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An audit of performance in the processing of macro-invertebrate samples in 1994. NRA North West Region

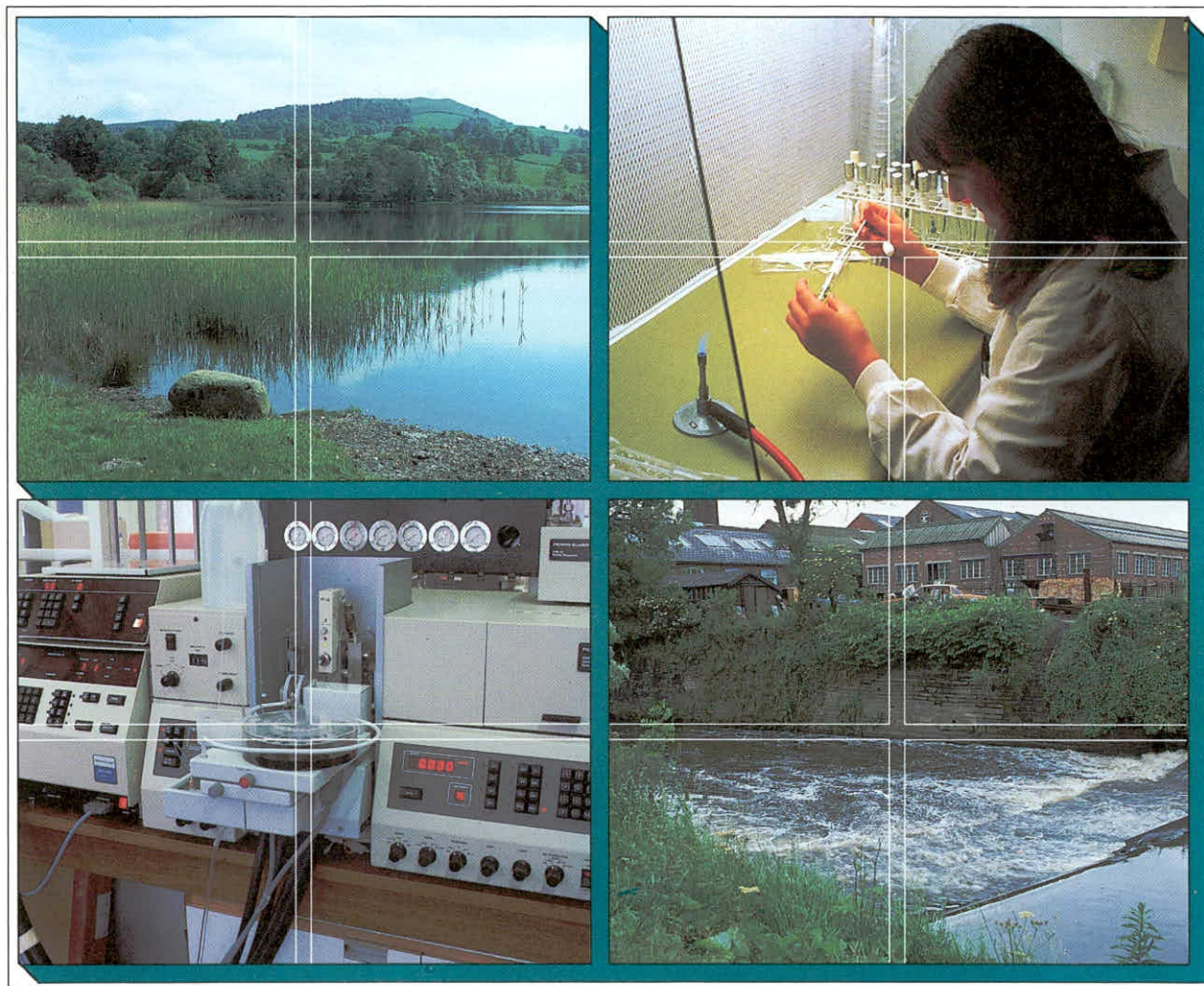
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Report To:
IFE Report Ref. No:

National Rivers Authority, North West Region
RL/T04071h1/03





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NRA North West Region**

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Report Date:	May 1995
Report To:	National Rivers Authority, North West Region
IFE Report Ref. No:	RL/T04071h1/03

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1. INTRODUCTION

In 1994 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 54 samples audited for NRA North West Region. 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.

TABLE 1. The IFE Report form

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	<input type="text"/>	RIVER	<input type="text"/>
DATE	<input type="text"/>	SITE	<input type="text"/>
SORTER	<input type="text"/>	CODE	<input type="text"/>

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 FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box is only completed when no vial is supplied with the sample)	

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

TABLE 2. The 43 spring samples audited for North West Region.

River	Site	Sorter	Losses	Gains	Omissions
Leith	Cliburn	AJ/RW	0	2	0
Stainton Beck	Rowell Bridge	BJI/NC	0	1	0
Ellen	Harriston	AJ/AJ	2	4	2
Ehen	Braystones	KJR/NC	0	1	0
Loo Gill	NY 627 427	RFP/NC	0	3	0
Furnace Gill	d/s Broughton Moor STW	AJ/RW	0	3	0
Colton Beck	Colton Beck Bridge	BJI/NC	0	1	0
Calder	B6430 Bridge	SLP	1	5	1
Carr Brook	ptc R. Lostock	ADE	0	2	0
Park Lane Brook	Forton Road Bridge	ADE	1	4	1
Cuncsough Brook	B5197 Bridge	EIG	0	0	0
Calico Brook	ptc R. Douglas	JAW	0	3	0
Barton Brook	Cardwell Bridge	JEL	1	3	0
Wasdale Beck	ptc Birk Beck	JAW	0	0	0
Yarrow	Birkacre	SML	0	3	0
Borrow Beck	A685 Bridge	JAW	0	2	0
Castle Clough Brook	ptc R. Calder	JEL	0	1	0
Calder	Gawthorpe Hall	JEL	0	3	0
Downholland Brook	ptc R. Alt	SML	0	0	0
Darwen	Cann Bridge	SML	0	2	0
Douglas	Wigan Football Club	SML	0	0	0
Douglas	u/s Rivington Reservoir	JAW	0	4	0
Tarleton Runner	Long Ditch Bridge	EIG	0	5	0
Brock	Roe Bridge	KE	0	3	0
Pedley Brook	Springwood Farm	SJ	1	3	0
Blackburns Brook	d/s Rostherne Mere	KW	1	6	0
Limy Water	u/s Loveclough Textiles	JH	0	6	1

River	Site	Sorter	Losses	Gains	Omissions
Croco	Sproston Hall	SJM	0	3	0
Norbury Brook	ptc Poynton Brook	JH	0	1	0
Marthall Brook	Springwood Farm	KW	1	5	0
Whitewell Brook	ptc Shawclough Brook	JH	0	1	1
Pott Shrigley Brook	ptc Harrop Brook	TDP	1	6	1
Rosendale Brook	ptc R. Bollin	SJ	1	7	0
Dean	u/s Rainow ETW	JH	0	5	0
Weaver	Rookery Hall	GM/DGH	0	0	1
Randall Carr Brook	ptc R. Goyt	SJ/DGH	0	4	0
Goyt	u/s Strines Print Works	GM/DGH	0	1	0
Etherow	d/s Bottoms Reservoir	PN/DGH	0	2	0
Kinder	ptc R. Sett	SJM/DGH	0	5	0
Bickley Brook	u/s Bar Mere	TDP/DGH	1	2	0
Crowton Brook	Crowton Mill	JB/DGH	0	1	0
Cliff Brook	ICI intake	JB/DGH	0	0	0
Bogart Brook	ptc R. Weaver	GM/DGH	1	3	0

TABLE 3. The 3 summer samples audited for North West Region.

River	Site	Sorter	Losses	Gains	Omissions
Ribble	Paythorne Bridge	SLP	0	5	1
Stock Beck	A682 Bridge	EIG	0	7	0
Stock Beck	Horton Bridge	KE	0	2	0

TABLE 4. The 8 autumn samples audited for North West Region.

River	Site	Sorter	Losses	Gains	Omissions
Old Water	NY 575 537	RFP/NC	0	1	0
Leven	Haverthwaite	BJI/NC	0	3	0
Coledale Beck	d/s Birkthwaite Beck	AJ/AJ	0	0	0
Trout Beck	ptc Windermere	BJI/NC	0	1	0
Show Burn	NY 526 722	DS/RW	0	1	0
Cald Beck	Caldbeck Church	AJ/AJ	0	0	0
Dash Beck	NY 216 310	AJ/AJ	0	1	0
Hoff Beck	Near Colby	DS/RW	0	0	0

APPENDIX

Results of individual sample audits

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Leith
DATE	18.4.94	SITE	Cliburn
SORTER	AJ/RW	CODE	NRA03 Orgw

A	<p align="center">VIAL</p> <p>Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE</p>	<p align="center">BMWP FAMILIES NOT FOUND BY IFE</p>	<p align="center">ADDITIONAL FAMILIES FOUND BY IFE</p>
		None	None

B	<p align="center">SAMPLE</p> <p>Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE</p>	<p align="center">BMWP FAMILIES NOT FOUND BY IFE</p>	<p align="center">ADDITIONAL FAMILIES FOUND BY IFE</p>
		(This box is only completed when no vial is supplied with the sample)	1 Lymnaeidae 2 Gyrinidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Lymnaea peregra 1 only
 2 Orectochilus villosus (larva) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Stainton Beck
DATE	21.4.94	SITE	Rowell Bridge
SORTER	BJI/NC	CODE	NRA03 13co

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 is only completed when no vial is supplied with the sample)	1 Ephemerellidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Ephemerella ignita 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Ellen
DATE	21.2.94	SITE	Harriston
SORTER	AJ/AJ	CODE	NRA03 08kc

A	VIAL Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Sphaeriidae* 2 Leptophlebiidae 3 Hydrophilidae* 4 Sericostomatidae	5 Nemouridae 6 Lepidostomatidae

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	7 Planariidae 8 Lymnaeidae 9 Sphaeriidae* 10 Hydrophilidae*

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 Nemoura cambrica/erratica
6 Lepidostoma hirtum
7 Polycelis nigra/tenuis 1 only
8 Lymnaea peregra
9 Pisidium sp. 1 only
10 Hydraena gracilis (adult) 1 only |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Ehen
DATE	12.5.94	SITE	Braystones
SORTER	KJR/NC	CODE	NRA03 01xg

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Hydraena gracilis (adult) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Loo Gill
DATE	22.3.94	SITE	NY 627 427
SORTER	RFP/NC	CODE	NRA03 Oiha

A	<p align="center">VIAL</p> <p>Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE</p>	<p align="center">BMWP FAMILIES NOT FOUND BY IFE</p>	<p align="center">ADDITIONAL FAMILIES FOUND BY IFE</p>
		None	1 Siphonuridae 2 Hydrophilidae

B	<p align="center">SAMPLE</p> <p>Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE</p>	<p align="center">BMWP FAMILIES NOT FOUND BY IFE</p>	<p align="center">ADDITIONAL FAMILIES FOUND BY IFE</p>
		(This box is only completed when no vial is supplied with the sample)	3 Hydropsychidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|------------------------------------------------------------------------------------------------|
| 1 Ameletus inopinatus
2 Octhebius exsculptus (adult)
3 Hydropsyche sp. (juvenile) 1 only |
|------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Furnace Gill
DATE	25.3.94	SITE	d/s Broughton Moor STW
SORTER	AJ/RW	CODE	NRA03 0cks

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 is only completed when no vial is supplied with the sample)	1 Hydrobiidae 2 Sphaeriidae 3 Erpobdellidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|---------------------------------------------------------------------------------------------|
| <p>1 Potamopyrgus jenkinsi
2 Pisidium sp. 1 only
3 Erpobdella octoculata 1 only</p> |
|---------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Colton Beck
DATE	14.2.94	SITE	Colton Bridge
SORTER	BJI/NC	CODE	NRA03 1b2g

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Halesus digitatus/radiatus

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Calder
DATE	18.3.94	SITE	B6430 Bridge ptc R.Wyre
SORTER	SLP	CODE	

A	VIAL Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Gammaridae* 2 Psychomyiidae	3 Polycentropodidae

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	4 Gammaridae* 5 Leptophlebiidae 6 Caenidae 7 Hydrophilidae 8 Sericostomatidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 Polycentropus flavomaculatus
4 Gammarus pulex
5 Paraleptophlebia submarginata 1 only
6 Caenis rivulorum 1 only
7 Hydraena gracilis (adults)
8 Sericostoma personatum 1 only |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Carr Brook
DATE	22.5.94	SITE	ptc R.Lostock
SORTER	ADE	CODE	

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 Chironomidae

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 is only completed when no vial is supplied with the sample)	2 Dendrocoelidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

<p>1 Metriocnemus sp., Rheocricotopus sp., Thienemannimyia group 2 Dendrocoelum lacteum</p>

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Park Lane Brook
DATE	22.2.94	SITE	Forton Road Bridge
SORTER	ADE	CODE	

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

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	3 Ancyliidae* 4 Hydrophilidae 5 Elmidae 6 Hydropsychidae 7 Limnephilidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Empty shells in vial and sample
2,3 Empty shell in vial, Ancyclus fluviatilis in sample
4 Hydraena riparia (adult) 1 only
5 Limnius volckmari (adult) 1 only
6 Hydropsyche angustipennis 1 only
7 Limnephilus lunatus 1 only |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Cunscough Brook
DATE	10.5.94	SITE	B5197 Cunscough Bridge West
SORTER	EIG	CODE	

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 is only completed when no vial is supplied with the sample)	None

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Calico Brook
DATE	6.5.94	SITE	ptc R.Douglas
SORTER	JAW	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Anphinemura sulcicollis 2 Polycelis nigra/tenuis 1 only 3 Helophorus brevipalpis (adult) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Barton Brook
DATE	8.3.94	SITE	Cardwell (A6) Bridge
SORTER	JEL	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- 1 Succineid in vial
- 2 Potamopyrgus jenkinsi
- 3 Ancyclus fluviatilis
- 4 Haliplus sp. (larva) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Wasdale Beck
DATE	4.3.94	SITE	ptc Birk Beck
SORTER	JAW	CODE	

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 is only completed when no vial is supplied with the sample)	None

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Yarrow
DATE	25.5.94	SITE	Birkacre
SORTER	SML	CODE	

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 Erpobdellidae 2 Tipulidae

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 is only completed when no vial is supplied with the sample)	3 Rhyacophilidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

<p>1 Erpobdella octoculata 2 Dicranota sp. 3 Glossosoma sp. (pupa) 1 only</p>

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Borrow Beck
DATE	4.3.94	SITE	A685 Bridge ptc R.Lune
SORTER	JAW	CODE	

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 Elmidae

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 is only completed when no vial is supplied with the sample)	2 Chironomidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 *Esolus parallelepipedus* (larva) in vial, *Limnius volckmari* (larva) in sample
2 *Micropsectra* sp.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Castle Clough Brook
DATE	24.5.94	SITE	ptc R.Calder
SORTER	JEL	CODE	

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 is only completed when no vial is supplied with the sample)	1 Hydrophilidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Hydraena gracilis (adult) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Calder
DATE	24.5.94	SITE	Gawthorpe Hall
SORTER	JEL	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Potamopyrgus jenkinsi 1 only 2 Ephemerella ignita 1 only 3 Limnius volckmari (larvae)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Downholland Brook
DATE	10.5.94	SITE	ptc R.Alt
SORTER	SML	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Darwen
DATE	21.2.94	SITE	Cann Bridge, Higher Walton
SORTER	SML	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Polycelis nigra/tenuis 2 Crangonyx pseudogracilis 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Douglas
DATE	5.5.94	SITE	Wigan Football Club
SORTER	SML	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Douglas
DATE	4.5.94	SITE	u/s Rivington Reservoir
SORTER	JAW	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- 1 Isoperla grammatica
- 2 Chloroperla torrentium, C.tripunctata
- 3 Beraea maurus
- 4 Sphaerium sp. 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Tarleton Runner
DATE	10.5.94	SITE	Long Ditch Bridge
SORTER	EIG	CODE	

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

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	3 Planariidae 4 Valvatidae 5 Heptageniidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 <i>Piscicola geometra</i>
2 <i>Ischnura elegans</i>
3 <i>Dugesia polychroa/lugubris</i>
4 <i>Valvata cristata, V.piscinalis</i>
5 <i>Rhithrogena sp.</i> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Brock
DATE	31.3.94	SITE	Roe Bridge ptc New Draught
SORTER	KE	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|---------------------------------------------------------------------------------------|
| 1 Athripsodes bilineatus
2 Armiger crista 1 only
3 Erpobdella octoculata 1 only |
|---------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Pedley Brook
DATE	26.4.94	SITE	Springwood Farm
SORTER	SJ	CODE	NRA03 lhuc

A	VIAL Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Dytiscidae	2 Sialidae

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

2 Sialis fuliginosa 3 Sphaerium sp. 1 only 4 Ephemera danica 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Blackburns Brook
DATE	29.4.94	SITE	d/s Rostherne Mere
SORTER	KW	CODE	NRA03 ligk

A	VIAL Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Sericostomatidae	2 Hydrobiidae 3 Molannidae 4 Leptoceridae 5 Tipulidae

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	6 Asellidae 7 Elmidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 Potamopyrgus jenkinsi
3 Molanna angustata 1 only
4 Athripsodes cinereus
5 Limnophila (Eloeophila) sp. 1 only
6 Asellus aquaticus
7 Elmis aenea (adult) 1 only |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Limy Water
DATE	16.3.94	SITE	u/s Loveclough Textiles
SORTER	JH	CODE	NRA03 pdt8

A	VIAL Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Planorbidae*	2 Taeniopterygidae

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	3 Planariidae 4 Planorbidae* 5 Ancyliidae 6 Perlodidae 7 Beraeidae 8 Sericostomatidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1,4 Zonitidae in vial, Bathyomphalus contortus + Planorbis carinatus in vial
2 Brachyptera risi
3 Polycelis nigra/tenuis
5 Ancylus fluviatilis 1 only
6 Isoperla grammatica 1 only
7 Beraea pullata 1 only
8 Sericostoma personatum |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Croco
DATE	18.3.94	SITE	Sproston Hall
SORTER	SJM	CODE	NRA03 ngwk

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|---------------------------------------------------------------------------|
| 1 Lymnaea peregra
2 Nemoura sp. (juveniles)
3 Potamopyrgus jenkinsi |
|---------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Norbury Brook
DATE	3.5.94	SITE	ptc Poynton Brook
SORTER	JH	CODE	NRA03 q3w4

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 is only completed when no vial is supplied with the sample)	1 Asellidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Asellus aquaticus

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Marthall Brook
DATE	26.4.94	SITE	Springwood Farm
SORTER	KW	CODE	NRA03 1hrk

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- 2 Potamopyrgus jenkinsi
- 3 Halesus radiatus, Potamophylax cingulatus/latipennis
- 4 Pisidium sp. 1 only
- 5 Glossiphonia complanata 1 only
- 6 Amphinemura sulcicollis 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Whitewell Brook
DATE	10.3.94	SITE	ptc Shawclough Brook
SORTER	JH	CODE	NRA03 pcqc

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

2 Pisidium sp. 3 Stylodrilus spp.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Pott Shrigley Brook
DATE	15.4.94	SITE	ptc Harrop Brook
SORTER	TDP	CODE	NRA03 nb4c

A	VIAL Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Goeridae 2 Chironomidae*	3 Chloroperlidae

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	4 Hydrobiidae 5 Ancylidae 6 Sphaeriidae 7 Hydrophilidae 8 Polycentropodidae 9 Chironomidae*

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Large Glossosoma sp. in vial
3 Chloroperla torrentium
4 Potamopyrgus jenkinsi
5 Ancylus fluviatilis 1 only
6 Sphaerium sp., Pisidium sp.
7 Hydraena gracilis (adult) 1 only
8 Plectrocnemia sp. 1 only
9 Orthocladiinae, Tanytarsini |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Rossendale Brook
DATE	21.4.94	SITE	ptc R.Bollin
SORTER	SJ	CODE	NRA03 1h5c

A	VIAL Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Hirudinidae	2 Erpobdellidae 3 Taeniopterygidae 4 Hydrophilidae

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	5 Leptophlebiidae 6 Chloroperlidae 7 Hydropsychidae 8 Tipulidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 Trocheta subviridis
3 Brachyptera risi
4 Hydraena gracilis (adults)
5 Habrophlebia fusca
6 Chloroperla torrentium 1 only
7 Hydropsyche siltalai
8 Dicranota sp., Molophilus sp. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Dean
DATE	15.4.94	SITE	u/s Rainow ETW, Hough Hole
SORTER	JH	CODE	NRA03 n5pw

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

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	1 Hydrobiidae 2 Asellidae 3 Nemouridae 4 Chloroperlidae 5 Sericostomatidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- 1 Potamopyrgus jenkinsi
- 2 Asellus aquaticus
- 3 Amphinemura sulcicollis 1 only
- 4 Chloroperla torrentium 1 only
- 5 Sericostoma personatum

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Weaver
DATE	6.5.94	SITE	Rookery Hall
SORTER	GM/DGH	CODE	NRA03 rpgc

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 Planariidae*	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 is only completed when no vial is supplied with the sample)	2 Planariidae*

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

2 Indet Planariid 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Randall Carr Brook
DATE	22.3.94	SITE	ptc R.Goyt
SORTER	SJ/DGH	CODE	NRA03 019g

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|----------------------------------------------------------------------------------------------------------------|
| 1 Lype sp.
2 Potamopyrgus jenkinsi
3 Indet Hydrophilid (larva) 1 only
4 Sericostoma personatum 1 only |
|----------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Goyt
DATE	31.3.94	SITE	u/s Strines Print Works
SORTER	GM/DGH	CODE	NRA03 cin0

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Glossiphonia complanata

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Etherow
DATE	4.5.94	SITE	d/s Bottoms Reservoir
SORTER	PN/DGH	CODE	NRA03 neto

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Hydroptila sp. 2 Indet Sphaeriid (decalcified) 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Kinder
DATE	23.3.94	SITE	ptc R.Sett
SORTER	SJM/DGH	CODE	NRA03 or4k

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 is only completed when no vial is supplied with the sample)	1 Planariidae 2 Sphaeriidae 3 Taeniopterygidae 4 Chloroperlidae 5 Beraeidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- 1 Polycelis felina 1 only
- 2 Pisidium sp. 1 only
- 3 Brachyptera risi 1 only
- 4 Chloroperla torrentium
- 5 Beraea maurus 1 only

Note on data sheet that Taeniopteryx found in labsort but disappeared from AQC. A juvenile Brachyptera risi found by IFE in sample. This is included as a gain since Taeniopteryx not included in listing.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Bickley Brook
DATE	6.5.94	SITE	u/s Bar Mere
SORTER	TDP/DGH	CODE	NRA03 rup8

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 is only completed when no vial is supplied with the sample)	2 Sphaeriidae 3 Asellidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

2 Pisidium sp.
3 Asellus aquaticus 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Crowton Brook
DATE	11.5.94	SITE	Crowton Mill, d/s Small Brook
SORTER	JB/DGH	CODE	NRA03 sib8

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Amphinemura sulcicollis 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Cliff Brook
DATE	11.5.94	SITE	ICI intake, ptc R.Weaver
SORTER	JB/DGH	CODE	NRA03 shuk

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Bogart Brook
DATE	10.5.94	SITE	ptc R.Weaver
SORTER	GM/DGH	CODE	NRA03 sgx8

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Succinea sp. in vial, empty Lymnaea sp. shells in sample
2 Potamopyrgus jenkinsi
3 Elmis aenea (adults + larva)
4 Rhyacophila sp. (juvenile) 1 only |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Ribble
DATE	2.8.94	SITE	Paythorne Bridge
SORTER	SLP	CODE	

A	VIAL Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Polycentropodidae*	2 Leuctridae

B	SAMPLE Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	3 Hydrobiidae 4 Asellidae 5 Hydrophilidae 6 Polycentropodidae* 7 Leptoceridae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 Leuctra fusca, L.geniculata
3 Potamopyrgus jenkinsi
4 Asellus aquaticus 1 only
5 Hydraena pulchella (adult) 1 only (Notable a)
6 Polycentropus flavomaculatus
7 Athripsodes albifrons (larva + pupa) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Stock Beck
DATE	2.8.94	SITE	A682 Bridge, Gisburn
SORTER	EIG	CODE	

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

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box is only completed when no vial is supplied with the sample)	1 Dendrocoelidae 2 Valvatidae 3 Oligochaeta 4 Gammaridae 5 Leuctridae 6 Psychomyiidae 7 Chironomidae
Differences between: i) BMWP families listed on sample data sheet and and ii) BMWP families found in SAMPLE by IFE			

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Dendrocoelum lacteum 1 only
2 Valvata cristata 1 only
3 Tubificidae, Lumbriculidae
4 Crangonyx pseudogracilis 1 only
5 Leuctra fusca 1 only
6 Tinodes waeneri
7 Tanypodinae, Orthocladiinae |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Stock Beck
DATE	2.8.94	SITE	Horton Bridge
SORTER	KE	CODE	

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Valvata cristata 2 Haliplus sp. (larvae)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Old Water
DATE	2.9.93	SITE	NY 575 537
SORTER	RFP/NC	CODE	NRA03 0o5g

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 is only completed when no vial is supplied with the sample)	1 Gammaridae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Gammarus pulex 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Leven
DATE	28.9.94	SITE	Haverthwaite
SORTER	BJI/NC	CODE	NRA03 184w

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

- 1 Lymnaea peregra
- 2 Physa fontinalis
- 3 Simulium aureum group 1 only

Note in vial that Dendrocoelidae could not be found. Not found by IFE in vial or sample.

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Coledale Beck
DATE	5.12.94	SITE	d/s Birkthwaite Beck
SORTER	AJ/AJ	CODE	NRA03 04v0

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Trout Beck
DATE	22.9.94	SITE	ptc Windermere
SORTER	BJI/NC	CODE	NRA03 19ak

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Potamopyrgus jenkinsi 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Show Burn
DATE	24.11.94	SITE	NY 526 722
SORTER	DS/RW	CODE	NRA03 0ts8

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 is only completed when no vial is supplied with the sample)	1 Chloroperlidae

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Chloroperla torrentium 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Cald Beck
DATE	12.10.94	SITE	Caldbeck Church
SORTER	AJ/AJ	CODE	NRA03 0kg4

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Dash Beck
DATE	28.9.94	SITE	NY 216 310
SORTER	AJ/AJ	CODE	NRA03 053c

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

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

1 Ephemerella ignita 1 only

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES - 1994

REGION	North West	RIVER	Hoff Beck
DATE	8.11.94	SITE	Near Colby
SORTER	DS/RW	CODE	NRA03 0gfo

A	<p align="center">VIAL</p> <p>Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE</p>	<p align="center">BMWP FAMILIES NOT FOUND BY IFE</p>	<p align="center">ADDITIONAL FAMILIES FOUND BY IFE</p>
		None	None

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

* Taxa recorded on data sheet but absent from vial and found by I.F.E. in sample (omissions)

NET LOSSES NET GAINS OMISSIONS

NOTES:

