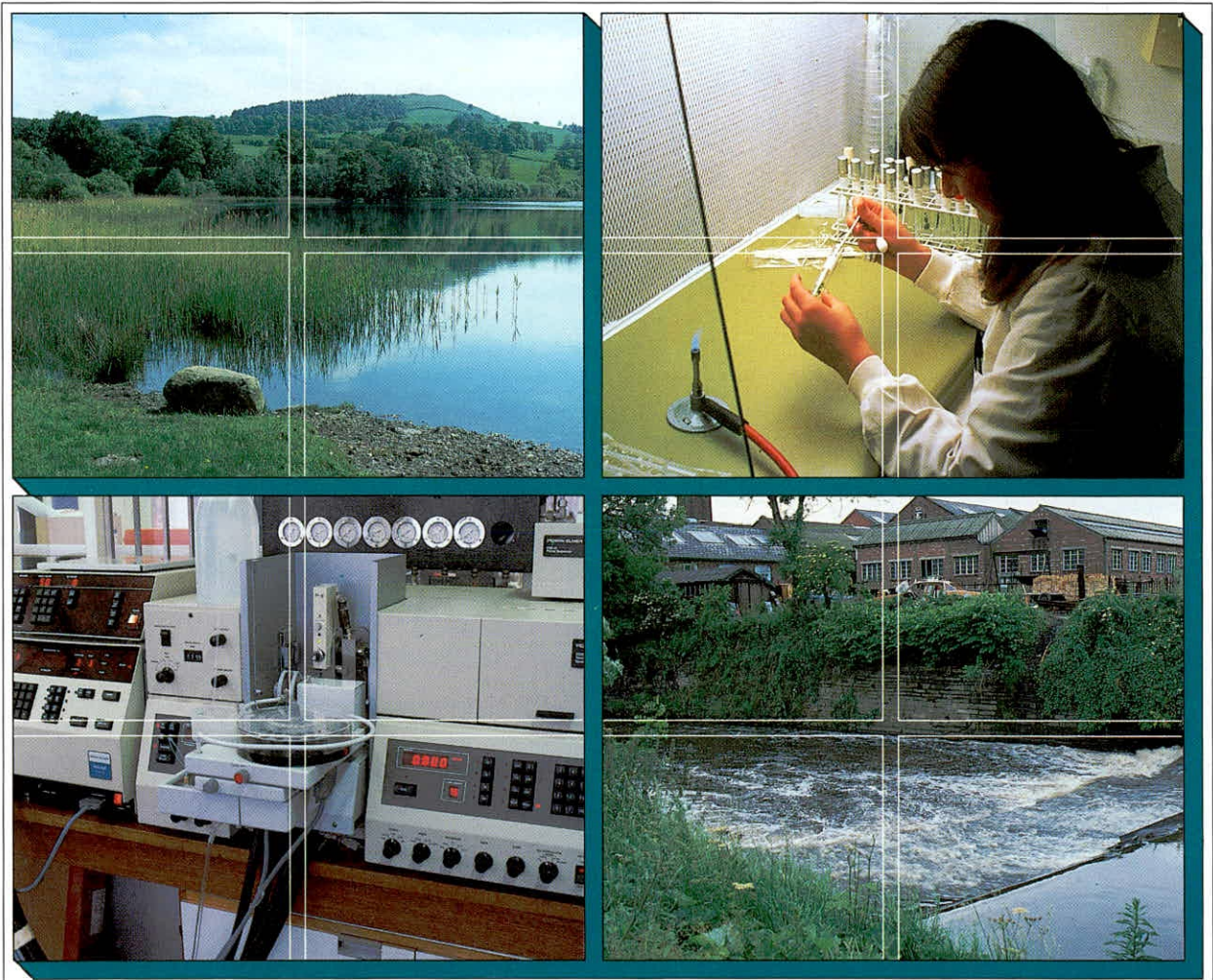




**Institute of
Freshwater
Ecology**

An audit of performance in the processing of macro-invertebrate samples in 1993. NRA Northumbria & Yorkshire Region

R.J.M Gunn, BA
J.M. Winder, PhD
N.J. Grieve, BSc
J.H. Blackburn, BSc
J.F. Wright, PhD
K.L. Symes, HNC



INSTITUTE OF FRESHWATER ECOLOGY
River Laboratory, East Stoke, Wareham, Dorset BH20 6BB

Tel: 0929 462314

Fax: 0929 462180

**An audit of performance in the processing
of macro-invertebrate samples in 1993.
NRA Northumbria & Yorkshire Region**

R.J.M. Gunn, J.M. Winder, N.J. Grieve,
J.H. Blackburn, J.F. Wright & K.L. Symes

Project leader:	R.J.M. Gunn
Report date:	April 1994
Report to:	National Rivers Authority Northumbria & Yorkshire Region
IFE Report Ref:	RL/T04071e1/02
TFS Project No:	T04071e1

In accordance with our normal practice, this report is for the use only of the party to whom it is addressed, and no responsibility is accepted to any third party for the whole or any part of its contents. Neither the whole nor any part of this report or any reference thereto may be included in any published document, circular or statement, nor published or referred to in any way without our written approval of the form and context in which it may appear.

The Institute of Freshwater Ecology is part of the Terrestrial and Freshwater Sciences Directorate of the Natural Environment Research Council.

1. INTRODUCTION

In 1993 the sampling of aquatic macro-invertebrates for the biological assessment of river quality continued throughout the United Kingdom. This task was undertaken by the National Rivers Authority (NRA) in England and Wales, the River Purification Boards (RPBs) in Scotland and the Industrial Research & Technology Unit (IRTU) in Northern Ireland.

In view of the number of staff involved and the variability of sample processing techniques, it was recognised that an independent quality control exercise was necessary to promote a consistently high level of reliability. The IFE was contracted to undertake an audit of the sample sorting and identification performance of each NRA region, several RPBs and the IRTU. This report presents the results of 61 samples audited for Northumbria & Yorkshire Region of the NRA. The IFE was not required to perform any statistical analyses nor interpretation of the results of the audit.

Each organisation employed standard collection procedures, as used in the 1990 River Quality Survey, and the sampling strategy was therefore compatible with RIVPACS (River InVertebrate Prediction And Classification System), which has been developed by the Institute of Freshwater Ecology (IFE).

Samples were sorted by NRA, RPB and IRTU personnel for the families of macro-invertebrates included in the Biological Monitoring Working Party (BMWP) system. Taxa present were recorded on site data sheets. Sample processing and recording techniques varied from region to region.

2. SAMPLE SELECTION

Samples for audit were selected internally by each of the agencies being monitored. The biologists processing these samples had no prior knowledge of the samples to be audited.

The manner of sample selection, which biologists would be monitored and the number of audit samples from each season, were left to the discretion of the agency, within the limits of the total number of samples that IFE was contracted to audit.

3. SAMPLE PROCESSING

The normal protocol for NRA, RPB and IRTU biologists was to sort their samples within the laboratory and to select examples of each scoring taxon within the BMWP system. In most cases, the invertebrates were placed in a vial of preservative (4% formaldehyde solution or 70% industrial alcohol) and the BMWP taxa were listed on a data sheet. The vial of animals and the sorted material were then returned to the sample container and preservative added. Thus, each sample available to IFE for audit should have included:

- i) a list of the BMWP families found in the sample
- ii) a vial containing representatives from each family
- iii) the preserved sample

When these three elements were present, the sequence of operations at IFE was as follows:

- a) The remainder of the sample was sorted and the BMWP families listed
- b) The families contained within the vial were identified and listed
- c) A comparison was made between the NRA listing of families and those identified from the vial by IFE
- d) A comparison was made between the NRA listing of families and those found in the sample by IFE
- e) "Losses" or "gains" from the NRA listing of families were noted. In the case of "gains", each additional family was identified, where possible, to species level, in order to clarify any specific repetitive errors.

For a number of different reasons, some samples did not include a vial containing representative examples of the families listed on the data sheet. Others arrived with the vial damaged in transit such that the representative examples were no longer separated. For these samples, only operations a), d) and e) above were appropriate.

Several directives were issued to IFE relating to the treatment of BMWP taxa. Terrestrial representatives of BMWP scoring families, animals deemed to have been dead at the time of sampling, cast insect skins, pupal exuviae, empty mollusc shells and posterior ends of "living" specimens were to be excluded from the listing of families present. Chrysomelidae and Curculionidae, which appear in the BMWP list, were also to be excluded for the purposes of the audit. Trichopteran pupae, although not routinely identified by many biologists, were to be included in the listing of families.

4. REPORTING

The results of each sample audit were recorded on a standard report form (Table 1). For audit samples where a vial of animals was included, the comparison between the NRA listing and the taxa found in the vial by IFE was shown in box A of the report form. Discrepancies could be due to carelessness, misidentifications or errors in completing the NRA data sheet. Families not on the NRA listing but found by IFE in the remainder of the sample were entered in box B of the report form under "additional families". When the families listed as "losses" in section A of the report form were compared with the full list of families recorded in the sample by IFE, some apparent losses from the vial were offset by the presence of those families in the remainder of the sample. These taxa were therefore listed in the "losses" box of section A and the "gains" box of section B and were neither a net loss nor a net gain. In these cases, the families were marked with an asterisk in both boxes. Such errors are noted as "omissions" in the tables which summarise the results for each season (Tables 2, 3 and 4).

Species identifications, state of development (eg adult or larval coleopterans) and the presence of a single representative of a family within the remainder of the sample were recorded in the notes section of the report form. Where the NRA data sheet indicated that a family was noted and released at the site, this was recorded in the notes section but not included as a "loss", even though the family was not found in the vial.

For those samples in which the vial of animals was damaged or missing, box A of the report form was not applicable (N/a). Families not on the NRA list but present in the sample were listed in box B under "additional families" as before. Families recorded on the NRA list but not found by IFE were indicated on the left hand side of box B. If the vial of animals was retained by the NRA, entries in this box could include the sole representative of a family which was removed by the NRA, a family seen at the site which escaped or was released (without mention being made on the NRA data sheet), inaccurate identification, the wrong family box being ticked on the NRA data sheet or the family being present in the sample but missed by IFE.

Results of the audits of individual samples are presented in the Appendix.

ACKNOWLEDGEMENTS

Thanks to Valerie Palmer for typing the report.

TABLE 1. The IFE Report form

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION		RIVER	
DATE		SITE	
SORTER		SAMPLE CODE	

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE		
B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	

NOTES:

NET LOSSES

NET GAINS

TABLE 2. The 19 spring samples audited for Northumbria & Yorkshire Region

River	Site	Sorter	Losses	Gains	Omissions
Hart Burn	Hartburn	VW	0	1	0
Fenwick Burn	Fenwick	VW	0	0	0
Carey Burn	Skirl Naked	RJ	1	0	0
Stockesley Burn	Stockesley Bridge	RJ	0	0	0
Blackheddon Burn	Black Heddon	SS	1	1	0
Valley Burn	u/s STW	EC	1	0	0
Coldcoats Burn	East Coldcoats Farm	RJ	0	0	0
Med Burn	Medburn	SS/RJ	0	0	0
Headleyhope	u/s Railway bridge	JH	0	1	1
Balder	Cotherstone	JH	1	0	0
Calder	Horbury Junction	SGT	0	0	0
Colne	Colnebridge	SAL	1	0	0
Esk	Briggswath	FN	0	0	0
Oak Beck	Birk Crag	EA	0	0	3
Oak Beck	Pot Bridge	FN	0	1	1
Fleet Beck	u/s Sike Beck	FN	0	2	0
Crimple Beck	Beckwithshaw	LG	0	2	0
Beckwithshaw Beck	Beckwith	FN	0	7	1
Woo Gill	Low Woodvale Farm	LG	0	1	0

TABLE 3. The 29 summer samples audited for Northumbria & Yorkshire Region

River	Site	Sorter	Losses	Gains	Omissions
Cawthorne Dike	Low Barugh	DH	0	1	0
Holme	Queensmill	JB	0	0	1
Calder	Todmorden	SGT	0	2	1
Wharfe	Grassington	LFM	0	0	0
Stainforth & Keadby Canal	South Bramwith	VH	0	0	0
Rother	Renishaw	SGT	0	0	0
Dibb	Hartlington Bridge	JB	0	0	1
Wharfe	Ryther	JB	0	1	0
Calder	Copley	LFM	0	0	0
Wharfe	Hubberholme	MCR	2	3	4
Fleet Beck	Tockwith	NL	0	2	0
Dearne	d/s Lundwood STW	VH	0	2	1
Crimple Beck	Burn Bridge	JH	0	0	0
Ouse	Acaster Malbis	EA	0	0	0
Crimple Beck	d/s CSO	LM	1	1	0
Dove	Sparrow Hall	LG	0	0	0
Ouse	d/s Esplanade SSO	EA	0	1	0
Cod Beck	Topcliffe	LG	1	2	0
Burn	Masham	FN	0	0	0
Coquet	Bygate Hall	VW	0	2	0
Westerhope Burn	Westerhope	JH	0	2	0
Wear	Belmont	SS/RJ	0	0	0
Blakehope Burn	Blakehopeburn	JH/VW	0	0	0
Blythe	Bedlington	EC/VW	0	0	0
Rowhope Burn	u/s Coquet	RJ	0	0	0
Wear	Finchale Park	RJ/RJ	0	0	0
Bollihope Burn	Whitfield	SS	0	0	0
Tees	Barnard Castle	SS	0	1	0
Brownney	A167 Bridge	JH	1	1	0

TABLE 4. The 13 autumn samples audited for Northumbria & Yorkshire Region

River	Site	Sorter	Losses	Gains	Omissions
Hemsworth Dike	u/s Grove Lane STW	SGT	1	1	2
Black Brook	Greetland	JB	0	1	0
Went	Sykehouse Bridge	RJJ	0	0	0
Ryburn	u/s Boothdean Clough	LS	0	0	2
Little Don	d/s Langsett WTW	VH	1	0	0
Dove	Wombwell	LFM	0	0	0
Dearne	Scissett	JB	0	1	0
Bedale Beck	Leeming	FN	0	1	0
Foss	Malton Road Bridge	NL	0	3	0
Cockhill Beck	Hampsthwaite	FN	0	0	0
Ainsby Beck	Nr Moorside	LG	0	0	0
Wharfe	Linton Bridge	JL	0	4	0
Wiske	Kirby Wiske	JL	0	1	1

APPENDIX

Results of individual sample audits

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Hart Burn

DATE 15.4.93

SITE Hartburn

SORTER VW

SAMPLE CODE NRA02 0890

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Simuliidae

NET LOSSES

0

NET GAINS

1

NOTES:

1 Simulium argyreatum/variegatum

Note on data sheet that Astacidae released at site.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Fenwick Burn

DATE 7.4.93

SITE Fenwick

SORTER VW

SAMPLE CODE NRA02 1090

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Carey Burn

DATE 7.5.93

SITE Skirl Naked

SORTER RJ

SAMPLE CODE NRA02 0145

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Dugesiidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

1 No Dugesia found by IFE in vial. Dugesiidae does not count as an additional family in the BMWP system.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Stockesley Burn
DATE	15.4.93	SITE	Stockesley Bridge
SORTER	RJ	SAMPLE CODE	NRA02 2600

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Blackheddon Burn

DATE 7.4.93

SITE Black Heddon

SORTER SS

SAMPLE CODE NRA02 1060

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Scirtidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Dytiscidae

NET LOSSES NET GAINS

NOTES:

1 Cast skin in vial
2 Potamonectes depressus (adult) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Valley Burn

DATE 6.5.93

SITE u/s STW

SORTER EC

SAMPLE CODE NRA02 2615

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Planorbidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

1 Zonitoides sp. in vial.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Coldcoats Burn

DATE 7.4.93

SITE East Coldcoats Farm

SORTER RJ

SAMPLE CODE NRA02 1050

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Med Burn
DATE	7.4.93	SITE	Medburn
SORTER	SS/RJ	SAMPLE CODE	NRA02 1080

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Headleyhope
DATE	6.5.93	SITE	u/s Railway Bridge
SORTER	JH	SAMPLE CODE	NRA02 2540

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Hydrobiidae*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Hydrobiidae* 3 Taeniopterygidae

NET LOSSES

0

NET GAINS

1

NOTES:

1,2 Empty shell in vial, Potamopyrgus jenkinsi in sample
3 Brachyptera risi 1 only

Data sheet gives sample date as 6.5.94!

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Balder
DATE	24.3.93	SITE	Cotherstone
SORTER	JH	SAMPLE CODE	NRA02 3910

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Planorbidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

1

NET GAINS

0

NOTES:

1 Zonitoides sp. in vial

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Calder
DATE	19.5.93	SITE	Horbury Junction
SORTER	SGT	SAMPLE CODE	NRA10 0059

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Colne
DATE	26.5.93	SITE	Colnebridge
SORTER	SAL	SAMPLE CODE	NRA10 0083

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Hydrophilidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

NET GAINS

NOTES:

1 Terrestrial larva in vial

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Esk
DATE	11.5.93	SITE	Briggswath
SORTER	FN	SAMPLE CODE	NRA10 0147

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Oak Beck
DATE	18.5.93	SITE	Birk Crag
SORTER	EA	SAMPLE CODE	NRA10 0230

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Oligochaeta* 2 Baetidae* 3 Hydrophilidae*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	4 Oligochaeta* 5 Baetidae* 6 Hydrophilidae*

NET LOSSES

NET GAINS

NOTES:

4 Lumbriculidae, Tubificidae
5 Baetis rhodani
6 Indet Hydrophilid (larva), Hydraena gracilis (adult)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Oak Beck

DATE 8.5.93

SITE Pot Bridge

SORTER FN

SAMPLE CODE NRA10 0871

AQC OF BMWP FAMILIES A. IN VIAL +

B. IN SAMPLE +

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Oligochaeta*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Oligochaeta* 3 Hydrophilidae

NET LOSSES 0

NET GAINS 1

NOTES:

2 Lumbriculidae, Enchytraeidae
3 Hydraena gracilis (adults)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Fleet Beck

DATE 19.5.93

SITE u/s Sike Beck

SORTER FN

SAMPLE CODE NRA10 0848

AQOC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Hydrobiidae

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Planariidae

NET LOSSES NET GAINS

NOTES:

1 Potamopyrgus jenkinsi
2 Polycelis nigra/tenuis 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Crimple Beck
DATE	18.5.93	SITE	Beckwithshaw
SORTER	LG	SAMPLE CODE	NRA10 0870

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Lymnaeidae 2 Ephemerellidae

NET LOSSES NET GAINS

NOTES:

1 Lymnaea palustris 1 only
2 Ephemerella ignita 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Beckwithshaw Beck
DATE	18.5.93	SITE	Beckwith
SORTER	FN	SAMPLE CODE	NRA10 0869

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Baetidae*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Baetidae* 3 Leptophlebiidae 4 Nemouridae 5 Hydrophilidae 6 Scirtidae 7 Elmidae 8 Psychomyiidae 9 Leptoceridae

NET LOSSES

NET GAINS

NOTES:

2 Baetis rhodani, Centroptilum luteolum
3 Habrophlebia fusca
4 Indet Nemourid 1 only
5 Hydraena gracilis (adult) 1 only
6 Elodes sp. (larva) 1 only
7 Elmis aenea (adult) 1 only
8 Tinodes maclachlani 1 only
9 Mystacides azurea 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Woo Gill
DATE	20.5.93	SITE	Low Woodvale Farm
SORTER	LG	SAMPLE CODE	NRA10 0823

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Siphonuridae

NET LOSSES NET GAINS

NOTES:

1 Ameletus inopinatus

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Cawthorne Dike
DATE	8.6.93	SITE	Low Barugh
SORTER	DH	SAMPLE CODE	NRA10 0068

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Hydrophilidae

NET LOSSES NET GAINS

NOTES:

1 Indet Hydrophilid (larva) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Holme

DATE 25.8.93

SITE Queensmill

SORTER JB

SAMPLE CODE NRA10 0181

AQC OF BMWP FAMILIES A. IN VIAL +

B. IN SAMPLE +

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Hydrobiidae*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Hydrobiidae*

NET LOSSES 0

NET GAINS 0

NOTES:

1,2 Empty shell in vial, Potamopyrgus jenkinsi in sample

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Calder
DATE	25.8.93	SITE	Todmorden
SORTER	SGT	SAMPLE CODE	NRA10 0063

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Oligochaeta*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Sphaeriidae 3 Oligochaeta* 4 Beraeidae

NET LOSSES

0

NET GAINS

2

NOTES:

2 Pisidium sp. 1 only
 3 Eiseniella tetraedra, Stylodrilus sp.
 4 Beraea pullata 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Wharfe

DATE 1.7.93

SITE Grassington

SORTER LFM

SAMPLE CODE NRA10 0341

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

Note on data sheet relating to pupa in vial. Identified by IFE as *Lepidostoma hirtum*.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Stainforth & Keadby Canal
DATE	5.8.93	SITE	South Bramwith
SORTER	VH	SAMPLE CODE	NRA10 0583

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES:

Sample pot and vial labelled Kirk Bramwith, data sheet labelled South Bramwith.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Rother
DATE	22.6.93	SITE	Renishaw
SORTER	SGT	SAMPLE CODE	NRA10 2006

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Dibb
DATE	1.7.93	SITE	Hartlington Bridge
SORTER	JB	SAMPLE CODE	NRA10 0110

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Chironomidae*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Chironomidae*

NET LOSSES NET GAINS

NOTES:

2 Macropelopia sp., Potthastia longimana group, Eukiefferiella sp., Tvetenia sp., Polypedilum sp.

Note on data sheet that Astacidae "released, not in vial". Not found by IFE in vial or sample.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Wharfe
DATE	22.6.93	SITE	Ryther
SORTER	JB	SAMPLE CODE	NRA10 0340

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Tipulidae

NET LOSSES NET GAINS

NOTES:

1 Antocha vitripennis 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Calder
DATE	25.8.93	SITE	Copley
SORTER	LFM	SAMPLE CODE	NRA10 0065

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Wharfe
DATE	1.7.93	SITE	Hubberholme
SORTER	MCR	SAMPLE CODE	NRA100336

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Caenidae* 2 Haliplidae 3 Philopotamidae* 4 Psychomyiidae* 5 Lepidostomatidae 6 Tipulidae*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	7 Caenidae* 8 Chloroperlidae 9 Hydrophilidae 10 Philopotamidae* 11 Psychomyiidae* 12 Leptoceridae 13 Tipulidae*

NET LOSSES NET GAINS

NOTES:

- 7 Caenis rivulorum
- 8 Chloroperla torrentium 1 only
- 9 Hydraena gracilis (adults)
- 10 Wormaldia sp.
- 11 Psychomyia pusilla
- 12 Athripsodes sp. (juvenile) 1 only
- 13 Antocha vitripennis, Dicranota sp.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Fleet Beck
DATE	28.6.93	SITE	Tockwith
SORTER	NL	SAMPLE CODE	NRA10 0424

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Hydrobiidae 2 Baetidae

NET LOSSES

0

NET GAINS

2

NOTES:

1 Potamopyrgus jenkinsi 1 only
2 Baetis rhodani 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Dearne
DATE	8.6.93	SITE	d/s Lundwood STW
SORTER	VH	SAMPLE CODE	NRA10 2338

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Erpobdellidae*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Hydrobiidae 3 Ancyliidae 4 Erpobdellidae*

NET LOSSES NET GAINS

NOTES:

1,4 Elongated Helobdella stagnalis in vial, Erpobdella octoculata + Trocheta subviridis in sample.
 2 Potamopyrgus jenkinsi 1 only
 3 Ancylys fluviatilis 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Crimble Beck

DATE 9.8.93

SITE Burn Bridge

SORTER JH

SAMPLE CODE NRA10 0090

AQC OF BMWP FAMILIES A. IN VIAL +

B. IN SAMPLE +

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES 0

NET GAINS 0

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Ouse
DATE	1.7.93	SITE	Acaster Malbis (sweeps)
SORTER	EA	SAMPLE CODE	NRA10 0236

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Crimple Beck
DATE	9.8.93	SITE	d/s CSO
SORTER	LM	SAMPLE CODE	

AQC OF BMWP FAMILIES A. IN VIAL ☐B. IN SAMPLE ☐

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Scirtidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Sphaeriidae

NET LOSSES

☐

NET GAINS

☐

NOTES:

1 Cast skin in vial
2 Pisidium sp. 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Dove
DATE	7.6.93	SITE	Sparrow Hall
SORTER	LG	SAMPLE CODE	NRA10 0127

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Ouse
DATE	1.7.93	SITE	d/s Esplanade SSO (airlift)
SORTER	EA	SAMPLE CODE	

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE C. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Planariidae

NET LOSSES NET GAINS

NOTES:

1 Indet Planariid (Planaria torva?) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Cod Beck
DATE	16.6.93	SITE	Topcliffe
SORTER	LG	SAMPLE CODE	NRA10 0075

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Lepidostomatidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Rhyacophilidae 3 Hydroptilidae

NET LOSSES

NET GAINS

NOTES:

2 Glossosoma sp. (pupa) 1 only
3 Hydroptila sp. (pupae)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Burn
DATE	8.6.93	SITE	Masham
SORTER	FN	SAMPLE CODE	NRA10 0053

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

NET GAINS

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Coquet
DATE	30.6.93	SITE	Bygate Hall
SORTER	VW	SAMPLE CODE	NRA02 0500

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Asellidae 2 Chloroperlidae

NET LOSSES

0

NET GAINS

2

NOTES:

1 Asellus aquaticus 1 only
2 Chloroperla torrentium 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Westerhope Burn
DATE	1.6.93	SITE	Westerhope
SORTER	JH	SAMPLE CODE	NRA02 2790

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Ephemerellidae 2 Philopotamidae

NET LOSSES NET GAINS

NOTES:

1 Ephemerella ignita 1 only
2 Wormaldia sp. 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Wear
DATE	30.6.93	SITE	Belmont
SORTER	SS/RJ	SAMPLE CODE	NRA02 2100

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks.	RIVER	Blakehope Burn
DATE	17.6.93	SITE	Blakehopeburn
SORTER	JH/VW	SAMPLE CODE	NRA02 2002

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Blyth
DATE	9.7.93	SITE	Bedlington
SORTER	EC/VW	SAMPLE CODE	NRA02 0910

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Rowhope Burn
DATE	30.6.93	SITE	u/s Coquet
SORTER	RJ	SAMPLE CODE	NRA02 0693

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE.	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Wear
DATE	30.6.93	SITE	Finchale Park
SORTER	RJ/RJ	SAMPLE CODE	NRA02 2090

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'umbria & Yorks

RIVER Bollilhope Burn

DATE 6.7.93

SITE Whitfield

SORTER SS

SAMPLE CODE NRA02 2750

AQC OF BMWP FAMILIES A. IN VIAL +

B. IN SAMPLE +

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES 0

NET GAINS 0

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Tees
DATE	22.7.93	SITE	Barnard Castle
SORTER	SS	SAMPLE CODE	NRA02 2990

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Lepidostomatidae

NET LOSSES

0

NET GAINS

1

NOTES:

1 *Lepidostoma hirtum* 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Browney
DATE	3.8.93	SITE	A167 Bridge
SORTER	JH	SAMPLE CODE	NRA02 2480

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Erpobdellidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Hydroptilidae

NET LOSSES

1

NET GAINS

1

NOTES:

2 Hydroptila sp. (pupa) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Hemsworth Dike
DATE	8.10.93	SITE	u/s Grove Lane STW, d/s SWO
SORTER	SGT	SAMPLE CODE	NRA10 2356

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Sphaeriidae* 2 Glossiphoniidae* 3 Tipulidae	4 Limnephilidae

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	5 Sphaeriidae* 6 Glossiphoniidae*

NET LOSSES

1

NET GAINS

1

NOTES:

3 Large Dolichopodid in vial
4 Micropterna sequax
5 Pisidium sp.
6 Helobdella stagnalis

Note on data sheet that Hydrobiidae and Lymnaeidae "not in vial".
Potamopyrgus jenkinsi found by IFE in sample.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Black Brook
DATE	18.1.94	SITE	Greetland
SORTER	JB	SAMPLE CODE	NRA10 0041

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Lymnaeidae

NET LOSSES

NET GAINS

NOTES:

1 Lymnaea peregra 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Went
DATE	10.11.93	SITE	Sykehouse Bridge
SORTER	RJJ	SAMPLE CODE	NRA10 2004

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Ryburn
DATE	21.12.93	SITE	u/s Boothdean Clough
SORTER	LS	SAMPLE CODE	NRA10 0254

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Lymnaeidae* 2 Oligochaeta*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	3 Lymnaeidae* 4 Oligochaeta*

NET LOSSES

0

NET GAINS

0

NOTES:

3 Lymnaea sp. (damaged specimen) 1 only
 4 Stylodrilus sp. (Lumbriculidae), Eiseniella tetraedra (Lumbricidae)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Little Don
DATE	5.10.93	SITE	d/s Langsett WTW
SORTER	VH	SAMPLE CODE	NRA10 0199

AQC OF BMWP FAMILIES A. IN VIAL

+

B. IN SAMPLE

+

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Sialidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

1

NET GAINS

0

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Dove
DATE	10.11.93	SITE	Wombwell
SORTER	LFM	SAMPLE CODE	NRA10 2318

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Dearne
DATE	28.10.93	SITE	Scissett
SORTER	JB	SAMPLE CODE	NRA10 0099

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Dytiscidae

NET LOSSES NET GAINS

NOTES:

1 Oreodytes sanmarkii (adults)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Bedale Beck
DATE	29.9.93	SITE	Leeming
SORTER	FN	SAMPLE CODE	NRA10 0032

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Leptoceridae

NET LOSSES NET GAINS

NOTES:

1 Mystacides sp. (juvenile) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Foss
DATE	19.11.93	SITE	Malton Road Bridge
SORTER	NL	SAMPLE CODE	NRA10 0152

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Piscicolidae 2 Corixidae 3 Elmidae

NET LOSSES

NET GAINS

NOTES:

1 Piscicola geometra 1 only
 2 Sigara sp. (damaged specimen) 1 only
 3 Oulimnius tuberculatus (adult) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Cockhill Beck
DATE	28.9.93	SITE	Hampsthwaite
SORTER	FN	SAMPLE CODE	NRA10 0874

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES

NET GAINS

NOTES:

--

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION N'Umbria & Yorks

RIVER Ainsby Beck

DATE 26.10.93

SITE Nr Moorside

SORTER LG

SAMPLE CODE NRA10 0849

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	None

NET LOSSES NET GAINS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Wharfe
DATE	5.11.93	SITE	Linton Bridge
SORTER	JL	SAMPLE CODE	NRA10 2058

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	1 Neritidae 2 Planorbidae 3 Ephemerellidae 4 Lepidostomatidae

NET LOSSES NET GAINS

NOTES:

- 1 Theodoxus fluviatilis (damaged specimen) 1 only
 2 Gyraulus albus 1 only
 3 Ephemerella ignita 1 only
 4 Lepidostoma hirtum 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1993

REGION	N'umbria & Yorks	RIVER	Wiske
DATE	25.10.93	SITE	Kirby Wiske
SORTER	JL	SAMPLE CODE	NRA10 0354

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Sphaeriidae*	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial is supplied with sample)	2 Sphaeriidae* 3 Dytiscidae

NET LOSSES NET GAINS

NOTES:

2 Empty shell in vial, Sphaerium sp., Pisidium sp. in sample
3 Ilybius sp. (larva) 1 only

