



An Audit of Performance in the Analysis of Biological Samples in 1997 IRTU, Northern Ireland

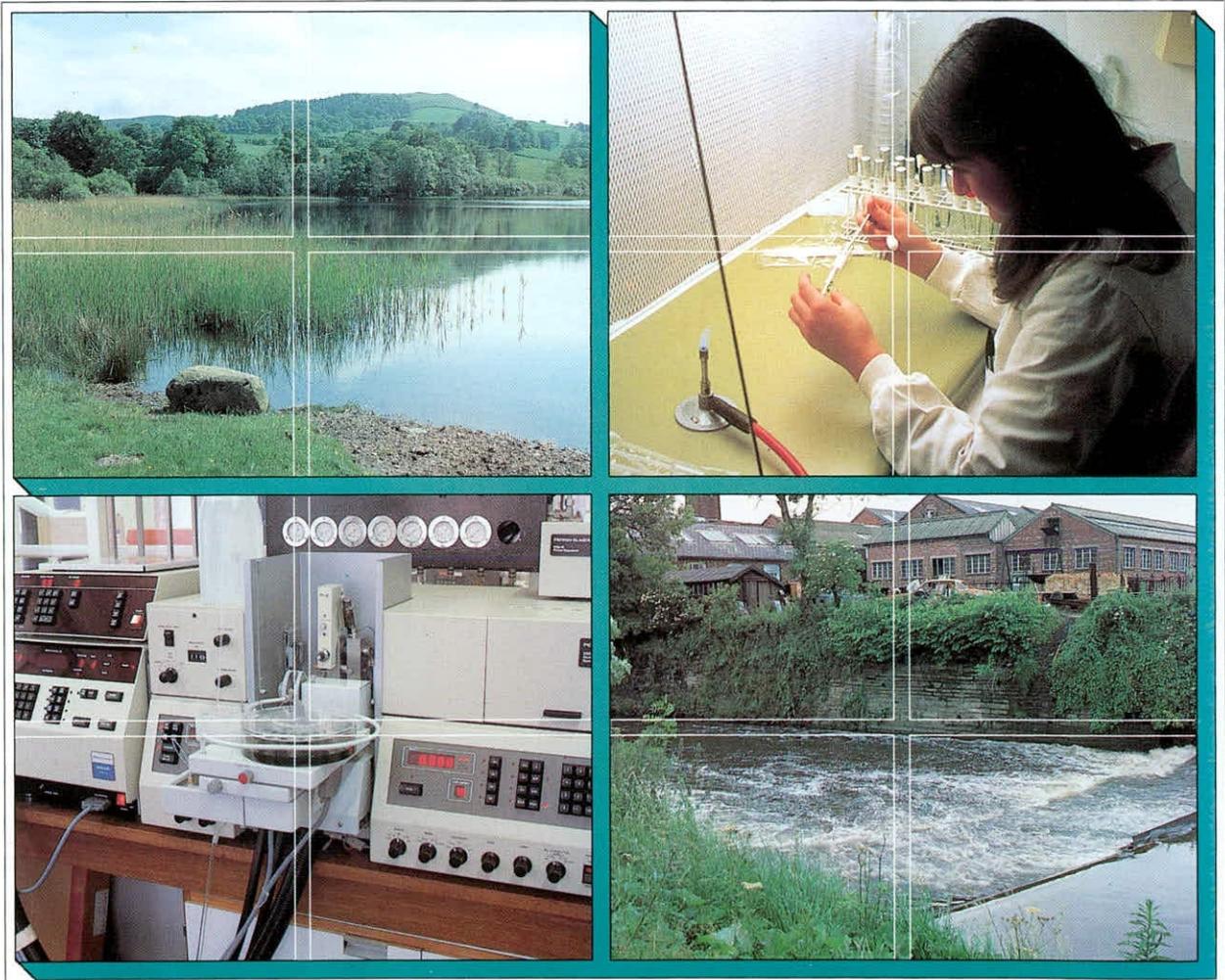
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1. INTRODUCTION

In 1997 the sampling of aquatic macro-invertebrates for the biological assessment of river quality was carried out throughout the United Kingdom. This task was undertaken by the Environment Agency (EA) in England and Wales, the Scottish Environment Protection Agency (SEPA) in Scotland and the Industrial Research and Technology Unit (IRTU) undertook the work in Northern Ireland.

Each organisation employed standard collection procedures as used in the 1995 General Quality Assessment (GQA) Survey. The sampling strategy was therefore 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 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) inspector. For most agencies, these inspectors 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 EA and SEPA region and for IRTU. This commission was consistent with the audit performed by IFE for the National River Quality Surveys in 1990 and 1995 and for the routine biological monitoring of river sites each year between 1991 and 1994 and again in 1996. Where samples sent to IFE had been subjected to an internal AQC inspection, the audit provided a measure of the quality of performance of the AQC analyst rather than the primary analyst.

This report presents the results of the audit of 60 samples analysed by IRTU staff.

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

- i) a 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 (see Appendix) and sent to the Quality Control Manager. 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". This section also includes taxa added by the internal AQC analyst. 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 or the wrong family box being ticked on the data sheet.

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 centred 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, at family level, the taxa missed in sorting by IRTU's analysts in the 1997 audit. Table 7 lists the species most frequently missed by IRTU's biologists, as found by the 1997 audit. Tables 8 and 9 give a listing of all missed taxa at family and species level for the entire 1997 audit for the whole of the UK (Primary and AQC Audits for EA regions plus single Audit for other organisations

6. ACKNOWLEDGEMENTS

Grateful thanks to John Murray-Bligh of EA 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 IRTU

River	Site	Analyst	Losses	Gains	Omissions
Magherfelt Burn	Granias Bridge	CAK	0	1	0
Douglas Burn	Douglas Bridge	CAK	0	1	0
Gleinaan	Cushendall	CAK	0	2	0
Faughan	Ardmore	CAK	0	0	0
Glenshesk	B15 Bridge	CC	0	0	0
Glendun	Knocknacarry Bridge	CC	0	0	0
Camowen	Ramacken Bridge	CC	1	1	0
Kilroot	Kilroot	CC	0	0	1
Moneycarragh	Moneylane	IO'N	0	1	0
Muff	Mill Bridge	IO'N	0	0	0
Larne	Owens Bridge	IO'N	0	0	0
Glenlark	Glenlark Bridge	IO'N	0	0	0
Annalong	Annalong	MB	1	3	0
Moyola	New Bridge	MB	1	1	1
Carey	Careymill Bridge	MB	0	1	0
Tow	Nr Old Gasworks	MB	0	1	0
Creevan Burn	Creevan Cottage	PRH	0	1	0
Owenkillew	Killymore Bridge	PRH	1	1	0
Owenkillew	Drumlea	PRH	0	0	0
Main	Dundermot Bridge	PRH	0	2	0

Table 2 The 20 summer samples audited for IRTU

River	Site	Analyst	Losses	Gains	Omissions
Glynn	Glynn	CAK	0	3	1
Gleinaan	Cushendall	CAK	0	1	1
Glenshesk	B15 Bridge	CAK	0	4	0
Glenariff	Callisnagh Bridge	CAK	0	2	0
Cullys Burn	Glenavna Hotel	CC	0	0	0
Bush	Ballyhoe Bridge	CC	1	0	0
Dervock	Iderown Bridge	CC	0	1	0
Glenlark	Glenlark Bridge	CC	2	0	0
Blackwater	Ballymartin Road	IO'N	0	1	0
Main	Dunmore Bridge	IO'N	1	2	0
Clogh	Glarryford Bridge	IO'N	0	3	0
Finn	Rosslea Bridge	IO'N	0	1	0
Woodburn	Courtalds Factory	MB	1	1	0
Enler	Kennel Bridge	MB	0	3	1
Braid	Tullyagherley Bridge	MB	2	1	0
Kellswater	Currys Bridge	MB	0	0	2
Gillygooly Burn	Mill House	PRH	1	0	0
Erne	Enniskillen	PRH	1	3	0
Hollybrook	Aghalurcher	PRH	1	2	1
Lackey	Knockballymore	PRH	0	0	0

Table 3 The 20 autumn samples audited for IRTU

River	Site	Analyst	Losses	Gains	Omissions
Enler	Kennel Bridge	BR	1	1	0
Blackwater	Ballymartin Bridge	BR	2	1	0
Quiggery Water	Edergoole Bridge	CAK	0	1	0
Killyclougher Burn	Lovers Retreat	CAK	0	0	0
Glenelly	Sperrin	CAK	0	0	0
Owenbeg	Dungiven	CAK	0	2	0
Castle	Drummond Bridge	CC	1	2	0
Burnfoot	Rush Hall	CC	0	0	0
Burngushet	Burngushet Bridge	CC	0	0	0
Bush	Conagher	CC	1	0	0
Faughanvale	Faughanvale Bridge	IO'N	0	1	0
Roe	Corrick Bridge	IO'N	0	2	0
Roe	Bonnanaboigh Bridge	IO'N	0	1	0
Cladagh	Gorteen	IO'N	0	0	0
Merok Burn	McCaughan Park	MB	3	3	0
Knock	Cherry Valley	MB	2	2	0
Arney	Drumane Bridge	PRH	0	2	0
Boho Tributary	Boho	PRH	0	0	0
Edenclaw	Edenclaw	PRH	0	2	0
Glenmornan	Catherines Bridge	PRH	0	1	0

Table 4 Statistics of the 1997 audit results

Analyst	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no.gains	Mean errors (l+g+o)	Standard error
BR	2	1.00	0	0	0	1	2.50	0.50
CAK	12	1.42	0.36	2	16.67	4	1.58	0.40
CC	12	0.33	0.19	0	0	2	0.92	0.29
ION	12	1.00	0.28	1	8.33	3	1.08	0.31
MB	10	1.60	0.34	3	30.00	3	3.00	0.49
PRH	12	1.17	0.30	1	8.33	3	1.58	0.40
IRTU	60	1.08	0.14	7	11.67	4	1.62	0.18

Table 5 Net effects of the audit on BMWP score and number of scoring taxa

Analyst	n	Mean net effect on BMWP score	% 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
BR	2	-4.00	0	-3	-0.50	0	0
CAK	12	6.25	16.67	17	1.42	16.67	4
CC	12	-0.92	0	8	-0.17	0	1
ION	12	5.83	8.33	20	0.92	8.33	3
MB	10	2.20	10.00	15	0.60	10.00	3
PRH	12	5.75	25.00	15	0.83	0	2
IRTU	60	3.62	11.67	20	0.68	6.67	4

Table 6 The families missed by IRTU's analysts in the 1997 audit

Family	n	% of IRTU's missed families
Tipulidae	5	9.43
Glossiphoniidae	4	7.55
Sphaeriidae	4	7.55
Simuliidae	3	5.66
Hydropsychidae	3	5.66
Erpobdellidae	3	5.66
Hydrophilidae (incl. Hydraenidae)	2	3.77
Lymnaeidae	2	3.77
Physidae	2	3.77
Leptoceridae	2	3.77
Elmidae	2	3.77
Rhyacophilidae (incl. Glossosomatidae)	2	3.77
Sericostomatidae	2	3.77
Caenidae	1	1.89
Gyrinidae	1	1.89
Beraeidae	1	1.89
Haliplidae	1	1.89
Hydrobiidae (incl. Bithyniidae)	1	1.89
Gerridae	1	1.89
Asellidae	1	1.89
Leptophlebiidae	1	1.89
Leuctridae	1	1.89
Nemouridae	1	1.89
Oligochaeta	1	1.89
Perlodidae	1	1.89
Piscicolidae	1	1.89
Planariidae (incl. Dugesiidae)	1	1.89
Planorbidae	1	1.89
Psychomyiidae (incl. Ecnomidae)	1	1.89
Hydroptilidae	1	1.89
Total	53	100

Table 7 The species missed by IRTU's analysts in the 1997 audit

Species	n	% of IRTU's missed species
Dicranota sp.	3	5.45
Simulium (Simulium) ornatum group	3	5.45
Pisidium sp.	3	5.45
Glossiphonia complanata (L.)	3	5.45
Sericostoma personatum (Spence)	2	3.64
Physa fontinalis (L.)	2	3.64
Hydropsyche sp.	2	3.64
Erpobdellidae indet	2	3.64
Hydraena gracilis Germar	1	1.82
Helophorus (Atracthelophorus) brevipalpis Bedel	1	1.82
Helobdella stagnalis (L.)	1	1.82
Haliplus sp.	1	1.82
Gyraulus albus (Muller)	1	1.82
Gerris sp.	1	1.82
Hydropsyche siltalai Dohler	1	1.82
Elmis aenea (Muller)	1	1.82
Ceraclea dissimilis (Stephens)	1	1.82
Caenis rivulorum Eaton	1	1.82
Beraeodes minutus (L.)	1	1.82
Bathyomphalus contortus (L.)	1	1.82
Athripsodes sp.	1	1.82
Asellus aquaticus (L.)	1	1.82
Erpobdella octoculata (L.)	1	1.82
Nemoura avicularis Morton	1	1.82
Tinodes waeneri (L.)	1	1.82
Sphaeriidae indet	1	1.82
Rhyacophila dorsalis (Curtis)	1	1.82
Potamopyrgus jenkinsi (Smith)	1	1.82
Piscicola geometra (L.)	1	1.82
Phagocata vitta (Duges)	1	1.82
Hydroptila sp.	1	1.82
Orectochilus villosus (Muller)	1	1.82
Agapetus sp.	1	1.82
Naididae	1	1.82
Molophilus sp.	1	1.82
Lymnaea truncatula (Muller)	1	1.82
Lymnaea peregra (Muller)	1	1.82
Limonia sp.	1	1.82
Limnius volckmari (Panzer)	1	1.82
Leuctra inermis Kempny	1	1.82
Tipula (Tipula) paludosa Meigen	1	1.82

Table 7 continued

Species	n	% of IRTU's missed species
Isoperla grammatica (Poda)	1	1.82
Paraleptophlebia sp.	1	1.82
Total	55	100

Table 8 Missed families for all samples in the 1997 audit

Family	n	% of missed families in 1997 audit
Hydroptilidae	68	5.75
Elmidae	66	5.58
Hydrophilidae (incl. Hydraenidae)	61	5.16
Planariidae (incl. Dugesiidae)	53	4.48
Leptoceridae	45	3.81
Hydrobiidae (incl. Bithyniidae)	43	3.64
Simuliidae	36	3.05
Lymnaeidae	36	3.05
Planorbidae	36	3.05
Sphaeriidae	34	2.88
Ancylidae (incl. Acroloxidae)	32	2.71
Hydropsychidae	32	2.71
Limnephilidae	32	2.71
Nemouridae	32	2.71
Caenidae	29	2.45
Haliplidae	28	2.37
Tipulidae	28	2.37
Psychomyiidae (incl. Ecnomidae)	28	2.37
Asellidae	25	2.12
Ephemerellidae	22	1.86
Lepidostomatidae	22	1.86
Rhyacophilidae (incl. Glossosomatidae)	20	1.69
Valvatidae	19	1.61
Goeridae	18	1.52
Physidae	18	1.52
Scirtidae	17	1.44
Dytiscidae (incl. Noteridae)	17	1.44
Coenagriidae	16	1.35
Leuctridae	16	1.35
Baetidae	15	1.27
Glossiphoniidae	15	1.27
Gammaridae (incl. Crangonyctidae)	13	1.10
Leptophlebiidae	13	1.10
Sericostomatidae	13	1.10
Chironomidae	12	1.02
Erpobdellidae	12	1.02
Heptageniidae	11	0.93
Gerridae	11	0.93
Polycentropodidae	11	0.93
Perlodidae	10	0.85
Gyrinidae	10	0.85
Dendrocoelidae	9	0.76

Table 8 continued

Family	n	% of missed families in 1997 audit
Piscicolidae	9	0.76
Taeniopterygidae	8	0.68
Corixidae	8	0.68
Odontoceridae	8	0.68
Beraeidae	7	0.59
Calopterygidae	7	0.59
Dryopidae	7	0.59
Sialidae	7	0.59
Oligochaeta	7	0.59
Hydrometridae	5	0.42
Chloroperlidae	5	0.42
Ephemeraeidae	4	0.34
Brachycentridae	4	0.34
Libellulidae	2	0.17
Notonectidae	2	0.17
Molannidae	2	0.17
Unionidae	1	0.08
Phryganeidae	1	0.08
Philopotamidae	1	0.08
Nepidae	1	0.08
Pleidae	1	0.08
Corophiidae	1	0.08
Total	1182	100

Table 9 Missed species for all samples in the 1997 audit

Species	n	% of missed species in 1997 audit
Hydroptila sp.	49	3.90
Potamopyrgus jenkinsi (Smith)	40	3.18
Elmis aenea (Muller)	38	3.02
Hydraena gracilis Germar	34	2.70
Pisidium sp.	28	2.23
Polycelis nigra group	26	2.07
Lymnaea peregra (Muller)	26	2.07
Asellus aquaticus (L.)	23	1.83
Ephemerella ignita (Poda)	22	1.75
Ancylus fluviatilis Muller	22	1.75
Limnephilidae indet	19	1.51
Mystacides azurea (L.)	18	1.43
Caenis rivulorum Eaton	18	1.43
Lepidostoma hirtum (Fabricius)	18	1.43
Simulium (Simulium) ornatum group	18	1.43
Hydropsyche siltalai Dohler	17	1.35
Haliphus sp.	16	1.27
Limnius volckmari (Panzer)	15	1.19
Ithytrichia sp.	15	1.19
Polycelis felina (Dalyell)	14	1.11
Physa fontinalis (L.)	13	1.03
Sericostoma personatum (Spence)	13	1.03
Tinodes waeneri (L.)	13	1.03
Elodes sp.	13	1.03
Lype sp.	12	0.95
Gyraulus albus (Muller)	12	0.95
Valvata piscinalis (Muller)	12	0.95
Glossiphonia complanata (L.)	12	0.95
Oulimnius sp.	11	0.87
Orectochilus villosus (Muller)	10	0.79
Helophorus (Atracthelophorus) brevipalpis Bedel	10	0.79
Dendrocoelum lacteum (Muller)	9	0.72
Dicranota sp.	9	0.72
Piscicola geometra (L.)	9	0.72
Coenagriidae indet	9	0.72
Nemurella picteti Klapalek	9	0.72
Oulimnius tuberculatus (Muller)	9	0.72
Valvata cristata Muller	9	0.72
Bathyomphalus contortus (L.)	8	0.64
Odontocerum albicorne (Scopoli)	8	0.64
Orthoclaadiinae	8	0.64
Hydropsyche sp.	8	0.64

Table 9 continued

Species	n	% of missed species in 1997 audit
<i>Isoperla grammatica</i> (Poda)	8	0.64
<i>Agapetus</i> sp.	8	0.64
<i>Anisus vortex</i> (L.)	8	0.64
<i>Goera pilosa</i> (Fabricius)	7	0.56
<i>Gammarus pulex</i> (L.)	7	0.56
Erpobdellidae indet	7	0.56
<i>Nemoura avicularis</i> Morton	7	0.56
<i>Caenis luctuosa</i> group	7	0.56
<i>Amphinemura sulcicollis</i> (Stephens)	7	0.56
<i>Dugesia polychroa</i> group	7	0.56
<i>Armiger crista</i> (L.)	7	0.56
<i>Dryops</i> sp.	7	0.56
<i>Sialis lutaria</i> (L.)	7	0.56
<i>Calopteryx splendens</i> (Harris)	7	0.56
<i>Rhyacophila dorsalis</i> (Curtis)	7	0.56
<i>Acroloxus lacustris</i> (L.)	6	0.48
<i>Baetis rhodani</i> (Pictet)	6	0.48
<i>Lymnaea truncatula</i> (Muller)	6	0.48
<i>Hydropsyche angustipennis</i> (Curtis)	6	0.48
<i>Agabus</i> sp.	6	0.48
<i>Athripsodes bilineatus</i> (L.)	6	0.48
<i>Helobdella stagnalis</i> (L.)	6	0.48
<i>Agraylea multipunctata</i> Curtis	6	0.48
<i>Dugesia tigrina</i> (Girard)	6	0.48
<i>Oxyethira</i> sp.	6	0.48
<i>Athripsodes aterrimus</i> (Stephens)	5	0.40
<i>Tipula</i> (<i>Yamatotipula</i>) <i>montium</i> group	5	0.40
<i>Athripsodes</i> sp.	5	0.40
<i>Erpobdella octoculata</i> (L.)	5	0.40
<i>Silo pallipes</i> (Fabricius)	5	0.40
<i>Oreodytes sanmarkii</i> (Sahlberg)	5	0.40
<i>Gerris</i> (<i>Gerris</i>) <i>lacustris</i> (L.)	5	0.40
Sphaeriidae indet	5	0.40
<i>Tipula</i> sp.	5	0.40
<i>Antocha vitripennis</i> (Meigen)	5	0.40
<i>Chloroperla torrentium</i> (Pictet)	5	0.40
<i>Leuctra fusca</i> (L.)	5	0.40
<i>Hydraena riparia</i> Kugelann	5	0.40
<i>Rhithrogena</i> sp.	5	0.40
<i>Paraleptophlebia</i> sp.	5	0.40
<i>Hydrometra stagnorum</i> (L.)	5	0.40
<i>Leuctra geniculata</i> (Stephens)	4	0.32
<i>Leuctra hippopus</i> (Kempny)	4	0.32

Table 9 continued

Species	n	% of missed species in 1997 audit
Ischnura elegans (Van der Linden)	4	0.32
Athripsodes cinereus (Curtis)	4	0.32
Baetis vernus Curtis	4	0.32
Hydrophilidae indet	4	0.32
Brachycentrus subnubilus Curtis	4	0.32
Brachyptera risi (Morton)	4	0.32
Haliphus fluviatilis Aube	4	0.32
Ceraclea dissimilis (Stephens)	4	0.32
Ancylidae indet	4	0.32
Ecdyonurus sp.	4	0.32
Beraea maurus (Curtis)	4	0.32
Sigara (Sigara) sp.	4	0.32
Tubificidae	4	0.32
Platambus maculatus (L.)	4	0.32
Tanypodinae	4	0.32
Taeniopteryx nebulosa (L.)	4	0.32
Polycentropus flavomaculatus (Pictet)	4	0.32
Psychomyia pusilla (Fabricius)	4	0.32
Simulium (Nevermannia) cryophilum group	4	0.32
Scirtidae indet	4	0.32
Lymnaea stagnalis (L.)	4	0.32
Silo nigricornis (Pictet)	4	0.32
Crangonyx pseudogracilis Bousfield	3	0.24
Caenis horaria (L.)	3	0.24
Helophorus (Helophorus) obscurus Mulsant	3	0.24
Pyrrhosoma nymphula (Sulzer)	3	0.24
Cloeon dipterum (L.)	3	0.24
Habrophlebia fusca (Curtis)	3	0.24
Crunoecia irrorata (Curtis)	3	0.24
Glossosoma sp.	3	0.24
Polycentropodidae indet	3	0.24
Ephemera danica Muller	3	0.24
Gammarus sp.	3	0.24
Physa sp.	3	0.24
Esolus parallelepipedus (Muller)	3	0.24
Haliphus lineatocollis (Marsham)	3	0.24
Simulium (Eusimulium) aureum group	3	0.24
Adicella reducta (McLachlan)	3	0.24
Limnephilus lunatus Curtis	3	0.24
Leptophlebiidae indet	3	0.24
Leuctra sp.	3	0.24
Nemoura cambrica group	3	0.24

Table 9 continued

Species	n	% of missed species in 1997 audit
Simulium (Boophthora) erythrocephalum (de Geer)	3	0.24
Simulium (Wilhelmia) sp.	3	0.24
Athripsodes albifrons (L.)	3	0.24
Simulium (Simulium) argyreatum group	3	0.24
Cyrnus trimaculatus (Curtis)	2	0.16
Asellus meridianus Racovitza	2	0.16
Protonemura praecox (Morton)	2	0.16
Crenobia alpina (Dana)	2	0.16
Ecclisopteryx guttulata (Pictet)	2	0.16
Anisus sp.	2	0.16
Tanytarsini	2	0.16
Protonemura meyeri (Pictet)	2	0.16
Brychius elevatus (Panzer)	2	0.16
Corixidae indet	2	0.16
Beraeodes minutus (L.)	2	0.16
Protonemura sp.	2	0.16
Simulium (Wilhelmia) equinum (L.)	2	0.16
Simulium (Nevermannia) angustitarse group	2	0.16
Chironomini	2	0.16
Rhyacophila sp.	2	0.16
Baetis scambus group	2	0.16
Riolus subviolaceus (Muller)	2	0.16
Polycentropus sp.	2	0.16
Silo sp.	2	0.16
Sigara sp.	2	0.16
Bithynia tentaculata (L.)	2	0.16
Athripsodes albifrons/bilineatus	2	0.16
Ochthebius bicolon Germar	2	0.16
Libellulidae indet	2	0.16
Lumbricidae	2	0.16
Molanna angustata Curtis	2	0.16
Molophilus sp.	2	0.16
Mystacides nigra/longicornis	2	0.16
Naididae	2	0.16
Nemoura cinerea (Retzius)	2	0.16
Notonecta sp.	2	0.16
Hippeutis complanatus (L.)	2	0.16
Oecetis lacustris (Pictet)	2	0.16
Helius sp.	2	0.16
Haliplus wehncke (Gerhardt)	2	0.16
Paraleptophlebia submarginata (Stephens)	2	0.16
Perlodes microcephala (Pictet)	2	0.16

Table 9 continued

Species	n	% of missed species in 1997 audit
Gerris (Gerris) sp.	2	0.16
Gerris (Gerris) gibbifer Schummel	2	0.16
Physa acuta group	2	0.16
Gerris sp.	2	0.16
Ephemera sp.	1	0.08
Enchytraeidae	1	0.08
Baetis sp.	1	0.08
Diamesinae	1	0.08
Laccobius (Macrolaccobius) sinuatus/striatulus	1	0.08
Laccobius sp.	1	0.08
Lasiocephala basalis/Lepidostoma hirtum	1	0.08
Lymnaea sp.	1	0.08
Lymnaea palustris (Muller)	1	0.08
Lumbriculidae	1	0.08
Simulium sp.	1	0.08
Phagocata vitta (Duges)	1	0.08
Anodonta cygnea (L.)	1	0.08
Ochthebius minimus (Fabricius)	1	0.08
Leuctra inermis Kempny	1	0.08
Anisus leucostoma (Millet)	1	0.08
Plea leachi Mcgregor & Kirkaldy	1	0.08
Limonia sp.	1	0.08
Anacaena globulus (Paykull)	1	0.08
Anacaena bipustulata (Marsham)	1	0.08
Anabolia nervosa (Curtis)	1	0.08
Tinodes assimilis/machlachlani	1	0.08
Tipula (Acutipula) maxima/fulvipennis	1	0.08
Tipula (Tipula) paludosa Meigen	1	0.08
Limnephilus marmoratus Curtis	1	0.08
Agabus didymus (Olivier)	1	0.08
Limnephilus politus/rhombicus	1	0.08
Sphaerium sp.	1	0.08
Helophorus (Meghelophorus) grandis Illiger	1	0.08
Drusus annulatus/Ecclisopteryx guttulata	1	0.08
Gyrinus sp.	1	0.08
Corophium lacustre Vanhoffen	1	0.08
Haliplidae indet	1	0.08
Pedicia (Pedicia) rivosa (L.)	1	0.08
Prodiamesinae	1	0.08
Chloroperla tripunctata (Scopoli)	1	0.08
Potamophylax rotundipennis (Brauer)	1	0.08
Potamophylax latipennis (Curtis)	1	0.08

Table 9 continued

Species	n	% of missed species in 1997 audit
Oreodytes septentrionalis (Sahlberg)	1	0.08
Wormaldia sp.	1	0.08
Hydropsychidae indet	1	0.08
Glossiphonia heteroclita (L.)	1	0.08
Caenis pusilla Navas	1	0.08
Heptagenia lateralis (Curtis)	1	0.08
Heptagenia sulphurea (Muller)	1	0.08
Glyptotaelius pellucidus (Retzius)	1	0.08
Planaria torva (Muller)	1	0.08
Limnephilus sp.	1	0.08
Dytiscidae indet	1	0.08
Bithynia leachii (Sheppard)	1	0.08
Nepa cinerea L.	1	0.08
Beraea pullata (Curtis)	1	0.08
Ecnomus tenellus (Rambur)	1	0.08
Hydropsyche pellucidula (Curtis)	1	0.08
Phryganea sp.	1	0.08
Centroptilum luteolum (Muller)	1	0.08
Total	1258	100

APPENDIX

Results of individual sample audits

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 08/04/97

WATER-COURSE: Magherfelt Burn

PRIMARY ANALYST: CAK

AQC ANALYST:

SITE: Granias Bridge

CODE: 110251

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Elmidae

9

Limnius volckmari (Panzer) (a) 1 only

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: 09/04/97

WATER-
COURSE: Douglas Burn

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Douglas Bridge

CODE: 110281

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Sphaeriidae

9

Pisidium sp. 1 only

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

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: 10/04/97

WATER-
COURSE: Glенаan

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Cushendall

CODE: 110190

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Caenidae	9
Caenis rivulorum Eaton	
Tipulidae	9
Molophilus sp. 1 only	

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: 14/04/97

WATER-
COURSE: Faughan

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Ardmore

CODE: 110175

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 10/04/97

WATER-
COURSE: Glenshesk

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: B15 Bridge

CODE: 110193

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 10/04/97

WATER-
COURSE: Glendun

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Knocknacarry Bridge

CODE: 110191

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 17/04/97

WATER-COURSE: Camowen

PRIMARY ANALYST: CC

AQC ANALYST:

SITE: Ramacken Bridge

CODE: 110259

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Dytiscidae (incl. Noteridae)

5

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Glossiphoniidae

9

Glossiphonia complanata (L.) 1 only

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: 21/04/97

WATER-
COURSE: Kilroot

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Kilroot

CODE: 110216

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Baetidae * 1

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Baetidae * 1

Baetis rhodani (Pictet)

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 1

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: 02/04/97

WATER-
COURSE: Moneycarragh

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Moneylane

CODE: 110237

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Sericostomatidae

9

Sericostoma personatum (Spence)

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: 14/04/97

WATER-
COURSE: Muff

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Mill Bridge

CODE: 110266

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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

LABORATORY: IRTU, Lisburn

DATE: 21/04/97

WATER-
COURSE: Larne

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Owens Bridge

CODE: 110218

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 23/04/97

WATER-
COURSE: Glenlark

PRIMARY
ANALYST: IO'N

AQC
ANALYST: .

SITE: Glenlark Bridge

CODE: 110204

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: Annalong
 SITE: Annalong

LABORATORY: IRTU, Lisburn
 PRIMARY ANALYST: MB
 CODE: 110234

DATE: 02/04/97
 AQC ANALYST:
 SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Dendrocoelidae 7

Additional BMWP taxa found in vial

Planariidae (incl. Dugesiidae) 7
 Phagocata vitta (Duges)

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Sericostomatidae 9

 Sericostoma personatum (Spence) 1 only

Tipulidae 9

 Dicranota sp. 1 only

SUMMARY OF AUDIT

LOSSES 1

GAINS 3

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: 08/04/97

WATER-
COURSE: Moyola

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: New Bridge

CODE: 110078

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Sericostomatidae 8

Leptoceridae * 1

Additional BMWP taxa found in vial

Lepidostomatidae 8

Lepidostoma hirtum (Fabricius)

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Leptoceridae * 1

Mystacides azurea (L.)

Oecetis testacea (Curtis)

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

OMISSIONS: 1

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: 10/04/97

WATER-
COURSE: Carey

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: Careymill Bridge

CODE: 110192

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Simuliidae

Simulium (Simulium) ornatum group 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: 10/04/97

WATER-
COURSE: Tow

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: Nr Old Gasworks

CODE: 110194

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Glossiphoniidae

9

Helobdella stagnalis (L.) 1 only

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
WATER-
COURSE: Creevan Burn
SITE: Creevan Cottage

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: PRH
CODE: 110293

DATE: 22/04/97
AQC
ANALYST:
SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Hydropsychidae

Hydropsyche siltalai Dohler

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
WATER-
COURSE: Owenkillew
SITE: Killymore Bridge

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: PRH
CODE: 110008

DATE: 23/04/97
AQC
ANALYST:
SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Glossiphoniidae

1

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Hydrobiidae (incl. Bithyniidae)

9

Potamopyrgus jenkinsi (Smith) 1 only

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: 23/04/97

WATER-
COURSE: Owenkillev

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Drumlea

CODE: 110177

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 01/05/97

WATER-
COURSE: Main

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Dundermot Bridge

CODE: 110032

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

Gerridae

6

Gerris (Gerris) odontogaster (Zetterstedt)

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Perlodidae

9

Isoperla grammatica (Poda) 1 only

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: 03/07/97

WATER-COURSE: Glynn

PRIMARY ANALYST: CAK

AQC ANALYST:

SITE: Glynn

CODE: 110217

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Hydroptilidae * 4

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Sphaeriidae 9

Pisidium sp. 1 only

Glossiphoniidae 9

Glossiphonia complanata (L.) 1 only

Hydrophilidae (incl. Hydraenidae) 9

Hydraena gracilis Germar (a)

Hydroptilidae * 4

Allotrichia pallicornis (Eaton) 1 only

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 11

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: 16/07/97

WATER-
COURSE: Glенаan

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Cushendall

CODE: 110190

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Ephemerellidae * 1

Additional BMWP taxa found in vial

Oligochaeta 6

Naididae 1 only

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Ephemerellidae * 1

Ephemerella ignita (Poda)

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 1

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland
WATER-
COURSE: Glenshesk

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: CAK

DATE: 16/07/97
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: B15 Bridge

CODE: 110193

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Sphaeriidae	9
Sphaeriidae indet (juv) 1 only	
Oligochaeta	9
Naididae	
Psychomyiidae (incl. Ecnomidae)	9
Tinodes waeneri (L.) 1 only	
Tipulidae	9
Dicranota sp. 1 only	

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 17

ON NO. OF TAXA 4

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

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

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

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 16/07/97

WATER-
COURSE: Glenariff

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Callisnagh Bridge

CODE: 110189

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Planariidae (incl. Dugesiidae)	9
Phagocata vitta (Duges) 1 only	
Lymnaeidae	9
Lymnaea truncatula (Muller) 1 only	

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

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
WATER-
COURSE: Cullys Burn

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: CC

DATE: 03/07/97
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Glenavna Hotel

CODE: 110213

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 17/07/97

WATER-
COURSE: Bush

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Ballyhoe Bridge

CODE: 110264

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Oligochaeta

7

Nematoda

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

None

SUMMARY OF AUDIT

LOSSES 1 GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -1

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: 17/07/97

WATER-
COURSE: Dervock

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Iderown Bridge

CODE: 110093

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Hydropsychidae

9

Hydropsyche sp. (p) 1 only

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: 21/07/97

WATER-COURSE: Glenlark

PRIMARY ANALYST: CC

AQC ANALYST:

SITE: Glenlark Bridge

CODE: 110204

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Oligochaeta	7
Nematoda	
Sericostomatidae	1

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

None

SUMMARY OF AUDIT

LOSSES 2

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -11

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
WATER-
COURSE: Blackwater
SITE: Ballymartin Road

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: IO'N
CODE: 110113

DATE: 21/07/97
AQC
ANALYST:
SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Hydrophilidae (incl. Hydraenidae)

9

Helophorus (Atracthelophorus) brevivalpis Bedel (a) 1 only

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: 22/07/97

WATER-COURSE: Main

PRIMARY ANALYST: IO'N

AQC ANALYST:

SITE: Dunmore Bridge

CODE: 110030

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Valvatidae	7
Bithynia tentaculata	

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Glossiphoniidae	9
Glossiphonia complanata (L.) 1 only	
Leptoceridae	9
Ceraclea dissimilis (Stephens) (p) 1 only	

SUMMARY OF AUDIT

LOSSES 1

GAINS 2

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: 22/07/97

WATER-
COURSE: Clogh

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Glarryford Bridge

CODE: 110036

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Gerridae	9
Gerris sp. (l) 1 only	
Hydropsychidae	9
Hydropsyche sp. (p) 1 only	
Leptoceridae	9
Athripsodes sp. 1 only	

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 20

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: 08/08/97

WATER-
COURSE: Finn

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Rosslea Bridge

CODE: 110279

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Gyrinidae

9

Orectochilus villosus (Muller) (l) 1 only

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

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: 21/07/97

WATER-COURSE: Woodburn

PRIMARY ANALYST: MB

AQC ANALYST:

SITE: Courtalds Factory

CODE: 110214

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Sphaeriidae

4

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Physidae

9

Physa fontinalis (L.) 1 only

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: 21/07/97

WATER-
COURSE: Enler

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: Kennel Bridge

CODE: 110114

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Oligochaeta * 1

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Physidae 9

Physa fontinalis (L.)

Lymnaeidae 9

Lymnaea peregra (Muller) 1 only

Sphaeriidae 9

Pisidium sp. 1 only

Oligochaeta * 1

Tubificidae 1 only

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 9

ON NO. OF TAXA 3

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 24/07/97

WATER-
COURSE: Braid

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: Tullyagharley Bridge

CODE: 110034

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Dendrocoelidae 7

Dugesia lugubris/polychroa (pale specimen)

Caenidae 4

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Haliplidae 9

Haliplus sp. (1)

SUMMARY OF AUDIT

LOSSES 2 GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -7

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: 24/07/97

WATER-
COURSE: Kellswater

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: Currys Bridge

CODE: 110033

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Hydrobiidae (incl. Bithyniidae) * 2

Glossiphoniidae * 1

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Hydrobiidae (incl. Bithyniidae) * 2

Potamopyrgus jenkinsi (Smith) 1 only

Glossiphoniidae * 1

Glossiphonia complanata (L.)

SUMMARY OF AUDIT

LOSSES 0 GAINS 0 OMISSIONS: 2

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: 29/07/97

WATER-
COURSE: Gillygooly Burn

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Mill House

CODE: 110294

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Piscicolidae

3

Posterior end only, probably Erpobdellidae, probably dead at time of sampling

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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

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: 30/07/97

WATER-COURSE: Erne

PRIMARY ANALYST: PRH

AQC ANALYST:

SITE: Enniskillen

CODE: 110123

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Limnephilidae 7

Additional BMWP taxa found in vial

Phryganeidae 7

Phryganeidae indet (juv)

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Elmidae 9

Elmis aenea (Muller) (l) 1 only

Hydroptilidae 9

Hydroptila sp. 1 only

SUMMARY OF AUDIT

LOSSES 1

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 14

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: Hollybrook

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: PRH

DATE: 30/07/97
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Aghalurcher

CODE: 110278

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Sphaeriidae	4
Rhyacophilidae (incl. Glossosomatidae) *	1

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Asellidae	9
Asellus aquaticus (L.)	
Rhyacophilidae (incl. Glossosomatidae) *	1
Agapetus sp. (l+p)	
Beraeidae	9
Beraeodes minutus (L.) 1 only	

SUMMARY OF AUDIT

LOSSES 1

GAINS 2

OMISSIONS: 1

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: 08/08/97

WATER-
COURSE: Lackey

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Knockballymore

CODE: 110158

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 12/11/97

WATER-
COURSE: Enler

PRIMARY
ANALYST: BR

AQC
ANALYST:

SITE: Kennel Bridge

CODE: 110114

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Lepidostomatidae

7

Additional BMWP taxa found in vial

Limnephilidae

7

Limnephilidae indet (juv)

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -3

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: 12/11/97

WATER-
COURSE: Blackwater

PRIMARY
ANALYST: BR

AQC
ANALYST:

SITE: Ballymartin Bridge

CODE: 110113

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Dytiscidae (incl. Noteridae) 2

Terrestrial larva Carabidae? in vial

Hydropsychidae 1

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Tipulidae 9

Tipula (Tipula) paludosa Meigen 1 only

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

LABORATORY: IRTU, Lisburn

DATE: 06/10/97

WATER-
COURSE: Quiggery Water

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Edergoole Bridge

CODE: 110016

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Planorbidae

9

Bathyomphalus contortus (L.)

Gyraulus albus (Muller)

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: 06/10/97

WATER-
COURSE: Killyclougher Burn

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Lovers Retreat

CODE: 110200

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 09/10/97

WATER-COURSE: Glenelly

PRIMARY ANALYST: CAK

AQC ANALYST:

SITE: Sperrin

CODE: 110257

SORT/AQC

METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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

LABORATORY: IRTU, Lisburn

DATE: 22/10/97

WATER-
COURSE: Owenbeg

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Dungiven

CODE: 110029

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Leptophlebiidae	9
Paraleptophlebia sp. (juv) 1 only	
Simuliidae	9
Simulium (Simulium) ornatum group 1 only	

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

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: 22/10/97

WATER-
COURSE: Castle

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Drummond Bridge

CODE: 110282

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Leptoceridae 7

Additional BMWP taxa found in vial

Psychomyiidae (incl. Ecnomidae) 6

Tinodes waeneri (L.) (damaged)

Sericostomatidae 7

Sericostoma personatum (Spence)

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

None

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

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: 22/10/97

WATER-
COURSE: Burnfoot

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Rush Hall

CODE: 110268

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 27/10/97

WATER-
COURSE: Burngushet

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Burngushet Bridge

CODE: 110090

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 27/10/97

WATER-
COURSE: Bush

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Conagher

CODE: 110091

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Leptoceridae

1

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -10

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: 22/10/97

WATER-COURSE: Faughanvale

PRIMARY ANALYST: IO'N

AQC ANALYST:

SITE: Faughanvale Bridge

CODE: 110267

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Piscicolidae

9

Piscicola geometra (L.) 1 only

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

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: 22/10/97

WATER-
COURSE: Roe

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Corrick Bridge

CODE: 110027

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Erpobdellidae	9
Erpobdellidae indet (juv) 1 only	
Leuctridae	9
Leuctra inermis Kempny 1 only	

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 13

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: 22/10/97

WATER-COURSE: Roe

PRIMARY ANALYST: IO'N

AQC ANALYST:

SITE: Bonnanaboigh Bridge

CODE: 110024

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Erpobdellidae

9

Erpobdella octoculata (L.)

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: 06/11/97

WATER-COURSE: Cladagh

PRIMARY ANALYST: IO'N

AQC ANALYST:

SITE: Gorteen

CODE: 110162

SORT/AQC METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: Merok Burn
SITE: McCaughan Park

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: MB
CODE: 11L8

DATE: 08/12/97
AQC
ANALYST:
SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Planorbidae	2
Sphaeriidae	1
Sericostomatidae	7

Additional BMWP taxa found in vial

Limnephilidae	7
Potamophylax cingulatus (Stephens)	
Tipulidae	6
Pedicicia (Pedicicia) sp.	
Chironomidae	6
Chironomini	

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

None

SUMMARY OF AUDIT

LOSSES 3 GAINS 3 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: 09/12/97

WATER-
COURSE: Knock

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: Cherry Valley

CODE: 11K3

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

Planorbidae 2

Sericostomatidae 7

Additional BMWP taxa found in vial

Limnephilidae 7

Potamophylax sp.

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Tipulidae 9

Dicranota sp.

Limonia sp.

SUMMARY OF AUDIT

LOSSES 2

GAINS 2

OMISSIONS: 0

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: 06/11/97

WATER-
COURSE: Arney

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Drumane Bridge

CODE: 110132

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Rhyacophilidae (incl. Glossosomatidae)	9
Agapetus sp. 1 only	
Simuliidae	9
Simulium (Simulium) ornatum group 1 only	

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: 06/11/97

WATER-
COURSE: Boho Tributary

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Boho

CODE: 110166

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

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: 15/11/97

WATER-
COURSE: Edenclaw

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Edenclaw

CODE: 110143

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Nemouridae	9
Nemoura avicularis Morton 1 only	
Rhyacophilidae (incl. Glossosomatidae)	9
Rhyacophila dorsalis (Curtis)	

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 14
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
WATER-
COURSE: Glenmornan
SITE: Catherines Bridge

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: PRH
CODE: 110292

DATE: 04/12/97
AQC
ANALYST:
SORT/AQC
METHOD: Live

RESULTS OF AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found in vial

None

Additional BMWP taxa found in vial

None

SAMPLE

BMWP taxa not found in sample (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found in sample

Erpobdellidae

9

Erpobdellidae indet (juv) 1 only

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)

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