
08/07/1994	5.75	38	29	178	0	3	53	75	122	1	24	2		45	1	0.836	14
07/08/1994	6.78	130	31	181	0	13	78	137	141	1	19	4	60	17	6	0.454	7.6
25/08/1994	6.29	76	32	177	0	7	71	111	141	1	18	2	2.5	28	3	0.629	9.9
03/09/1994	6.51	136	37	200	0	12	81	136	153	1	16	5	2.5	18	3	0.488	7.6
22/09/1994	6.27	95	33	186	0	7	66	123	160	0	13	2		21	0		7.3
29/12/1994	5.47	5	24	125	0	6	39	36	139	0	24	1		35	3	0.238	4.6
27/03/1995	5.74	15	22	129	0	5	32	40	121	0	21	2	2.5	18	1	0.26	5.3
27/04/1995	6.1	61	29	168	0	15	48	80	158	0	24	1	2.5	30	1	0.284	6.6
02/06/1995	6.26	60	29	169	0	5	47	68	129	0	13	1	2.5	35	7	0.548	11
15/07/1995	6.46	140	46	202	0	6	86	154	138	0	94	1	2.5	12	2	0.343	8.5
06/08/1995	6.51	195	40	219	0	8	86	164	155	1	30	1		15	1	0.417	8.6
25/08/1995	6.81	221	49	225	0	7	99	176	171	0	35	1	2.5	9	0	0.266	6.1
04/09/1995	6.22	70	63	239	0	8	134	208	125	1	302	0	6	14	0	0.239	6.8
24/09/1995	5.21	0	35	167	0	5	66	84	115	0	112	0		37	5	0.494	12
11/11/1995	5.91	37	26	139	0	4	47	72	98	1	37	0	2.5	32	6	0.473	8.7
10/01/1996	5.31	0	23	126	2	6	42	47	96	1	68	0	2.5	35	5	0.305	6.6
27/02/1996	5.28	0	28	152	0	4	51	55	166	1	56	0	2.5	19	8	0.237	4.8
03/04/1996	6.29	67	36	189	4	12	62	105	172	1	75	1	2.5	15	0	0.17	4.7
02/05/1996	6.06	62	31	159	2	6	51	83	132	0	44	0	2.5	21	3	0.311	6.5
12/06/1996	5.41	13	24	127	0	2	36	47	103	0	17	3	3	41	2	0.627	12.6
04/07/1996	5.83	39	27	144	0	3	51	77	104	0	32	1	2.5	23	13	0.586	19.8
27/07/1996	6.24	124	34	168	0	4	71	128	122	0	19	2	2.5	20	2	0.52	12.7
18/08/1996	6.75	208	41	198	0	7	89	169	140	1	20	1	2.5	14	1	0.464	9.7
07/09/1996	6.13	117	35	174	0	9	78	130	136	1	16	2	2.5	27	4	0.677	14
28/09/1996	6.31	102	42	194	0	9	78	128	183	1	42	1	2.5	18	1	0.372	9.3
30/10/1996	5.53	10	25	118	0	10	41	53	112	0	20	2		46	8	0.505	10
03/12/1996	5.16	-4	46	227	0	7	72	73	305	2	40	0	2.5	25	1	0.166	3.9



Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
28/01/1997	5.95	28	26	142	2	4	39	58	106	1	43	0	2.5	26	1	0.371	7.4
10/03/1997	5.68	14	39	204	0	6	57	70	241	1	38	0	2.5	15	0	0.154	3.3
30/04/1997	5.88	31	30	178	0	5	49	72	168	1	17	0	2.5	27	0	0.37	7.5
21/05/1997	5.98	41	27	152	0	3	43	67	125	0	13	2	2.5	33	0	0.55	11.2
05/07/1997	6.12	79	29	166	6	8	50	87	114	1	14	1	2.5	30	10	0.59	12
30/07/1997	6.02	63	28	155	0	4	58	93	112	0	9	2	2.5	39	0	0.841	17.7
19/08/1997	6.5	216	74	229	0	10	95	380	148	1	233	1	2.5	25	0	0.638	14
07/09/1997	5.69	23	26	140	0	4	52	73	116	0	12	2	2.5	59	6	0.766	15
05/10/1997	5.76	26	33	158	0	9	64	86	183	0	14	1	2.5	46	1	0.541	12
14/11/1997	5.46	13	28	143	0	16	51	59	127	0	27	1	2.5	50	3	0.697	16
05/01/1998	5.44	3	32	167	0	5	61	62	214	0	29	0	2.5	25	0	0.195	4
05/02/1998	5.64	15	21	110	0	3	35	45	93	1	27	1	2.5	26	0	0.361	8.2
21/03/1998	6.19	54	38	185	0	6	58	80	208	1	26	0	2.5	9	5	0.135	3.4
07/05/1998	5.63	17	27	146	0	4	43	53	129	0	13	1	2.5	30	5	0.507	10.9
20/06/1998	6.46	161	36	194	0	6	65	119	129	0	20	2	2.5	16	0	0.271	6.9
20/07/1998	5.89	45	23	130	0	1	52	74	77	0	9	2	2.5	46	1	0.773	16.3
09/08/1998	6.05	70	26	140	0	4	62	86	86	0	10	2	2.5	43	3	0.751	16.5
29/08/1998	6.33	159	36	172	0	7	76	129	117	1	15	3	6	24	0	0.437	9
27/09/1998	6.43	212	42	189	2	8	96	169	145	4	17	2	2.5	35	3	0.529	11
25/10/1998	5.56	15	23	109	0	9	43	55	103	0	17	2	2.5	38	0	0.522	9.8
25/11/1998	5.46	6	26	136	0	4	42	52	144	0	22	1	2.5	39	4	0.371	7.9
12/02/1999	5.7	8	50	278	0	7	83	93	363	1	36	0	6	13	2	0.119	3.7
25/03/1999	5.56	8	28	167	2	5	37	42	177	0	20	1	2.5	29	0	0.358	7.9
10/05/1999	5.67	20	28	168	0	6	44	55	153	0	18	3	6	49	1	0.608	14.3
17/06/1999	5.84	32	27	164	0	2	46	60	143	0	7	3	6	47	1	0.613	12.3
12/07/1999	6.21	133	36	196	0	6	87	129	138	1	11	31		50	5	0.93	19.3
03/08/1999	6.49	215	46	222	0	10	100	167	158	4	20	1	6	34	10	0.639	13.3
01/09/1999	6.07	61	35	173	0	5	70	109	157	0	46	0	2.5	18	2	0.431	9.7
26/09/1999	5.32	8	18	92	0	9	33	41	75	0	10	4	6	30	6	0.624	13.7
06/11/1999	5.29	1	24	129	0	10	36	45	134	0	22	0	2.5	22	1	0.354	5.9
20/01/2000	6.01	37	28	167	0	3	47	70	167	0	32	6	6	13	0	0.171	3.9
05/03/2000	5.33	2	27	161	0	5	35	40	171	1	25	1	2.5	19	0	0.19	4.5
14/04/2000	6.31	84	34	191	0	6	54	104	182	1	19	0	2.5	7	3	0.186	4.7
31/05/2000	6.16	56	32	193	0	3	56	84	155	1	30	0	2.5	24	9	0.444	9.6
17/06/2000	6.43	90	35	207	0	5	68	100	177	2	18	0	2.5	15	9	0.347	8.1
12/07/2000	6.36	76	33	189	0	4	67	104	158	1	19	2	6	23	6	0.503	12
05/08/2000	6.3	105	38	194	2	5	73	110	154	2	26	4	6	23	1	0.546	13.6
04/09/2000	6.34	128	41	200	0	7	83	129	182	1	10	0	6	22	9	0.624	13
08/10/2000	5.62	20	30	160	0	13	54	64	171	0	13	1	2.5	37	7	0.628	11.9
21/11/2000	6.01	39	25	139	0	5	42	56	125	1	18	0	6	21	6	0.406	8.3
09/01/2001	5.98	32	17	100	0	4	31	49	69	1	18	0	6	22	2	0.383	7.9
08/03/2001	5.58	11	21	109	1	5	31	40	100	1	39	0	2.5	29	0	0.327	
26/04/2001	5.96	28	27	147	2	5	45	65	135	0	28	0	6	21	10	0.414	9.7
06/06/2001	6.3	97	31	164	1	4	53	95	119	0	16	0	6	12	4	0.388	9.2
03/07/2001	5.98	62	24	137	0	3	48	78	84	0	12	0	11	54	0	0.792	15.1
23/07/2001	6.22	73	24	135	2	4	54	78	90	2	11	0	6	35	3	0.69	14.3
19/08/2001	6.12	91	27	127	1	5	64	93	90	1	10	5	6	13	12	0.693	15.5
07/10/2001	5.6	16	28	112	0	15	48	51	137	1	15	2	6	30	0	0.488	11.5
14/11/2001	6.31	61	24	119	0	11	48	76	107	2	17	3	6	16	4	0.361	10
10/12/2001	6.28	63	22	114	0	8	46	72	94	1	21	7	8	12	5	0.338	7.6
22/01/2002	5.5	6	17	106	0	6	28	32	111	0	16	0	6	21	2	0.246	5.9
04/04/2002	6	36	40	252	0	9	58	76	288	1	26	1	2.5	13	0	0.215	4.9
07/05/2002	6.38	119	38	227	0	9	61	104	190	1	20	1	6	10	0	0.24	4.8
12/06/2002	5.99	49	23	148	0	4	46	61	86	0	8	5	11	28	0	0.752	15.9
14/07/2002	6.36	137	35	168	0	5	75	115	115	0	12	10	13	7	10	0.625	14
31/07/2002	5.9	56	22	116	0	4	62	78	67	0	6	6	21	29	8	0.94	20

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	AI-NL	AI-L	Abs-250	TOC
01/09/2002	6.34	110	32	159	0	6	83	122	138	1	11	1	2.5	23	0	0.669	16.6
29/09/2002	6.51	266	45	200	0	9	96	173	163	2	16	0	19	4	6	0.289	8.5
21/10/2002	5.55	12	33	148	0	23	68	73	199	0	26	3	21	11	8	0.448	12
08/12/2002	6.22	61	24	132	0	6	45	73	102	2	24	1	20	22	3	0.362	8.4
26/01/2003	5.36	2	41	198	0	5	61	61	259	0	35	1	18	17	5	0.176	4.5
03/03/2003	5.95	16	35	184	2	7	47	55	192	1	48	0	6	31	3	0.239	5.3
28/04/2003	6.05	44	35	202	3	6	54	77	193	1	37	0	13	16	4	0.357	8.3
11/06/2003	5.8	38	22	135	0	1	40	55	81	0	10	3	35	23	1	0.8	14.5
21/07/2003	5.86	50	24	132	2	4	51	77	87	0	18	3	12	20	0	0.674	14.4
10/08/2003	6.45	197	39	189	0	7	102	174	127	1	14	3	11	18	1	0.645	15.7
08/09/2003	6.6	221	43	197	0	7	89	171	156	2	18	2	13	6	0	0.278	8.9
27/10/2003	6.32	124	39	196	5	9	93	181	209	1	22	0	8	2	1	0.117	14.6
16/12/2003	6.15	50	21	118	0	4	39	67	89	0	24	0	10	15	1	0.33	6
12/02/2004	5.33	0	34	178	0	6	54	53	227	0	24	0	6	13	4	0.138	2.2
09/04/2004	6.19	44	26	151	0	1	58	85	138	0	18	1	8	14	1	0.296	5.3
20/05/2004	6.44	100	28	159	9	1	75	144	117	1	11	4	10	15	0	0.423	9.4
16/06/2004	6.21	63	19	113		2	30	51	64	0	8	5	11	26	2	0.644	12.5
14/07/2004	6.66	180	36	165.9		4.3	64.5	120.5	102	0	13	4	11	10	5	0.208	5.9
10/08/2004	5.41	15	20	93	0	7	41	60	66	0	11	5		23	14	0.795	12.7
13/09/2004	5.68	23	24	98.9	0	7	38	53	101	0	8	7	18	14	5	0.556	9.9
05/10/2004	5.44	4	19	75	0	11	23	31	95	0	10	1	7	10	3	0.26	4
14/12/2004	5.65	10	10	48	0	4	9	15	43	0	11	2	12	5	2	0.284	3.8
26/01/2005	5.42	1	80	404	0	8	107	105	527	3	49	2	8	0	1	0.041	1.2
02/03/2005	6.2	38	46	249	0	7	57	72	294	0	31	0	15	3	2	0.11	1.9
20/04/2005	6.32	61	34	195	1	9	44	52	186	0	13	1	5	16	3	0.298	5.7
06/06/2005	5.67	29	21	123	1	3	27	31	80	0	6	3	6	23	3	0.742	13.6
14/07/2005	6.49	213	42	195	0	6	82	144	130	0	14	5	10	16	0	0.53	9.9
15/08/2005	6.64	200	41	181	0	5	80	147	148	0	19	2	9	3	2	0.332	7.8
07/09/2005	6.52	132	35	161	0	6	63	104	139	1	14	1	12	7	3	0.45	8.3
04/10/2005	5.92	28	31	138	0	4	44	53	170	0	11	1	9	10	2	0.259	6.3
06/12/2005	6	26	32	160	0	4	37	50	181	0	28	18	3	10	0	0.189	4.7
08/02/2006	5.71	19	26	126	0	7	28	41	128	0	30	5	1	21	5	0.261	6.6
26/03/2006	6.14	40	21	111	0	6	26	42	93	1	30	8	4	15	1	0.24	4.7
11/05/2006	6.35	117	36	173	0	8	54	85	153	0	16	5	4.47	7	6	0.257	5.5
07/06/2006	6.57	165	39	182	0	6	61	110	142	0	16	3	6.95	12	2	0.294	8.23
29/06/2006	6.37	152	34	156	115	3	58	101	115	0	14	5	7.06	18	3	0.387	22.11
27/07/2006	6.64	256	47	211	0	5	90	165	146	0	17	4	10.7	7	3	0.424	10.34
21/08/2006	6.19	90	29	144	0	3	51	76	108	0	19	7	8.59	10	1	0.448	12.33
13/09/2006	6.4	122	32	157	0	4	58	91	121	1	11	2	3.68	10	5	0.434	11.18
26/10/2006	5.39	8	21	101	0	10	33	37	101	0	13	0		14	3	0.509	9.61
23/11/2006	5.61	9	28	146	0	7	42	46	188	1	24	0	4.79	11	2	0.183	3.88
10/01/2007	5.6	8	25	129	0	4	30	34	145	0	18	0	4.71	4	3	0.225	5.64
21/02/2007	5.89	23	37	224	6	6	46	56	232	1	29	2	6.01	6	2	0.239	6.59
05/04/2007	6.4	110	42	216	4	7	58	92	222	2	22	5	5.48	2	0	0.153	4.94
04/06/2007	5.83	32	24	147	0	2	31	40	113	0	6	3	10.14	23	0	0.705	14.07
03/07/2007	6.03	77	26	142	4	4	48	66	87	0	7	3	8.55	29	0	0.943	16.35
09/08/2007	6.24	130	31	140	0	4	70	101	103	1	9	3	7.62	50	7	0.581	11.8
30/08/2007	7.09	182	41	175	1	5	104	157	142	1	12	2	12.62	59	9	0.923	18.48
25/10/2007	6.32	140	39	172	0	9	70	112	174	3	11	0	5.9	7	2	0.308	6.14
07/12/2007	5.67	16	20	106	0	4	27	31	103	0	10	0	5.54	4	4	0.452	8.21
05/02/2008	5.66	30	23	116	0	3	27	31	139	0	18	0	5.75	8	4	0.145	5.64
02/04/2008	5.68	14	33	186	0	5	39	42	215	0	22	0	5.9	3	0	0.213	3.86
16/07/2008	6.28	134	35	176	0	4	60	97	120	0	19	0	6.38	9	11	0.439	9.74
01/09/2008	5.64	27	23	135	0	3	42	57	112	0	8	0	6.9	33	6	0.775	14.82
04/10/2008	5.31	5	26	114	0	7	36	39	133	0	8	0	4.83	8	7	0.46	9.79

**Table 4 Water chemistry for the Experimental Burn (Lower site) July 1995 - April 2010**

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
15/07/1995	6.63	155	62	210	0	6	73	276	148	0	206	1	2.5	12	0	0.348	7.7
06/08/1995	6.77	220	115	287	0	11	99	868	154	0	749	2		18	2	0.524	11
04/09/1995	6.36	85	67	245	0	8	110	275	144	0	337	0	11	16	0	0.28	7.6
24/09/1995	5.13	-3	33	165	0	7	64	86	120	0	109	0		33	4	0.514	13
11/11/1995	5.76	30	29	139	0	9	44	82	113	0	55	0	2.5	51	3	0.384	7.4
10/01/1996	5.26	-1	22	119	2	3	39	43	82	1	69	0	2.5	40	2	0.369	8
27/02/1996	5.28	-1	28	148	0	7	48	46	165	0	51	0	2.5	19	12	0.167	3.5
03/04/1996	6.31	70	50	185	0	8	59	211	168	1	188	1	2.5	11	0	0.149	4
02/05/1996	6.03	63	48	167	0	6	50	195	134	0	175	0	2.5	18	3	0.299	6.1
12/06/1996	4.98	-11	27	128	0	3	34	41	109	0	21	3	4	36	2	0.7	14.3
04/07/1996	5.89	38	34	151	0	3	50	113	111	0	79	0	2.5	26	6	0.538	15.8
27/07/1996	6.15	125	48	184	3	7	67	209	140	0	111	2	6	18	6	0.488	10.9
18/08/1996	6.67	231	75	227	0	9	90	430	148	0	278	1	2.5	14	1	0.477	10
07/09/1996	6.02	125	51	193	0	12	81	228	147	0	118	3	3.5	41	2	0.75	15.7
28/09/1996	6.3	97	49	206	0	13	75	172	199	2	94	1	2.5	12	1	0.35	9
30/10/1996	5.49	13	26	122	0	15	42	57	113	0	27	0		49	10	0.479	10
03/12/1996	5.41	-2	48	230	3	10	73	77	309	1	50	1	2.5	22	10	0.155	3.6
28/01/1997	5.87	24	30	145	2	5	40	83	114	1	75	0	2.5	24	1	0.328	6.7
10/03/1997	5.54	9	44	207	0	8	59	101	243	1	77	0	2.5	13	0	0.133	3
30/04/1997	5.77	28	35	179	2	6	48	96	174	1	48	0	2.5	25	1	0.344	7.3
21/05/1997	6.11	40	33	154	0	3	40	107	128	0	65	1	2.5	31	0	0.474	10.2
05/07/1997	6.08	75	39	176	3	8	49	143	127	0	80	1	2.5	21	7	0.502	11
30/07/1997	6.02	75	34	169	3	7	57	124	135	0	38	2	16	29	3	0.731	15.3
19/08/1997	6.67	140	38	173	3	9	67	142	124	1	39	1	2.5	29	0	0.445	9.4
07/09/1997	5.72	22	29	149	3	6	52	81	125	0	28	1	2.5	64	4	0.766	16.4
05/10/1997	5.74	31	37	171	0	12	65	115	194	0	39	0	2.5	36	2	0.519	12
14/11/1997	5.55	18	28	144	0	17	49	63	134	0	29	1	17	43	4	0.613	14
05/01/1998	5.44	3	33	170	0	7	59	67	215	0	36	0	2.5	20	0	0.176	3.7
05/02/1998	5.64	14	22	115	0	5	35	48	100	1	32	1	2.5	28	2	0.323	7.7
21/03/1998	6	47	45	210	2	9	64	142	241	1	95	0	2.5	13	4	0.131	3.3
20/06/1998	6.26	144	61	209	0	6	70	291	132	0	232	1	2.5	4	13	0.27	6.8
20/07/1998	5.75	39	26	137	0	3	50	91	86	0	29	5	6	42	42	0.759	16
09/08/1998	5.85	62	31	143	0	5	63	124	85	0	51	2	2.5	50	2	0.808	17.4
29/08/1998	6.21	142	51	178	0	5	75	235	118	0	145	3	6	31	0	0.47	9.8
27/09/1998	6.34	203	65	207	3	10	99	351	149	2	218	1	2.5	32	2	0.482	10
25/10/1998	5.58	14	20	100	0	5	35	51	89	0	20	2	2.5	57	6	0.496	10.8
25/11/1998	5.44	6	27	143	0	6	42	54	151	0	26	1	2.5	31	4	0.351	7.5
12/02/1999	5.47	3	50	255	0	12	77	84	336	1	36	0	6	15	1	0.082	2.8
25/03/1999	5.51	7	28	163	1	7	36	44	174	0	24	1	2.5	28	4	0.32	7.2
10/05/1999	5.75	26	29	168	0	7	43	63	161	0	30	2	6	40	1	0.474	11.3
17/06/1999	5.71	25	29	169	0	3	46	72	155	0	26	4	6	31	9	0.607	12.9
12/07/1999	5.87	111	45	207	0	9	92	195	150	0	75	3		109	7	1.195	23
03/08/1999	6.25	208	81	246	0	12	111	432	156	1	312	0	2.5	31	3	0.684	14.1
01/09/1999	6.29	68	39	175	0	7	65	133	164	1	67	3	6	19	0	0.38	8.8
26/09/1999	4.97	-6	20	88	0	11	29	32	74	0	10	6	8	30	8	0.691	14.7
06/11/1999	5.46	7	24	131	0	12	38	47	137	1	23	0	6	34	5	0.352	7
20/01/2000	5.99	36	35	168	0	4	48	110	171	2	71	1	6	11	2	0.149	3.6
05/03/2000	6.39	3	27	158	0	6	34	40	171	0	27	0	2.5	22	0	0.161	4.2
14/04/2000	6.38	90	48	200	0	6	55	205	184	1	128	0	2.5	7	3	0.191	4.6
31/05/2000	6.11	57	37	200	0	4	58	127	165	1	78	0	2.5	22	13	0.31	6.9
17/06/2000	6.2	80	46	217	0	6	70	185	186	1	105	1	2.5	31	1	0.356	8.6

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	AI-NL	AI-L	Abs-250	TOC
12/07/2000	6.37	76	41	200	0	6	69	170	169	1	86	0	6	15	9	0.468	10.3
05/08/2000	6.23	117	52	215	2	8	75	201	178	1	114	1	6	24	6	0.535	13.4
04/09/2000	6.27	132	54	217	2	9	83	228	189	1	114	0	6	31	2	0.64	14
08/10/2000	5.63	20	31	161	0	17	52	63	170	0	18	1	2.5	52	1	0.58	9.2
21/11/2000	5.93	38	28	142	0	7	43	77	130	1	37	0	6	24	2	0.374	8
09/01/2001	5.95	31	21	103	0	6	34	71	76	1	41	0	6	37	2	0.347	7.8
08/03/2001	5.61	10	22	107	1	6	30	42	100	1	39	0	6	21	2	0.235	5
26/04/2001	5.95	30	31	149	0	6	45	88	137	1	51	0	2.5	21	8	0.421	9.6
06/06/2001	6.31	117	47	199	5	9	62	218	140	1	133	0	6	22	0	0.4	10.4
03/07/2001	5.95	62	27	137	0	4	47	101	83	1	41	4	6	42	16	0.791	15
23/07/2001	6.26	84	22	144	3	5	54	112	96	2	41	0	6	16	7	0.632	14.1
19/08/2001	6.04	88	33	126	1	6	65	137	90	1	52	5	6	15	12	0.73	17.9
07/10/2001	5.6	19	26	117	2	15	48	58	130	1	19	3	6	31	6	0.49	10.5
14/11/2001	6.37	51	26	114	0	11	44	95	103	2	46	2	2.5	19	1	0.334	8.6
10/12/2001	6.21	60	26	119	0	8	43	106	97	1	61	3	6	13	0	0.338	7.3
22/01/2002	5.71	11	19	112	0	7	29	37	117	0	18	0	2.5	21	0	0.227	5.4
04/04/2002	5.96	34	46	249	0	10	60	115	282	1	73	1	2.5	14	0	0.185	4.4
07/05/2002	6.37	113	60	239	0	10	65	263	193	2	199	1	6	10	0	0.234	5.6
12/06/2002	5.89	42	24	145	0	4	43	71	93	0	23	4	6	30	0	0.712	15.2
14/07/2002	6.23	108	40	168	0	5	67	169	120	0	81	3	12	11	11	0.598	12.7
31/07/2002	5.65	40	22	117	0	5	57	72	69	0	13	6	22	50	6	0.949	
01/09/2002	6.19	90	34	160	0	7	77	144	143	0	50	5	6	28	5	0.663	15.8
29/09/2002	6.31	179	61	201	0	11	90	367	153	1	181	2	22	16	8	0.362	9.1
21/10/2002	5.78	13	30	141	0	21	59	69	181	0	30	2	21	20	1	0.329	8.8
08/12/2002	6.09	54	29	137	0	8	42	102	112	1	57	1	24	22	1	0.326	7.6
26/01/2003	5.4	3	41	202	0	8	61	70	254	0	39	0	18	24	4	0.165	4.2
03/03/2003	5.7	15	37	187	2	9	48	65	200	0	63	1	6	20	3	0.2	5.2
28/04/2003	6.16	57	40	201	0	7	56	120	195	1	67	0	13	14	0	0.324	7.5
11/06/2003	5.68	33	23	126	0	2	38	60	88	1	20	7	16	26	9	0.733	13.5
21/07/2003	5.81	47	26	131	2	4	51	94	94	0	36	2	9	26	9	0.643	14.4
10/08/2003	5.99	156	49	198	2	8	98	259	135	2	117	4	12	101	16	1.215	22.2
08/09/2003	6.21	146	57	196	0	8	80	268	157	0	178	1	13	19	7	0.373	9.8
27/10/2003	6.08	95	48	195	0	9	78	269	204	1	126	0	8	3	10	0.115	22.5
16/12/2003	6.21	44	25	121	0	6	37	99	95	0	58	0	11	19	0	0.305	5.5
11/02/2004	5.36	0	34	177	0	7	53	50	225	0	28	0	7	12	6	0.139	2.3
09/04/2004	6.1	41	30	152	0	3	51	138	139	0	59	1	8	15	2	0.287	5.1
20/05/2004	6.41	95	35	154	0	0	55	192	119	1	67	4	11	24	6	0.423	8
16/06/2004	6.12	63	24	125		2.3	35.3	90	69	0	43	4	12	34	2	0.619	11.8
14/07/2004	6.76	190	63	185.7		5.6	70.1	311.9	110	0	210	4	10	6	6	0.204	6
10/08/2004	5.45	17	21	89	0	11	41	52	68	0	12	5		28	11	0.778	12.7
13/09/2004	5.57	19	24	100.7	0	11	42	51	100	0	11	4	18	26	10	0.53	10.3
05/10/2004	5.2	-2	19	76	0	12	21	26	91	0	9	0	9	14	5	0.302	3.6
14/12/2004	5.25	1	12	55	0	6	10	12	50	0	12	2	11	9	3	0.347	4.8
26/01/2005	5.38	0	79	406	29	11	106	109	513	3	61	0	8	1	3	0.038	1
02/03/2005	6.26	46	52	248	0	10	59	120	292	1	82		10	3	0	0.103	1.9
20/04/2005	6.18	53	42	203	1	11	49	100	195	0	86	2	5	17	4	0.34	6.3
06/06/2005	5.51	22	21	118	2	3	27	33	78	0	10	3	7	38	6	0.747	13.8
14/07/2005	6.53	222	83	230	0	8	91	449	138	0	351	6	7	12	1	0.504	9.2
15/08/2005	6.57	187	58	189	0	7	77	270	155	0	158	1	10	3	4	0.315	6.8
07/09/2005	6.34	118	45	163	0	7	62	176	138	0	100	0	10	15	1	0.458	9.2
04/10/2005	5.78	26	29	140	0	6	44	69	169	0	28	1	10	16	3	0.28	6.5
06/12/2005	5.92	25	35	163	0	5	39	70	181	1	50	0	3	11	1	0.184	4.8
08/02/2006	5.78	20	23	120	0	5	26	36	113	0	24	7	0	13	1	0.316	7.7
26/03/2006	6.07	40	25	116	2	8	28	62	103	1	47		3.6	9	0	0.233	4.8
11/05/2006	6.44	124	61	183	0	9	60	249	155	0	202	4	7.15	7	3	0.278	6.29
07/06/2006	6.62	177	79	219	0	9	75	406	147	0	339	7	3.51	10	0	0.278	9.29

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
29/06/2006	6.46	168	60	174	48	5	63	283	121	0	210	4	6.6	16	3		15.78
27/07/2006	6.87	304	112	270	0	9	96	742	151	0	546	6	10.61	5	0	0.36	8.45
21/08/2006	6.05	68	34	154	2	4	49	98	132	0	45	2	9.88	20	6	0.462	12.31
13/09/2006	6.4	117	43	164	3	6	58	160	129	0	90	0	3.96	16	7	0.457	12.79
26/10/2006	5.47	13	21	98	0	11	33	37	90	0	13	0		27	12	0.546	10.88
23/11/2006	5.63	10	30	149	0	8	45	58	184	0	35	1	4.55	11	2	0.191	4.27
10/01/2007	5.59	10	26	132	0	5	32	39	149	0	24	0	4.93	9	1	0.221	5.8
21/02/2007	5.95	28	41	268	13	8	59	109	248	1	64	1	5.08	8	4	0.235	5.22
05/04/2007	6.56	137	78	243	4	9	69	340	225	2	283	0	5.48	2	0	0.164	5.42
04/06/2007	5.77	34	28	153	3	5	34	55	125	0	21	2	11.08	26	7	0.704	13.45
03/07/2007	5.87	65	28	136	5	4	49	87	91	0	29	2	12.39	34	7	0.986	17.31
09/08/2007	6.12	127	40	142	0	5	76	165	103	0	77	3	9.94	90	31	0.713	14.79
30/08/2007	7.08	169	53	170	0	7	101	239	138	0	109	1	10.92	99	6	1.06	16.87
25/10/2007	6.27	136	49	173	0	11	67	190	167	2	104	0	6.52	5	0	0.328	6.2
05/12/2007	5.62	14	21	109	0	5	26	31	110	0	13	2	6.26	8	1	0.408	8.03
05/02/2008	5.58	8	25	120	0	4	28	34	145	0	25	0	4.96	8	4	0.136	6.79
02/04/2008	5.55	12	35	186	0	6	40	54	216	0	40	0	6.01	4	0	0.215	4.05
16/07/2008	6.48	143	47	186	0	4	61	198	128	0	119	1	6.73	4	2	0.386	8.89
01/09/2008	5.54	25	25	134	0	4	41	58	113	0	12	0	7.54	35	8	0.776	15.34
04/10/2008	5.54	12	24	107	0	6	34	38	121	0	9	0	6.02	12	0	0.39	8.32
09/12/2008	5.79	22	26	128	1	2	30	50	125	0	40	0	2.43	8	0	0.274	6.42
12/01/2009	5.27	-1	28	143	2	3	28	29	166	0	23	6	3.15	11	1	0.157	6.01
18/03/2009	5.94	29	38	180	2	5	39	78	188	0	69	0	2.43	12	7	0.221	4.96
27/04/2009	5.56	16	30	161	1	5	32	40	147	0	16	0	4.78	12	8		11.69
12/05/2009	6.1	62	31	164	0	4	38	47	153	0	12	1	2.67	13	0		6.19
12/06/2009	6.75	212	88	234	2	8	78	414	158	0	354	1	8.4	11	0	0.33	5.72
15/07/2009	6.17	89	34	143	0	4	50	112	105	1	44	5	4.92	20	2	0.636	12.41
11/08/2009	6.1	60	27	126	2	4	47	77	105	2	11	0	6.17	41	3	0.725	20.5
28/09/2009	6.17	53	33	131	2	5	49	105	138	0	51	14	14.52	18	0	0.338	13.04
16/11/2009	5.58	13	16	75	1	4	20	25	58	0	12	0	7.59	19	6	0.506	8.07
30/04/2010	5.86	25	23	114	0	3	28	51	95	0	25	5	3.82	18	2	0.443	8.75

**Table 5 Water chemistry for the Allt Riabhach na Bioraich (Lower site) June 1995 - April 2010**

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
02/06/1995	6.15	42	25	137	0	5	41	68	109	1	26	0	2.5	53	0	0.431	8.8
15/07/1995	6.35	68	41	175	0	9	76	128	121	9	104	0	2.5	30	8	0.436	11
06/08/1995	6.8	122	38	207	0	13	65	142	148	2	80	1		15	3	0.287	6.6
04/09/1995	6.19	44	43	182	0	9	84	132	118	0	156	0	6	39	0	0.347	8.5
24/09/1995	5.41	7	28	150	0	6	63	85	107	1	96	0		66	8	0.517	13
11/11/1995	6.03	44	26	130	0	6	47	81	94	1	43	1	2.5	65	0	0.411	7.9
27/02/1996	5.68	17	30	155	1	5	55	74	166	2	64	0	2.5	29	1	0.213	4.1
03/04/1996	6.07	35	33	153	6	12	59	100	135	8	88	0	2.5	29	2	0.194	4.6
02/05/1996	5.98	67	31	139	0	6	48	98	115	0	60	0	2.5	32	2	0.241	4.8
12/06/1996	5.52	14	23	115	0	3	37	51	91	0	23	3	4	40	29	0.563	6.7
04/07/1996	5.92	35	27	130	0	4	49	85	96	0	46	0	2.5	47	14	0.553	23
27/07/1996	6.36	75	29	140	0	5	57	117	100	1	34	1	2.5	42	4	0.532	10.7
18/08/1996	6.69	141	35	158	0	7	62	144	108	2	39	2	2.5	24	2	0.398	8
07/09/1996	6.34	117	34	162	0	11	65	137	117	1	40	2	2.5	35	4	0.485	10.2
28/09/1996	6.21	53	37	169	0	10	74	120	174	3	57	1	2.5	46	9	0.484	10.9
30/10/1996	5.61	15	21	97	0	7	36	53	80	1	22	1		90	7	0.525	10
03/12/1996	5.26	0	44	218	0	8	71	75	293	2	42	0	2.5	35	7	0.16	3.7

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
28/01/1997	6.09	37	27	129	2	6	41	73	104	4	49	4	6	45	0	0.305	6
10/03/1997	5.64	18	38	184	0	9	56	77	218	3	46	1	2.5	26	0	0.142	3
30/04/1997	5.92	31	29	154	0	5	48	79	149	1	27	0	2.5	43	1	0.382	7.8
21/05/1997	6.09	41	26	144	4	5	45	76	120	0	25	1	2.5	52	7	0.501	10.4
05/07/1997	6.23	70	30	148	3	7	51	97	108	0	35	1	2.5	55	0	0.48	9.9
30/07/1997	6.18	57	27	136	0	5	54	97	104	0	27	1	2.5	70	8	0.769	15.7
19/08/1997	6.63	104	33	163	0	8	60	112	120	1	22	1	2.5	32	0	0.478	9.8
07/09/1997	5.68	20	25	125	0	4	47	71	103	0	20	2	2.5	89	10	0.74	14.5
05/10/1997	5.75	21	29	143	0	7	57	84	145	0	24	0	2.5	82	5	0.644	14
14/11/1997	6.02	42	26	139	0	8	50	76	114	2	30	1	2.5	57	5	0.561	12
05/01/1998	5.46	6	28	146	1	6	49	55	168	2	31	0	2.5	31	0	0.209	3.9
05/02/1998	5.72	15	21	115	3	7	36	53	102	3	30	1	2.5	47	1	0.346	8.2
21/03/1998	6.05	43	34	171	2	8	50	77	183	1	40	0	2.5	24	2	0.149	3.8
20/06/1998	6.48	148	39	180	0	9	60	138	120	0	62	1	2.5	23	0	0.228	5.7
20/07/1998	5.94	46	24	129	0	4	48	77	81	0	18	1	2.5	85	3	0.735	15.2
09/08/1998	5.89	37	22	123	0	4	44	71	82	0	20	1	2.5	55	9	0.634	12.5
29/08/1998	6.36	120	31	156	0	8	51	106	101	0	34	1	2.5	27	1	0.35	7.1
27/09/1998	6.52	163	35	159	0	8	66	159	109	1	51	1	2.5	21	0	0.312	6.8
25/10/1998	5.49	14	24	109	0	12	43	51	107	0	20	2	2.5	49	12	0.513	10.3
25/11/1998	5.56	8	26	134	0	5	40	55	145	1	26	1	2.5	45	4	0.318	6.7
12/02/1999	5.8	16	43	238	0	8	69	89	299	2	38	1	2.5	16	0	0.098	2.8
25/03/1999	5.56	7	26	142	0	6	35	42	158	1	23	1	2.5	39	0	0.274	6.2
10/05/1999	5.89	27	27	149	0	9	45	68	139	0	28	3	6	51	0	0.558	12
17/06/1999	5.74	23	25	142	0	2	42	61	129	0	14	2	2.5	52	20	0.617	12.9
12/07/1999	6.2	82	29	168	0	7	57	105	124	0	27	0		82	2	0.752	15.3
03/08/1999	6.56	110	36	179	0	9	59	138	145	2	51	0	6	24	0	0.372	7.7
01/09/1999	5.83	30	28	136	0	5	54	78	110	0	40	2	2.5	61	10	0.647	13
26/09/1999	5.5	20	21	108	0	5	36	52	88	0	21	3	6	68	5	0.563	10.6
06/11/1999	5.02	-6	23	110	0	6	35	31	119	0	22	1	2.5	18	2	0.303	7.9
20/01/2000	5.86	27	26	140	0	4	40	71	140	2	33	1	2.5	31	2	0.19	4.1
05/03/2000	5.47	6	28	163	0	4	39	52	182	1	29	0	2.5	24	2	0.188	4.4
14/04/2000	5.47	2	31	188	0	3	43	57	215	1	27	0	2.5	10	5	0.108	2.4
31/05/2000	6.31	55	31	174	0	5	57	95	145	0	47	0	2.5	34	15	0.364	8
17/06/2000	6.27	61	35	187	0	6	61	100	179	1	40	0	2.5	34	3	0.269	6.4
12/07/2000	6.33	62	30	163	0	5	59	109	139	0	31	0	6	29	12	0.397	8.5
05/08/2000	6.48	80	34	174	3	6	58	104	143	1	45	0	6	26	3	0.389	9.3
04/09/2000	6.59	97	35	169	0	6	62	118	152	0	27	0	6	24	4	0.439	9.8
08/10/2000	5.47	14	28	144	0	6	46	62	146	0	20	2	6	83	9	0.636	10.7
21/11/2000	5.92	34	24	127	0	4	40	66	117	1	25	0	6	40	3	0.414	8.3
09/01/2001	5.92	28	18	97	0	4	31	55	73	1	25	0	6	47	0	0.372	8.2
08/03/2001	5.51	6	22	98	2	8	32	41	97	7	36	0	6	21	8	0.222	5
26/04/2001	6.03	38	28	141	3	9	43	76	123	2	37	0	2.5	35	11	0.47	10
06/06/2001	6.45	91	30	151	2	6	53	98	108	0	36	4	6	23	4	0.371	8.3
03/07/2001	5.95	45	23	125	1	3	43	77	79	1	22	2	2.5	95	14	0.788	14.4
23/07/2001	6.32	66	24	126	2	4	47	80	86	1	20	0	5	46	2	0.563	11.6
19/08/2001	6.06	35	21	108	1	3	35	64	82	2	23	3	6	24	15	0.474	11.2
07/10/2001	5.3	5	24	99	0	10	40	46	107	2	18	3	6	51	6	0.541	11.5
14/11/2001	6.04	15	22	108	0	8	39	67	88	2	25	5	6	34	4	0.379	8.5
10/12/2001	6.07	44	20	109	0	8	39	68	86	2	29	3	6	22	9	0.371	8
22/01/2002	4.59	-24	25	101	0	5	22	15	112	0	17	2	6	15	0	0.314	7.2
04/04/2002	6.01	36	32	191	3	10	47	68	200	4	36	1	2.5	18	5	0.237	5.1
07/05/2002	6.27	50	38	215	0	8	54	91	217	0	42	0	6	9	0	0.176	4.3
12/06/2002	5.8	34	21	123	0	5	38	60	79	0	15	2	6	63	2	0.772	15.1
14/07/2002	6.31	88	29	142	0	6	54	104	98	0	22	3	19	32	9	0.61	12.7
31/07/2002	5.53	21	19	97	0	4	39	53	55	1	10	4	18	57	22	0.928	
01/09/2002	6.17	67	29	153	0	9	62	103	121	0	21	0	2.5	40	3	0.673	16.7

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
29/09/2002	6.6	198	44	180	4	13	80	184	133	1	45	0	20	8	3	0.275	7
21/10/2002	6.24	60	32	155	0	17	64	95	163	1	31	3	25	12	6	0.376	9.1
08/12/2002	6.19	54	26	133	0	8	44	83	110	2	37	1	23	16	12	0.365	8.3
26/01/2003	5.25	-1	42	197	0	9	66	64	273	0	36	0	19	28	4	0.189	4.6
03/03/2003	5.84	15	30	155	2	9	43	55	161	2	45	0	5	38	5	0.27	6
28/04/2003	6.2	48	36	189	3	9	63	98	183	0	57	0	12	31	6	0.375	8.3
11/06/2003	5.75	32	23	120	0	3	43	66	89	0	14	3	14	47	15	0.831	15.9
24/07/2003	5.56	24	22	108	0	5	37	57	79	0	25	2	12	52	19	0.6	12.9
10/08/2003	6.33	129	37	169	0	10	69	166	120	1	59	1	9	39	76	0.473	15
08/09/2003	6.62	149	38	174	0	11	70	159	137	0	51	4	11	11	2	0.276	14.4
27/10/2003	6.35	125	35	170	0	11	88	187	160	0	38	0	8	7	2	0.178	22
16/12/2003	6	38	21	112	0	8	38	64	95	1	29	0	10	34	2	0.326	5.85
12/02/2004	5.2	-3	33	162	0	6	46	46	206	0	24	4	8	20	2	0.138	2.1
09/04/2004	6.13	45	25	130	0	1	50	91	122	0	27	1	8	27	1	0.301	4.8
20/05/2004	6.06	46	22	112	0	0	51	93	87	0	13	3	9	59	9	0.665	12
16/06/2004	5.97	34	19	105		3.5	29.6	55.1	69	0	16	3	10	57	10	0.675	12.3
14/07/2004	6.66	119	31	143.6		6.8	46.3	94	92	0	25	4	35	25	3	0.226	6.2
10/08/2004	5.17	3	20	80	0	10	36	46	60	0	15	6		41	23	0.848	13.3
13/09/2004	5.51	16	22	89.6	0	12	39	51	85	0	11	4	20	46	5	0.671	11.7
05/10/2004	5.26	0	17	66	0	10	20	26	81	0	10	1	9	20	4	0.292	3.9
14/12/2004	5.45	6	13	54	0	7	13	20	52	0	16	2	10	16	5	0.333	4.5
26/01/2005	5.36	0	66	333	0	11	90	80	463	3	47	0	8	6	5	0.069	1.5
02/03/2005	6.2	52	41	204	0	10	55	82	244	2	39	1	10	10	2	0.132	2
20/04/2005	6.23	47	32	171	0	10	44	63	171	0	29	2	4	25	6	0.299	
06/06/2005	5.6	22	18	98	2	3	26	34	64	0	9	6	7	48	4	0.739	13.5
14/07/2005	6.63	156	41	179	0	11	62	144	131	0	48	7	10	23	1	0.442	7.4
15/08/2005	6.6	133	37	162	0	9	63	126	144	0	31	1	10	10	5	0.411	8
07/09/2005	6.36	98	33	155	0	8	51	95	135	0	33	2	10	24	0	0.388	9
04/10/2005	5.76	21	26	132	0	7	41	54	156	0	16	1	7	52	14	0.36	9.2
06/12/2005	5.79	19	30	142	0	6	35	47	169	2	26	0	3	22	6	0.206	5.3
08/02/2006	5.65	15	24	113	0	8	30	44	111	0	32	1	0	28	2	0.349	8.1
26/03/2006	6.24	53	23	110	0	8	30	56	98	2	30		3.8	22	0	0.23	4.5
11/05/2006	6.27	57	30	136	0	6	37	67	130	1	33	4	5.28	11	2	0.198	5.16
07/06/2006	6.67	149	41	169	0	10	53	133	132	0	52	3	3.48	11	0	0.239	8.39
29/06/2006	6.34	87	37	134	69	7	44	83	121	0	38	2	6.2	13	4	0.294	12.77
27/07/2006	6.94	163	42	192	0	12	60	134	140	0	52	1	10.79	20	1	0.408	9.82
21/08/2006	6.15	62	31	140	2	5	50	82	115	0	23	4	12.92	46	5	0.664	15.55
13/09/2006	6.39	56	27	133	2	6	39	67	117	1	26	0	5.34	18	3	0.397	10.7
26/10/2006	5.37	8	15	80	0	9	25	31	58	0	12	0		38	6	0.62	11.87
23/11/2006	5.55	7	26	137	0	9	38	41	167	1	21	0	4.96	15	3	0.207	4.49
10/01/2007	5.56	7	25	120	0	6	29	33	139	1	18	0	4.97	16	1	0.201	5.57
21/02/2007	5.96	28	34	179	5	9	44	61	195	3	31	0	6.3	24	2	0.259	7.26
05/04/2007	6.78	117	45	197	3	10	58	124	199	0	59	0	5.13	4	0	0.154	4.89
04/06/2007	5.71	25	24	131	0	3	31	43	109	0	9	3	10.22	29	18	0.705	13.63
03/07/2007	5.97	48	24	129	4	4	38	59	98	0	14	2	12.07	65	0	0.784	14.57
09/08/2007	6.03	39	27	136	0	5	37	58	129	0	19	1	8.52	88	3	0.408	8.09
30/08/2007	6.65	92	32	142	0	5	61	104	121	0	18	2	9.87	33	13	0.683	14.39
25/10/2007	6.38	146	38	155	0	11	62	125	135	3	32	0	9.1	6	1	0.311	6.81
05/12/2007	5.73	15	19									0					
05/02/2008	5.52	6	24	122	0	6	28	32	145	1	21	0	6.6	14	1	0.16	9.42
02/04/2008	5.54	8	28	196	4	8	41	46	202	0	24	0	6.66	10	1	0.219	6.17
16/07/2008	6.36	88	31	152	2	4	50	88	113	0	26	2	8.13	21	1	0.497	10.23
01/09/2008	5.7	28	21	111	0	4	38	56	84	0	9	0	6.98	52	10	0.835	16.34
04/10/2008	5.49	12	22	96	0	7	34	41	99	0	11	0	6.34	25	9	0.581	11.57
09/12/2008	5.84	25	23	116	0	4	30	39	118	1	19	11	2.67	16	3	0.28	6.19
12/01/2009	5.4	3	26	132	2	5	27	29	153	0	21	7	5.4	14	3	0.205	6.46

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
18/03/2009	5.9	21	26	137	2	5	29	37	143	0	22	0	2.54	15	11	0.218	5.44
27/04/2009	5.68	20	27	140	0	4	32	42	119	0	14	0	5.2	26	4		12.84
12/05/2009	6.13	56	30	145	0	4	34	50	139	0	20	0	1.69	12	5		5.48
12/06/2009	6.9	163	44	177	2	9	54	120	141	0	54	1	6.61	12	3	0.361	4.93
15/07/2009	6.28	83	30	136	0	4	50	90	105	3	18	2	4.41	26	6	0.675	12.59
11/08/2009	6.01	75	33	143	2	2	57	97	127	1	24	0	6.51	24	2	0.69	21.11
28/09/2009	6	34	25	114	1	5	41	58	118	0	12	0	7.48	44	1	0.506	12.59
16/11/2009	5.61	14	15	71	1	5	20	26	59	0	11	0	7.42	33	7	0.505	7.95
30/04/2010	5.9	26	21	104	0	4	30	43	85	0	12	4	3.44	36	0	0.531	9.88

**Table 6 Water chemistry for the Allt Riabhach na Bioraich (Upper site) June 1995 - October 2008**

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
02/06/1995	6.17	38	23	139	0	7	39	60	105	0	20	0	2.5	49	2	0.457	9.4
15/07/1995	6.56	63	40	174	0	9	77	125	119	8	107	1	2.5	33	1	0.446	11
06/08/1995	6.59	84	30	186	0	10	53	108	137	6	43	1		53	1	0.488	9
04/09/1995	6.22	35	41	177	0	6	82	127	112	1	158	0	6	40	2	0.348	8.4
24/09/1995	5.56	9	28	146	0	5	62	86	105	1	94	0		60	8	0.488	11
11/11/1995	6.06	37	23	124	0	5	45	71	92	1	39	0	2.5	59	0	0.392	7.9
10/01/1996	5.42	3	20	106	4	5	39	49	83	2	60	3	4	44	5	0.301	6.7
27/02/1996	5.71	13	29	152	0	5	53	68	159	2	58	0	2.5	30	2	0.196	3.8
03/04/1996	6.02	23	31	145	0	8	58	88	127	7	82	0	2.5	27	4	0.193	4.3
02/05/1996	6.04	40	27	134	0	6	44	72	111	0	48	0	2.5	33	11	0.236	4.8
12/06/1996	5.55	16	22	112	0	2	36	52	89	0	23	3	4	59	8	0.546	11.1
04/07/1996	5.99	32	26	130	0	4	50	79	94	0	42	0	2.5	54	4	0.533	17.5
27/07/1996	6.3	67	27	134	0	6	56	103	100	0	30	1	2.5	39	7	0.528	11
18/08/1996	6.67	114	30	154	0	6	63	117	108	2	26	2	2.5	27	1	0.412	8.1
07/09/1996	6.48	88	29	148	0	10	60	110	113	1	24	0	2.5	32	6	0.487	10.1
28/09/1996	6.2	45	37	167	0	10	73	116	165	3	57	1	2.5	43	2	0.504	11.2
30/10/1996	5.62	14	20	97	0	6	36	53	80	1	21	1		70	4	0.514	10
03/12/1996	5.28	-1	43	218	2	7	69	75	290	2	40	1	2.5	36	6	0.16	4
28/01/1997	6.06	28	25	125	2	5	41	64	101	4	44	6	6	41	0	0.293	5.9
10/03/1997	5.63	7	36	182	0	8	53	66	218	2	39	0	2.5	24	0	0.141	3
30/04/1997	5.99	27	28	153	0	5	47	71	145	0	23	0	2.5	44	2	0.39	7.8
21/05/1997	6.2	37	25	137	0	3	43	70	115	0	20	1	2.5	51	13	0.48	10.1
05/07/1997	6.28	58	27	141	0	4	49	82	105	0	27	1	2.5	50	1	0.46	9.6
30/07/1997	6.19	49	29	137	0	5	55	97	101	0	19	1	2.5	67	6	0.83	16.9
19/08/1997	6.51	202	46	199	0	8	98	175	138	2	17	1	2.5	27	5	0.688	15
07/09/1997	5.76	21	25	125	0	4	46	68	104	0	18	1	2.5	90	28	0.714	14.1
05/10/1997	5.81	21	29	140	0	7	56	81	144	1	22	0	2.5	85	4	0.64	13
14/11/1997	6.06	36	24	134	1	9	47	72	110	2	27	1	2.5	64	8	0.561	12
05/01/1998	5.67	8	26	145	0	6	47	55	164	2	31	1	2.5	34	1	0.209	3.8
05/02/1998	5.75	14	21	103	0	5	33	48	93	2	27	1	2.5	47	0	0.333	7.6
21/03/1998	6.02	31	32	164	0	7	46	60	176	1	30	1	2.5	23	1	0.144	3.4
07/05/1998	5.76	19	24	127	0	4	39	55	108	0	16	1	2.5	43	8	0.501	10.1
20/06/1998	6.52	101	32	166	0	8	53	86	115	1	33	1	2.5	13	6	0.238	5.8
20/07/1998	6.08	43	23	125	0	4	47	71	78	0	15	1	2.5	67	3	0.709	14.1
09/08/1998	6.01	39	20	118	0	3	42	64	72	0	14	1	2.5	58	17	0.648	12.6
29/08/1998	6.46	83	25	137	0	5	38	514	90	0	21	1	2.5	12	27	0.38	7.1
27/09/1998	6.68	130	29	150	0	8	60	110	104	0	21	5	6	24	3	0.326	6.8
25/10/1998	5.69	15	20	100	0	6	36	51	89	0	19	3	6	52	6	0.473	10.5
25/11/1998	5.54	6	26	138	0	5	42	54	153	1	26	0	2.5	51	3	0.31	6.7



Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
12/02/1999	5.67	6	45	248	0	7	71	82	315	2	38	0	2.5	18	2	0.099	3.1
25/03/1999	5.62	8	25	144	0	7	35	40	160	0	22	1	2.5	37	1	0.263	6
10/05/1999	5.84	24	28	149	0	8	45	64	136	0	25	3	10	51	0	0.566	12.5
17/06/1999	5.95	17	29	178	0	6	39	55	191	1	25	1	2.5	19	3	0.242	5.3
12/07/1999	6.24	63	26	157	0	5	51	84	119	0	15	0		64	13	0.729	14.6
03/08/1999	6.46	85	30	167	0	8	54	98	137	0	23	0	2.5	32	6	0.438	8.5
01/09/1999	5.8	28	27	135	0	4	55	85	108	0	39	4	6	75	2	0.665	14
26/09/1999	5.59	15	19	100	0	5	34	47	82	0	15	8	1	50	6	0.577	11.1
06/11/1999	5.22	-2	22	112	0	6	31	35	117	1	21	0	6	44	0	0.328	7.3
20/01/2000	5.93	19	25	138	0	4	38	53	145	2	27	1	2.5	28	1	0.19	4.3
05/03/2000	5.54	5	28	165	0	4	40	50	185	1	27	0	2.5	27	2	0.173	4
14/04/2000	6.34	54	29	159	0	6	49	87	158	0	23	0	6	21	3	0.207	4.7
31/05/2000	6.28	48	30	168	0	5	58	88	142	0	46	0	2.5	47	2	0.389	8.5
17/06/2000	6.45	44	31	179	0	4	54	82	171	1	28	0	2.5	36	0	0.276	6.1
12/07/2000	6.33	46	28	158	0	4	55	96	139	1	24	0	6	37	0	0.402	8.4
05/08/2000	6.38	60	31	173	2	6	55	89	145	1	37	1	6	33	6	0.44	11.9
04/09/2000	6.51	79	32	162	0	5	58	99	149	0	17	0	6	28	6	0.466	11
08/10/2000	5.57	15	27	139	0	6	46	62	144	0	18	1	2.5	67	2	0.626	10.4
21/11/2000	6.05	30	23	128	0	4	39	62	117	1	20	0	6	36	0	0.399	8.1
09/01/2001	5.97	23	18	100	0	4	30	51	75	1	22	0	6	49	2	0.371	8.6
08/03/2001	5.47	4	22	98	2	8	32	40	100	7	36	0	10	20	8	0.2	4.5
26/04/2001	5.99	30	25	133	0	6	43	98	116	2	33	0	2.5	25	20	0.447	9.5
06/06/2001	6.38	71	27	144	1	5	48	83	103	0	30	2	2.5	19	14	0.416	8.8
03/07/2001	6.07	45	22	121	0	3	42	73	76	0	19	32	35	96	5	0.852	14.8
23/07/2001	6.29	58	22	119	1	4	47	75	77	2	17	0	2.5	43	0	0.641	12.4
19/08/2001	6.1	44	20	102	0	3	40	66	63	1	14	2	6	40	22	0.686	13.6
07/10/2001	5.44	9	23	99	0	9	39	46	106	1	18	2	6	37	14	0.539	11
14/11/2001	6.31	39	20	106	0	7	36	63	86	2	20	5	6	38	0	0.374	8.7
10/12/2001	6.22	46	20	110	0	7	38	63	85	1	24	15	20	28	0	0.343	6.9
22/01/2002	5.32	0	17	98	0	7	24	31	103	0	16	0	6	26	4	0.259	5.9
04/04/2002	6.02	27	30	190	4	10	46	60	199	3	33	0	2.5	21	14	0.265	5.6
07/05/2002	6.36	59	30	179	0	8	44	71	155	0	23	0	6	11	3	0.233	5
12/06/2002	5.85	32	21	124	0	4	38	56	78	0	12	3	12	52	11	0.741	14.7
14/07/2002	6.33	70	26	141	0	5	49	82	100	0	13	3	14	26	13	0.618	13.7
31/07/2002	5.63	23	18	99	0	4	39	55	55	0	10	5	18	70	12	0.893	
01/09/2002	6.23	59	25	142	0	6	59	94	115	0	15	0	6	43	2	0.664	15.7
29/09/2002	6.91	152	36	165	0	9	73	131	130	0	18	0	16	19	0	0.313	7.4
21/10/2002	6.35	54	32	154	0	20	63	91	169	0	27	2	28	16	2	0.316	
08/12/2002	6.27	52	24	130	0	8	46	75	103	3	30	2	20	27	1	0.382	8.3
28/01/2003	5.23	-2	41	202	0	9	64	64	274	1	36	0	18	30	11	0.183	2.7
03/03/2003	5.82	13	29	153	2	9	42	51	158	2	43	0	6	17	18	0.265	6.6
28/04/2003	6.26	41	35	187	3	8	61	91	181	0	55	0	14	33	2	0.379	8.8
11/06/2003	5.81	31	22	119	0	2	43	64	89	0	14	2	25	57	5	0.813	15.6
21/07/2003	5.61	21	21	114	0	6	38	67	83	0	27	0	14	58	12	0.6	13.3
10/08/2003	6.3	83	28	156	0	8	58	96	114	0	19	1	12	50	1	0.582	14.3
08/09/2003	6.57	119	32	158	0	8	64	109	127	0	21	1	13	15	2	0.288	9.6
27/10/2003	6.45	99	31	164	0	11	85	146	156	1	22	0	8	8	2	0.187	24.4
16/12/2003	6.22	36	20	113	0	7	36	59	95	0	25	0	10	31	1	0.288	5.2
11/02/2004	5.17	-5	32	161	0	5	46	45	206	0	24	0	7	13	1	0.138	2.1
09/04/2004	6.18	33	23	128	0	2	47	73	121	0	21	2	8	26	7	0.309	5.2
20/05/2004	6.11	43	22	113	0	0	52	90	89	0	9	3	9	56	8	0.657	12.4
16/06/2004	6.05	41	19	101		3.1	31	66	59	0	12	3	11	59	16	0.757	13.1
14/07/2004	6.67	94	27	140.5		6.7	41.3	72.3	90	0	17	4	10	25	5	0.271	6.6
10/08/2004	5.26	8	20	80	0	10	36	49	59	0	15	5		44	20	0.824	12.7
13/09/2004	5.57	17	22	89.2	0	11	40	52	85	0	10	4	19	53	3	0.651	11.6
06/10/2004	5.26	0	17	64	0	9	20	25	80	0	10	1	10	18	4	0.29	3.8

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
14/12/2004	5.49	7	13	55	0	7	14	20	52	0	16	5	14	16	3	0.33	4.4
26/01/2005	5.24	-3	67	335	0	11	90	76	464	3	45	0	9	8	7	0.071	1.4
02/03/2005	6.25	36	38	200	0	10	51	65	239	2	26	1	11	8	3	0.13	2
20/04/2005	6.23	41	29	165	0	9	39	49	159	0	19	1	4	30	3	0.298	5.7
06/06/2005	5.64	21	18	92	1	3	24	32	60	0	8	3	8	44	4	0.675	12.3
14/07/2005	6.49	106	33	166	0	9	53	88	129	0	19	5	7	24	2	0.436	8.1
15/08/2005	6.6	96	32	149	0	7	56	98	137	0	20	0	8	18	1	0.446	8.7
07/09/2005	6.51	77	29	139	0	6	46	70	125	0	79	2	9	23	7	0.399	7.3
04/10/2005	5.8	17	25	129	0	7	38	48	153	0	14	0	7	36	4	0.353	7.3
06/12/2005	5.85	14	29	141	0	5	33	42	169	2	23	0	3	20	4	0.206	5
08/02/2006	5.62	12	23	111	0	8	29	40	108	1	30	4	1	23	7	0.351	8.4
26/03/2006	6.24	47	23	109	0	8	31	51	96	2	33		4.3	24	1	0.249	5.4
11/05/2006	6.37	69	30	146	0	9	39	60	136	0	23	4	5.37	18	1	0.248	5.13
07/06/2006	6.52	101	32	161	0	10	47	76	130	0	23	0	2.27	18	3	0.261	9.51
29/06/2006	6.52	98	30	137	30	7	47	70	112	0	21	2	6.42	21	0	0.334	13.51
27/07/2006	6.58	143	36	183	0	12	59	102	130	3	24	2	9.71	20	11	0.392	8.74
21/08/2006	6.11	52	30	138	0	4	49	77	115	1	20	4	15.95	48	4	0.719	17.26
13/09/2006	6.55	81	28	141	2	7	48	72	116	0	13	0	4.2	21	5	0.46	12.17
26/10/2006	5.38	8	17	80	0	9	25	31	58	0	13	0		30	12	0.626	12.42
23/11/2006	5.73	10	25	135	0	8	37	43	161	0	21	0	5.28	20	2	0.203	3.92
10/01/2007	5.63	8	24	124	0	6	30	33	143	1	18	0	4.84	17	0	0.207	5.75
21/02/2007	6.03	24	32	182	3	9	43	55	195	2	26	1	5.04	17	3	0.253	5.25
05/04/2007	6.38	77	37	189	5	9	49	73	204	1	24	0	4.71	4	0	0.143	5.08
04/06/2007	5.82	25	23	131	3	3	31	43	110	0	8	2	10.24	41	4	0.669	13.33
03/07/2007	6.13	55	24	131	5	5	40	61	95	0	9	1	12.26	53	2	0.818	14.5
09/08/2007	6.24	59	25	125	0	4	42	61	98	0	10	1	8.3	7	7	0.531	9.19
30/08/2007	6.69	80	29	138	0	4	55	85	118	0	10	2	10.84	32	11	0.674	13.3
25/10/2007	6.58	114	32	145	0	9	56	91	131	2	15	0	8.21	5	2	0.331	6.77
05/12/2007	5.72	14	18									0					
05/02/2008	5.42	3	23	117	0	5	26	26	139	1	19	0	5.27	12	2	0.153	6.3
02/04/2008	5.67	9	27	345	18	15	74	84	221	0	26	0	10.07	11	0	0.227	6.9
16/07/2008	6.35	78	30	147	0	4	51	80	113	1	21	0	9.16	28	2	0.596	11.11
01/09/2008	5.74	26	20	110	0	4	39	57	82	0	8	0	6.91	56	4	0.837	15.98
04/10/2008	5.55	14	22	96	0	7	33	42	98	0	12	0	6.69	22	75	0.572	10.93

**Table 7 Water chemistry for the Loch Laidon outflow September 1995 - April 2010**

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
24/09/1995	6.15	24	24	150	0	4	39	69	136	2	43	1		20	0	0.225	7.1
11/11/1995	5.71	14	23	118	0	6	37	60	101	2	35	2	2.5	38	2	0.331	6.2
10/01/1996	5.57	7	18	102	2	5	32	49	86	3	38	0	2.5	35	0	0.303	6.4
27/02/1996	5.66	14	22	120	3	5	38	62	105	4	47	1	2.5	29	1	0.271	5.2
03/04/1996	6.08	35	32	148	1	8	61	99	129	6	91	0	2.5	31	3	0.209	4.7
02/05/1996	5.83	16	26	129	1	5	41	68	117	5	52	0	2.5	19	2		4.5
12/06/1996	5.75	16	27	132	2	5	41	68	117	3	47	3	4	32	3	0.271	6.1
27/07/1996	6.19	21	26	130	0	4	44	83	116	4	48	0	2.5	33	1	0.218	5
18/08/1996	6.27	27	25	130	3	5	44	87	115	4	47	0	2.5	14	0	0.214	5.2
07/09/1996	6.2	28	26	134	2	6	46	93	116	4	48	0	2.5	13	3	0.21	4.7
28/09/1996	6.25	26	27	137	0	5	44	76	121	4	50	0	2.5	20	1	0.231	5.2
30/10/1996	5.81	17	27	133	0	5	44	67	120	2	42	1		52	4	0.382	7.8
03/12/1996	5.52	6	28	145	0	7	44	53	160	2	34	1	6	30	7	0.269	5.9
28/01/1997	5.78	15	26	125	2	5	40	58	135	5	31	0	2.5	15	1	0.173	3.8

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
10/03/1997	5.51	2	32	171	0	5	45	55	196	2	34	0	2.5	20	2	0.141	3.1
30/04/1997	5.79	8	33	177	0	6	45	55	199	1	33	0	2.5	15	8	0.152	3.3
21/05/1997	5.54	3	30	167	5	6	42	51	188	2	31	1	2.5	22	0	0.174	4.2
05/07/1997	5.84	16	30	159	7	6	41	58	170	2	31	0		21	1	0.202	4.3
30/07/1997	6	15	29	159	0	6	41	61	162	2	32	9	10	16	5	0.197	4.8
19/08/1997	6.22	24	29	155	2	5	42	72	154	2	31	0	2.5	14	1	0.209	4.9
07/09/1997	6.08	20	29	155	0	5	42	69	153	2	31	1	2.5	27	1	0.263	5.9
05/10/1997	5.99	18	27	141	0	5	44	73	134	2	27	1	2.5	35	2	0.362	8.1
14/11/1997	6.31	26	25	137	2	7	39	63	128	3	28	1	2.5	22	3	0.323	7.2
05/01/1998	5.83	17	23	126	0	6	38	57	116	3	34	1	17	39	1	0.325	6
05/02/1998	5.75	13	23	119	0	5	34	50	116	2	28	1	2.5	43	1	0.249	5.7
21/03/1998	5.85	15	23	131	0	5	34	49	128	2	31	1	2.5	27	2	0.197	4.7
20/06/1998	5.9	15	27	156	0	9	41	56	161	2	29	1	2.5	18	3	0.168	4.1
20/07/1998	6.15	23	28	153	0	5	43	63	148	1	29	1	2.5	19	6	0.243	5.4
09/08/1998	6.06	26	26	142	0	4	41	62	126	3	28	0	2.5	29	2	0.293	7
29/08/1998	6.07	22	24	125	0	3	36	57	115	1	25	1	2.5	20	3	0.344	7
27/09/1998	6.08	28	22	122	0	4	38	69	105	2	24	1	2.5	26	1	0.373	7.7
25/10/1998	5.94	21	24	126	0	4	39	63	116	2	28	3	6	30	2	0.377	9.7
25/11/1998	5.63	10	28	147	0	5	43	60	165	1	29	1	2.5	34	5	0.285	6.6
12/02/1999	5.89	20	32	176	0	5	47	68	200	2	31	0	6	13	2	0.098	2.8
25/03/1999	5.48	2	36	203	0	5	45	47	243	1	31	1	6	28	1	0.149	3.9
10/05/1999	5.88	14	26	168	0	5	37	50	188	1	27	1	2.5	20	1	0.169	3.8
17/06/1999	5.81	23	24	142	0	3	42	58	130	0	12	2	6	49	12	0.579	11.7
12/07/1999	5.95	16	27	166	0	5	38	54	171	1	25	0		15	0	0.257	6.6
03/08/1999	6.09	19	26	153	0	4	38	59	156	1	24	0	2.5	18	0	0.255	5.8
01/09/1999	5.84	20	27	150	0	4	37	57	144	1	24	2	6	25	1	0.267	5.2
26/09/1999	5.99	23	25	133	0	4	37	64	132	3	27	2	2.5	23	0	0.34	7.2
06/11/1999	5.93	18	25	139	0	5	41	66	143	2	27	1	2.5	27	0	0.317	7
20/01/2000	5.65	8	27	155	0	3	40	56	174	2	30	2	6	17	2	0.127	3.3
05/03/2000	5.3	-1	39	225	0	5	55	55	272	1	34	1	2.5	23	5	0.102	2.9
14/04/2000	5.65	6	32	194	0	6	43	58	220	1	28	0	6	9	0	0.1	2.5
31/05/2000	5.88	10	30	179	0	5	48	66	206	1	28	0	2.5	22	4	0.114	2.6
17/06/2000	5.97	16	31	191	0	6	45	65	199	1	29	0	2.5	18	4	0.137	3.6
12/07/2000	5.97	15	30	178	0	4	43	57	186	1	29	0	6	9	5	0.357	4.2
05/08/2000	6.07	17	30	174	2	5	38	52	186	2	29	0	2.5	14	0	0.16	4.4
04/09/2000	6.11	22	31	168	0	4	38	60	186	1	30	0	2.5	7	0	0.17	4.4
08/10/2000	6.04	23	30	171	0	5	43	67	175	1	27	1	2.5	31	0	0.332	6.1
21/11/2000	5.93	22	25	135	0	5	36	61	134	2	22	0	17	27	0	0.312	6.3
09/01/2001	5.87	23	22	118	0	5	33	59	110	3	27	0	6	28	2	0.221	5.5
08/03/2001	5.67	10	20	100	3	5	26	41	99	8	26	0	11	13	2	0.23	4.6
26/04/2001	5.96	18	22	116	2	4	28	53	114	3	29	0	2.5	15	0	0.206	5
06/06/2001	5.97	19	23	126	4	5	29	51	115	3	31	2	6	15	2	0.207	5.2
03/07/2001	6.31	34	24	131	4	7	31	66	119	3	32	2	14	18	1	0.273	5.4
23/07/2001	6.27	32	24	143	7	15	32	60	129	5	31	0	2.5	12	0	0.277	7.1
19/08/2001	6	27	22	112	1	3	31	58	95	3	27	1	6	24	0	0.349	7.8
07/10/2001	6.05	27	24	115	0	5	34	57	107	4	28	3	10	26	3	0.379	8.7
14/11/2001	6.15	33	21	104	1	6	31	70	97	3	22	1	2.5	17	3	0.325	7.3
10/12/2001	5.96	28	20	107	0	8	32	59	101	2	23	3	6	22	2	0.3	6.5
22/01/2002	5.64	10	21	129	0	8	32	46	130	2	28	5	6	27	1	0.287	6.4
04/04/2002	5.78	11	39	233	0	7	55	64	284	1	37	0	2.5	5	6	0.095	2.8
07/05/2002	5.97	15	41	247	0	8	55	69	280	1	36	0	6	8	0	0.101	2.9
12/06/2002	5.87	15	34	202	0	6	48	60	209	0	29	1	11	17	4	0.251	6.7
14/07/2002	6.04	20	31	179	0	6	45	79	180	1	27	2	6	11	6	0.299	6.9
31/07/2002	5.92	20	28	172	0	5	40	56	164	1	25	1	11	15	9	0.318	
01/09/2002	6.05	24	25	161	0	5	42	64	146	1	25	0	2.5	17	0	0.352	8.4
29/09/2002	6.03	29	26	157	0	6	43	74	145	2	25	0	6	9	9	0.365	8.3

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
21/10/2002	6.27	33	26	147	1	5	43	74	139	2	27	3	25	19	3	0.362	7.7
08/12/2002	5.98	23	25	138	4	6	39	62	132	3	30	1	20	21	6	0.356	8.7
26/01/2003	5.83	15	30	157	0	7	48	66	171	3	33	1	20	24	2	0.184	6.2
03/03/2003	5.83	12	30	154	3	6	42	51	177	3	31	1	8	17	1	0.217	5.4
28/04/2003	5.92	13	29	160	4	6	42	52	182	2	32	1	12	11	2	0.171	4
11/06/2003	5.96	19	27	151	3	7	38	53	153	1	30	1	12	16	0	0.288	6.2
21/07/2003	5.94	25	26	144	3	7	37	62	141	1	30	1	7	10	4	0.276	7.5
10/08/2003	6.15	21	24	139	1	5	38	60	135	2	29	0	6	24	6	0.27	10.8
08/09/2003	6.28	30	26	138	2	7	39	69	134	2	30	0	12	12	0	0.272	13.1
27/10/2003	6.13	36	25	137	0	7	52	101	135	2	29	0	9	12	1	0.279	24.5
16/12/2003	5.91	20	27	150	0	6	43	68	151	2	34	0	12	29	2	0.3	6.51
12/02/2004	5.72	9	27	143	0	4	36	47	159	1	26	0	11	31	2	0.201	3.2
09/04/2004	6.04	23	27	151	0	0	41	67	169	0	29	1	11	20	2	0.169	3.1
20/05/2004	5.97	20	24	136	0	2	37	53	141	1	22	3	10	17	5	0.225	4.6
16/06/2004	6.17	27	25	134		5.8	26.5	59.7	125	0	22	4	11	19	3	0.263	5.7
14/07/2004	6.11	25	24	124.8		4.6	26.6	46.3	113	0	23	3	27	15	2	0.199	4.6
10/08/2004	6.26	33	23	119	0	5	28	54	101	4	23	3		14	2	0.29	4.7
13/09/2004	6.03	26	23	111.5	0	5	31	52	91	2	20	3	17	33	0	0.439	7.8
06/10/2004	5.5	10	22	100	0	6	27	43	102	0	19	2	26	39	15	0.456	5.4
14/12/2004	5.59	12	22	109	0	6	26	37	100	0	22	2	20	36	14	0.441	5.7
26/01/2005	6.15	34	47	229	0	7	57	84	284	3	35	1	10	8	0	0.093	1.5
02/03/2005	5.59	4	52	281	1	8	74	64	365	0	39	1	11	5	4	0.086	1.4
20/04/2005	5.65	4	40	228	0	7	55	43	276	2	30	1	4	12	0	0.116	3
06/06/2005	5.87	18	38	197	0	7	45	49	239	1	29	1	3	14	2	0.167	4.2
14/07/2005	6	19	32	180	0	6	39	47	200	1	26	2	9	23	0	0.245	5.2
15/08/2005	6.03	23	31	169	0	6	36	55	192	1	27	2	6	9	1	0.228	4.9
07/09/2005	6.07	23	30	157	0	6	37	51	177	1	27	0	6	12	2	0.269	5.6
04/10/2005	5.97	21	26	143	0	5	36	49	151	1	23	0	5	17	1	0.329	6.9
06/12/2005	5.96	23	29	139	0	8	34	54	169	2	24	0	3	17	1	0.215	5.9
08/02/2006	5.69	11	25	125	0	6	27	37	142	2	23	2	4	21	4	0.219	5.4
26/03/2006	5.93	23	23	117	0	5	27	43	129	2	24	14	15	13	0	0.181	3.9
11/05/2006	6.18	24	24	116	0	5	26	43	125	1	23	1	2.43	11	0	0.172	4.31
07/06/2006	6.06	20	25	130	0	5	28	41	136	2	24	0	2.24	14	1	0.196	8.38
29/06/2006	6.18	19	24	121	23	6	28	37	132	1	22	1	5.31	7	2	0.199	10.75
27/07/2006	6.17	22	24	141	0	6	30	43	131	1	24	4	8.69	9	1	0.201	5.54
21/08/2006	6.04	25	26	124	0	5	26	41	128	1	26	2	8.31	8	1	0.226	7.73
13/09/2006	6.28	24	25	128	2	5	28	44	127	2	26	1	4.7	9	4	0.25	7.44
26/10/2006	5.82	20	22	121	0	4	30	44	101	1	20	0		30	4	0.491	10.23
23/11/2006	5.88	18	21	113	7	6	30	45	113	2	63	1	7.34	18	1	0.351	6.79
21/02/2007	5.49	2	44	243	5	6	59	51	298	2	33	0	5.67	11	2	0.108	4.37
05/04/2007	5.7	8	34	186	4	5	38	40	225	1	27	0	4.23	5	1	0.135	4.51
04/06/2007	5.94	52	31	168	0	5	34	45	192	1	24	1	7.02	9	2	0.207	5.68
03/07/2007	6.08	21	31	167	5	7	34	47	185	0	23	0	12.59	14	2	0.286	6.69
09/08/2007	6.16	32	30	154	0	5	33	53	159	0	21	0	5.97	23	4	0.291	6.22
30/08/2007	6.01	28	28	147	0	5	33	47	149	1	21	1	7.68	19	4	0.393	8.9
25/10/2007	6.21	41	27	137	0	5	34	62	135	3	21	0	7.52	6	1	0.359	7.16
05/12/2007	5.88	20	25	132	0	5	32	42	139	1	20	0	7.64	14	3	0.394	7.47
05/02/2008	5.51	5	24	125	0	4	25	28	142	1	22	0	4.99	14	1	0.153	6.39
02/04/2008	5.61	6	34	299	10	8	64	66	267	0	34	0	7.07	10	4	0.165	6.4
16/07/2008	6	18	33	170	0	5	35	44	191	1	28	0	6.46	5	1	0.187	3.58
01/09/2008	6	24	28	155	0	6	39	58	152	0	24	0	7.5	27	5	0.428	9.93
04/10/2008	5.86	21	27	135	0	4	35	49	139	1	20	2	6.5	14	10	0.402	8.26
09/12/2008	5.86	15	26	128	0	5	30	37	145	1	21	10	2.27	8	1	0.223	5.33
12/01/2009	5.47	4	31	160	0	5	35	35	187	1	25	0	4.15	25	4	0.179	6.04
18/03/2009	5.81	12	32	172	0	4	35	43	199	1	26	0	3.74	15	2	0.141	3.39
27/04/2009	5.76	12	30	173	0	3	32	36	175	0	22	0	3.94	13	5		7.55

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
12/05/2009	5.96	18	31	156	0	4	31	38	176	1	22	0	2.42	12	1		4.16
12/06/2009	5.96	20	30	156	2	5	29	36	174	1	21	1	2.49	10	1	0.271	4.48
15/07/2009	6.03	18	28	145	0	4	29	41	158	2	22	0	1.78	13	0	0.213	4.7
11/08/2009	6.12	22	28	150	2	5	32	44	155	1	21	0	7.56	15	3	0.318	12.77
28/09/2009	5.92	22	22	114	1	3	28	39	106	1	16	0	5.21	8	16	0.358	9.81
16/11/2009	5.82	18	21	100	1	4	26	36	102	2	14	0	5.64	21	2	0.356	5.87
30/04/2010	6.18	39	24	119	0	5	33	61	103	8	18	2	3.54	41	0	0.552	10.43

**Table 8 Water chemistry for the recently planted forest site September 2000 - April 2010**

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
04/09/2000	7.27	330	58	196	0	12	71	295	157	2	45	0	2.5	5	33	0.068	2.4
08/10/2000	5.89	22	28	160	0	5	46	56	173	0	14	0	2.5	39	8	0.227	6.3
21/11/2000	5.72	19	22	124	0	3	35	46	115	0	18	0	12	58	0	0.437	8.1
09/01/2001	5.73	16	16	87	0	3	24	38	60	1	19	0	17	51	3	0.374	7.9
08/03/2001	5.61	9	21	98	0	6	31	43	95	0	36	0	6	29	0	0.3	6.2
26/04/2001	5.79	19	25	143	4	5	40	57	127	0	32	0	2.5	59	2	0.385	8.8
06/06/2001	5.92	41	24	140	2	2	40	59	101	0	19	3	6	42	14	0.397	8.9
03/07/2001	5.74	37	20	113	0	1	39	63	64	0	12	2	6	108	0	0.752	15.2
23/07/2001	5.89	38	20	107	1	2	43	64	70	2	10	0	6	73	4	0.732	14.8
19/08/2001	5.77	47	20	106	0	3	48	73	69	1	10	14	16	42	34	0.771	17.9
07/10/2001	5.4	9	24	102	0	8	41	52	115	1	15	2	2.5	52	5	0.535	10.9
14/11/2001	5.91	30	19	96	0	6	35	60	80	1	17	2	2.5	31	6	0.408	9.4
10/12/2001	6	35	19	102	0	5	34	55	77	1	19	4	6	32	8	0.4	8.3
22/01/2002	5.52	5	17	101	0	5	27	36	106	0	16	0	2.5	22	1	0.263	6
04/04/2002	5.48	9	36	229	0	8	47	58	255	1	31	0	2.5	14	17	0.224	5.3
07/05/2002	5.76	39	33	210	0	10	43	58	189	0	16	2	6	26	10	0.316	7.3
12/06/2002	5.7	29	26	131	0	3	40	54	80	0	10	2	6	64	10	0.758	
14/07/2002	5.93	71	27	145	0	4	54	80	99	0	10	4	16	36	19	0.646	14.8
31/07/2002	5.67	31	19	95	0	2	45	65	52	0	8	4	18	58	15	0.856	
01/09/2002	6.06	75	25	139	0	3	65	97	118	0	12	0	2.5	41	7	0.619	14.1
29/09/2002	6	111	30	152	0	3	77	94	132	0	12	1	6	8	51	0.385	9.7
21/10/2002	6.1	27	30	146	2	10	57	81	163	0	26	2	26	27	15	0.283	7.9
08/12/2002	5.97	36	22	122	0	5	38	60	97	1	27	1	24	35	6	0.371	8.9
26/01/2003	5.42	4	41	206	0	6	66	77	272	0	35	0	17	22	5	0.18	4.6
03/03/2003	5.66	10	32	171	2	7	43	51	180	0	45	0	7	38	1	0.232	5.2
28/04/2003	5.74	19	33	184	4	4	50	65	189	0	44	0	13	27	5	0.257	6.2
11/06/2003	5.7	28	21	119	0	1	37	53	81	0	9	2	14	48	15	0.668	12.7
21/07/2003	5.68	29	18	97	1	2	37	57	64	0	16	5	10	30	16	0.511	11.8
10/08/2003	5.59	107	30	149	2	5	79	109	102	2	7	6	16	126	5	1.028	19.5
08/09/2003	5.65	126	32	142	0	3	73	109	123	0	12	0	15	23	8	0.304	11.5
27/10/2003	5.89	54	31	162	0	4	72	121	185	1	22	0	7	5	2	0.115	21.7
16/12/2003	6	32	18	108	0	4	32	58	85	0	24	0	17	36	3	0.318	6.68
11/02/2004	5.4	0	32	165	0	6	50	53	208	0	24	0	8	17	3	0.143	2.3
09/04/2004	5.91	20	23	133	0	0	40	59	127	0	21	2	8	26	13	0.271	5.1
20/05/2004	6.01	38	22	129	0	0	41	64	107	1	9	2	9	42	14	0.44	8.2
16/06/2004	5.92	37	18	104		1.9	25.6	58.7	62	0	10	1	12	50	24	0.597	11.1
14/07/2004	6.03	65	22	115.2		1.9	31.2	50.3	73	0	9	3	10	43	15	0.115	9.5
10/08/2004	5.39	12	19	80	0	4	36	54	60	0	14	2		43	16	0.754	12.3
13/09/2004	5.52	15	23	92.5	0	5	40	55	93	0	9	3	16	51	17	0.599	10.8
06/10/2004	5.43	4	18	70	0	9	23	35	88	0	11	2	10	16	8	0.279	4.1
14/12/2004	5.59	7	13	62	0	5	15	22	53	0	16	1	24	17	5	0.38	4.9

Date	pH	Alk 2	Cond	Na	NH4	K	Mg	Ca	Cl	NO3	SO4	PO4-P	Total P	Al-NL	Al-L	Abs-250	TOC
26/01/2005	5.09	-7	74	376	0	8	93	92	525	0	49	0	8	3	13	0.042	1
02/03/2005	5.52	5	41	227	1	7	49	55	282	0	31	1	11	9	7	0.091	1.8
20/04/2005	5.83	22	29	175	0	7	34	36	177	0	15	1	4	35	2	0.251	5.2
06/06/2005	5.55	18	20	113	0	2	23	29	75	0	7	2	5	48	3	0.666	11.5
14/07/2005	5.59	100	30	158	0	3	51	66	108	0	6	1	10	58	6	0.507	10
15/08/2005	6.14	59	27	142	0	3	41	67	133	0	20	0	9	4	1	0.264	6.6
07/09/2005	5.93	30	27	138	0	3	43	60	129	0	12	1	12	38	3	0.379	7.7
04/10/2005	5.48	9	26	130	0	3	39	48	164	0	11	0	7	39	4	0.297	7.5
06/12/2005	5.54	7	28	145	0	3	31	38	170	0	25	0	2	23	9	0.194	5.2
08/02/2006	5.54	11	23	113	0	6	25	34	107	0	25	4	3	26	11	0.331	8.4
26/03/2006	5.78	20	19	102	0	5	21	30	82	1	30	76	13	29	4	0.271	5.5
11/05/2006	5.69	34	28	136	0	4	32	40	138	1	15	5	2.93	44	5	0.26	5.92
07/06/2006	5.58	53	27	144	0	2	37	49	120	0	7	2	4.58	66	10	0.411	10.83
29/06/2006	5.85	56	24	118	19	1	36	41	98	0	12	2	5.19	41	4	0.321	9.77
27/07/2006	5.74	150	33	158	0	5	70	92	109	0	8	5	13.08	21	8	0.452	9.75
21/08/2006	5.73	29	26	124	1	2	34	47	103	0	24	2	7.74	41	5	0.395	11.28
13/09/2006	5.91	46	25	137	2	3	38	53	115	0	10	1	4.34	43	8	0.416	10.95
27/10/2006	5.32	7	22	98	0	11	33	40	90	0	14	0		40	15	0.526	13.61
23/11/2006	5.45	3	26	131	0	6	38	42	167	0	20	2	5.22	19	3	0.192	3.87
10/01/2007	5.28	2	23	115	0	4	26	30	128	0	17	0	4.68	17	5	0.221	6.42
21/02/2007	5.51	6	34	207	7	6	41	47	221	1	30	0	4.94	17	7	0.194	6.23
05/04/2007	5.62	17	37	196	5	7	42	48	241	1	22	0	4.55	12	1	0.121	4.74
04/06/2007	5.59	17	24	143	0	2	26	33	121	0	7	1	9.85	40	12	0.61	12.12
03/07/2007	5.74	38	23	131	4	3	34	46	88	0	7	3	12.63	71	11	0.88	15.93
09/08/2007	5.81	63	26	128	0	3	45	60	95	0	8	3	7.74	11	3	0.609	13.37
30/08/2007	6.38	58	30	137	2	3	60	89	119	2	10	4	10.81	71	35	0.895	19.12
25/10/2007	5.85	64	31	148	0	8	50	64	157	1	9	0	8.28	9	1	0.352	7.92
05/12/2007	5.63	13	20	102	0	6	27	32	101	0	11	0	5.36	17	3	0.444	8.5
05/02/2008	5.54	6	23	116	0	4	26	29	140	0	19	1	5.08	9	3	0.133	5.83
02/04/2008	5.41	4	32	356	13	20	73	78	270	0	28	0	8.33	10	0	0.197	6.94
16/07/2008	5.68	37	26	135	0	3	33	43	101	0	24	0	7.22	35	7	0.367	7.97
01/09/2008	5.42	14	23	120	0	2	34	45	100	0	6	0	7.65	50	20	0.698	16.3
04/10/2008	5.34	5	24	111	0	5	33	37	124	0	9	8	5.15	20	18	0.458	9.73
09/12/2008	5.6	11	22	115	0	2	24	28	117	0	17	0	2.36	16	3	0.225	5.42
12/01/2009	5.33	0.16	25	126	0	3	27	28	147	0	20	0	3.78	13	3	0.172	6.7
18/03/2009	5.55	8	28	147	0	4	27	29	162	1	19	0	2.45	22	2	0.18	4.11
27/04/2009	5.49	9	27	168	1	3	28	31	147	0	10	0	4.32	15	25		11.48
12/05/2009	6.74	90	34	156	0	7	45	78	166	0	20	2	2.05	17	2		4.74
12/06/2009	5.61	54	28	152	0	1	36	42	135	0	3	3	2.68	38	17	0.537	8.1
15/07/2009	5.83	37	22	114	2	3	31	44	86	2	9	4	4.29	31	14	0.474	9.91
11/08/2009	5.63	31	25	125	2	1	43	56	110	0	3	0	6.42	52	6	0.74	24.02
16/11/2009	5.55	13	16	80	0	5	21	27	58	0	9	0	6.33	137	12	0.588	7.96
30/04/2010	6.23	26	21	106	0	4	22	39	105	1	18	1	2.38	17	0	0.237	5.19

N.B. Chemistry for this site funded by MS Pitlochry since 04/2007

**Table 9 Macroinvertebrate taxon list and total abundances – Control Burn.**

TAXON	1993	1994	1996	1997	1998	1999	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010
NEMATODA			1													
OLIGOCHAETA	22	6	8	3	5	2	1	3	3	2	3		4	3		3
TUBIFICIDAE												1	3			3
ENCHYTRAEIDAE												1	3	1		2
LUMBRICULIDAE										1		1				3
<i>Stylogrilus heringianus</i>																2
LUMBRICIDAE										1			2			1
HYDRACARINA						1		4	6		18	8				6
COLLEMBOLA																1
SIPHONURIDAE										1						
<i>Siphonurus</i> sp.												1				
<i>Siphonurus lacustris</i>								1	4	2	5					
<i>Ameletus inopinatus</i>	11	4			1	1	3						3	6		
BAETIDAE									4	2						
<i>Baetis</i> sp.				52							23		6	19	2	1
<i>Baetis rhodani</i>	5		7		39	30	20	142	138	34		12	50	34	9	40
<i>Baetis muticus</i>	3	2	3				1	1				12		1		
<i>Baetis niger</i>													22	3	3	
HEPTAGENIIDAE					9					1	1				1	
<i>Heptagenia</i> sp.									2							
<i>Heptagenia lateralis</i>	3	18	11	9	2	3	13	10	16	4	5			1	1	
<i>Ecdyonurus</i> sp.					1											
<i>Ecdyonurus dispar</i>				1												
<i>Leptophlebia marginata</i>			1			1										
<i>Leptophlebia vespertina</i>													2	1		1
<i>Brachyptera risi</i>								1								
<i>Protonemura praecox</i>							1									
<i>Amphinemura sulcicollis</i>	168	32	27	17	52	54	103	57	76	69	38	26	161	91	12	87
<i>Nemurella picteti</i>				1												
<i>Nemoura</i> sp.												1				
LEUCTRIDAE					1											
<i>Leuctra</i> sp.									9	2	19	2	7			
<i>Leuctra inermis</i>	41	6	1	5	3	22	30	2	8	2	3	5	10	18	3	20
<i>Leuctra hippopus</i>		1														
<i>Perlodes microcephala</i>	2					1									2	
<i>Isoperla grammatica</i>	106	4	8	9	20	25	25	32	17	5	6	14	21	24	9	12
<i>Siphonoperla torrentium</i>	109	48	54	2	61	29	30	29	23	12	6	4	49	51	11	11
<i>Chloroperla tripunctata</i>				11												4
<i>Cordulegaster boltonii</i>																1
<i>Velia</i> sp.											1					
<i>Oreodytes rivalis</i>	18	36	7	1												
<i>Platambus maculatus</i>		1														

TAXON	1993	1994	1996	1997	1998	1999	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010
HYDROPHILIDAE									1							
Hydraena gracilis								2								
Elodes sp.	1															
Elmis aenea	17		1		88	2	1	1			2					
Esolus sp.																
Esolus parallelepipedus												9	1			
Limnius volckmari	129	16	46	17		34	65	32	54	56	37	39	59	43	9	54
Oulimnius sp.					3				83	11		68	5	21	6	40
Oulimnius tuberculatus	55	22	21	5		14	8	27			91					
Sialis lutaria																1
Rhyacophila sp.								1		2						1
Rhyacophila dorsalis	1		1	2		4	2	1			1					
POLYCENTROPODIDAE									4			7	4	4		2
Plectrocnemia conspersa	6	1	5	3	2			4	8	1	6	1	3	2	2	3
Plectrocnemia geniculata		2														
Polycentropus sp.						2										
Polycentropus flavomaculatus		2	3		4			1	2	4	13	11	8	8	2	2
Tinodes sp.											1					
Hydropsyche sitalai	1				1					1		2	6	3		
HYDROPTILIDAE										2						
Agraylea sp.													1			
Hydroptila sp.		2									19	9				2
Oxyethira sp.		1										5	1			
LIMNEPHILIDAE	10	7	6		3	3	4	1	3		4	5	9	8	1	8
Potamophylax sp.										1						
Potamophylax cingulatus																1
Halesus sp.								1					1			
Halesus radiatus												2		1		1
Chaetopteryx villosa											2		7			
DIPTERA					2				1	2		3	3			3
TIPULIDAE	2	1						2	1	3	7		1	1		
Dicranota sp.	8	2	3	3	1	5	1	8	4	3		2	12	7		11
Psychodidae	1															
CHIRONOMIDAE	26	17	28	13	6	11	4	40	12	15	157	59	24	12	5	53
SIMULIIDAE	23		1	23	3	11	1	5	3	2	39		5	6	1	2
EMPIDIDAE						2		1			1	1	1		1	3



**Table 10 Macroinvertebrate taxon list and total abundances – Experimental Burn.**

TAXON	1993	1994	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
NEMATODA	2		1	1													
Pisidium sp.		1												1			
OLIGOCHAETA	14	10	26		3			3	1		8	1			3	1	2
NAIDIDAE																1	1
TUBIFICIDAE																	1
ENCHYTRAEIDAE										4			1				1
LUMBRICULIDAE														1	1		
Stylodrilus heringianus															1		
LUMBRICIDAE												2		2		1	
HYDRACARINA					1			1	8		7	1	4			1	
COLLEMBOLA					1				1			2				1	1
Siphonurus sp.													1				
Siphonurus lacustris			35				1		1			2					
Baetis sp.		1									1			3	4		2
Baetis rhodani				1	1	1			3			1	1	1			1
Baetis muticus	9		3														
Baetis niger														1			
LEPTOPHLEBIIDAE														2	17	1	5
Leptophlebia sp.									1		21	4	8				
Leptophlebia marginata	16	19	6			7	5	3		2		6			8	1	1
Leptophlebia vespertina	20	61	9	9		7	15	42	5	2		25	35	62	47	24	23
Protonemura meyeri	1																
Amphinemura sulcicollis	20	1	2	14	7	7	12	1	4	2	1	3		3	2		1
Nemurella picteti				1													
Nemoura sp.							1										
Nemoura avicularis		2				1			1	1							
Nemoura cambrica	2		1			1		3				6	4	16	6	2	1
Leuctra sp.									1		5				1		
Leuctra inermis	1																
Leuctra hippopus					1		1	1									
Leuctra nigra	1																
Isoperla grammatica	7				2	4	6	1	1			3		2	7		2
Siphonoperla torrentium	23	5		5	3	1	2				6	6	3	1	1		2
ODONATA												1					
Pyrrhosoma nymphula	1	1				1											
Cordulegaster boltonii	1														1		

TAXON	1993	1994	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
VELIIDAE									3					3			
Velia sp.											2						
Dytiscidae undet. (larvae)		1		1													
Agabus guttatus	1																
Anacaena globulus			1											1			1
Elodes sp.															1		
Elmis aenea																	1
Esolus parallelepipedus													1	1			
Limnius volckmari	2	5		17	1	1	1	2		2	2			1	2	1	1
Oulimnius sp.					9				27	20		14	10	6	12	11	1
Oulimnius tuberculatus	151	98	19	15		12	20	14			78						
POLYCENTROPODIDAE									5	1	7	8	9	7	6	2	7
Plectrocnemia conspersa	13	9	9	15	1	2	5	35	9	5	6	8	5	4	8	2	1
Plectrocnemia geniculata		1															
Polycentropus sp.						2	6										
Polycentropus flavomaculatus	23	6	6		3	5		13	13	6	16	15	21	8	11	4	19
Polycentropus irroratus												3					
Hydropsyche sp.								1									
HYDROPTILIDAE	38				2				1	5							
Hydroptila sp.			1								2				1		
Oxyethira sp.		29				4		2			1	2	2	3			1
LIMNEPHILIDAE	66	2	7	4	17	41	47	5	6	15	29	19	10	14	24	17	16
Potamophylax rotundipennis					1												
Halesus sp.							1					1				2	1
Halesus radiatus			6					4				5			2	1	
Halesus digitatus								1									
Chaetopteryx villosa											14			2			
DIPTERA					2				2	1				1	1		
TIPULIDAE	1			1				1		1	3	1					1
Dicranota sp.	6	2	1	3	2	2	3	1				1		3	3		1
CERATOPOGONIDAE														1			
CHIRONOMIDAE	56	86	104	15	24	36	22	89	33	33	93	27	32	30	52	9	28
SIMULIIDAE	2		1	1	5	6	11	3	8	14	1	16		57	10	1	5
Simulium latipes		3															
EMPIDIDAE					2	1					1				1		
Clinocera sp.							1										
ANISOPTERA														1			
GERRIDAE								1									

**Table 11 Macroinvertebrate taxon list and total abundances – Allt Riabhach na Bioraich Burn**

TAXON	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
NEMATODA	1												1		
Pisidium sp.												1			
OLIGOCHAETA	12		5	12	1	13	1		2	2	2	6	7		1
NAIDIDAE							1				1		1		
TUBIFICIDAE										1	1	1			
ENCHYTRAEIDAE								2			1	6	10		4
LUMBRICULIDAE							2	1			2	1	3		1
Stylodrilus heringianus								2			1		7	1	1
LUMBRICIDAE								1				2			1
HYDRACARINA						2	6		14	9	9	5	1	5	1
COLLEMBOLA								1							
Siphonurus sp.							1					1			
Siphonurus lacustris	17					3			9		11	3			
Ameletus inopinatus										1					4
BAETIDAE												3		1	
Baetis sp.									45	1		1			1
Baetis rhodani			8	4		8	16	21		57	14	46	123	27	44
Baetis muticus											1				
Baetis niger															1
HEPTAGENIIDAE									1						
Heptagenia lateralis	2	1	2	1	2										1
Leptophlebia sp.									1			1			
Leptophlebia vespertina	5										9	3	1	1	
Brachyptera risi				1											1
Amphinemura sulcicollis	9	23	28	25	99	45	27	85	14	51	26	92	178	17	74
Nemoura sp.		2													
Nemoura cambrica				1									1	1	
Leuctra sp.						6	3	1	13	19	5	15	3	1	1
Leuctra inermis		2	14	27	17	3	5	12	1	14	2	4	17	5	33
Leuctra hippopus															1
Perlodes microcephala															1
Isoperla grammatica	3	46	45	36	74	79	37	55	14	76	2	27	58	17	19
Siphonoperla torrentium	7	8	33	24	20	8	3	4	2	9	3	4	18	1	26

TAXON	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Chloroperla tripunctata		5													6
Cordulegaster boltonii								1							
Dytiscidae undet. (larvae)	1														
Oreodytes rivalis	1														
Oreodytes sanmarkii				1		1									
Agabus arcticus												1			
Anacaena globulus												1		1	
Elodes sp.										1					
Elmis aenea															1
Limnius volckmari	3	7	9	18	22	20	19	18	27	31	14	32	76	6	81
Oulimnius sp.			1				79	25		36	20	18	39	11	17
Oulimnius tuberculatus	9	10		4	56	40			23						
Sialis fuliginosa								1					2		
Rhyacophila sp.						3				2	2	1	4	1	1
Rhyacophila dorsalis				1		2	1								
Rhyacophila obliterated									1						
POLYCENTROPODIDAE									1	1		3	3		
Plectrocnemia conspersa	11	1	1	1	2	3	4	4	5	4	14	3	3	1	
Polycentropus flavomaculatus	1			3			6	4	15	7	3	7	2	4	4
Hydropsyche siltalai															7
HYDROPTILIDAE															1
Hydroptila sp.									1		1	3		3	
Oxyethira sp.									2				1		
LIMNEPHILIDAE	6	3	6	5	8	6	4	8	3	2	11	18	24	3	14
Ecclisopteryx guttulata			1										2		
Halesus sp.									6			1	1		
Halesus radiatus								2		2	5	4		1	
Halesus digitatus						2									
Chaetopteryx villosa									2			5			
DIPTERA			1	1				6		4	8	5	3	2	2
TIPULIDAE							1	3	6			1	1	1	1
Dicranota sp.	7		5	9		5	3	8		20	4	9	11	1	7
CHIRONOMIDAE	14	7	10	18	6	186	8	18	81	26	33	31	18	12	8
SIMULIIDAE		12	1	76	1	2	7	1	7	8		3	5		
EMPIDIDAE								2	2				13	1	

TAXON	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
ANISOPTERA												4			

**Table 12 Control Burn macroinvertebrate summary statistics**

<b>Year</b>	<b>1993</b>	<b>1994</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Total Count</b>	768	231	256	178	307	257	314	409	428	241	508	667	311	494	371	78	385
<b>Total no. of taxa</b>	24	22	27	19	21	23	18	26	19	21	23	20	19	18	16	12	19
<b>RICHNESS (rareftn 100)</b>	17	17	18	15	12	17	13	15	14	17	17	14	16	13	13	12	14
<b>HILL'S N1</b>	11.5	11.9	12.8	10.6	8.0	11.8	7.8	8.9	8.7	9.0	10.3	9.5	11.0	8.5	9.5	9.5	9.7
<b>HILL'S N2</b>	8.4	9.0	9.0	7.5	5.9	9.3	5.6	5.8	6.2	6.0	6.6	7.2	8.1	6.0	7.6	9.2	7.5
<b>EVENNESS (E5)</b>	0.71	0.73	0.68	0.68	0.69	0.76	0.67	0.61	0.68	0.63	0.60	0.73	0.71	0.66	0.78	0.97	0.75
<b>BMWP</b>	110	99	125	88	88	118	93	108	88	104	116	101	84	104	103	77	103
<b>ASPT</b>	6.4	6.6	6.6	6.3	6.3	6.6	6.1	6.7	6.8	6.5	6.4	6.7	6.5	6.5	6.9	7.0	6.4

**Table 13 Experimental Burn macroinvertebrate summary statistics**

<b>Year</b>	<b>1993</b>	<b>1994</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Total Count</b>	477	231	247	110	96	142	162	227	134	114	313	183	147	238	233	83	128
<b>Total no. of taxa</b>	25	20	20	18	20	22	19	22	18	14	18	19	13	19	16	10	19
<b>RICHNESS (rareftn 100)</b>	18	14	14	16	19	19	16	13	16	13	13	16	12	14	12	9	17
<b>HILL'S N1</b>	11.3	7.9	7.7	11.4	11.9	9.8	10.1	6.6	9.0	8.5	7.6	10.1	6.5	6.4	6.7	6.2	8.3
<b>HILL'S N2</b>	6.9	5.4	4.6	10.0	8.5	6.4	7.3	4.5	6.7	6.7	5.6	8.1	5.1	5.2	4.9	5.3	6.3
<b>EVENNESS (E5)</b>	0.57	0.64	0.54	0.87	0.69	0.61	0.69	0.67	0.71	0.76	0.70	0.78	0.75	0.59	0.68	0.82	0.72
<b>BMWP</b>	108	83	82	67	94	84	93	80	79	52	88	79	69	74	92	44	84
<b>ASPT</b>	6.4	5.5	5.9	6.1	6.3	6.5	7.0	5.7	6.6	5.2	5.9	6.6	6.2	6.2	6.6	5.5	6.0

**Table 14 Allt Riabhach na Bioraich Burn macroinvertebrate summary statistics**

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Total Count</b>	109	128	171	268	315	437	234	286	316	384	205	372	637	126	365
<b>Total no. of taxa</b>	17	13	16	22	13	20	18	20	21	15	18	20	18	18	20
<b>RICHNESS (rareftn 100)</b>	17	12	13	16	10	13	15	16	17	12	16	15	12	16	15
<b>HILL'S N1</b>	12.6	7.6	8.8	10.3	6.6	6.7	9.1	9.9	11.9	9.2	12.3	10.8	8.6	10.7	10.2
<b>HILL'S N2</b>	11.9	5.5	6.8	7.5	5.1	4.2	6.0	6.7	8.7	8.0	10.0	8.2	6.6	8.8	7.8
<b>EVENNESS (E5)</b>	0.94	0.67	0.74	0.69	0.73	0.57	0.62	0.64	0.70	0.84	0.80	0.74	0.73	0.80	0.74
<b>BMWP</b>	89	78	83	105	75	95	80	85	121	80	96	111	100	96	115
<b>ASPT</b>	6.9	7.1	6.4	6.6	6.1	6.3	6.7	6.1	6.7	6.7	6.9	6.5	6.3	6.4	6.8



**Table 15 Control Burn aquatic macrophyte percentage cover**

	1992	1993	1994	1995	1996	1997	1998	1999	2001	2002	2003	2004	2005	2006
<i>Batrachospermum</i> sp.	+	0.7	+		+				+	+			+	
<i>Marsupella emarginata</i> var <i>aquatica</i>	4.4	4.0	4.9	0.4	1.5	0.2	1.9	1.2	+	0.6	1.0	0.5	0.7	
<i>Scapania undulata</i>	2.8	3.7	1.7	0.9	2.0	1.9	3.7	3.3	2.9	3.2	3.8	2.1	10.7	
<i>Racomitrium aciculare</i>	0.3	+	2.1	0.4	+	+		0.7	0.1	0.6	1.1	+	1.7	+
<i>Juncus bulbosus</i> var <i>fluitans</i>	0.1	+												+
<b>TOTAL COVER</b> (excluding filamentous green algae)	7.6	8.4	8.7	1.7	3.5	2.2	5.6	5.2	3.0	4.4	5.9	2.6	13.1	+
Filamentous green algae	+	10.7	+	0.1	+	+	+	1.3	+	0.8	0.3	+	+	

Sampling stretch 50m long.

Recent data pending; Awaiting expert voucher confirmation.

**Table 16 Experimental Burn aquatic macrophyte percentage cover**

	1993	1994	1995	1996	1997	1998	1999
<i>Batrachospermum</i> sp.	33.3	12.7	54.2	32.8	35.0	28.8	17.8
<i>Marsupella emarginata</i> var <i>aquatica</i>	38.0	37.3	9.4	27.4	23.2	25.7	26.7
<i>Scapania undulata</i>		5.0	21.7	12.0	11.8	15.2	22.1
<i>Juncus bulbosus</i> var <i>fluitans</i>	2.6	9.0	2.7	6.6		3.3	0.2
<b>TOTAL COVER</b> (excluding filamentous green algae)	73.9	64.0	88.0	78.8	70.0	73.0	66.8
Filamentous green algae	68.0	+					

Sampling stretch 20m long. Sampling ceased in 1999.

**Table 17 Allt Riabhach na Bioraich Burn aquatic macrophyte percentage cover**

	1996	1997	1998	1999	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<i>Batrachospermum</i> sp.		1.6	0.3	0.3	0.4	+				+				+
<i>Lemnaea</i> sp.													+	
<i>Marsupella emarginata</i> var <i>aquatica</i>	+											+	0.1	
<i>Scapania undulata</i>	0.4	0.2	0.7	0.5	0.9	1.0	0.4	0.3	1.5	1.2	0.5	0.8	1.9	1.5
<i>Racomitrium aciculare</i>			0.2	0.2	0.2	0.2	0.2		0.1	0.1	+	0.2	0.4	0.4
cf. <i>Blindia acuta</i>												+	0.4	+
<b>TOTAL COVER</b> (excluding filamentous green algae)	0.4	1.8	1.2	1.0	1.5	1.2	0.6	0.3	1.6	1.3	0.5	1.0	2.8	1.9
Filamentous green algae	0.4		+	+	+	0.2	3.9		+		0.3	+	+	+

Sampling stretch 50m long.

**Table 18 Fish population data**

Site	Year	Area Fished (m <sup>2</sup> )	Density (no. m <sup>-2</sup> )	
			Age 0+	Age > 0+
Control Burn	1993	115	0.25	0.14
Control Burn	1994	115	0.35	0.02
Control Burn	1995	118	0.33	0.05
Control Burn	1996	87	1.51	0.26
Control Burn	1997	109	0.20	0.11
Control Burn	1998	101	0.42	0.05
Control Burn	1999	117.5	0.29	0.04
Control Burn	2000	114	0.06	0.02
Control Burn	2001	116	0.56	0.03
Control Burn	2002	106	0.40	0.21
Control Burn	2003	104	0.15	0.13
Control Burn	2004	120	0.11	0.08
Control Burn	2005	135	0.07	0.01
Control Burn	2006	107	0.15	0.03
Control Burn	2009	107	0.10	0.03
Experimental Burn	1993	32	0.97	0.13
Experimental Burn	1994	32	0.14	0.28
Experimental Burn	1995	36	0.34	0.03
Experimental Burn	1996	38	0.78	0.03
Experimental Burn	1997	45	0.31	0.07
Experimental Burn	1998	44	0.36	0.14
Experimental Burn	1999	31	0.32	0.13
Experimental Burn	2000	42	0.14	0.21
Experimental Burn	2001	45	0.55	0.11
Experimental Burn	2002	32	0.40	0.12
Experimental Burn	2003	38	0.03	0.24
Experimental Burn	2004	47	0.19	0.19
Experimental Burn	2005	44	0.21	0.20
Experimental Burn	2006	37	0.24	0.22
Experimental Burn	2009	31	0.26	0.06
ARnB Burn	1995	79	0.54	0.05
ARnB Burn	1996	57	0.63	0.24
ARnB Burn	1997	73	0.21	0.07
ARnB Burn	1998	71	0.27	0.18
ARnB Burn	1999	63	0.60	0.13
ARnB Burn	2000	75	0.04	0.05
ARnB Burn	2001	73	0.36	0.07
ARnB Burn	2002	63	0.85	0.21
ARnB Burn	2003	65	0.19	0.08
ARnB Burn	2004	77	0.20	0.03
ARnB Burn	2005	73	0.22	0.10
ARnB Burn	2006	61	0.64	0.08
ARnB Burn	2009	62	0.24	0.13

**Table 19 Biology sampling dates**

<b>Sampling Year</b>	<b>Fish</b>	<b>Macroinvertebrates</b>	<b>Epilithic Diatoms</b>	<b>Aquatic Macrophytes</b>
1992 *			15 Aug	15 Aug
1993	29 Sept	3 May	29 Sept	29 Sept
1994	27 Sept	12 May	25 Aug	25 Aug
1995	27 Sept	No sample	25 Aug	25 Aug
1996	24 Sept	15 May	28 Aug	28 Aug
1997	17 Sept	21 May	23 July	23 July
1998	1 Oct		1 Aug	1 Aug
1999	6 Oct		19 Aug	19 Aug
2000	20 Nov		4 Aug	4 Aug
2001	28 Sept	18 May	30 Jul	30 Jul
2002	24 Sept	15 May	28 Aug	28 Aug
2003	16 Sept	2 May	10 Aug	10 Aug
2004	2 Nov	13 May	12 Aug	12 Aug
2005	20 Oct	10 May	21 Aug	21 Aug
2006	10 Oct	9 May	9 Aug	9 Aug
2007	N/A	10 May	14 Aug	14 Aug
2008	N/A	30 April	13 Nov	13 Nov
2009	25 Sept	12 May	14 Aug	14 Aug
2010	N/A	30 April	11 Aug	11 Aug

\* Only control burn sampled in 1992

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