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An audit of performance in the analysis of biological samples in 1995 NRA North West Region: AQC Audit

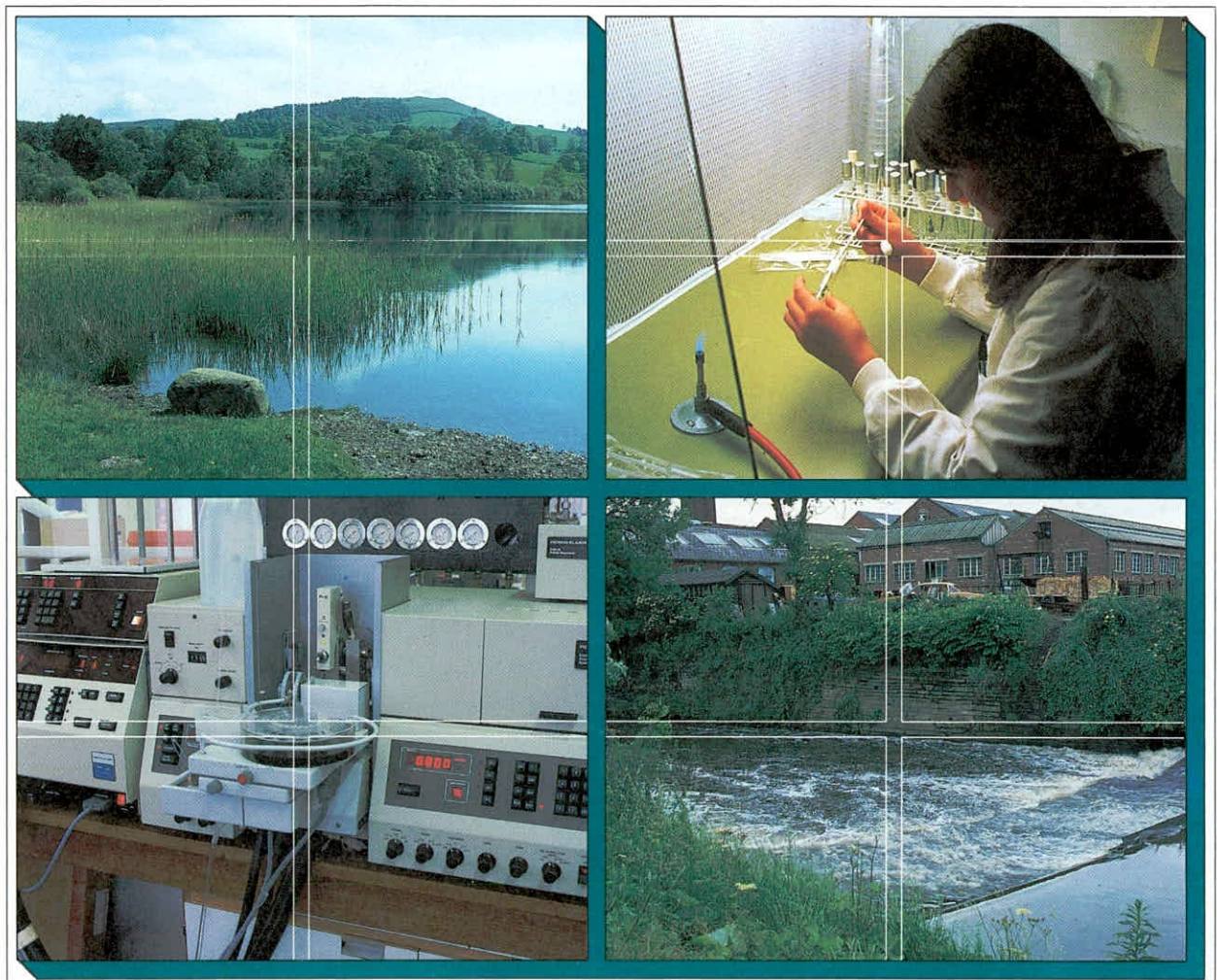
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1. INTRODUCTION

The 1995 General Quality Assessment (GQA) Survey included the sampling of aquatic macro-invertebrates for biological assessment of river quality throughout the United Kingdom. In England and Wales the survey was undertaken by the National Rivers Authority (NRA), the River Purification Boards (RPBs) sampled in Scotland, the Industrial Research and Technology Unit (IRTU) undertook the work in Northern Ireland and the Government Laboratory covered the Isle of Man (IOM).

The majority of sites surveyed were sampled in two seasons, spring and autumn. Standard collection procedures were used and the sampling strategy was compatible with RIVPACS (River InVertebrate Prediction And Classification System), a computer model developed by the Institute of Freshwater Ecology (IFE).

Samples were sorted for the families of macro-invertebrates included in the Biological Monitoring Working Party (BMWP) system. Taxa present were recorded on site data sheets. Although attempts had been made to standardise sample processing and recording techniques, these did vary somewhat from region to region.

In order to undertake this massive programme of fieldwork and sample processing, a large number of staff, many of whom were relatively inexperienced, were employed by the surveying agencies. In view of the number of staff involved and the variability of sample processing techniques, it was recognised that a quality assurance exercise was necessary to minimise and quantify errors. Each laboratory appointed at least one experienced analyst to act as an internal analytical quality control (AQC) checker. For most agencies, these checkers re-sorted about 10% of the laboratory's samples, those samples chosen for re-sorting being selected at random. In addition, IFE was contracted to undertake an independent, external audit of the quality of the laboratory analysis of biological samples for each NRA region, each RPB, IRTU and IOM. This commission was consistent with the audit performed by IFE for the National River Quality Survey in 1990 and for the routine biological monitoring of river sites each year between 1991 and 1994. This audit was originally intended as a measure of the quality of the AQC analyses and is termed the main audit or AQC audit. The data collected for the 1995 GQA Survey was not adjusted for errors identified by either of the quality assurance procedures. Therefore the NRA contracted IFE to subject their samples to a further audit of the primary analysis (the primary audit) to provide an independent assessment of the quality of the Survey data.

This report presents the results of the 42 AQC'd samples audited for NRA North West Region and represents a measure of the performance of the AQC analyst rather than that of the primary analyst. The results of the Primary Audit, detailing the performance of primary analysts for all 60 samples for the Region, are reported separately.

2. SAMPLE SELECTION

Samples for audit were selected internally by each of the agencies being monitored. The number of samples selected for audit varied between the different agencies and the biologists processing these samples had no prior knowledge of which samples were to be audited. Some agencies only sent to IFE samples that had been processed twice. Others adopted a random selection process, whereby some samples had been analysed just once and some had been re-sorted. 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, IRTU and IOM 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 data sheet containing 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, without reference to the data sheet or to the vial of animals, and the BMWP families identified.
- b) The families contained within the vial were identified.
- c) A comparison was made between the listing of families and those found in the sample by IFE.
- d) A comparison was made between the listing of families and those identified from the vial by IFE.
- e) "Losses" or "gains" from the original 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. Single representatives of a "gained" taxon were noted as such.
- f) An error code, selected from a list on the result sheet, was assigned by the IFE auditor for each "loss" or "gain".

Occasionally a sample did not include a vial containing representative examples of the families listed on the data sheet, while some arrived with the vial damaged in transit such that the representative specimens were no longer separated. For these samples, only operations a), c), e) and f) above were appropriate.

Several directives were issued to IFE relating to the treatment of BMWP taxa. Every taxon recorded on the data sheet must be supported by a voucher specimen of that family in the vial (or, for very large specimens, left in the sample). The only exceptions to this rule were the native crayfish, *Austropotamobius pallipes*, the medicinal leech, *Hirudo medicinalis* and the pearl mussel, *Margaritifera margaritifera* (which does not belong to a BMWP family), all of which are protected species. Where possible, IFE gave the benefit of doubt to the analyst in cases of the "loss" of Planariidae, specimens of which have been known to disintegrate in preservative. Animals deemed to have been dead at the time of sampling, cast insect skins, pupal exuviae and empty mollusc shells were to be excluded from the listing of families present. Isolated posterior ends of "living" specimens were not acceptable as records of a taxon. In these cases, thorax plus abdomen was deemed acceptable but abdomen only was deemed unacceptable. Terrestrial representatives of BMWP scoring families were also to be excluded from the audit. For this reason, Clambidae, Chrysomelidae and Curculionidae, which appear in the BMWP list, were excluded for the purposes of the audit since most representatives of these families are, at best, only semi-aquatic. 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 and sent to the Regional Biologist. Copies of these report forms are presented in the Appendix. For audit samples where a vial of animals was included, the comparison between the listing of families and the taxa found in the vial by IFE was shown in the section of the report form headed "VIAL". Discrepancies could be due to carelessness, misidentifications or errors in completing the data sheet listing the families present. Families not on the listing but found by IFE in the remainder of the sample were entered in the section of the report form headed "SAMPLE" under "Additional BMWP taxa found by IFE". Taxa recorded here represent families missed by the analyst(s) on sorting the sample. When the families listed as "losses" in the first section 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 both as "losses" from the vial and as "gains" from the sample 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".

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 centre section of the report form under "species name".

IFE was asked to interpret each error to provide a possible cause. An error code, selected from a list of options at the foot of each result sheet, was entered against each taxon in the column headed "Presumed cause of error".

For those samples in which the vial of animals was damaged or missing, the "VIAL" sections of the report form were not applicable (N/a). Families not on the list but present in the sample were entered in the section under "SAMPLE" : "Additional taxa" as before. Families recorded on the list but not found by IFE were indicated in the section above this. 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.

The final section of the result sheet summarises the audit, giving details of the numbers of "losses", "gains" and "omissions", together with the net effects on BMWP score and the number of scoring taxa.

5. RESULTS

The results of the AQC audit for North West Region are summarised by area in Tables 1 to 3. Table 4 displays the statistics of these regional audit results centered around the target of acceptability of no more than two missed taxa per sample. These data are presented for each analyst, for their Area laboratories and for the Region as a whole. Table 5 compares these results for each NRA Region and Area laboratory. Table 6 presents data for North West Region for the net effects of the AQC audit on the BMWP score and number of taxa. This table is again based on the target of no more than two missed taxa per sample. The figure of 13 for an acceptable underestimate of BMWP score is based on twice the average score of all taxa in the BMWP listing (excluding Clambidae, Chrysomelidae and Curculionidae, which are excluded from the audit). This average score is 6.57. Table 7 compares this BMWP data for each NRA Region and Area laboratory. Table 8 lists the taxa missed in sorting by North West Region's AQC analysts in the 1995 audit and Table 9 lists all such taxa for the entire 1995 audit (Primary and AQC Audits for NRA regions and Main Audit for other organisations) for the whole of the UK.

6. ACKNOWLEDGEMENTS

Grateful thanks to John Murray-Bligh of NRA Thames Region, who provided an invaluable service in the development and implementation of improved methodology and in providing helpful advice throughout.

Table 1. The 12 AQC'd samples audited for Northern Area

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Keekle	Keekle Grove	NC	0	0	0
Briggle Beck	NY 583 341	NC	0	0	0
Roe	Thrangholm Bridge	NC	0	1	0
New Mills Beck	d/s Golf Links	NC	0	1	2
Trout Beck	ptc Windermere	NC	0	0	0
Eden	Appleby	NC	0	3	0
Calthwaite Beck	ptc R.Petteril	NC	1	1	0
AUTUMN					
Petteril	Stoneyholme	AJ	2	1	0
Derwent Tributary	d/s Greysouthen STW	AJ	1	0	0
Well Sike	NY 372 646	AJ	0	0	0
Cargo Beck	NY 372 591	NC	0	0	0
Gill Beck	d/s Blindcrake STW	NC	0	2	1

Table 2. The 12 AQC'd samples audited for Central Area

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Darwen	u/s Darwen STW	EIG	0	0	0
Lune	d/s Forge Weir	JAW	0	1	0
Carr Brook	ptc River Lostock	JAW	0	3	0
Keer	d/s Railway viaduct	JEL	0	3	0
Skirden Beck	ptc Holden Beck	SLP	0	0	0
Fen Beck	d/s Waters Bridge	SLP	0	3	0
AUTUMN					
Davyfield Brook	ptc R.Darwen	EIG	0	0	0
Douglas	ptc Pearl Brook	EIG	0	1	0
Darwen	Cann Bridge	JAW	0	0	0
Ribble	Brockholes Bridge	JAW	0	0	0
Poolstock Brook	d/s Scotsmans Flash	JEL	0	0	0
Crossens	Crossens P.S.	JEL	1	0	0

Table 3. The 18 AQC'd samples audited for Southern Area

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Worsley Brook	Barnton	DH	0	0	0
Micker Brook	ptc R.Mersey	DH	0	6	0
Valley Brook	u/s Rof Tributary	DH	1	3	0
Tame	d/s Readycon Dean Reservoir	DH	0	1	0
Kidsgrove Stream	ptc R.Wheelock	SL	0	1	0
Kinder	ptc R.Sett	SL	0	3	0
Whittle Brook	ptc Union Bank Brook	SL	1	2	0
Millingford Brook	u/s Newton Lake	SL	0	0	0
AUTUMN					
Luzley Brook	u/s Royton ETW	DH	0	3	0
Arrowe Brook	ptc The Birket	DH	0	4	0
Checkley Brook	ptc R.Lea	DH	0	0	0
Crowton Brook	Crowton Mill	DH	0	3	0
Pedley Brook	ptc Birkin Brook	TP	0	1	0
Biddulph Brook	u/s Biddulph ETW	TP	1	0	0
Randall Carr Brook	Cadster	TP	1	0	0
Weaver	Wrenbury	TP	0	1	0
Roch	u/s Rochdale ETW	TP	0	0	0
Whitewell Brook	ptc Shawclough Brook	TP	0	2	0

Table 4. Statistics of 1995 AQC Audit results for North West Region

Analyst/Group	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (l+g+o)	Standard error
Northern	12	0.75	0.28	1	8.33	3	1.33	0.40
AJ	3	0.33	0.33	0	0.00	1	1.33	0.88
NC	9	0.89	0.35	1	11.11	3	1.33	0.47
Central	12	0.92	0.38	3	25.00	3	1.00	0.37
EIG	3	0.33	0.33	0	0.00	1	0.33	0.33
JAW	4	1.00	0.71	1	25.00	3	1.00	0.71
JEL	3	1.00	1.00	1	33.33	3	1.33	0.88
SLP	2	1.50	1.50	1	50.00	3	1.50	1.50
Southern	18	1.67	0.40	6	33.33	6	1.89	0.40
DH	8	2.50	0.73	5	62.50	6	2.63	0.75
SL	4	1.50	0.65	1	25.00	3	1.75	0.75
TP	6	0.67	0.33	0	0.00	2	1.00	0.26
NW Region	42	1.19	0.22	10	23.81	6	1.48	0.23
Whole of NRA	287	0.92	0.07	36	12.54	6	1.20	0.08

Table 5. Summary of errors found in 1995 AQC Audit for each NRA Laboratory

Region/Lab.	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (l+g+o)	Standard error
Anglian	33	1.24	0.20	5	15.15	4	1.76	0.25
Central	13	1.23	0.36	2	15.38	4	2.15	0.45
Eastern	13	1.38	0.33	2	15.38	4	1.62	0.33
Northern	7	1.00	0.38	1	14.29	3	1.29	0.52
N'umb & Yorks	30	0.87	0.16	2	6.67	3	1.00	0.19
South Yorkshire	18	0.83	0.20	1	5.56	3	0.94	0.24
Northumbria	2	1.00	0.00	0	0.00	1	1.00	0.00
Dales	10	0.90	0.35	1	10.00	3	1.10	0.41
North West	42	1.19	0.22	10	23.81	6	1.48	0.23
Northern	12	0.75	0.28	1	8.33	3	1.33	0.40
Central	12	0.92	0.38	3	25.00	3	1.00	0.37
Southern	18	1.67	0.40	6	33.33	6	1.89	0.40
Severn-Trent	48	1.19	0.21	8	16.67	6	1.46	0.23
Upper Severn	12	0.75	0.28	1	8.33	3	1.08	0.31
Lower Severn	10	1.60	0.62	3	30.00	5	2.10	0.67
Upper Trent	9	0.78	0.22	0	0.00	2	1.00	0.29
Lower Trent	17	1.47	0.41	4	23.53	6	1.59	0.45
Southern	24	0.38	0.14	1	4.17	3	0.67	0.19
Western	9	0.00	0.00	0	0.00	0	0.22	0.15
Eastern	15	0.60	0.21	1	6.67	3	0.93	0.27
South Western	53	0.51	0.11	1	1.89	3	0.57	0.12
Devon	15	0.73	0.23	0	0.00	2	0.80	0.22
Cornwall	15	0.40	0.21	1	6.67	3	0.40	0.21
North Wessex	14	0.50	0.23	0	0.00	2	0.57	0.23
South Wessex	9	0.33	0.24	0	0.00	2	0.44	0.34
Thames	21	1.10	0.26	4	19.05	3	1.52	0.33
Fobney Mead	13	1.46	0.35	4	30.77	3	2.08	0.45
Waltham Cross	8	0.50	0.27	0	0.00	2	0.63	0.26
Welsh	36	0.89	0.19	5	13.89	3	1.25	0.21
Northern	12	1.50	0.34	3	25.00	3	1.83	0.34
South Western	12	0.58	0.33	2	16.67	3	0.92	0.36
South Eastern	12	0.58	0.23	0	0.00	2	1.00	0.35
Whole of NRA	287	0.92	0.07	36	12.54	6	1.20	0.08

Table 6. Net effects of the AQC Audit on BMWP score and number of scoring taxa

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Northern	12	2.42	0.00	13	0.42	8.33	3
AJ	3	-4.33	0.00	0	-0.67	0.00	0
NC	9	4.67	0.00	13	0.78	11.11	3
Central	12	6.50	25.00	24	8.33	25.00	3
EIG	3	3.33	0.00	1	0.33	0.00	1
JAW	4	6.50	25.00	16	1.00	25.00	3
JEL	3	6.33	33.33	24	0.67	33.33	3
SLP	2	11.50	50.00	23	1.50	50.00	3
Southern	18	7.22	16.67	23	1.44	27.78	6
DH	8	10.38	25.00	23	2.38	50.00	6
SL	4	4.25	0.00	13	1.25	25.00	3
TP	6	5.00	16.67	18	0.33	0.00	2
N.West Region	42	5.64	14.29	24	0.98	21.43	6
Whole of NRA	287	4.11	11.50	30	0.71	10.80	6

Table 7. Net effects of the AQC Audit on BMWP score and number of scoring taxa for each NRA Area

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Anglian	33	4.42	9.09	17	0.88	12.12	4
Central	13	3.92	15.38	17	0.69	15.38	3
Eastern	13	5.46	7.69	14	1.15	15.38	4
Northern	7	3.43	0.00	8	0.71	0.00	2
N'umb & Yorks	30	4.67	3.33	25	0.80	3.30	3
South Yorkshire	18	4.28	0.00	13	0.78	5.56	3
Northumbria	2	5.00	0.00	5	1.00	0.00	1
Dales	10	5.30	10.00	25	0.80	10.00	3
North West	42	5.64	14.29	24	0.98	21.43	6
Northern	12	2.42	0.00	13	0.42	8.33	3
Central	12	6.50	25.00	24	8.33	25.00	3
Southern	18	7.22	16.67	23	1.44	27.78	6
Severn-Trent	48	5.00	16.67	30	0.98	16.67	5
Upper Severn	12	2.67	8.33	21	0.42	8.33	3
Lower Severn	10	6.60	30.00	30	1.20	30.00	5
Upper Trent	9	4.78	11.11	18	0.78	0.00	2
Lower Trent	17	5.82	17.65	22	1.35	23.53	5
Southern Region	24	0.88	0.00	12	0.08	0.00	2
Western	9	-1.22	0.00	0	-0.22	0.00	0
Eastern	15	2.13	0.00	12	0.27	0.00	2
South Western	53	2.85	11.32	22	0.45	1.89	3
Devon	15	4.07	20.00	15	0.67	0.00	2
Cornwall	15	2.20	6.67	22	0.40	6.67	3
N.Wessex	14	2.93	14.29	16	0.43	0.00	2
S.Wessex	9	1.78	0.00	10	0.22	0.00	1
Thames	21	4.19	14.29	19	0.76	14.29	3
Fobney Mead	13	5.77	23.08	19	1.00	23.08	3
Waltham Cross	8	1.63	0.00	10	0.38	0.00	2
Welsh	36	4.39	19.44	30	0.58	11.11	3
Northern	12	8.67	41.67	20	1.17	16.67	3
S.Western	12	1.92	16.67	30	0.25	16.67	3
S.Eastern	12	2.58	0.00	11	0.33	0.00	2
Whole of NRA	287	4.11	11.50	30	0.71	10.80	6

Table 8. Taxa missed by North West Region's AQC analysts

Family	n	% of North West Region's missed taxa in AQC Audit	% of missed taxa in AQC Audit for all NRA Regions
Sphaeriidae	6	14.63	5.17
Hydrobiidae (incl. Bithyniidae)	3	7.32	5.17
Planariidae (incl. Dugesiidae)	3	7.32	5.17
Hydrophilidae (incl. Hydraenidae)	3	7.32	6.47
Psychomyiidae (incl. Ecnomidae)	2	4.88	1.72
Nemouridae	2	4.88	3.02
Limnephilidae	2	4.88	2.16
Leptoceridae	2	4.88	3.88
Dytiscidae (incl. Noteridae)	2	4.88	2.59
Caenidae	2	4.88	2.59
Sericostomatidae	1	2.44	0.43
Planorbidae	1	2.44	1.29
Halplidae	1	2.44	1.29
Baetidae	1	2.44	2.16
Beraeidae	1	2.44	0.43
Ancylidae (incl. Acroloxidae)	1	2.44	1.29
Perlidae	1	2.44	0.86
Coenagriidae	1	2.44	0.86
Leuctridae	1	2.44	0.86
Goeridae	1	2.44	1.29
Leptophlebiidae	1	2.44	1.29
Ephemerellidae	1	2.44	1.72
Oligochaeta	1	2.44	0.43
Tipulidae	1	2.44	3.88

Table 9. Missed taxa for all samples in 1995 audit

Family	n	% of all missed taxa in 1995 audit
Hydrophilidae (incl. Hydraenidae)	68	5.97
Hydroptilidae	59	5.18
Sphaeriidae	52	4.57
Hydrobiidae (incl. Bithyniidae)	50	4.39
Planariidae (incl. Dugesiidae)	46	4.04
Caenidae	40	3.51
Elmidae	39	3.42
Leptoceridae	39	3.42
Psychomyiidae (incl. Ecnomidae)	39	3.42
Lymnaeidae	33	2.90
Simuliidae	32	2.81
Nemouridae	31	2.72
Limnephilidae	30	2.63
Planorbidae	29	2.55
Haliplidae	28	2.46
Tipulidae	25	2.19
Bactidae	23	2.02
Glossiphoniidae	22	1.93
Goeridae	22	1.93
Leptophlebiidae	22	1.93
Dytiscidae (incl. Noteridae)	21	1.84
Ephemerellidae	20	1.76
Valvatidae	20	1.76
Hydropsychidae	18	1.58
Ancylidae (incl. Acroloxidae)	16	1.40
Asellidae	16	1.40
Leuctridae	16	1.40
Piscicolidae	16	1.40
Rhyacophilidae (incl. Glossosomatidae)	16	1.40
Scirtidae	16	1.40
Sericostomatidae	15	1.32
Gyrinidae	14	1.23
Erpobdellidae	13	1.14
Lepidostomatidae	13	1.14
Polycentropodidae	13	1.14
Chloroperlidae	11	0.97
Odontoceridae	11	0.97
Dendrocoelidae	10	0.88
Heptageniidae	10	0.88

Table 9. (cont.)

Family	n	% of all missed taxa in 1995 audit
Gammaridae (incl. Crangonyctidae)	9	0.79
Taeniopterygidae	9	0.79
Hydrometridae	8	0.70
Oligochaeta	8	0.70
Physidae	7	0.61
Chironomidae	6	0.53
Coenagriidae	6	0.53
Perlidae	6	0.53
Brachycentridae	5	0.44
Calopterygidae	5	0.44
Perlodidae	5	0.44
Sialidae	5	0.44
Beraeidae	4	0.35
Corixidae	4	0.35
Corophiidae	4	0.35
Ephemeridae	4	0.35
Unionidae	4	0.35
Capniidae	3	0.26
Dryopidae	3	0.26
Gerridae	3	0.26
Libellulidae	3	0.26
Siphonuridae	3	0.26
Aphelocheiridae	2	0.18
Neritidae	2	0.18
Platycnemididae	2	0.18
Aeshnidae	1	0.09
Cordulegasteridae	1	0.09
Notonectidae	1	0.09
Philopotamidae	1	0.09
Viviparidae	1	0.09

APPENDIX

Results of individual sample audits

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 21.3.95

WATER-
COURSE: Keekle

PRIMARY
ANALYST: NC

AQC
ANALYST: NC

SITE: Keekle Grove

CODE: NRA03 02cq

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

WATER-COURSE: Briggie Beck

SITE: NY 583 341

LABORATORY: Northern

PRIMARY ANALYST: DS

CODE: NRA03 0ha8

DATE: 22.3.95

AQC ANALYST: NC

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

N/a

Additional BMWP taxa found by IFE

None

(For samples where vial is broken or absent)

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:
ON BMWP SCORE 0
ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 13.3.95

WATER-
COURSE: Roe

PRIMARY
ANALYST: AJ

AQC
ANALYST: NC

SITE: Thrangholm Bridge

CODE: NRA03 012c

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	9
-----------------------------------	----------------------------------	---

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 5
ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 7.3.95

WATER-
COURSE: New Mills Beck

PRIMARY
ANALYST: NC

AQC
ANALYST: NC

SITE: d/s Golf Links

CODE: NRA03 01e0

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

Goeridae *	5
Nemouridae *	1

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Nemouridae *	Nemoura cambrica/erratica, Amphinemura sp. (damaged specimen)	1
Beraeidae	Beraeodes minutus	9
Goeridae *	Silo pallipes	5

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 2

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 12.4.95

WATER-
COURSE: Trout Beck

PRIMARY
ANALYST: BJI

AQC
ANALYST: NC

SITE: ptc Windermere

CODE: NRA03 19ak

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 13.4.95

WATER-
COURSE: Eden

PRIMARY
ANALYST: DS

AQC
ANALYST: NC

SITE: Appleby

CODE: NRA03 Oeco

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	12
Planariidae (incl. Dugesiiidae)	Polycelis felina 1 only	9
Sphaeriidae	Pisidium sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 13

ON NO. OF TAXA 3

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 2.3.95

WATER-
COURSE: Calthwaite Beck

PRIMARY
ANALYST: DS

AQC
ANALYST: NC

SITE: ptc R.Petteril

CODE: NRA03 0m58

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

Planorbidae	Terrestrial snail in vial	11
-------------	---------------------------	----

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Tipulidae	Limonia sp. 1 only	9
-----------	--------------------	---

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 2

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 4.9.95

WATER-
COURSE: Petteril

PRIMARY
ANALYST: AG

AQC
ANALYST: AJ

SITE: Stoneyholme

CODE: NRA03 0lls

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

Dytiscidae (incl. Noteridae)		5
Lepidostomatidae	Anabolia nervosa	7

Additional BMWP taxa found by IFE

Limnephilidae	Anabolia nervosa	7
---------------	------------------	---

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 2

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -8
ON NO. OF TAXA -1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 6.11.95

WATER-

PRIMARY

AQC

COURSE: Derwent Tributary

ANALYST: AJ

ANALYST: AJ

SITE: d/s Greysouthen STW

CODE: NRA03 05ms

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

Dytiscidae (incl. Noteridae)

4

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

There is some doubt about the validity of the record of Planariidae (added at AQC). Benefit of doubt given to AQC analyst.

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -5

ON NO. OF TAXA -1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 11.10.95

WATER-

PRIMARY

AQC

COURSE: Well Sike

ANALYST: DS

ANALYST: AJ

SITE: NY 372 646

CODE: NRA03 Oubo

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 8.9.95

WATER-
COURSE: Cargo Beck

PRIMARY
ANALYST: AG

AQC
ANALYST: NC

SITE: NY 372 591

CODE: NRA03 0jtw

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 5.10.95

WATER-
COURSE: Gill Beck

PRIMARY
ANALYST: AJ

AQC
ANALYST: NC

SITE: d/s Blindcrake STW

CODE: NRA03 06k4

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

Hydrobiidae (incl. Bithyniidae) *

4

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae) *

Potamopyrgus jenkinsi

4

Nemouridae

Nemoura avicularis 1 only

9

Hydrophilidae (incl. Hydraenidae)

Hydraena gracilis (adult) 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 12

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 17.5.95

WATER-
COURSE: Darwen

PRIMARY
ANALYST: JAW

AQC
ANALYST: EIG

SITE: u/s STW, d/s Paper Mill

CODE: 92/S9511

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 20.4.95

WATER-
COURSE: Lune

PRIMARY
ANALYST: JAW

AQC
ANALYST: JAW

SITE: d/s Forge Weir

CODE: 409/S9516

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Perlidae

Dinocras cephalotes 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 22.5.95

WATER-
COURSE: Lostock

PRIMARY
ANALYST: JAW

AQC
ANALYST: JAW

SITE: Carr Brook, ptc River Lostock

CODE: S9524/45

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Psychomyiidae (incl. Ecnomidae)	Tinodes waeneri 1 only	9
Planariidae (incl. Dugesiidae)	Polycelis felina 1 only	9
Sphaeriidae	Pisidium sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 16

ON NO. OF TAXA 3

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 21.4.95

WATER-
COURSE: Keer

PRIMARY
ANALYST: JAW

AQC
ANALYST: JEL

SITE: d/s Railway viaduct

CODE: 493/S9501

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Caenidae	Caenis rivulorum 1 only	9
Nemouridae	Amphinemura sulcicollis 1 only	9
Goeridae	Silo pallipes 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 24

ON NO. OF TAXA 3

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 28.4.95

WATER-
COURSE: Ribble

PRIMARY
ANALYST: EIG

AQC
ANALYST: SLP

SITE: Skirden Beck ptc Holden Beck

CODE: 273/S9514

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 12.4.95

WATER-
COURSE: Lune

PRIMARY
ANALYST: SLP

AQC
ANALYST: SLP

SITE: Fen Beck d/s Waters Bridge

CODE: 464/S9518

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Sericostomatidae	Sericostoma personatum 1 only	12
Caenidae	Caenis rivulorum	9
Ancylidae (incl. Acroloxidae)	Ancylus fluviatilis 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 23

ON NO. OF TAXA 3

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 1.11.95

WATER-
COURSE: Darwen

PRIMARY
ANALYST: ADE

AQC
ANALYST: EIG

SITE: Davyfield Brook ptc R.Darwen

CODE: S9535/109

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 2.10.95

WATER-
COURSE: Douglas

PRIMARY
ANALYST: KC

AQC
ANALYST: EIG

SITE: d/s M61 ptc Pearl Brook

CODE: S9553/663

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Leptoceridae

Mystacides azurea 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 6.11.95

WATER-
COURSE: Darwen

PRIMARY
ANALYST: AM

AQC
ANALYST: JAW

SITE: Cann Bridge

CODE: S9539/101

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 2.10.95

WATER-
COURSE: Ribble

PRIMARY
ANALYST: AM

AQC
ANALYST: JAW

SITE: Brockholes Bridge

CODE: S9554/257

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 3.10.95

WATER-
COURSE: Douglas

PRIMARY
ANALYST: JEL

AQC
ANALYST: JEL

SITE: Poolstock Brk d/s Scotsmans Flash CODE: S9549/682

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 21.9.95

WATER-
COURSE: Crossens

PRIMARY
ANALYST: KC

AQC
ANALYST: JEL

SITE: The Sluice, Crossens P.S.

CODE: S9552/766

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

Hydrophilidae (incl. Hydraenidae)

Lathridiidae (adult)

2

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -5

ON NO. OF TAXA -1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 6.4.95

WATER-

PRIMARY

AQC

COURSE: Worsley Brook

ANALYST: MW

ANALYST: DH

SITE: u/s Liverpool Road, Barnton

CODE: ps0c (2027)

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West	LABORATORY: Southern	DATE: 5.5.95
WATER- COURSE: Micker Brook	PRIMARY ANALYST: PN	AQC ANALYST: DH
SITE: ptc R.Mersey, d/s M63	CODE: q5fo (2201)	SORT/AQC METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Limnephilidae	Limnephilus lunatus	6
Lymnaeidae	Lymnaea truncatula	7
Oligochaeta	Tubificidae	12

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Planorbidae	Armiger crista	9
Baetidae	Baetis rhodani 1 only	9
Dytiscidae (incl. Noteridae)	Agabus sp. (larva) 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 6 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 23
ON NO. OF TAXA 6

- | | | |
|--------------------------------------------|------------------------------------------|----------------------------------------------------|
| 1 No representative of family in vial | 5 Specimen dead at time of sampling | 9 Taxon missed in sorting |
| 2 Alternative terrestrial specimen in vial | 6 Taxon in vial but not recorded | 10 Unexplained error |
| 3 Posterior end only in vial | 7 Mis-identification | 11 Taxon added in internal AQC |
| 4 Empty shell or case or cast skin in vial | 8 Typographical error - wrong box ticked | 12 Recorded taxon that was rejected by AQC analyst |

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West
WATER-
COURSE: Valley Brook
SITE: u/s Rof Tributary

LABORATORY: Southern
PRIMARY
ANALYST: SJ
CODE: rdq4 (2775)

DATE: 12.5.95
AQC
ANALYST: DH
SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

Planariidae (incl. Dugesiidae)	7
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Additional BMWP taxa found by IFE

Dendrocoelidae	Dendrocoelum lacteum	7
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SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	9
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Sphaeriidae	Pisidium sp. 1 only	9
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SUMMARY OF AUDIT

LOSSES 1 GAINS 3 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6
ON NO. OF TAXA 2

1 No representative of family in vial
2 Alternative terrestrial specimen in vial
3 Posterior end only in vial
4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling
6 Taxon in vial but not recorded
7 Mis-identification
8 Typographical error - wrong box ticked

9 Taxon missed in sorting
10 Unexplained error
11 Taxon added in internal AQC
12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 31.5.95

WATER-
COURSE: Tame

PRIMARY
ANALYST: SL

AQC
ANALYST: DH

SITE: d/s Readycon Dean Reservoir

CODE: qzok (2593)

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Ephemerellidae

Ephemerella ignita

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 29.3.95

WATER-
COURSE: Kidsgrove Stream

PRIMARY
ANALYST: JB

AQC
ANALYST: SL

SITE: ptc R.Wheelock

CODE: my5o (707)

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Oligochaeta	Tubificidae	9
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SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 1

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 23.5.95

WATER-
COURSE: Kinder

PRIMARY
ANALYST: JB

AQC
ANALYST: SL

SITE: ptc R.Sett

CODE: or4k (1549)

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Limnephilidae	Ecclisopteryx guttulata	9
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi 1 only	9
Sphaeriidae	Pisidium sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 13
ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 4.5.95

WATER-

PRIMARY

AQC

COURSE: Whittle Brook

ANALYST: TP

ANALYST: SL

SITE: ptc Union Bank Brook

CODE: tna8 (3832)

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

Tipulidae

4

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Dytiscidae (incl. Noteridae)

Agabus sp./Ilybius sp. (larva) 1 only

9

Sphaeriidae

Pisidium sp. 1 only

9

SUMMARY OF AUDIT

LOSSES 1

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

ON NO. OF TAXA 1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 28.4.95

WATER-
COURSE: Millingford Brook

PRIMARY
ANALYST: TP

AQC
ANALYST: SL

SITE: d/s A573, u/s Newton Lake

CODE: tmo0 (3824)

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West
WATER-
COURSE: Luzley Brook

LABORATORY: Southern
PRIMARY
ANALYST: MW

DATE: 27.10.95
AQC
ANALYST: DH
SORT/AQC
METHOD: Preserved/Preserved

SITE: u/s Royton ETW

CODE: oxrg-Au9510

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Oligochaeta	Tubificidae, Lumbriculidae	6
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SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Sphaeriidae	Pisidium sp., Sphaerium sp.	9
Planariidae (incl. Dugesiidae)	Polycelis nigra/tenuis 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 3 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 9
ON NO. OF TAXA 3

1 No representative of family in vial
2 Alternative terrestrial specimen in vial
3 Posterior end only in vial
4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling
6 Taxon in vial but not recorded
7 Mis-identification
8 Typographical error - wrong box ticked

9 Taxon missed in sorting
10 Unexplained error
11 Taxon added in internal AQC
12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 31.10.95

WATER-
COURSE: Arrowe Brook

PRIMARY
ANALYST: GM

AQC
ANALYST: DH

SITE: ptc The Birket

CODE: tbh8-Au9514

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Gammaridae (incl. Crangonyctidae)	Gammarus pulex	12
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SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	9
Coenagriidae	Ischnura elegans 1 only	9
Limnephilidae	Limnephilus sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 22

ON NO. OF TAXA 4

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 23.11.95

WATER-

PRIMARY

AQC

COURSE: Checkley Brook

ANALYST: KW

ANALYST: DH

SITE: ptc R.Lea

CODE: s5ck-Au9528

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	-----------------------------------------------

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 9.11.95

WATER-
COURSE: Crowton Brook

PRIMARY
ANALYST: KW

AQC
ANALYST: DH

SITE: Crowton Mill

CODE: si68-Au9530

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	12
Tipulidae	Dicranota sp, Limnophila (Eloeophila) sp	12

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Haliplidae	Haliphus sp. (larva) 1 only	9
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SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 13

ON NO. OF TAXA 3

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 25.9.95

WATER-

PRIMARY

AQC

COURSE: Pedley Brook

ANALYST: SL

ANALYST: TP

SITE: ptc Birkin Brook

CODE: lhuc (29)

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Leuctridae

Leuctra inermis 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 1.11.95

WATER-

COURSE: Biddulph Brook

PRIMARY

ANALYST: JB

AQC

ANALYST: TP

SITE: u/s Biddulph ETW

CODE: mlck-Au9512

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Planorbidae

Zonitidae

7

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -3

ON NO. OF TAXA -1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 31.10.95

WATER-

COURSE: Randall Carr Brook

PRIMARY

ANALYST: AG

AQC

ANALYST: TP

SITE: Cadster

CODE: ol3w-Au9520

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Dytiscidae (incl. Noteridae)

Hemerobiidae (lacewing)

7

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -5

ON NO. OF TAXA -1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 28.11.95

WATER-
COURSE: Weaver

PRIMARY
ANALYST: JB

AQC
ANALYST: TP

SITE: Wrenbury

CODE: rmzg-Au9523

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Leptoceridae

Mystacides azurea 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 24.11.95

WATER-
COURSE: Roch

PRIMARY
ANALYST: AG

AQC
ANALYST: TP

SITE: u/s Rochdale ETW

CODE: qi38-Au9533

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 9.11.95

WATER-
COURSE: Whitewell Brook

PRIMARY
ANALYST: CB

AQC
ANALYST: TP

SITE: ptc Shawclough Brook

CODE: pcqc-Au9536

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Leptophlebiidae	Paraleptophlebia sp.	9
Psychomyiidae (incl. Ecnomidae)	Tinodes waeneri 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 18

ON NO. OF TAXA 2

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)