

The Faunal Richness of Headwater Streams

Progress Report for the Period
January 1994 - March 1994

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Institute of Freshwater Ecology

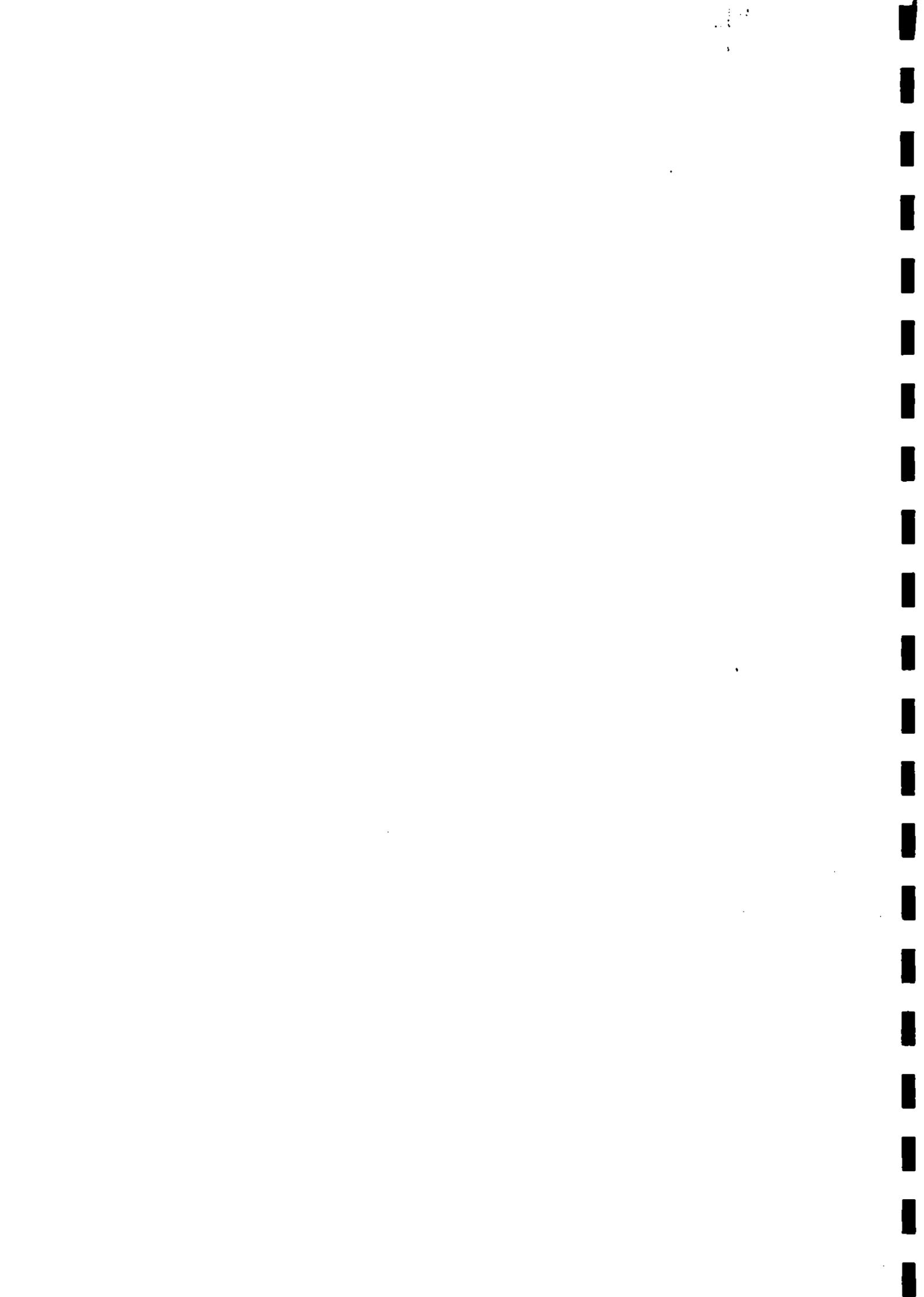
April 1994

Progress Report 242/12/Y



NRA

National Rivers Authority



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1. INTRODUCTION

This project is in four stages:-

- A review of existing data.
- Catchment studies.
- An evaluation of the impact of agricultural activities.
- The development of a catchment strategy.

Stages 1 is complete and has been fully documented in previous reports.

Final copies of the Stage 2 report were produced during this reporting period.

The principal work undertaken during the period has been the identification of the Stage 3 samples.

2. TECHNICAL PROGRESS

2.1 Objectives

The overall and specific objectives of each stage are detailed in the Project Investment Appraisal (PIA) which is Schedule 2 of the Memorandum of Agreement for Research Contract (ref:54015000) between the National Rivers Authority (NRA) and the Institute of Freshwater Ecology (IFE)

2.2 Work programme

Stage 3 activities outlined in Schedule 2 of the PIA comprise:-

- Establish which agricultural practices have not been sufficiently well covered by the catchment studies for a range of geological and geographical catchments.
- Consult the NRA and other sources of land use/pollution information and in consultation with the project leader establish further headwater stream sites to fill these gaps.

An agreed interpretation of the first two elements of the work programme was formulated by NRA and IFE. This was detailed and summarised in the reports for the periods July 1994 - September 1994 and October 1994 - December 1994.

Full details of the locations of the Stage 3 sample sites are given in Appendices I - IV.

- Utilise the same field methodologies as Stage 2 in order to obtain biological, land cover and river corridor data for these sites.
- Analyse the data as appropriate.
- Identify taxa which may be used as indicators of environmental damage due to agricultural activity.
- Produce an R&D note reporting on this stage of the work.

2.3 Progress achieved

2.3.1 Stage 2

In the previous progress report it was noted that a third revision of the main volume of the Stage 2 report and the latest revision of the appendix volume were forwarded to NRA for approval.

Minor modifications, recommended by NRA, were received and implemented. The required number of both volumes of the report were produced and forwarded to the Project Leader for circulation.

A draft of the Project Digest was produced by the R&D Co-ordinator for the Northumbria & Yorkshire Region. Suggested modifications were circulated between the Project Leader and Project Manager and feedback provided to the R&D Co-ordinator.

2.3.2 Stage 3

Sorting and identification of the Stage 3 samples were completed during the reporting period.

2.3.2 General and administrative

The project Leader and Project Manager have liaised, as necessary, throughout the reporting period.

An R & D Progress Meeting was held at the IFE River Laboratory on Monday 7th March.

3. INTERIM RESULTS

Preliminary BMWP index values (score, number of taxa and ASPT) are presented for each sample in Appendices I - IV.

3.1 River Cam

Summarised BMWP index values for the River Cam sites, per predominant land cover type, are as follows:-

Land cover (number of sites)	Index	Mean	Max	Min
Agricultural grass (5)	BMWP Score	35.4	60	17
	Number of taxa	9.2	15	5
	ASPT	3.74	4.17	3.50
Arable (10)	BMWP Score	34.1	68	6
	Number of taxa	9.2	17	3
	ASPT	3.54	4.13	2.00

3.2 River Derwent

Summarised BMWP index values for the River Derwent sites, per predominant land cover type, are as follows:-

Land cover (number of sites)	Index	Mean	Max	Min
Wood/Forest (5)	BMWP Score	49.2	111	12
	Number of taxa	11.6	18	3
	ASPT	4.44	6.17	4.00
Dwarf Shrub (5)	BMWP Score	29.0	32	25
	Number of taxa	5.2	7	5
	ASPT	4.69	5.00	4.33
Herb Grass (5)	BMWP Score	78.0	98	32
	Number of taxa	14.0	17	7
	ASPT	5.49	6.23	4.57
Agricultural Grass (10)	BMWP Score	69.1	158	26
	Number of taxa	13.0	24	5
	ASPT	5.07	6.58	3.89
Arable (14)	BMWP Score	48.9	141	25
	Number of taxa	15.8	24	7
	ASPT	4.08	5.88	3.13

3.3 River Lugg

Summarised BMWP index values for the River Lugg sites, per predominant land cover type, are as follows:-

Land cover (number of sites)	Index	Mean	Max	Min
Wood/Forest (5)	BMWP Score	79.8	157	22
	Number of taxa	14.0	23	6
	ASPT	5.36	6.83	3.67
Dwarf Shrub (2)	BMWP Score	87.5	128	47
	Number of taxa	15.0	20	10
	ASPT	5.55	6.40	4.70
Herb Grass (6)	BMWP Score	107.0	146	77
	Number of taxa	17.8	23	14
	ASPT	5.93	6.48	5.50
Agricultural Grass (16)	BMWP Score	72.8	118	26
	Number of taxa	14.4	20	7
	ASPT	4.84	6.53	3.43
Arable (10)	BMWP Score	63.2	113	22
	Number of taxa	13.5	20	7
	ASPT	4.41	5.65	2.75

3.4 River Stour

Summarised BMWP index values for the River Stour sites, per predominant land cover type, are as follows:-

Land cover (number of sites)	Index	Mean	Max	Min
Wood/Forest (7)	BMWP Score	45.6	103	20
	Number of taxa	9.3	19	4
	ASPT	4.78	5.63	3.63
Dwarf Shrub (1)	BMWP Score	28.0	28	28
	Number of taxa	7.0	7	7
	ASPT	4.00	4.00	4.00
Agricultural Grass (25)	BMWP Score	52.5	102	13
	Number of taxa	11.9	21	4
	ASPT	4.29	5.32	3.25
Arable (5)	BMWP Score	58.0	113	14
	Number of taxa	14.2	23	5
	ASPT	4.41	5.05	2.80

4. WORK PROGRAMME FOR THE NEXT REPORTING PERIOD

4.1 Stage 2

- The R&D Digest will be completed by the NRA R&D Co-ordinator in consultation with the Project Leader and Project Manager.
- A list of recommended recipients of Stage 2 reports, together with addresses, will be compiled jointly by the Project Leader and Project Manager.

4.2 Stage 3

- Computer files containing biological data will be created and validated.
- Computer files containing site environmental data will be created and validated.
- Computer files containing river corridor data will be created and validated.
- Base maps for digitization will be created from Field Assessment Booklet land cover maps.
- Terms and conditions for digitizing the base maps will be agreed with Ordnance Survey.
- Base maps will be digitized.
- Computer files containing land cover data will be created from the digitised base maps and these will be validated.
- Requisite, interpreted satellite imagery data will be sought from the Environmental Information Centre at Monks' Wood.
- Data analysis will begin.
- The results of Stage 2 will be publicised through the medium of trade and other journals.
- Liaison with the Project Leader will be maintained and progress with the project will be reported to the NRA.

5. COST OF WORK DURING THE REPORTING PERIOD

The cost of the work during the reporting period is likely to be generally in line with cost-base adjusted budget in the Memorandum of Agreement.

Detailed costings will be made available to the NRA, via the IFE Finance Office.

6. ESTIMATE OF THE TOTAL COSTS OF THE WORK

The total cost of the work is likely to be generally in line with the cost-adjusted budget listed in Section 10 of the PIA and Schedule 8 of the project contract.

Two exceptions referred to in the previous Progress Report still apply. The first concerns the additional costs of the use of colour in the principal project reports, as requested by the NRA. Following discussions between IFE Project Manager and NRA Project Leader, a request for an additional sum of £2,070 is to be submitted to the NRA R&D Co-ordinator to meet these extra costs.

A second possible source of additional costs remains the licence fees payable to Ordnance Survey for digitizing their base-maps, as used for land cover surveys in this study. The potential costs involved here have still to be quantified.

7. ESTIMATE OF COSTS FOR THE NEXT REPORTING PERIOD

Costs for the next three months will not exceed expectation and may be less for the reasons given in Section 8 below.

8. FACTORS LIKELY TO AFFECT THE SATISFACTORY COMPLETION OF THE WORK

The urgent requirement to develop a prototype version of RIVPACS III, in time to be fully tested prior to the 1995 River Quality Survey, is likely to conflict with the staffing needs of the current project. Unavailability of key staff members, working on the RIVPACS project, is anticipated to cause a two month delay in the timetable for the production of the Stage 3 report.

It is not envisaged that this will cause a delay in the completion of the project as a whole, although work on the production of the Stage 4 report is now certain to overlap with the completion of Stage 3.

APPENDIX I Names, locations, field site codes, sampling dates and BMWP index values for the Stage 3 headwater sites on the River Cam.

Watercourse name	Site name	NGR	Code	Date	SCOR	TAXA	ASPT
AGRICULTURAL GRASS							
Un-named watercourse	Harcamlow Way	TL 359 580	AG1	16-06-93	21	6	3.50
Un-named watercourse	Near Whaddon	TL 334 473	AG2	15-06-93	29	8	3.63
Un-named watercourse	Exning	TL 622 650	AG3	15-06-93	17	5	3.40
Un-named watercourse	Croyden	TL 319 490	AG4	17-06-93	50	12	4.17
Un-named watercourse	Trinity Conduit	TL 422 599	AG5	16-06-93	60	15	4.00
ARABLE							
Un-named watercourse	Harlton	TL 379 526	A1	15-06-93	41	11	3.73
Un-named watercourse	Bowers	TL 573 428	A2	15-06-93	33	8	4.13
Un-named watercourse	Church End	TL 575 419	A4	15-06-93	33	9	3.67
Un-named watercourse	Longstowe	TL 305 553	A5	16-06-93	40	11	3.64
Un-named watercourse	East Hatley	TL 290 250	A6	17-06-93	27	8	3.38
Un-named watercourse	Reach	TL 561 658	A7	14-06-93	51	13	3.90
Un-named watercourse	Poor's Fen	TL 572 694	A8	14-06-93	13	4	3.33
Un-named watercourse	Highbridge Farm	TL 552 658	A9	14-06-93	68	17	4.00
Un-named watercourse	Gill's Hill	TL 332 562	AR2	16-06-93	6	3	2.00
Un-named watercourse	North End	TL 293 442	AR3	17-06-93	29	8	3.63

APPENDIX II Names, locations, field site codes, sampling dates and BMWP index values for the Stage 3 headwater sites on the River Derwent.

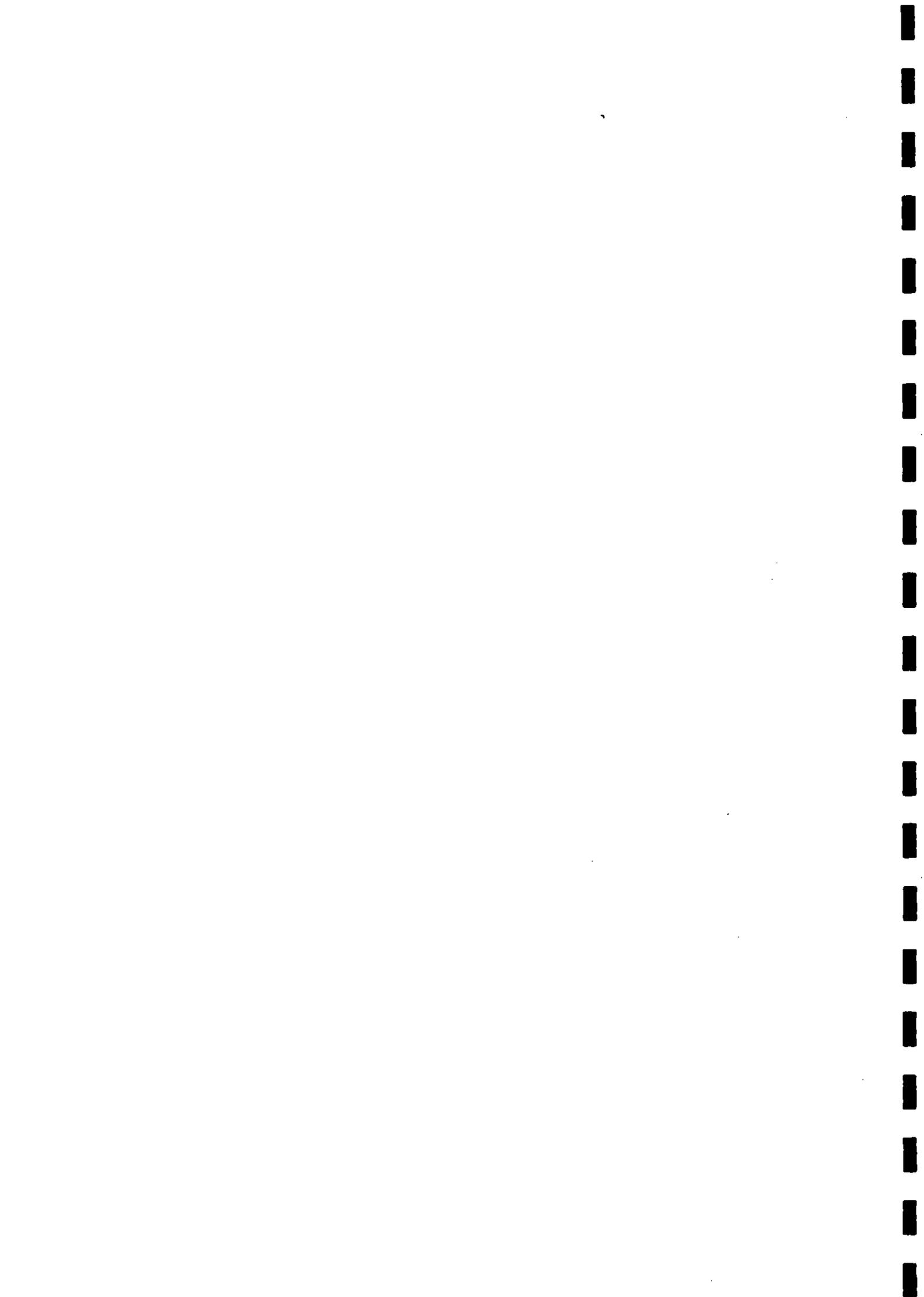
Watercourse name	Site name	NGR	Code	Date	SCOR	TAXA	ASPT
WOOD/FOREST							
Muffles Dike	Low Muffles	SE 766 941	WF1	27-06-93	41	7	5.86
White Mires Dike	White House	SE 764 964	WF4	02-07-93	34	7	4.86
Oak Rigg Gill	High Dales	SE 949 933	WF5	27-06-93	111	18	6.17
Un-named watercourse	North Side	SE 906 928	WFR1	01-07-93	48	9	5.33
Grain Beck	Blakey Topping	SE 876 944	WFR4	07-07-93	12	3	4.00
DWARF SHRUB							
Mickle Sike	Prod Hills	SE 518 971	DS1	30-06-93	32	7	4.55
Un-named watercourse	Hazel Green	SE 617 918	DS2	01-07-93	26	6	4.33
Loskey Beck	Spaunton Moor	SE 713 940	DS3	02-07-93	25	5	5.00
Un-named watercourse	Slape Wath Moor	SE 596 983	DS4	01-07-93	32	7	4.55
Mucky Hole Slack	Fylingdales Moor	NZ 914 001	DS5	06-07-93	30	6	5.00
HERB GRASS							
Un-named watercourse	Hagg House	SE 584 973	HG1	30-06-93	81	13	6.23
Un-named watercourse	Hole of Horcam	SE 845 934	HG2	06-07-93	88	17	5.18
Locker Beck	Locker Wood	SE 507 935	HG3	30-06-93	98	16	6.13
Shortsha Beck	Lowna	SE 693 914	HG4	02-07-93	32	7	4.57
Un-named watercourse	High Horcam	SE 847 934	HG5	06-07-93	91	17	5.35
AGRICULTURAL GRASS							
Un-named watercourse	Place Newton	SE 888 727	AG1	25-06-93	83	15	5.53
The Washdike	Lairs	SE 865 497	AG2	24-06-93	88	17	5.18
Sutterland Beck	Peat Rigg	SE 768 899	AG3	29-06-93	79	14	5.64
Un-named watercourse	Coulton	SE 637 746	AG4	25-06-93	41	10	4.10
Un-named watercourse	Cock Flat	NZ 553 000	AG5	28-06-93	158	24	6.58
Bloody Beck	Ebberston	SE 896 826	AG6	25-06-93	51	11	4.65
Un-named watercourse	Cross Holme	SE 565 973	AG7	28-06-93	26	5	5.20
Un-named watercourse	Folkton Carr	TA 047 808	AG8	28-06-93	35	9	3.89
Gundale Beck	Saintoft Brow	SE 794 890	AG9	29-06-93	37	9	4.11
Un-named watercourse	Spout House	SE 645 997	AG10	29-06-93	93	16	5.81
ARABLE							
Un-named watercourse	Scagglethorpe	SE 828 736	A1	24-06-93	78	17	4.59
Un-named watercourse	Low Gaterley	SE 730 703	A2	05-07-93	51	11	4.65
Un-named watercourse	Snargate	SE 605 716	A3	24-06-93	80	16	5.00
Charity Drain	Great West Wood	SE 740 425	A4	23-06-93	25	8	3.13
Un-named watercourse	Sommerfield	SE 663 807	A5	25-06-93	31	8	3.88
Un-named watercourse	Fangfoss Grange	SE 753 527	A6	22-06-93	27	7	3.86
Winter Beck	Full Sutton	SE 747 559	A7	22-06-93	29	8	3.63
Un-named watercourse	Sutton Wood	SE 710 479	A8	22-06-93	48	12	4.00
Un-named watercourse	Warren House	SE 761 464	A9	23-06-93	32	8	4.00
Un-named watercourse	Thornton le Clay	SE 686 664	A10	23-06-93	38	10	3.80
Mill Beck	Aldmoor	SE 782 650	A11	24-06-93	30	8	3.75
Keld Spring Beck	Wombleton	SE 680 834	A12	25-06-93	141	24	5.88
Millsike Beck	Minster Way	SE 725 548	A13	22-06-93	42	12	3.50
Black Dike	Thornton	SE 751 449	A14	23-06-93	31	9	3.44

APPENDIX III Names, locations, field site codes, sampling dates and BMWP index values for the Stage 3 headwater sites on the River Lugg.

Watercourse name	Site name	NGR	Code	Date	SCOR	TAXA	ASPT
WOOD/FOREST							
Un-named watercourse	Wigmore Rolls	SO 396 691	WF1	18-07-93	84	15	5.90
Un-named watercourse	Rhiw Lawr	SO 210 656	WF2	17-07-93	22	6	3.67
Un-named watercourse	Checkley	SO 596 376	WF3	23-07-93	56	11	5.09
Un-named watercourse	Cwm y Gerwyn	SO 192 669	WF4	17-07-93	157	23	6.83
Un-named watercourse	Nash Scar	SO 301 622	WFR2	23-07-93	80	15	5.33
DWARF SHRUB							
Un-named watercourse	Gwauncestre Hill	SO 169 552	DS2	16-07-93	47	10	4.70
Un-named watercourse	Black Hill	SO 169 519	DS3	15-07-93	128	20	6.40
HERB GRASS							
Un-named watercourse	Cwmynace	SO 204 540	HG1	13-07-93	92	16	5.75
Un-named watercourse	Mawn Pools	SO 169 515	HG2	15-07-93	136	21	6.48
Un-named watercourse	Bwlch	SO 193 530	HG3	13-07-93	78	14	5.57
Un-named watercourse	Black Yatt	SO 199 567	HG5	16-07-93	77	14	5.50
Un-named watercourse	Dreavour Farm	SO 180 523	HGR2	15-07-93	113	19	5.95
Un-named watercourse	Beilibedw Mawn Pool	SO 183 560	HGR3	16-07-93	146	23	6.35
AGRICULTURAL GRASS							
Un-named watercourse	Bircher	SO 480 660	AG1	19-07-93	51	12	4.25
Un-named watercourse	Crowther's Pool	SO 217 488	AG2	14-07-93	87	17	5.12
Un-named watercourse	Moseley Common	SO 380 581	AG3	18-07-93	86	18	4.78
Un-named watercourse	Elsdon	SO 326 545	AG4	18-07-93	87	18	4.83
Un-named watercourse	Crungoed	SO 194 718	AG5	17-07-93	118	18	4.83
Un-named watercourse	Siluria	SO 230 585	AG6	17-07-93	54	11	4.91
Un-named watercourse	Knapton Green	SO 447 524	AG7	21-07-93	54	12	4.50
Un-named watercourse	Winslow Green	SO 646 570	AG8	22-07-93	52	12	4.33
Un-named watercourse	Hope Under Dinmore	SO 500 527	AG9	20-07-93	34	8	4.25
Un-named watercourse	Hegdon Hill	SO 596 537	AG11	21-07-93	26	7	3.71
Un-named watercourse	Pentre-draen	SO 242 518	AG12	14-07-93	98	17	5.76
Un-named watercourse	Lynch Court	SO 417 422	AG13	19-07-93	97	20	4.85
Un-named watercourse	Newhouse	SO 223 553	AG14	13-07-93	75	15	5.00
Un-named watercourse	Holme Marsh	SO 353 550	AG15	20-07-93	88	14	6.29
Un-named watercourse	New Radnor	SO 212 612	AG16	16-07-93	111	17	6.53
Un-named watercourse	Lower Woodbatch	SO 386 680	AGR2	23-07-93	48	14	3.43
ARABLE							
Un-named watercourse	Lower Kinsham	SO 357 639	A1	18-07-93	84	18	4.67
Un-named watercourse	Hawkhurst	SO 610 547	A2	22-07-93	113	20	5.65
Un-named watercourse	Hyatt Sarnesfield	SO 383 500	A3	19-07-93	71	15	4.73
Un-named watercourse	Mousenatch	SO 474 605	A4	19-07-93	92	17	5.41
Un-named watercourse	Elms Green	SO 503 568	A5	20-07-93	22	8	2.75
Un-named watercourse	Thornby Court	SO 616 600	A6	22-07-93	48	12	4.00
Un-named watercourse	Hope Farm	SO 655 589	A7	22-07-93	50	11	4.55
Un-named watercourse	Marsh Court	SO 576 521	A9	20-07-93	24	7	3.43
Un-named watercourse	Butthouse	SO 435 489	A10	21-07-93	95	18	5.28
Un-named watercourse	Lower Chadnor	SO 432 527	AR5	23-07-93	33	9	3.67

APPENDIX IV Names, locations, field site codes, sampling dates and BMWP index values for the Stage 3 headwater sites on the River Stour.

Watercourse name	Site name	NGR	Code	Date	SCOR	TAXA	ASPT
WOOD/FOREST							
Un-named watercourse	Noon Hill	SU 109 089	WF1	09-06-93	46	9	5.11
Un-named watercourse	West Knoyle	ST 858 317	WF2	02-06-93	53	11	4.82
Un-named watercourse	Middlemarsh	ST 668 069	WF3	05-06-93	29	8	3.63
Un-named watercourse	Cranborne Common	SU 106 116	WF4	09-06-93	45	8	5.63
Un-named watercourse	Cockroad Wood	ST 747 317	WF5	01-06-93	103	19	5.42
Un-named watercourse	Ferndown	SU 080 018	WFR2	14-06-93	23	6	3.83
Un-named watercourse	Cannon Hill	SU 048 015	WFR4A	08-06-93	20	4	5.00
DWARF SHRUB							
Un-named watercourse	Holt Heath	SU 064 035	DS1A	10-06-93	28	7	4.00
AGRICULTURAL GRASS							
Un-named watercourse	Marsh Farm	ST 778 086	AG1	07-06-93	85	16	5.31
Un-named watercourse	Lymburghs Farm	ST 809 187	AG3	03-06-93	13	4	3.25
Un-named watercourse	Barrow Lane	ST 723 322	AG5	01-06-93	59	12	4.92
Un-named watercourse	Stour Row	ST 815 210	AG6	03-06-93	31	8	3.88
Un-named watercourse	Stour Provost	ST 800 210	AG7	03-06-93	21	6	3.50
Un-named watercourse	West End	ST 911 032	AG8	08-06-93	102	21	4.86
Un-named watercourse	Hammond Street Farm	ST 734 070	AG10	05-06-93	71	15	4.73
Un-named watercourse	Knackers' Hole	ST 780 108	AG11	07-06-93	35	8	4.38
Un-named watercourse	Gold Hill	ST 820 135	AG12	10-06-93	35	8	4.38
Un-named watercourse	Lugmarsh Farm	ST 860 311	AG13	02-06-93	39	9	4.33
Un-named watercourse	Marsh Court	ST 735 257	AG14	01-06-93	67	16	4.18
Un-named watercourse	Thornhill	ST 735 150	AG16	04-03-93	43	11	3.91
Un-named watercourse	Belchalwell	ST 790 095	AG17	07-06-93	43	10	4.30
Un-named watercourse	Hays	ST 875 286	AG19	03-06-93	40	10	4.00
Un-named watercourse	Sharnhill Green	ST 713 050	AG20	05-06-93	42	10	4.20
Un-named watercourse	Bedchester	ST 856 171	AG21	03-06-93	56	14	4.00
Un-named watercourse	The Middles	ST 846 319	AG23	02-06-93	81	17	4.76
Un-named watercourse	Rivers' Corner	ST 784 130	AGR4	07-06-93	48	10	4.80
Un-named watercourse	Canning's Court	ST 714 077	AGR5	05-06-93	45	12	3.75
Un-named watercourse	Shapwick	ST 929 023	AGR6	14-06-93	70	16	4.38
Un-named watercourse	Mill Farm	ST 814 110	AGR7	08-06-93	27	8	3.38
Un-named watercourse	Little Pamphill	ST 996 003	AGR9	08-06-93	66	14	4.71
Un-named watercourse	Wilkin Throop	ST 692 234	AGR10	15-06-93	101	19	5.32
Un-named watercourse	Sedgehill	ST 863 278	AGR11A	17-06-93	54	12	4.50
Un-named watercourse	East Stour	ST 810 227	AGR12	15-06-93	39	11	3.55
ARABLE							
Un-named watercourse	Charnage	ST 836 321	A1	02-06-93	49	11	4.46
Un-named watercourse	Holtwood Farm	ST 700 143	A5	04-06-93	14	5	2.80
Un-named watercourse	Witchampton	ST 984 055	A6	11-06-93	96	19	5.05
Un-named watercourse	Wimborne St.Giles	SU 024 133	A8	09-06-93	113	23	4.91
Un-named watercourse	White Kennels	ST 930 120	A9	10-06-93	63	13	4.85



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