



**Institute of
Freshwater
Ecology**

An audit of performance in the analysis of biological samples in 1995 IRTU, Northern Ireland

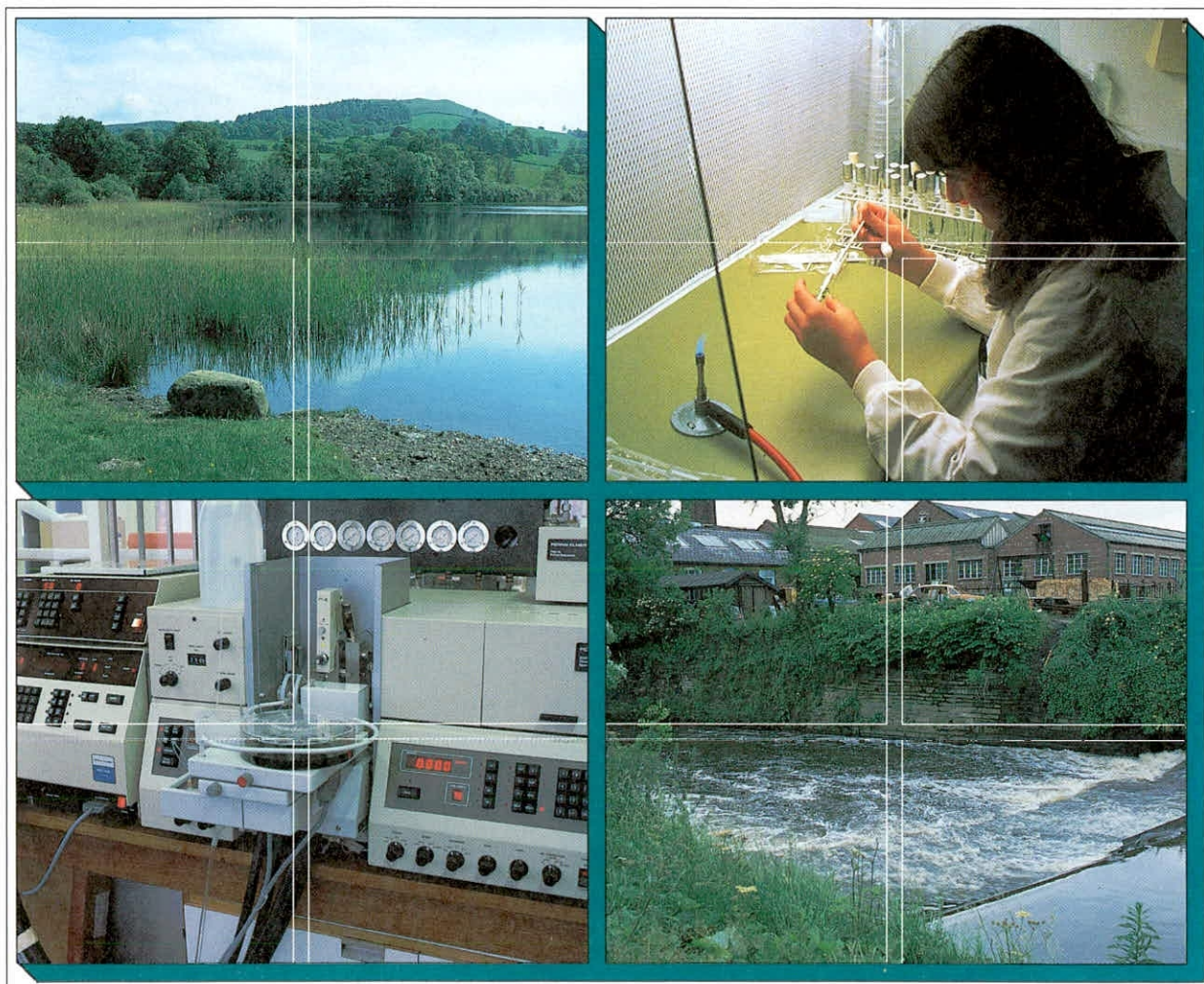
R.J.M. Gunn, BA
J.F. Wright, PhD

J.H. Blackburn, BSc
K.L. Symes, HND

J.M. Winder, PhD

Report To:
IFE Report Ref. No:

Industrial Research & Technology Unit, Northern Ireland
RL/T04071o7/17





**Institute of
Freshwater
Ecology**

River Laboratory
East Stoke
WAREHAM Dorset
BH20 6BB

Tel: 01929 462314
Fax: 01929 462180

An audit of performance in the analysis of biological samples in 1995. IRTU, Northern Ireland

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

Project Leader:
Report Date:
Report To:
IFE Report Ref. No:

R.J.M. Gunn
June 1996
Industrial Research & Technology Unit, Northern Ireland
RL/T0407107/17

INTELLECTUAL PROPERTY RIGHTS

CONFIDENTIALITY STATEMENT

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

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 60 samples audited for IRTU. For samples that have been subjected to an internal AQC check, the results measure the performance of the AQC analyst rather than that of the primary analyst.

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 audit for IRTU are summarised by season in Tables 1 to 3. Table 4 displays the statistics of these audit results centered around the target of acceptability of no more than two missed taxa per sample. These data are presented for each analyst and for the laboratory as a whole. Table 5 presents data for IRTU for the net effects of the 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 6 lists the taxa missed in sorting by IRTU's analysts in the 1995 audit and Table 7 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 20 spring samples audited for Northern Ireland

River	Site	Analyst	Losses	Gains	Omissions
Upper Bann	Gilford Bridge	CAK	0	3	0
Eskragh Water	Seskinore Mill Bridge	CAK	2	1	0
Upper Bann	McCombs Bridge	CAK	0	1	1
Clady	Glenone Bridge	CAK	0	0	0
Muddock	Muddock Bridge	IO'N	0	1	0
Lower Bann	Portglenone	IO'N	1	1	1
Aghivey	Moneycarrie Bridge	IO'N	0	2	0
Manyburns	Manyburns Bridge	IO'N	0	2	1
Tempo	Killashanabally	IO'N	1	1	0
Upper Bann	Ballydown	CAK/IO'N	0	1	0
Glenarm	Glenarm	MJO	0	1	0
Cusher	Knock Bridge	MJO	1	2	0
Corcrair (Ballybay)	Obins Street	MJO	1	1	0
Upper Bann	Dynes Bridge	MJO	2	1	0
Owenkillew	Killymore Bridge	PRH	0	2	0
Cleen	Corralongford	PRH	0	2	0
Quiggery Water	Edergoole Bridge	PRH	0	2	0
Glenmornan	Catherines Bridge	PRH	0	0	0
Colebrook	Ballindarragh Bridge	PRH	1	0	0
Quiggery	Ecclesville	MJO/PRH	0	1	0

Table 2. The 20 summer samples audited for Northern Ireland

River	Site	Analyst	Losses	Gains	Omissions
Glenshesk	B15 Bridge	CAK	0	1	0
Callan	Papermill Bridge	CAK	0	1	0
Tall	Redmonds Bridge	CAK	1	1	0
Tall	Drumard	CAK	1	2	0
Bannagh	Drumnagreshial Tributary	IO'N	2	1	0
Boho Tributary	Boho	IO'N	0	1	0
Tynan	A28 Bridge	IO'N	0	2	0
Oona Water	Oona Bridge	IO'N	3	0	0
Owenreagh	Ballynahatty Bridge	MJO	2	3	1
Upper Bann	Dynes Bridge	MJO	0	2	1
Forkhill	Forkhill Lower Bridge	MJO	0	0	0
Upper Bann	Hilltown	MJO	0	3	0
Upper Bann	Katesbridge	MK/MJO	0	3	0
Larne	Owens Bridge	MK	1	2	1
Glynn	Glynn	MK	0	1	0
Ghann	Green Park Bridge	MK	1	2	0
Ballygawley Water	Lismore Bridge	PRH	0	1	0
Moygannon	Moygannon Ford	PRH	0	0	0
Cullywater	Carrive	PRH	1	0	0
Fury	Belalastera	PRH	0	0	0

Table 3. The 20 autumn samples audited for Northern Ireland

River	Site	Analyst	Losses	Gains	Omissions
Upper Bann	Dynes Bridge	CAK	2	2	0
Enler	Kennel Bridge	CAK	0	1	0
Aughrim	Kilkeel	CAK	0	2	1
Whitewater	Whitewater Bridge	CAK	2	0	1
Manyburns	Manyburns Bridge	IO'N	0	0	0
Upper Bann	Katesbridge	IO'N	0	1	0
Sillees	Derrygonnelly	IO'N	0	1	0
Upper Bann	Hilltown	IO'N	1	0	0
Glencloy	Camlough	MJO	0	1	0
Cusher	Clare Bridge	MJO	1	1	0
Blackwater (ARDS)	Ballymartin Bridge	MJO	0	0	0
Cusher	Knock Bridge	MJO	1	0	0
Glenarm	Glenarm	MK	0	1	0
Upper Bann	Gilford Bridge	MK	1	2	0
Moygannon	Moygannon Ford	MK	2	3	1
Kilkeel	A2 Road Bridge	MK	2	2	3
Colebrook	Ballindarragh Bridge	PRH	0	1	0
Sillees	Carr Bridge	PRH	0	0	0
Hollybrook	Aghalurcher	PRH	0	2	0
Cladagh	Gorteen	PRH	0	1	0

Table 4. Statistics of 1995 audit results for Northern Ireland

Analyst	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (l+g+o)	Standard error
CAK	12	1.25	0.25	1	8.33	3	2.17	0.34
IO'N	14	1.00	0.18	0	0.00	2	1.71	0.27
MJO	13	1.38	0.31	3	23.08	3	2.15	0.45
MK	7	1.86	0.26	1	14.29	3	3.57	0.87
PRH	14	0.86	0.23	0	0.00	2	1.00	0.21
N. Ireland	60	1.20	0.12	5	8.33	3	1.95	0.19

Table 5. Net effects of the 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
CAK	12	3.92	16.67	25	0.58	8.33	3
IO'N	14	2.86	14.29	16	0.43	0.00	2
MJO	13	4.85	15.38	21	0.77	15.38	3
MK	7	4.14	0.00	10	0.86	0.00	1
PRH	14	5.29	14.29	17	0.71	0.00	2
N. Ireland	60	4.22	13.33	25	0.65	5.00	3

Table 6. Taxa missed by N. Ireland's analysts

Family	n	% of IRTU's missed taxa in audit	% of all missed taxa in 1995 audit
Haliplidae	7	10.94	2.46
Psychomyiidae (incl. Ecnomidae)	7	10.94	3.42
Hydrophilidae (incl. Hydraenidae)	5	7.81	5.97
Nemouridae	5	7.81	2.72
Lymnaeidae	4	6.25	2.90
Glossiphoniidae	4	6.25	1.93
Leuctridae	3	4.69	1.40
Limnephilidae	2	3.13	2.63
Corixidae	2	3.13	0.35
Tipulidae	2	3.13	2.19
Rhyacophilidae (incl. Glossosomatidae)	2	3.13	1.40
Simuliidae	2	3.13	2.81
Sphaeriidae	2	3.13	4.57
Hydroptilidae	2	3.13	5.18
Caenidae	1	1.56	3.51
Planariidae (incl. Dugesiidae)	1	1.56	4.04
Perlodidae	1	1.56	0.44
Scirtidae	1	1.56	1.40
Dendrocoelidae	1	1.56	0.88
Polycentropodidae	1	1.56	1.14
Leptophlebiidae	1	1.56	1.93
Calopterygidae	1	1.56	0.44
Erpobdellidae	1	1.56	1.14
Gerridae	1	1.56	0.26
Goeridae	1	1.56	1.93
Gyrinidae	1	1.56	1.23
Hydrobiidae (incl. Bithyniidae)	1	1.56	4.39
Lepidostomatidae	1	1.56	1.14
Leptoceridae	1	1.56	3.42

Table 7. 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
Baetidae	23	2.02
Glossiphoniidae	22	1.93
Gocridae	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 7. (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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 6.4.95

WATER-
COURSE: Upper Bann

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Gilford Bridge

CODE: 11 0283

SORT/AQC
METHOD: Live

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 luctuosa/macrura 1 only	9
Psychomyiidae (incl. Ecnomidae)	Psychomyia pusilla 1 only	9
Goeridae	Goera pilosa 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 25

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 11.4.95

WATER-
COURSE: Eskragh Water

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Seskinore Mill Bridge

CODE: 11 0206

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Lymnaeidae	Succineidae	7
Lepidostomatidae		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

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

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

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 3.4.95

WATER-
COURSE: Upper Bann

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: McCombs Bridge

CODE: 11 0288

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Corixidae *

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

Corixidae *

Hesperocorixa sahlbergi

1

Callicorixa praeusta

Halipilidae

Halipilus fluviatilis (adult) 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 27.4.95

WATER-
COURSE: Clady

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Glenone Bridge

CODE: 11 0084

SORT/AQC
METHOD: Live

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 3.4.95

WATER-
COURSE: Muddock

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Muddock Bridge

CODE: 11 0289

SORT/AQC
METHOD: Live

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

Simuliidae

Simulium ornatum group

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 27.4.95

WATER-
COURSE: Lower Bann

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Portglenone

CODE: 11 0080

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Oligochaeta *		1
Rhyacophilidae (incl. Glossosomatidae)	Polycentropus sp. (pupae)	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

Oligochaeta *	Lumbriculidae	1
Psychomyiidae (incl. Ecnomidae)	Lype sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 1
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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 27.4.95

WATER-
COURSE: Aghivey

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Moneycarrie Bridge

CODE: 11 0188

SORT/AQC
METHOD: Live

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

Leuctridae	Leuctra inermis 1 only	9
Hydroptilidae	Hydroptila sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 16

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 18.5.95

WATER-
COURSE: Manyburns

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Manyburns Bridge

CODE: 11 0154

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Ancylidae (incl. Acroloxidae) * Note on data sheet "Discarded in error". 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

Ancylidae (incl. Acroloxidae) *	Ancylus fluviatilis	1
Nemouridae	Amphinemura sulcicollis 1 only	9
Psychomyiidae (incl. Ecnomidae)	Psychomyia pusilla 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 15
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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 18.5.95

WATER-
COURSE: Tempo

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Killashanabally

CODE: 11 0151

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Unionidae	Note on data sheet "Spotted on site"	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

Psychomyiidae (incl. Ecnomidae)	Psychomyia pusilla	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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 3.4.95

WATER-
COURSE: Upper Bann

PRIMARY
ANALYST: CAK

AQC
ANALYST: IO'N

SITE: Ballydown

CODE: 11 0050

SORT/AQC
METHOD: Live/Live

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)	Psychomyia pusilla	9
---------------------------------	--------------------	---

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 8

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 1.5.95

WATER-
COURSE: Glenarm

PRIMARY
ANALYST: MJO

AQC
ANALYST:

SITE: Glenarm

CODE: 11 0195

SORT/AQC
METHOD: Live

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 4.4.95

WATER-
COURSE: Cusher

PRIMARY
ANALYST: MJO

AQC
ANALYST:

SITE: Knock Bridge

CODE: 11 0052

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Tipulidae	Chelifera type (Empididae)	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

Lymnaeidae	Lymnaea sp. (no shell) 1 only	9
Halplidae	Halplus sp. (larva) 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

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 6.4.95

WATER-
COURSE: Corcrain (Ballybay)

PRIMARY
ANALYST: MJO

AQC
ANALYST:

SITE: Obins Street

CODE: 11 0054

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Tipulidae	Hemerodromia type (Empididae)	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

Haliplidae	Haliplus sp. (larvae)	9
------------	-----------------------	---

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 4.4.95

WATER-
COURSE: Upper Bann

PRIMARY
ANALYST: MJO

AQC
ANALYST:

SITE: Dynes Bridge

CODE: 11 0047

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Dendrocoelidae	Polycelis nigra/tenuis (pale specimen)	7
Tipulidae	Limnophora sp. (Muscidae)	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

Hydrophilidae (incl. Hydraenidae)	Helophorus brevivalpis (adult) 1 only	9
-----------------------------------	---------------------------------------	---

SUMMARY OF AUDIT

LOSSES 2

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: N.Ireland
WATER-
COURSE: Owenkillew
SITE: Killymore Bridge

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: PRH
CODE: 11 0008

DATE: 20.4.95
AQC
ANALYST:
SORT/AQC
METHOD: Live

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

Nemouridae	Nemoura cinerea 1 only	9
Simuliidae	Simulium ornatum group 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 12
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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 18.5.95

WATER-
COURSE: Cleen

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Corralongford

CODE: 11 0153

SORT/AQC
METHOD: Live

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

Leptophlebiidae	Paraleptophlebia cincta	9
Rhyacophilidae (incl. Glossosomatidae)	Agapetus sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 17
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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 11.4.95

WATER-
COURSE: Quiggery Water

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Edergoole Bridge

CODE: 11 0016

SORT/AQC
METHOD: Live

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
Leptoceridae	Athripsodes sp. (juvenile) 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 15

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 22.4.95

WATER-
COURSE: Glenmornan

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Catherines Bridge

CODE: 11 0292

SORT/AQC
METHOD: Live

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 18.05.95

WATER-
COURSE: Colebrook

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Ballindarragh Bridge

CODE: 11 0130

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Unionidae

Note on data sheet "Noted on site"

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

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -6

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 11.4.95

WATER-
COURSE: Quiggery

PRIMARY
ANALYST: MJO

AQC
ANALYST: PRH

SITE: Ecclesville

CODE: 11 0260

SORT/AQC
METHOD: Live/Live

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

Scirtidae	Elodes sp. (larva) 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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 14.8.95

WATER-
COURSE: Glenshesk

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: B15 Bridge

CODE: 11 0193

SORT/AQC
METHOD: Live

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

Nemouridae

Protonemura sp. (juvenile) 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 7

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 10.7.95

WATER-
COURSE: Callan

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Papermill Bridge

CODE: 11 0064

SORT/AQC
METHOD: Live

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

Erpobdellidae

Indet Erpobdellid (juvenile) 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 19.7.95

WATER-
COURSE: Tall

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Redmonds Bridge

CODE: 11 0069

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Gerridae	Note on data sheet "noted on site"	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

Tipulidae	Tipula sp. (juvenile) 1 only	9
-----------	------------------------------	---

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 19.7.95

WATER-
COURSE: Tall

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Drumard

CODE: 11 0070

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Tipulidae	Limnophora sp. (Muscidae) in vial	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

Lymnaeidae	Lymnaea sp. (without shell) 1 only	9
Corixidae	Indet Corixid (nymph) 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

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 11.8.95

WATER-

PRIMARY

AQC

COURSE: Bannagh

ANALYST: IO'N

ANALYST:

SITE: Drumnagreshial Tributary

CODE: 11 0138

SORT/AQC

METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Rhyacophilidae (incl. Glossosomatidae)	Empty Polycentropodid pupal cases in vial	7
--	---	---

Hydroptilidae		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

Tipulidae	Dicranota sp. 1 only	9
-----------	----------------------	---

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

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 12.8.95

WATER-
COURSE: Boho Tributary

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Boho

CODE: 11 0166

SORT/AQC
METHOD: Live

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

Glossiphoniidae

Theromyzon tessulatum 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 6.7.95

WATER-
COURSE: Tynan

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: A28 Bridge

CODE: 11 0231

SORT/AQC
METHOD: Live

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

Glossiphoniidae	Glossiphonia complanata	9
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 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: N.Ireland
WATER-
COURSE: Oona Water

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: IO'N

DATE: 6.7.95
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Oona Bridge

CODE: 11 0060

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Rhyacophilidae (incl. Glossosomatidae)	Decomposed Hydropsyche pupa in vial	7
Gerridae		1
Dendrocoelidae	Note on data sheet "spotted in river"	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

None

SUMMARY OF AUDIT

LOSSES 3 GAINS 0 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -17
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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 17.7.95

WATER-

PRIMARY

AQC

COURSE: Owenreagh

ANALYST: MJO

ANALYST:

SITE: Ballynahatty Bridge

CODE: 11 0017

SORT/AQC

METHOD: Live

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)

1

Caenidae *

4

Ancylidae (incl. Acroloxidae)

4

Additional BMWP taxa found by IFE

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

Additional BMWP taxa found by IFE

Corixidae

Sigara sp. (nymph) 1 only

9

Caenidae *

Caenis rivulorum 1 only

4

Gerridae

Gerris sp. (nymphs)

9

Haliplidae

Haliplus fluviatilis (adult) 1 only

9

SUMMARY OF AUDIT

LOSSES 2

GAINS 3

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 4

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: N.Ireland
WATER-
COURSE: Upper Bann

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: MJO

DATE: 31.7.95
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Dynes Bridge

CODE: 11 0047

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Piscicolidae *	Hemiclepsis marginata	7
----------------	-----------------------	---

Additional BMWP taxa found by IFE

Glossiphoniidae	Hemiclepsis marginata	7
-----------------	-----------------------	---

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Piscicolidae *	Piscicola geometra 1 only	7
Psychomyiidae (incl. Ecnomidae)	Psychomyia pusilla 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 11
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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 10.7.95

WATER-

PRIMARY

AQC

COURSE: Forkhill

ANALYST: MJO

ANALYST:

SITE: Forkhill Lower Bridge

CODE: 11 0246

SORT/AQC

METHOD: Live

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: N.Ireland
WATER-
COURSE: Upper Bann

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: MJO

DATE: 27.7.95

AQC
ANALYST:

SITE: Hilltown

CODE: 11 0051

SORT/AQC
METHOD: Live

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

Nemouridae	Protonemura sp. (juvenile) 1 only	9
Polycentropodidae	Polycentropus flavomaculatus 1 only	9
Hydrophilidae (incl. Hydraenidae)	Helophorus brevipalpis (adults)	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 3 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 19
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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 27.7.95

WATER-

PRIMARY

AQC

COURSE: Upper Bann

ANALYST: MK

ANALYST: MJO

SITE: Katesbridge

CODE: 11 0287

SORT/AQC

METHOD: Live/Live

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

Leuctridae	Leuctra sp. (juvenile) 1 only	9
Calopterygidae	Calopteryx sp. (juvenile) 1 only	9
Lymnaeidae	Lymnaea peregra 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 21

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 2.8.95

WATER-
COURSE: Larne

PRIMARY
ANALYST: MK

AQC
ANALYST:

SITE: Owens Bridge

CODE: 11 0218

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Haliplidae	1
Hydrophilidae (incl. Hydraenidae) *	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	Protonemura sp. (juvenile) 1 only	9
Hydrophilidae (incl. Hydraenidae) *	Helophorus brevipalpis (adults), Hydraena gracilis (adults)	1
Sphaeriidae	Pisidium sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 1

GAINS 2

OMISSIONS: 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 2.8.95

WATER-

PRIMARY

AQC

COURSE: Glynn

ANALYST: MK

ANALYST:

SITE: Glynn

CODE: 11 0217

SORT/AQC

METHOD: Live

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

Lymnaeidae

Lymnaea sp. (without shell) 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 26.7.95

WATER-
COURSE: Ghann

PRIMARY
ANALYST: MK

AQC
ANALYST:

SITE: Green Park Bridge

CODE: 11 0220

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Limnephilidae	Crunoecia irrorata (Lepidostomatidae)	7
---------------	---------------------------------------	---

Additional BMWP taxa found by IFE

Lepidostomatidae	Crunoecia irrorata	7
------------------	--------------------	---

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Glossiphoniidae	Glossiphonia complanata 1 only	9
-----------------	--------------------------------	---

SUMMARY OF AUDIT

LOSSES 1

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 6.7.95

WATER-

PRIMARY

AQC

COURSE: Ballygawley Water

ANALYST: PRH

ANALYST:

SITE: Lismore Bridge

CODE: 11 0230

SORT/AQC

METHOD: Live

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

Psychomyiidae (incl. Ecnomidae)

Psychomyia pusilla

6

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 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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 26.7.95

WATER-
COURSE: Moygannon

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Moygannon Ford

CODE: 11 0219

SORT/AQC
METHOD: Live

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: N.Ireland
WATER-
COURSE: Cullywater
SITE: Carrive

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: PRH
CODE: 11 0247

DATE: 10.7.95
AQC
ANALYST:
SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Valvatidae

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

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 6.7.95

WATER-
COURSE: Fury

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Belalastera

CODE: 11 0228

SORT/AQC
METHOD: Live

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: N.Ireland
WATER-
COURSE: Upper Bann
SITE: Dynes Bridge

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: CAK
CODE: 11 0047

DATE: 16.10.95
AQC
ANALYST:
SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Limnephilidae		1
Valvatidae	Bithynia tentaculata (juvenile)	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

Halplidae	Halplus sp. (larva) 1 only	9
Gyrinidae	Orectochilus villosus (larva) 1 only	9

SUMMARY OF AUDIT

LOSSES 2 GAINS 2 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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 30.10.95

WATER-
COURSE: Enler

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Kennel Bridge

CODE: 11 0114

SORT/AQC
METHOD: Live

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

Haliplidae

Halipus wehncke (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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 10.10.95

WATER-
COURSE: Aughrim

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Killeel

CODE: 11 0232

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Chironomidae *		1
----------------	--	---

Additional BMWP taxa found by IFE

Psychomyiidae (incl. Ecnomidae)	Tinodes waeneri 1 only	6
---------------------------------	------------------------	---

Rhyacophilidae (incl. Glossosomatidae)	Agapetus sp. (pupa) 1 only	6
--	----------------------------	---

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Chironomidae *	Tanypodinae, Prodiamesinae, Orthocladiinae	1
----------------	---	---

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 15

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 10.10.95

WATER-
COURSE: Whitewater

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Whitewater Bridge

CODE: 11 0222

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Sericostomatidae *	1
Rhyacophilidae (incl. Glossosomatidae)	1
Oligochaeta	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

Sericostomatidae *	Sericostoma personatum	1
--------------------	------------------------	---

SUMMARY OF AUDIT

LOSSES 2

GAINS 0

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE -8

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 4.11.95

WATER-

PRIMARY

AQC

COURSE: Manyburns

ANALYST: IO'N

ANALYST:

SITE: Manyburns Bridge

CODE: 11 0154

SORT/AQC

METHOD: Live

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 1.11.95

WATER-
COURSE: Upper Bann

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Katesbridge

CODE: 11 0287

SORT/AQC
METHOD: Live

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

Asellidae

Asellus aquaticus 1 only

6

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 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 8.11.95

WATER-

PRIMARY

AQC

COURSE: Sillees

ANALYST: IO'N

ANALYST:

SITE: Derrygonnelly

CODE: 11 0165

SORT/AQC

METHOD: Live

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

Sericostomatidae

Sericostoma personatum

6

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 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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 1.11.95

WATER-
COURSE: Upper Bann

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Hilltown

CODE: 11 0051

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Baetidae

3

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 -4

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 6.11.95

WATER-

PRIMARY

AQC

COURSE: Glencloy

ANALYST: MJO

ANALYST:

SITE: Carnlough

CODE: 11 0196

SORT/AQC

METHOD: Live

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

Perlodidae	Isoperla grammatica	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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 18.10.95

WATER-
COURSE: Cusher

PRIMARY
ANALYST: MJO

AQC
ANALYST:

SITE: Clare Bridge

CODE: 11 0053

SORT/AQC
METHOD: Live

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)

Indet Hydrophilid larva

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

Planariidae (incl. Dugesiidae)

Polycelis nigra/tenuis 1 only

9

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 30.10.95

WATER-
COURSE: Blackwater (ARDS)

PRIMARY
ANALYST: MJO

AQC
ANALYST:

SITE: Ballymartin Bridge

CODE: 11 0113

SORT/AQC
METHOD: Live

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 16.10.95

WATER-
COURSE: Cusher

PRIMARY
ANALYST: MJO

AQC
ANALYST:

SITE: Knock Bridge

CODE: 11 0052

SORT/AQC
METHOD: Live

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)

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

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 6.11.95

WATER-
COURSE: Glenarm

PRIMARY
ANALYST: MK

AQC
ANALYST:

SITE: Glenarm

CODE: 11 0195

SORT/AQC
METHOD: Live

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

Leuctridae

Leuctra sp. (juvenile) 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: N.Ireland
WATER-
COURSE: Upper Bann

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: MK

DATE: 16.10.85
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Gilford Bridge

CODE: 11 0283

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Gerridae	Note on data sheet "seen on site"	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

Psychomyiidae (incl. Ecnomidae)	Psychomyia pusilla	9
Dendrocoelidae	Dendrocoelum lacteum 1 only	9

SUMMARY OF AUDIT

LOSSES 1

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 8

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 10.10.95

WATER-
COURSE: Moygannon

PRIMARY
ANALYST: MK

AQC
ANALYST:

SITE: Moygannon Ford

CODE: 11 0219

SORT/AQC
METHOD: Live

RESULTS OF MAIN AUDIT

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

VIAL

BMWP taxa not found by IFE

Perlodidae		1
Tipulidae	Limnophora sp. (Muscidae)	7
Lymnaeidae *	Succineidae	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

Rhyacophilidae (incl. Glossosomatidae)	Rhyacophila sp. (juvenile) 1 only	9
Limnephilidae	Indet Limnephilid (juvenile) 1 only	9
Lymnaeidae *	Lymnaea peregra 1 only	7
Glossiphoniidae	Helobdella stagnalis 1 only	9

SUMMARY OF AUDIT

LOSSES 2

GAINS 3

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 2

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 10.10.95

WATER-
COURSE: Killeel

PRIMARY
ANALYST: MK

AQC
ANALYST:

SITE: A2 Road Bridge

CODE: 11 0233

SORT/AQC
METHOD: Live

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)	Orectochilus villosus larva (Gyrinidae)	7
Psychomyiidae (incl. Ecnomidae) *		1
Sphaeriidae *		1
Tipulidae *	Empty Limnophora (Muscidae) puparium	7
Sericostomatidae		1

Additional BMWP taxa found by IFE

Gyrinidae	Orectochilus villosus (larvae)	7
-----------	--------------------------------	---

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.	1
Tipulidae *	Tipula sp. 1 only	7
Haliplidae	Haliplus sp. (larva) 1 only	9
Psychomyiidae (incl. Ecnomidae) *	Tinodes waeneri	1

SUMMARY OF AUDIT

LOSSES 2

GAINS 2

OMISSIONS: 3

NET EFFECTS:

ON BMWP SCORE -5

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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 4.11.95

WATER-
COURSE: Colebrook

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Ballindarragh Bridge

CODE: 11 0130

SORT/AQC
METHOD: Live

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

Lepidostomatidae	Lepidostoma hirtum 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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 8.11.95

WATER-
COURSE: Sillees

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Carr Bridge

CODE: 11 0164

SORT/AQC
METHOD: Live

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: N.Ireland
WATER-
COURSE: Hollybrook

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: PRH

DATE: 7.11.95
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Aghalurcher

CODE: 11 0278

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	Potamophylax cingulatus/latipennis 1 only	9
Sphaeriidae	Indet Sphaeriid 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10
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: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 5.11.95

WATER-
COURSE: Cladagh

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Gorteen

CODE: 11 0162

SORT/AQC
METHOD: Live

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

Hydroptilidae

Ithytrichia sp. 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6

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)

