

An Audit of Performance in the Analysis of Biological Samples in 1998 IRTU, Northern Ireland

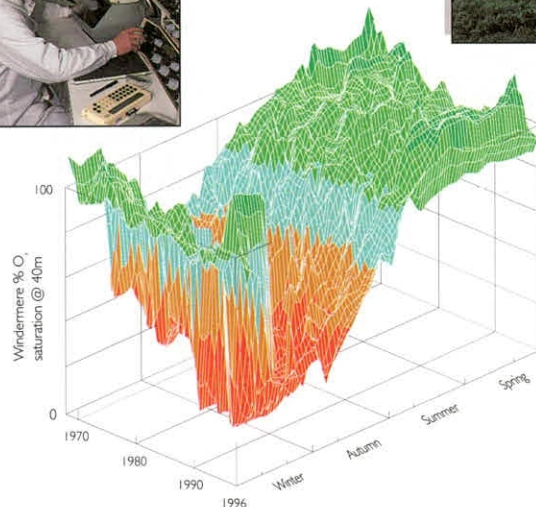
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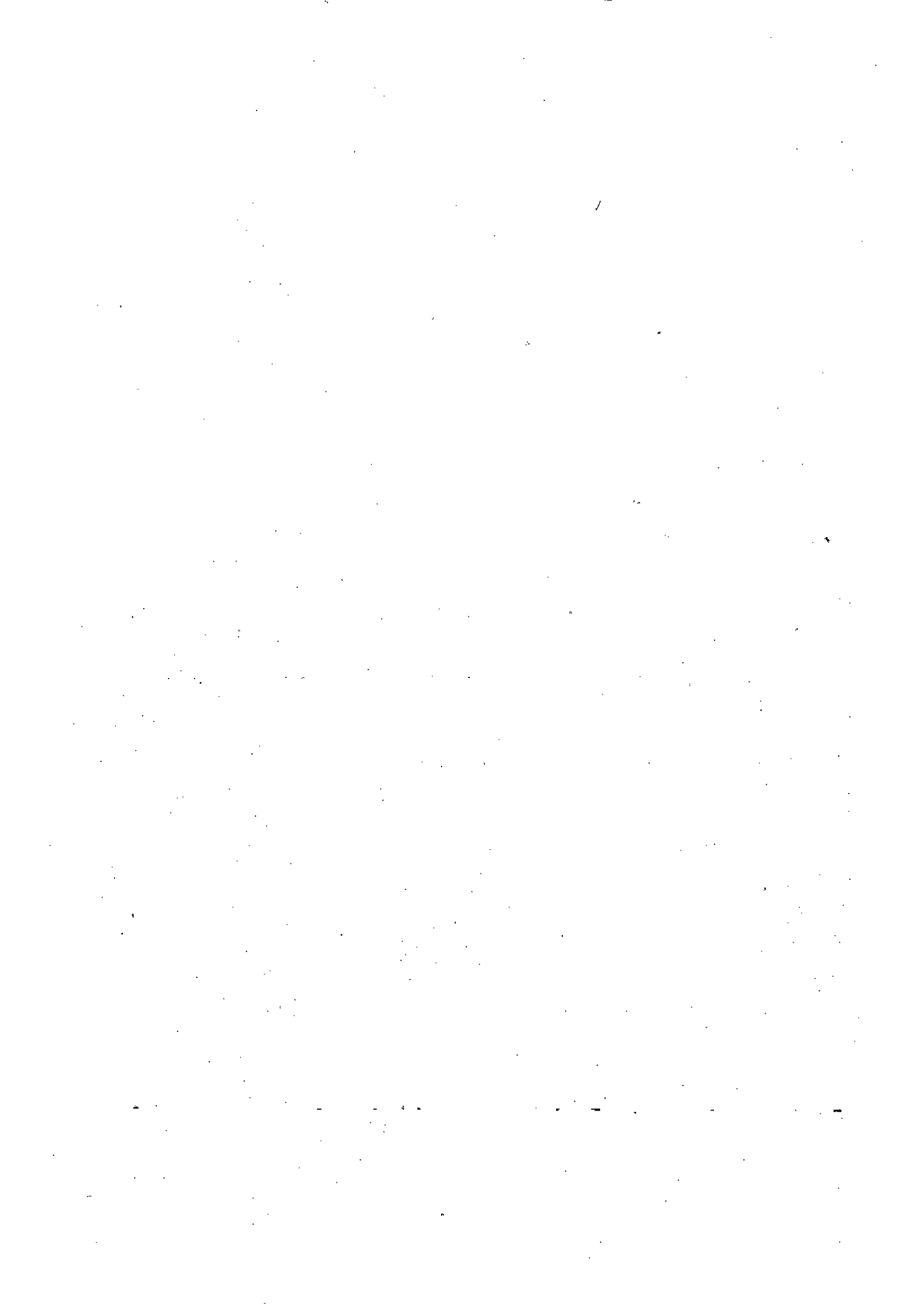
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1. INTRODUCTION

In 1998 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. For each site the taxa present were recorded on a standard data sheet. 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 and 1997. The audit undertaken for IRTU provided a measure of the quality of performance of the primary analyst, even for those samples that had been subjected to an internal AQC inspection.

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. Tables 6 and 7 list, at family and species level respectively, the taxa missed in sorting by IRTU's analysts in the 1998 audit. Tables 8 and 9 give a listing of all missed taxa at family and species level for the entire 1998 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 the Environment Agency's Thames Region, who provided an invaluable assistance in the development of the audit methodology and who has been a reliable source of helpful advice throughout.

Table 1 The 20 spring samples audited for IRTU

River	Site	Analyst	Losses	Gains	Omissions
Cloughfin	Blackhill	BR	0	2	0
Camowen	Ramacken Bridge	BR	0	0	0
Derg	Aghyaran Bridge	BR	0	1	0
Ballynahinch	d/s STP	BR	0	0	0
Crumlin	Cider Court Bridge	CAK	1	1	0
Glenavy	Leap Bridge	CAK	0	2	1
Glasswater	Kilmore	CAK	0	2	0
Doagh	Dunamoy	CAK	0	1	0
Owenreagh	Drumlea Bridge	CC	0	0	0
Glenavy	Ballydonaghy	CC	0	0	0
Ballynahinch	Leggycurry Bridge	CC	0	2	0
Ballynahinch	Casey's Bridge	CC	0	0	0
Manyburns	Manyburns Bridge	IO'N	0	0	0
Lackey	Knockballymore	IO'N	0	1	0
Owenkillew	Monanameal Bridge	MB	0	0	1
Owenkillew	Killymore Bridge	MB	3	2	0
Annacloy	Annacloy Bridge	MB	0	0	0
Killen Burn	Glashagh	MB	1	0	0
Colebrooke	Ballindarragh Bridge	PRH	1	0	0
Newtownbutler	Newtownbutler Bridge	PRH	0	0	0

Table 2 The 20 summer samples audited for IRTU

River	Site	Analyst	Losses	Gains	Omissions
Glenelly	Corrick Bridge	BR	1	1	0
Kilroot	Kilroot	BR	0	0	0
Strule	Moyle Bridge	CAK	0	0	0
Fairywater	Monaghans Bridge	CAK	0	1	0
Cullys Burn	Glenavna Hotel	CAK	0	3	0
Quiggery Water	Ecclesville	CAK	1	0	0
Carey	Careymill Bridge	CC	0	0	0
Glenshesk	B15 Bridge	CC	0	1	0
Routing Burn	Browns Bridge	IO'N	0	4	0
Gilly Gooly Burn	Mill House	IO'N	0	0	0
Derg	Millbrook New Bridge	IO'N	0	1	0
Irvinestown Tributary	Necarne	IO'N	1	0	0
Owenreagh	Drumlea Bridge	MB	3	2	0
Glenelly	Sperrin	MB	1	1	1
Woodburn	Courtalds Factory	MB	1	1	0
Six Mile Water	d/s Ballyclare	MB	0	0	0
Killyclogher Burn	Lovers Retreat	PRH	0	0	0
Eskragh Water	Seskinore Mill Bridge	PRH	1	1	0
Mourne Beg	Mourne Beg	PRH	1	1	2
Glendurragh	Ednamohill	PRH	0	2	0

Table 3 The 20 autumn samples audited for IRTU

River	Site	Analyst	Losses	Gains	Omissions
Woodburn	Courtalds Factory	BR	1	0	0
Enler	Kennel Bridge	BR	1	0	0
Six Mile Water	d/s Ballyclare	BR	1	1	1
Cassy Water	Cassy Water Bridge	BR	0	2	0
Ballymoney	Glenstall Bridge	CAK	0	1	0
Glenelly	Sperrin	CAK	0	0	0
Glendun	Knocknacarry Bridge	CC	2	1	0
Glenshesk	B15 Bridge	CC	0	0	0
Kilbroney	Newtown Bridge	CC	0	1	0
Foreglen	Dungorkin	CC	0	1	0
Fourmile Burn	Newmill	IO'N	1	0	0
Gilly Gooly Burn	Mill House	IO'N	0	1	0
Irvinestown Tributary	Necarne	IO'N	0	0	0
Manyburns	Manyburns Bridge	IO'N	1	0	0
Lagan	Shaws Bridge	MB	0	3	0
Newry	Newry	MB	0	3	1
Creevan Burn	Creevan Cottage	PRH	0	0	0
Faughan	Park	PRH	0	0	0
Ballynamallard	Ballycassidy Bridge	PRH	0	0	0
Bannagh	Drumnagalliagh	PRH	1	1	0

Table 4 Statistics of the 1998 audit results

Analyst	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no.gains	Mean errors (I+g+o)	Standard error
BR	10	0.70	0.26	0	0	2	1.20	0.33
CAK	10	1.10	0.31	1	10.00	3	1.40	0.34
CC	10	0.60	0.22	0	0	2	0.80	0.33
IO'N	10	0.70	0.40	1	10.00	4	1.00	0.37
MB	10	1.20	0.39	2	20.00	3	2.40	0.60
PRH	10	0.50	0.22	0	0	2	1.10	0.43
IRTU	60	0.80	0.13	4	6.67	4	1.32	0.17

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	10	2.80	20.00	18	0.30	0	2
CAK	10	5.20	10.00	18	0.90	10.00	3
CC	10	2.30	0	13	0.40	0	2
IO'N	10	1.70	10.00	20	0.40	10.00	4
MB	10	3.40	20.00	24	0.30	20.00	3
PRH	10	-0.30	0	8	0.10	0	2
N.Ireland	60	2.52	10.00	24	0.40	6.67	4

Table 6 The families missed by IRTU's analysts in the 1998 audit

Family	n	% of IRTU's missed families in 1998 audit
Psychomyiidae (incl. Ecnomidae)	4	10.81
Sphaeriidae	3	8.11
Elmidae	3	8.11
Caenidae	2	5.41
Planariidae (incl. Dugesiidae)	2	5.41
Ephemerellidae	2	5.41
Glossiphoniidae	2	5.41
Hydrophilidae (incl. Hydraenidae)	2	5.41
Leptoceridae	1	2.70
Coenagriidae	1	2.70
Dytiscidae (incl. Noteridae)	1	2.70
Erpobdellidae	1	2.70
Goeridae	1	2.70
Hydropsychidae	1	2.70
Asellidae	1	2.70
Lepidostomatidae	1	2.70
Tipulidae	1	2.70
Limnephilidae	1	2.70
Lymnaeidae	1	2.70
Philopotamidae	1	2.70
Planorbidae	1	2.70
Polycentropodidae	1	2.70
Sericostomatidae	1	2.70
Simuliidae	1	2.70
Hydroptilidae	1	2.70
Total	37	100

Table 7 The species missed by IRTU's analysts in the 1998 audit

Species	n	% of IRTU's missed species in 1998 audit
Pisidium sp.	3	7.89
Ephemerella ignita (Poda)	2	5.26
Elmis aenea (Muller)	2	5.26
Lype sp.	2	5.26
Hydraena gracilis Germar	2	5.26
Crenobia alpina (Dana)	2	5.26
Psychomyia pusilla (Fabricius)	2	5.26
Caenis rivulorum Eaton	1	2.63
Caenis luctuosa group	1	2.63
Glossiphoniidae indet	1	2.63
Bathymphalus contortus (L.)	1	2.63
Athripsodes bilineatus (L.)	1	2.63
Erpobdella octoculata (L.)	1	2.63
Esolus parallelepipedus (Muller)	1	2.63
Glossiphonia complanata (L.)	1	2.63
Dicranota sp.	1	2.63
Asellus aquaticus (L.)	1	2.63
Hydropsyche sp.	1	2.63
Simulium (Simulium) ornatum group	1	2.63
Ithytrichia sp.	1	2.63
Lepidostoma hirtum (Fabricius)	1	2.63
Limnephilidae indet	1	2.63
Lymnaea peregra (Muller)	1	2.63
Philopotamus montanus (Donovan)	1	2.63
Polycentropus flavomaculatus (Pictet)	1	2.63
Potamonectes depressus (Fabricius)	1	2.63
Pyrrhosoma nymphula (Sulzer)	1	2.63
Sericostoma personatum (Spence)	1	2.63
Silo pallipes (Fabricius)	1	2.63
Helobdella stagnalis (L.)	1	2.63
Total	38	100

Table 8 Missed families for all samples in the 1998 audit

Family	n	% of missed families in 1998 audit
Hydroptilidae	61	5.82
Planariidae (incl. Dugesiidae)	46	4.39
Sphaeriidae	45	4.29
Caenidae	44	4.20
Elmidae	40	3.82
Planorbidae	38	3.63
Limnephilidae	35	3.34
Psychomyiidae (incl. Ecnomidae)	35	3.34
Hydrophilidae (incl. Hydraenidae)	34	3.24
Lymnaeidae	32	3.05
Simuliidae	32	3.05
Ancylidae (incl. Acroloxidae)	31	2.96
Hydrobiidae (incl. Bithyniidae)	30	2.86
Glossiphoniidae	28	2.67
Baetidae	28	2.67
Leptoceridae	27	2.58
Nemouridae	27	2.58
Haliplidae	24	2.29
Tipulidae	22	2.10
Hydropsychidae	22	2.10
Dytiscidae (incl. Noteridae)	19	1.81
Gammaridae (incl. Crangonyctidae)	18	1.72
Lepidostomatidae	17	1.62
Goeridae	17	1.62
Polycentropodidae	17	1.62
Chloroperlidae	16	1.53
Ephemerellidae	16	1.53
Asellidae	15	1.43
Valvatidae	15	1.43
Sericostomatidae	14	1.34
Oligochaeta	14	1.34
Leptophlebiidae	14	1.34
Rhyacophilidae (incl. Glossosomatidae)	12	1.15
Taeniopterygidae	12	1.15
Beraeidae	12	1.15
Dendrocoelidae	11	1.05
Leuctridae	10	0.95
Piscicolidae	10	0.95
Physidae	10	0.95
Gyrinidae	10	0.95
Erpobdellidae	9	0.86

Table 8 continued

Family	n	% of missed families in 1998 audit
Scirtidae	8	0.76
Coenagrionidae	7	0.67
Libellulidae	7	0.67
Chironomidae	7	0.67
Hydrometridae	5	0.48
Corixidae	4	0.38
Sialidae	4	0.38
Notonectidae	4	0.38
Odontoceridae	4	0.38
Perlidae	3	0.29
Heptageniidae	3	0.29
Ephemeraeidae	3	0.29
Gerridae	3	0.29
Philopotamidae	3	0.29
Calopterygidae	3	0.29
Brachycentridae	3	0.29
Unionidae	3	0.29
Neritidae	2	0.19
Siphonuridae	1	0.10
Capniidae	1	0.10
Perlodidae	1	0.10
Total	1048	100

Table 9 Missed species for all samples in the 1998 audit

Species	n	% of missed species in 1998 audit
Hydroptila sp.	39	3.55
Pisidium sp.	39	3.55
Potamopyrgus jenkinsi (Smith)	30	2.73
Ancylus fluviatilis Muller	27	2.46
Elmis aenea (Muller)	26	2.37
Caenis luctuosa group	23	2.09
Polycelis nigra group	22	2.00
Lymnaea peregra (Muller)	21	1.91
Hydraena gracilis Germar	21	1.91
Baetis rhodani (Pictet)	21	1.91
Limnephilidae indet	19	1.73
Simulium (Simulium) ornatum group	17	1.55
Ephemerella ignita (Poda)	16	1.46
Haliphus sp.	15	1.36
Lype sp.	15	1.36
Caenis rivulorum Eaton	15	1.36
Sericostoma personatum (Spence)	14	1.27
Glossiphonia complanata (L.)	14	1.27
Gyraulus albus (Muller)	14	1.27
Gammarus pulex (L.)	13	1.18
Helobdella stagnalis (L.)	12	1.09
Lepidostoma hirtum (Fabricius)	12	1.09
Asellus aquaticus (L.)	12	1.09
Chloroperla torrentium (Pictet)	12	1.09
Valvata cristata Muller	11	1.00
Dendrocoelum lacteum (Muller)	11	1.00
Brachyptera risi (Morton)	10	0.91
Hydropsyche siltalai Dohler	10	0.91
Pisicicola geometra (L.)	10	0.91
Habrophlebia fusca (Curtis)	9	0.82
Polycelis felina (Dalyell)	9	0.82
Armiger crista (L.)	9	0.82
Ithytrichia sp.	9	0.82
Plectrocnemia conspersa (Curtis)	8	0.73
Tinodes waeneri (L.)	8	0.73
Psychomyia pusilla (Fabricius)	8	0.73
Orectochilus villosus (Muller)	8	0.73
Oulimnius tuberculatus (Muller)	8	0.73
Oxyethira sp.	8	0.73
Hydropsyche sp.	8	0.73
Silo pallipes (Fabricius)	7	0.64

Table 9 continued

Species	n	% of missed species in 1998 audit
<i>Caenis horaria</i> (L.)	7	0.64
<i>Elodes</i> sp.	7	0.64
<i>Oreodytes sanmarkii</i> (Sahlberg)	6	0.55
<i>Dicranota</i> sp.	6	0.55
Libellulidae indet	6	0.55
Lumbriculidae	6	0.55
<i>Potamonectes depressus</i> (Fabricius)	6	0.55
<i>Acroloxus lacustris</i> (L.)	6	0.55
<i>Erpobdella octoculata</i> (L.)	6	0.55
<i>Beraeodes minutus</i> (L.)	6	0.55
<i>Polycentropus flavomaculatus</i> (Pictet)	6	0.55
<i>Bathynomphalus contortus</i> (L.)	6	0.55
<i>Athripsodes aterrimus</i> (Stephens)	6	0.55
<i>Agapetus</i> sp.	6	0.55
Sphaeriidae indet	6	0.55
<i>Goera pilosa</i> (Fabricius)	6	0.55
<i>Athripsodes cinereus</i> (Curtis)	6	0.55
<i>Crangonyx pseudogracilis</i> Bousfield	5	0.45
<i>Crenobia alpina</i> (Dana)	5	0.45
<i>Anisus vortex</i> (L.)	5	0.45
<i>Hippeutis complanatus</i> (L.)	5	0.45
<i>Nemoura avicularis</i> Morton	5	0.45
<i>Oulimnius</i> sp.	5	0.45
<i>Mystacides azurea</i> (L.)	5	0.45
<i>Limnius volckmari</i> (Panzer)	5	0.45
<i>Lymnaea truncatula</i> (Muller)	5	0.45
<i>Lymnaea</i> sp.	5	0.45
<i>Haliphus lineatocollis</i> (Marsham)	5	0.45
<i>Chloroperla tripunctata</i> (Scopoli)	5	0.45
<i>Beraea maurus</i> (Curtis)	5	0.45
<i>Physa</i> sp.	5	0.45
<i>Baetis vernus</i> Curtis	5	0.45
<i>Protonemura</i> sp.	5	0.45
<i>Nemurella picteti</i> Klapalek	4	0.36
<i>Polycelis</i> sp.	4	0.36
<i>Valvata piscinalis</i> (Muller)	4	0.36
Tubificidae	4	0.36
<i>Brychius elevatus</i> (Panzer)	4	0.36
<i>Dugesia polychroa</i> group	4	0.36
Naididae	4	0.36

Table 9 continued

Species	n	% of missed species in 1998 audit
Lepidostomatidae indet	4	0.36
Tipula (Yamatotipula) montium group	4	0.36
Simulium (Wilhelmia) sp.	4	0.36
Rhyacophila sp.	4	0.36
Notonecta sp.	4	0.36
Odontocerum albicorne (Scopoli)	4	0.36
Athripsodes sp.	4	0.36
Leuctra fusca (L.)	4	0.36
Laccobius (Macrolaccobius) bipunctatus (Fabricius)	4	0.36
Simulium (Simulium) noelleri Friederichs	4	0.36
Tipula sp.	4	0.36
Leuctra sp.	3	0.27
Limnephilus lunatus Curtis	3	0.27
Hydropsyche pellucidula (Curtis)	3	0.27
Hydrometra stagnorum (L.)	3	0.27
Pyrrhosoma nymphula (Sulzer)	3	0.27
Agraylea multipunctata Curtis	3	0.27
Amphinemura sulcicollis (Stephens)	3	0.27
Anodonta sp.	3	0.27
Antocha vitripennis (Meigen)	3	0.27
Asellus meridianus Racovitza	3	0.27
Simulium (Eusimulium) aureum group	3	0.27
Athripsodes bilineatus (L.)	3	0.27
Silo sp.	3	0.27
Rhyacophila dorsalis (Curtis)	3	0.27
Lymnaea stagnalis (L.)	3	0.27
Brachycentrus subnubilus Curtis	3	0.27
Planaria torva (Muller)	3	0.27
Micronecta sp.	3	0.27
Calopteryx splendens (Harris)	3	0.27
Physa acuta group	3	0.27
Drusus annulatus (Stephens)	3	0.27
Orthoclaadiinae	3	0.27
Planariidae indet	3	0.27
Nemoura cambrica group	3	0.27
Dinocras cephalotes (Curtis)	3	0.27
Gammarus sp.	2	0.18
Agabus sp.	2	0.18
Agraylea sp.	2	0.18
Anacaena bipustulata (Marsham)	2	0.18

Table 9 continued

Species	n	% of missed species in 1998 audit
<i>Glossiphonia heteroclita</i> (L.)	2	0.18
<i>Cyrnus flavidus</i> Mclachlan	2	0.18
Baetis scambus group	2	0.18
<i>Athripsodes albifrons</i> (L.)	2	0.18
<i>Cloeon dipterum</i> (L.)	2	0.18
<i>Ephemera</i> sp.	2	0.18
Chironomidae indet	2	0.18
Erpobdellidae indet	2	0.18
<i>Bithynia tentaculata</i> (L.)	2	0.18
<i>Gerris</i> sp.	2	0.18
<i>Simulium</i> (<i>Boophthora</i>) <i>erythrocephalum</i> (de Geer)	2	0.18
<i>Wormaldia</i> sp.	2	0.18
Leptophlebiidae indet	2	0.18
<i>Leuctra geniculata</i> (Stephens)	2	0.18
<i>Micropterna</i> sp.	2	0.18
<i>Mystacides nigra</i> (L.)	2	0.18
<i>Nemoura cinerea</i> (Retzius)	2	0.18
<i>Ischnura elegans</i> (Van der Linden)	2	0.18
<i>Ormosia</i> sp.	2	0.18
<i>Limnephilus</i> sp.	2	0.18
<i>Paraleptophlebia submarginata</i> (Stephens)	2	0.18
<i>Sialis</i> sp.	2	0.18
<i>Protonemura meyeri</i> (Pictet)	2	0.18
<i>Ilybius</i> sp.	2	0.18
<i>Planorbis carinatus/planorbis</i>	2	0.18
<i>Potamophylax cingulatus/latipennis</i>	2	0.18
<i>Planorbis</i> sp.	2	0.18
<i>Nephrotoma</i> sp.	2	0.18
<i>Hydrometra</i> sp.	2	0.18
<i>Hydraena testacea</i> Curtis	2	0.18
<i>Hydraena riparia</i> Kugelann	2	0.18
<i>Triaenodes bicolor</i> (Curtis)	2	0.18
<i>Tinodes unicolor</i> (Pictet)	2	0.18
<i>Theromyzon tessulatum</i> (Muller)	2	0.18
<i>Tinodes rostocki</i> Mclachlan	2	0.18
<i>Heptagenia sulphurea</i> (Muller)	2	0.18
<i>Theodoxus fluviatilis</i> (L.)	2	0.18
<i>Hydropsyche angustipennis</i> (Curtis)	2	0.18
<i>Beraea pullata</i> (Curtis)	1	0.09
Prodiamesinae	1	0.09

Table 9 continued

Species	n	% of missed species in 1998 audit
<i>Agabus guttatus</i> (Paykull)	1	0.09
<i>Adicella reducta</i> (Mclachlan)	1	0.09
<i>Prosimulium hirtipes/latimucro</i>	1	0.09
<i>Potamophylax cingulatus</i> (Stephens)	1	0.09
<i>Baetis</i> sp.	1	0.09
<i>Sialis fuliginosa</i> Pictet	1	0.09
<i>Sialis lutaria</i> (L.)	1	0.09
<i>Silo nigricornis</i> (Pictet)	1	0.09
<i>Trocheta subviridis</i> Dutrochet	1	0.09
<i>Amphinemura standfussi</i> Ris	1	0.09
<i>Anabolia nervosa</i> (Curtis)	1	0.09
<i>Tanytarsini</i>	1	0.09
<i>Taeniopteryx nebulosa</i> (L.)	1	0.09
<i>Sympetrum</i> sp.	1	0.09
<i>Siphonurus lacustris</i> Eaton	1	0.09
<i>Simulium</i> (Nevermannia) <i>cryophilum</i> group	1	0.09
<i>Potamonectes</i> sp.	1	0.09
<i>Aplexa hypnorum</i> (L.)	1	0.09
<i>Simulium</i> sp.	1	0.09
<i>Simulium</i> (<i>Simulium</i>) <i>reptans</i> (L.)	1	0.09
<i>Amphinemura</i> sp.	1	0.09
<i>Simulium</i> (<i>Simulium</i>) <i>argyreatum</i> group	1	0.09
<i>Anacaena globulus</i> (Paykull)	1	0.09
<i>Simulium</i> (Nevermannia) <i>lundstromi</i> (Enderlein)	1	0.09
<i>Ceraclea nigronervosa</i> (Retzius)	1	0.09
<i>Hydrobius fuscipes</i> (L.)	1	0.09
<i>Leuctra inermis</i> Kempny	1	0.09
<i>Enallagma cyathigerum</i> (Charpentier)	1	0.09
Enchytraeidae	1	0.09
<i>Ephemera danica</i> Muller	1	0.09
<i>Esolus parallelepipedus</i> (Muller)	1	0.09
Hydrophilidae indet	1	0.09
<i>Physa fontinalis</i> (L.)	1	0.09
<i>Hydrocyphon deflexicollis</i> (Muller)	1	0.09
Diamesinae	1	0.09
Glossiphoniidae indet	1	0.09
<i>Glossosoma</i> sp.	1	0.09
<i>Glyptotaelius pellucidus</i> (Retzius)	1	0.09
Gyrinidae indet	1	0.09
<i>Gyrinus</i> sp.	1	0.09

Table 9 continued

Species	n	% of missed species in 1998 audit
Halesus radiatus (Curtis)	1	0.09
Helophorus (Atracthelophorus) brevipalpis Bedel	1	0.09
Gerris (Gerris) lacustris (L.)	1	0.09
Philopotamus montanus (Donovan)	1	0.09
Brachyptera sp.	1	0.09
Platambus maculatus (L.)	1	0.09
Caenis luctuosa (Burmeister)	1	0.09
Pilaria (Pilaria) sp.	1	0.09
Callicorixa praeusta (Fieber)	1	0.09
Capnia bifrons (Newman)	1	0.09
Helius sp.	1	0.09
Ecdyonurus sp.	1	0.09
Chaetopteryx villosa (Fabricius)	1	0.09
Nemouridae indet	1	0.09
Perlodes microcephala (Pictet)	1	0.09
Paraleptophlebia sp.	1	0.09
Coenagrionidae indet	1	0.09
Orthotrichia sp.	1	0.09
Crunoecia irrorata (Curtis)	1	0.09
Oreodytes sp.	1	0.09
Polycentropus sp.	1	0.09
Cercyon sp.	1	0.09
Total	1099	100

APPENDIX

Results of individual sample audits

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 15/04/98

WATER-
COURSE: Cloughfin

PRIMARY
ANALYST: BR

AQC
ANALYST:

SITE: Blackhill

CODE: 110208

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

Psychomyiidae (incl. Ecnomidae) 9

Lype sp. 1 only

Sericostomatidae 9

Sericostoma personatum (Spence) 1 only

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 18

ON NO. OF TAXA 2

1 No representative of family in vial

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: 15/04/98

WATER-
COURSE: Camowen

PRIMARY
ANALYST: BR

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

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: 20/04/98

WATER-COURSE: Derg

PRIMARY ANALYST: BR

AQC ANALYST:

SITE: Aghyaran Bridge

CODE: 110005

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

Hydroptilidae

9

Ithytrichia sp. 1 only

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6

ON NO. OF TAXA 1

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

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

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

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 20/04/98

WATER-
COURSE: Ballynahinch

PRIMARY
ANALYST: BR

AQC
ANALYST:

SITE: d/s STP

CODE: 110111

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: 15/04/98

WATER-COURSE: Crumlin

PRIMARY ANALYST: CAK

AQC ANALYST:

SITE: Cider Court Bridge

CODE: 110043

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

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 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 15/04/98

WATER-COURSE: Glenavy

PRIMARY ANALYST: CAK

AQC ANALYST:

SITE: Leap Bridge

CODE: 110044

SORT/AQC METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Erpobdellidae * 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

Sphaeriidae 9

Pisidium sp. 1 only

Erpobdellidae * 1

Dina lineata (Muller) 1 only

Tipulidae 9

Dicranota sp. 1 only

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 2

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland
WATER-
COURSE: Glasswater

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: CAK

DATE: 20/04/98
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Kilmore

CODE: 110248

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
Elmis aenea (Muller) (l) 1 only	
Simuliidae	9
Simulium (Simulium) ornatum group 1 only	

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 2

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

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

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

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 23/04/98

WATER-COURSE: Doagh

PRIMARY ANALYST: CAK

AQC ANALYST:

SITE: Dunamoy

CODE: 110226

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

Ephemerellidae

Ephemerella ignita (Poda)

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland
WATER-
COURSE: Owenreagh
SITE: Drumlea Bridge

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: CC
CODE: 110178

DATE: 31/03/98
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

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: 15/04/98

WATER-
COURSE: Glenavy

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Ballydonaghy

CODE: 110209

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: 20/04/98

WATER-COURSE: Ballynahinch

PRIMARY ANALYST: CC

AQC ANALYST:

SITE: Leggycurry Bridge

CODE: 110110

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

EphemereIIDae 6
EphemereIIa ignita (Poda)

SAMPLE

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

N/a

Additional BMWP taxa found in sample

ErpobdeIIidae 9
ErpobdeIIa octoculata (L.)

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

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: 20/04/98

WATER-COURSE: Ballynahinch

PRIMARY ANALYST: CC

AQC ANALYST:

SITE: Casey's Bridge

CODE: 110112

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: 15/05/98

WATER-
COURSE: Manyburns

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Manyburns Bridge

CODE: 110154

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: 19/05/98

WATER-
COURSE: Lackey

PRIMARY
ANALYST: IO'N

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

Psychomyiidae (incl. Ecnomidae)

9

Lype sp. 1 only

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 31/03/98

WATER-
COURSE: Owenkillew

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: Monanameal Bridge

CODE: 110255

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Gyrinidae * 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

Gyrinidae * 1

Orectochilus villosus (Muller) (l) 1 only

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
WATER-
COURSE: Owenkillew

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: MB

DATE: 08/04/98
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Killymore Bridge

CODE: 110008

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Lymnaeidae 2

Succineidae in vial

Haliplidae 1

Leptoceridae 7

Additional BMWP taxa found in vial

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

Psychomyiidae (incl. Ecnomidae) 9

Psychomyia pusilla (Fabricius) 1 only

SUMMARY OF AUDIT

LOSSES 3

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

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: 20/04/98

WATER-COURSE: Annacloy

PRIMARY ANALYST: MB

AQC ANALYST:

SITE: Annacloy Bridge

CODE: 110109

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
WATER-
COURSE: Killen Burn

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: MB

DATE: 20/04/98
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Glashagh

CODE: 110203

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Hydrophilidae (incl. Hydraenidae)

2

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 -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: Colebrooke

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: PRH

DATE: 15/05/98
AQC
ANALYST:
SORT/AQC
METHOD: Live

SITE: Ballindarragh Bridge

CODE: 110130

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Unionidae

1

Note on data sheet "A. anatina noted on site"

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 -6

ON NO. OF TAXA -1

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

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

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

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 20/05/98

WATER-
COURSE: Newtownbutler

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Newtownbutler Bridge

CODE: 110276

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: 01/07/98

WATER-COURSE: Glenelly

PRIMARY ANALYST: BR

AQC ANALYST:

SITE: Corrick Bridge

CODE: 110009

SORT/AQC METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Erpobdellidae 7

Additional BMWP taxa found in vial

Glossiphoniidae 7

Helobdella stagnalis (L.)

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 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: 16/07/98

WATER-
COURSE: Kilroot

PRIMARY
ANALYST: BR

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

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: 01/07/98

WATER-
COURSE: Strule

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Moyle Bridge

CODE: 110010

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: 06/07/98

WATER-
COURSE: Fairywater

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Monaghans Bridge

CODE: 110180

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

Coenagriidae

Pyrrhosoma nymphula (Sulzer) 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland
WATER-
COURSE: Cullys Burn
SITE: Glenavna Hotel

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: CAK
CODE: 110213

DATE: 06/07/98
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

Glossiphoniidae	9
Glossiphoniidae indet (juv) 1 only	
Elmidae	9
Elmis aenea (Muller) (l) 1 only	
Leptoceridae	9
Athripsodes bilineatus (L.) 1 only	

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 18

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: 07/07/98

WATER-
COURSE: Quiggery Water

PRIMARY
ANALYST: CAK

AQC
ANALYST:

SITE: Ecclesville

CODE: 110260

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Lymnaeidae

2

Succineidae in vial

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 -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: 05/08/98

WATER-
COURSE: Carey

PRIMARY
ANALYST: CC

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

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: 05/08/98

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

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: 02/07/98

WATER-
COURSE: Routing Burn

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Browns Bridge

CODE: 110207

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	
Asellidae	9
Asellus aquaticus (L.) 1 only	
Caenidae	9
Caenis rivulorum Eaton 1 only	
Polycentropodidae	9
Polycentropus flavomaculatus (Pictet) (p)	

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 20

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: 07/07/98

WATER-COURSE: Gilly Gooly Burn

PRIMARY ANALYST: IO'N

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

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: 08/07/98

WATER-
COURSE: Derg

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Millbrook New Bridge

CODE: 110004

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

Psychomyiidae (incl. Ecnomidae)

9

Psychomyia pusilla (Fabricius) (p)

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 08/08/98

WATER-
COURSE: Irvinestown Tributary

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Necarne

CODE: 110147

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Rhyacophilidae (incl. Glossosomatidae)

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

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

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
WATER-
COURSE: Owenreagh
SITE: Drumlea Bridge

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: MB
CODE: 110178

DATE: 25/06/98
AQC
ANALYST:
SORT/AQC
METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Perlodidae	1
Hydrophilidae (incl. Hydraenidae)	7
Terrestrial Curculionidae in vial	
Leptoceridae	7

Additional BMWP taxa found in vial

Lepidostomatidae	6
Lepidostoma hirtum (Fabricius)	
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 3

GAINS 2

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: 01/07/98

WATER-COURSE: Glenelly

PRIMARY ANALYST: MB

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

Oligochaeta *	1
Leptoceridae	7

Additional BMWP taxa found in vial

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

Oligochaeta *	1
Lumbricidae	

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: 06/07/98

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

Planorbidae

2

Endodontidae in vial

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

Hydraena gracilis Germar (a) 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: 08/07/98

WATER-
COURSE: Six Mile Water

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: d/s Ballyclare

CODE: 110041

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: 02/07/98

WATER-COURSE: Killyclogher Burn

PRIMARY ANALYST: PRH

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: 02/07/98

WATER-
COURSE: Eskragh Water

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Seskinore Mill Bridge

CODE: 110206

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Lymnaeidae

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

Dytiscidae (incl. Noteridae)

9

Potamonectes depressus (Fabricius) (a) 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

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: Mourne Beg
 SITE: Mourne Beg

LABORATORY: IRTU, Lisburn
 PRIMARY ANALYST: PRH
 CODE: 110006

DATE: 08/07/98
 AQC ANALYST:
 SORT/AQC METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Oligochaeta *	1
Leptophlebiidae *	1
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

Lymnaeidae	9
Lymnaea peregra (Muller) 1 only	
Oligochaeta *	1
Enchytraeidae	
Tubificidae	
Leptophlebiidae *	1
Paraleptophlebia sp. 1 only	

SUMMARY OF AUDIT

LOSSES 1 GAINS 1

OMISSIONS: 2

NET EFFECTS:

ON BMWP SCORE -4
 ON NO. OF TAXA 0

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

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

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

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 16/07/98

WATER-
COURSE: Glendurragh

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Ednamohill

CODE: 110141

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	
Hydropsychidae	9
Hydropsyche sp. (juv) 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

LABORATORY: IRTU, Lisburn

DATE: 14/09/98

WATER-COURSE: Woodburn

PRIMARY ANALYST: BR

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

Lymnaeidae

7

Succineidae in vial

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 -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: 08/10/98

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

Limnephilidae

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 -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: 12/10/98
WATER-COURSE: Six Mile Water	PRIMARY ANALYST: BR	AQC ANALYST:
SITE: d/s Ballyclare	CODE: 110041	SORT/AQC METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Planorbidae *	2
Leptoceridae	7

Additional BMWP taxa found in vial

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

Planorbidae *	2
Armiger crista (L.)	
Bathyomphalus contortus (L.)	

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 | 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: 21/10/98

WATER-
COURSE: Cassy Water

PRIMARY
ANALYST: BR

AQC
ANALYST:

SITE: Cassy Water Bridge

CODE: 110221

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

Gammaridae (incl. Crangonyctidae)

6

Gammarus sp. (juv)

SAMPLE

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

N/a

Additional BMWP taxa found in sample

Philopotamidae

9

Philopotamus montanus (Donovan) 1 only

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

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: Ballymoney
SITE: Glenstall Bridge

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: CAK
CODE: 110082

DATE: 05/10/98
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

Planorbidae

9

Bathyomphalus contortus (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

LABORATORY: IRTU, Lisburn

DATE: 07/10/98

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: 19/10/98

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

Dendrocoelidae 7

Lepidostomatidae 1

Additional BMWP taxa found in vial

Planariidae (incl. Dugesidae) 7

Crenobia alpina (Dana)

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 1

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
WATER-
COURSE: Glenshesk

LABORATORY: IRTU, Lisburn
PRIMARY
ANALYST: CC

DATE: 19/10/98
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

Lepidostomatidae

Lepidostoma hirtum (Fabricius) 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

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

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

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

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 21/10/98

WATER-COURSE: Kilbroney

PRIMARY ANALYST: CC

AQC ANALYST:

SITE: Newtown Bridge

CODE: 110121

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

Crenobia alpina (Dana) 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: 05/11/98

WATER-
COURSE: Foreglen

PRIMARY
ANALYST: CC

AQC
ANALYST:

SITE: Dungorkin

CODE: 110275

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

Esolus parallelepipedus (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

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: 12/10/98

WATER-
COURSE: Fourmile Burn

PRIMARY
ANALYST: IO'N

AQC
ANALYST:

SITE: Newmill

CODE: 110290

SORT/AQC
METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Caenidae

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 -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: 15/10/98

WATER-COURSE: Gilly Gooly Burn

PRIMARY ANALYST: IO'N

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

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

Crenobia alpina (Dana) 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: 11/11/98

WATER-

PRIMARY

AQC

COURSE: Irvinestown Tributary

ANALYST: IO'N

ANALYST:

SITE: Necarne

CODE: 110147

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: 11/11/98

WATER-COURSE: Manyburns

PRIMARY ANALYST: IO'N

AQC ANALYST:

SITE: Manyburns Bridge

CODE: 110154

SORT/AQC METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Lepidostomatidae

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: 07/09/98

WATER-
COURSE: Lagan

PRIMARY
ANALYST: MB

AQC
ANALYST:

SITE: Shaws Bridge

CODE: 110095

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
Glossiphonia complanata (L.)	
Helobdella stagnalis (L.)	
Hydrophilidae (incl. Hydraenidae)	9
Hydraena gracilis Germar (a) 1 only	
Goeridae	9
Silo pallipes (Fabricius) 1 only	

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 18

ON NO. OF TAXA 3

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 17/09/98

WATER-COURSE: Newry

PRIMARY ANALYST: MB

AQC ANALYST:

SITE: Newry

CODE: 110115

SORT/AQC METHOD: Live

RESULTS OF AUDIT

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

VIAL

BMWP taxa not found in vial

Valvatidae * 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

Valvatidae * 1

Valvata piscinalis (Muller)

Ephemerellidae 9

Ephemerella ignita (Poda) 1 only

Caenidae 9

Caenis luctuosa group 1 only

Limnephilidae 9

Limnephilidae indet (juv)

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 24

ON NO. OF TAXA 3

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

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

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: N.Ireland

LABORATORY: IRTU, Lisburn

DATE: 15/10/98

WATER-
COURSE: Creevan Burn

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Creevan Cottage

CODE: 110293

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: 05/11/98

WATER-COURSE: Faughan

PRIMARY ANALYST: PRH

AQC ANALYST:

SITE: Park

CODE: 110272

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: 11/11/98

WATER-
COURSE: Ballynamallard

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Ballycassidy Bridge

CODE: 110129

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: 18/11/98

WATER-
COURSE: Bannagh

PRIMARY
ANALYST: PRH

AQC
ANALYST:

SITE: Drumnagalliagh

CODE: 110137

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)

