



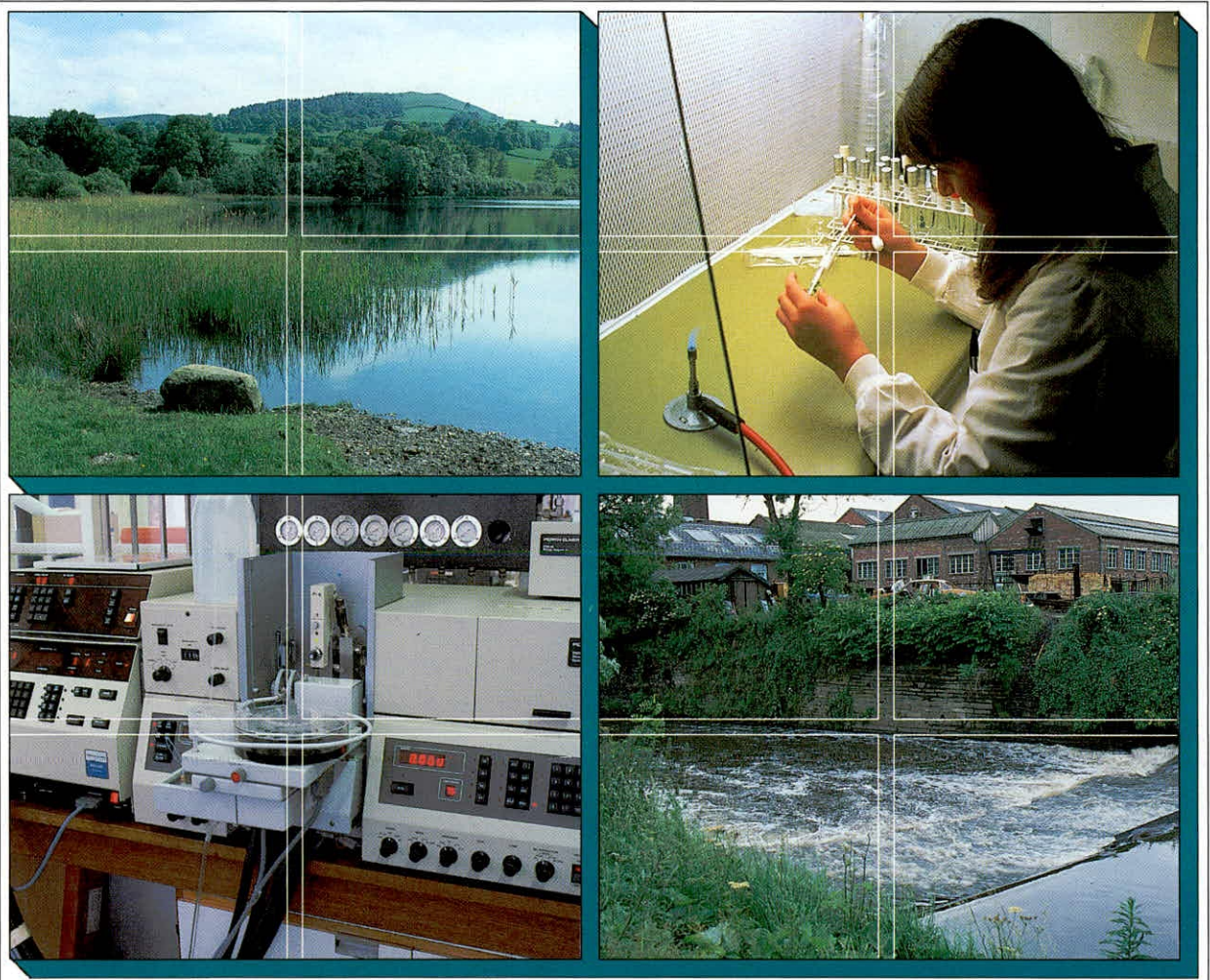
An audit of performance in the processing of macro-invertebrate samples in 1992. Forth River Purification Board

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**An audit of performance in the processing
of macro-invertebrate samples in 1992.
Forth River Purification Board**

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1. INTRODUCTION

In 1992 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 31 samples audited for Forth River Purification Board. 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 RPB listing of families and those identified from the vial by IFE
- d) A comparison was made between the RPB listing of families and those found in the sample by IFE
- e) "Losses" or "gains" from the RPB 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 RPB 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 RPB data sheet. Families not on the RPB 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 Tables 2, 3 and 4 which summarise the results.

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 RPB 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 list but present in the sample were entered in box B under "additional families" as before. Families recorded on the 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 sorter, entries in this box could include the sole representative of a family which was removed, a family seen at the site which escaped or was released (without mention being made on the data sheet), inaccurate identification, the wrong family box being ticked on the 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 Kay Symes for help with production of results and to Valerie Palmer for typing the manuscript.

TABLE 1. The IFE Report form

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

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

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)	

NET LOSSES

☐

NET GAINS

☐

NOTES:

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TABLE 2. The 10 spring samples audited for Forth RPB.

River	Site	Sorter	Losses	Gains	Omissions
Allan Water	Bridge of Allan	MP	0	2	0
Devon	B908 Bridge	MP	0	4	0
Almond	Cowhill	HT	0	0	0
South Esk	d/s Gore Water	SdP	0	2	0
Almond	Blackburn	HT	0	0	0
Devon	Dollarfield	MP	0	2	0
Dalhousie Burn	u/s Lothian Bridge	SdP	0	1	0
Teith	Torrie Cottages	KM	0	0	0
Killandean Burn	Almond confluence	KM	0	1	0
Almond	d/s Livingstone Village	KM	0	0	0

TABLE 3. The 6 summer samples audited for Forth RPB.

River	Site	Sorter	Losses	Gains	Omissions
Almond	Birdsmill	HT	0	0	0
Leven	Balfour Bridge	PW	0	2	1
Avon	Slamannan Bridge	HT	1	5	0
Teith	Bridge of Teith	PW	0	2	0
Leven	d/s National Steel Foundry	PW	0	2	0
Water of Leith	Currie	SdP	0	1	0

TABLE 4. The 15 autumn samples audited for Forth RPB.

River	Site	Sorter	Losses	Gains	Omissions
Killandean Burn	u/s Almond confluence	HT	0	0	0
Water of Leith	Murrayfield	SdP	0	1	0
Dreel Burn	Anstruther	IF	0	1	0
Tiel Burn	A92 Bridge	IF	0	6	0
Biel Water	Biel Mill	SdP	0	6	0
Middleton South Burn	Borthwick	SdP	0	1	0
Water of Chon	Loch Dhu outlet	PW	0	3	0
Leven	Balfour Bridge	IF	0	3	0
Eas Gobhain	Garchonzie Bridge	PW	0	2	0
Almond	Kirkliston	HT	0	0	0
Keithing Burn	Pargillis Bridge	IF	0	3	0
Cocklemill Burn	A917 Bridge	IF	0	0	0
Bannock Burn	Bannockburn	PW	0	2	0
Leven	d/s National Steel Foundry	IF	0	1	0
Forth	Cobleland	PW	0	4	0

APPENDIX

Results of individual sample audits

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Allan Water
DATE	20.5.92	SITE	Bridge of Allan
SORTER	MP	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	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 Hydrobiidae 2 Leptoceridae

NET LOSSES

NET GAINS

NOTES:

1 Potamopyrgus jenkinsi 1 only
2 Ceraclea dissimilis

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Devon
DATE	20.5.92	SITE	B908 Bridge
SORTER	MP	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	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 Hydrobiidae 2 Caenidae 3 Leuctridae 4 Lepidostomatidae

NET LOSSES

0

NET GAINS

4

NOTES:

- 1 Potamopyrgus jenkinsi
- 2 Caenis rivulorum 1 only
- 3 Leuctra fusca
- 4 Lepidostoma hirtum 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Almond
DATE	9.4.92	SITE	Cowhill
SORTER	HT	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	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

NOTES:

NET LOSSES NET GAINS

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES .

REGION	Forth RPB	RIVER	South Esk
DATE	9.4.92	SITE	d/s Gore Water
SORTER	SdP	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	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 2 Limnephilidae

NET LOSSES

0

NET GAINS

2

NOTES:

1 Polycelis felina 1 only
2 Potamophylax sp. 1 only (anterior end only)

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Almond
DATE	9.4.92	SITE	Blackburn
SORTER	HT	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	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:

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1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Devon
DATE	20.5.92	SITE	Dollarfield
SORTER	MP	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	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 Perlidae 2 Dytiscidae

NET LOSSES

0

NET GAINS

2

NOTES:

1 Dinocras cephalotes 1 only
2 Oreodytes sanmarkii (adult) 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Dalhousie Burn
DATE	9.4.92	SITE	u/s Lothian Bridge
SORTER	SdP	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	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

NET LOSSES

0

NET GAINS

1

NOTES:

1 Asellus aquaticus

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Teith
DATE	21.5.92	SITE	Torrie Cottages
SORTER	KM	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	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:

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Killandean Burn
DATE	9.4.92	SITE	Almond Confluence
SORTER	KM	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	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 Perlodidae

NET LOSSES

0

NET GAINS

1

NOTES:

1 Isoperla grammatica 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Almond
DATE	9.4.92	SITE	d/s Livingstone Village
SORTER	KM	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	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:

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1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Almond
DATE	9.7.92	SITE	Birdsmill
SORTER	HT	SAMPLE CODE	16/10/13.83

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:

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Leven
DATE	26.8.92	SITE	Balfour Bridge
SORTER	PW	SAMPLE CODE	2/10/8

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 Hydrobiidae 3 Hydroptilidae 4 Chironomidae*

NET LOSSES

0

NET GAINS

2

NOTES:

2 Potamopyrgus jenkinsi 1 only
3 Hydroptila sp.
4 Orthocladiinae

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Avon
DATE	15.7.92	SITE	Slamannan Bridge
SORTER	HT	SAMPLE CODE	14/10/33.38

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 Nemouridae	2 Taeniopterygidae

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)	3 Sphaeriidae 4 Caenidae 5 Hydrophilidae 6 Rhyacophilidae

NET LOSSES

NET GAINS

NOTES:

- 2 Taeniopteryx nebulosa
- 3 Pisidium sp 1 only
- 4 Caenis rivulorum
- 5 Indet Hydrophilid (larva) 1 only
- 6 Rhyacophila dorsalis (larva + pupa)

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Teith
DATE	4.8.92	SITE	Bridge of Teith, Doune
SORTER	PW	SAMPLE CODE	9/10/8

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 2 Sericostomatidae

NET LOSSES

0

NET GAINS

2

NOTES:

1 Limnebius truncatellus (adult) 1 only
2 Sericostoma personatum 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

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	None	1 Valvatidae

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 NET GAINS

NOTES:

1 Valvata piscinalis
2 Hydroptila sp. 1 only

Valvatidae and Sphaeriidae entered on data sheet as "?". BMWP score of 79 suggests that only one of these taxa is included. Since "Valvata sp. (could be)" is not underlined, this is taken to be the excluded taxon.

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION

Forth RPB

RIVER

Water of Leith

DATE

14.7.92

SITE

Currie

SORTER

SdP

SAMPLE CODE

18/10/19.55

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 Ancylidae

NET LOSSES

0

NET GAINS

1

NOTES:

1 Ancylus fluviatilis 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION

Forth RPB

RIVER

Killandean Burn

DATE

21.10.92

SITE

u/s Almond confluence

SORTER

HT

SAMPLE CODE

16/220/24.42

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:

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION Forth RPB

RIVER Water of Leith

DATE 13.11.92

SITE Murrayfield

SORTER SdP

SAMPLE CODE 18/10/8.75

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 Planorbidae

NET LOSSES NET GAINS

NOTES:

1 Armiger crista 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Dreel Burn
DATE	15.9.92	SITE	Anstruther
SORTER	IF	SAMPLE CODE	1/30/0.6

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 Planariidae

NET LOSSES NET GAINS

NOTES:

1 Polycelis nigra/tenuis 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Tiel Burn
DATE	25.11.92	SITE	A92 Bridge
SORTER	IF	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	None	1 Erpobdellidae

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 Planorbidae 3 Leptophlebiidae 4 Perlodidae 5 Psychomyiidae 6 Odontoceridae

NET LOSSES

NET GAINS

NOTES:

1 Erpobdella octoculata
2 Armiger crista 1 only
3 Paraleptophlebia sp. 1 only
4 Isoperla grammatica
5 Tinodes waeneri 1 only
6 Odontocerum albicorne 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Biel Water
DATE	14.10.92	SITE	Biel Mill
SORTER	SdP	SAMPLE CODE	23/230/5.3

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 Planariidae 2 Sphaeriidae 3 Nemouridae 4 Perlodidae 5 Goeridae 6 Simuliidae

NET LOSSES NET GAINS

NOTES:

- 1 Polycelis felina 1 only
- 2 Pisidium sp. 1 only
- 3 Amphinemura sulcicollis, Protonemura meyeri
- 4 Isoperla sp. (juvenile) 1 only
- 5 Silo pallipes
- 6 Simulium ornatum group, S.reptans

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Middleton South Burn
DATE	24.11.92	SITE	Borthwick
SORTER	SdP	SAMPLE CODE	20/400/25.96

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

NET LOSSES

0

NET GAINS

1

NOTES:

1 Potamopyrgus jenkinsi 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Water of Chon
DATE	10.11.92	SITE	Loch Dhu outlet
SORTER	PW	SAMPLE CODE	10/530/65.12

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	1 Sericostomatidae

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 Elmidae 3 Hydroptilidae

NET LOSSES

0

NET GAINS

3

NOTES:

1 Sericostoma personatum
2 Oulimnius sp. (larva) 1 only
3 Oxyethira sp.

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Leven
DATE	7.10.92	SITE	Balfour Bridge
SORTER	IF	SAMPLE CODE	2/10/8

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 Elmidae 2 Hydroptilidae 3 Lepidostomatidae

NET LOSSES

NET GAINS

NOTES:

1 Elmis aenea (adults)
2 Hydroptila sp. (pupa) 1 only
3 Lepidostoma hirtum 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Eas Gobhain
DATE	27.10.92	SITE	Garchonzie Bridge
SORTER	PW	SAMPLE CODE	9/200/24.3

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 Planariidae 2 Hydrophilidae

NET LOSSES

0

NET GAINS

2

NOTES:

1 Polycelis felina 1 only
2 Hydraena gracilis (adult) 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Almond
DATE	8.10.92	SITE	Kirkliston
SORTER	HT	SAMPLE CODE	16/10/9.09

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:

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1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Keithing Burn
DATE	25.11.92	SITE	Pargillis Bridge
SORTER	IF	SAMPLE CODE	3/160/3.1

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	1 Perlodidae

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 3 Hydrobiidae

NET LOSSES

0

NET GAINS

3

NOTES:

1 Isoperla grammatica
2 Crenobia alpina 1 only
3 Potamopyrgus jenkinsi

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Cocklemill Burn
DATE	25.11.92	SITE	A917 Bridge
SORTER	IF	SAMPLE CODE	1/90/4.3

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:

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1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Bannock Burn
DATE	21.10.92	SITE	Bannockburn
SORTER	PW	SAMPLE CODE	11/80/7.3

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 Planariidae 2 Hydrobiidae

NET LOSSES NET GAINS

NOTES:

1 Polycelis felina, P.nigra/tenuis
2 Potamopyrgus jenkinsi 1 only

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Leven
DATE	7.10.92	SITE	d/s National Steel Foundry
SORTER	IF	SAMPLE CODE	2/10/1.6

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 Leptoceridae

NET LOSSES NET GAINS

NOTES:

1 Athripsodes cinereus

1992 RIVER QUALITY SURVEY AQC - BIOLOGICAL SAMPLES

REGION	Forth RPB	RIVER	Forth
DATE	10.11.92	SITE	Cobleland
SORTER	PW	SAMPLE CODE	10/10/51.2

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 Erpobdellidae 2 Gammaridae 3 Sialidae 4 Chironomidae

NET LOSSES

0

NET GAINS

4

NOTES:

- 1 Indet Erpobdellids (juveniles)
- 2 Gammarus pulex 1 only
- 3 Sialis fuliginosa 1 only
- 4 Orthocladiinae 1 only

