

Environmental Protection Internal Report

**QUALITY AUDIT OF BIOLOGICAL SAMPLES
FOR THE 1990 RIVER QUALITY SURVEY
NRA SOUTH WEST REGION
BY RJM GUNN, JF WRIGHT, JH BLACKBURN
& MT FURSE**

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FWS/92/016**

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South West Region*

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SUMMARY

This report describes the quality audit of processing and identification of macro-invertebrate samples from NRA South West Region's routine biological river quality monitoring survey undertaken in 1990. This survey was the basis of the 1990 National Biological River Quality Survey in the South West Region. The survey comprised 1515 samples taken from 505 sites.

It was not considered practical to audit the quality of sample collection, instead a training video on sample collection was produced and shown to all staff involved in sampling.

A small percentage of the samples were re-sorted and identified by IFE, to audit the quality of the sample sorting and the identification of the macro-invertebrates. An attempt was made to audit at least four samples processed by each NRA biologist.

The audit results for NRA South West Region were good compared to the results from other NRA Regions, the DED in Northern Ireland, and the Scottish RPBs. Poorer results early in the survey reflected the lack of experience and training of staff. The results improved rapidly as staff gained competence. The South West Region was one of three regions whose audit results were of sufficient quality for use in defining a preliminary target distribution.

In general, there were more taxa found in the samples by the auditors but not recorded by NRA (termed 'gains') than taxa recorded as present by NRA but not found by the auditors ('losses'). A small number of recording errors were noted by the auditors.

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July 1992



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The Institute of Freshwater Ecology undertook the quality audit, and were also the authors of Appendix 1.

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1. INTRODUCTION

This report describes the quality audit of processing and identification of macro-invertebrate samples from the routine biological river quality monitoring programme undertaken by NRA South West Region in 1990.

1.1 Biological monitoring in the South West Region

Since 1990, NRA South West Region has undertaken a routine biological monitoring programme. This encompasses approximately 950 sites and covers more than 4230 km of river and approximately 27 km of canal. Each site is surveyed every other year. The invertebrate surveys form part of the NRA National Biological Survey programme. In 1990, this programme was the South West Region's contribution to the 1990 National Biological River Quality Survey.

501 sites on rivers and 3 sites on canals were surveyed in 1990, representing 2532 km of river and 26 km of canal, generating 1515 samples. Of these, five sites were not sampled owing to inaccessibility or unsuitable habitat (these represented chemically monitored reaches in lakes that form part of a watercourse).

1.2 Analytical quality audit

Prior to 1990, there had been no systematic programme of quality control for biological monitoring in the South West Region. The routine biological river quality monitoring programme has been subject to an independent quality audit since 1990.

The need for quality control was recognised during initial discussions on the 1990 National Biological River Quality Surveys of England and Wales, Scotland, and Northern Ireland, and the NRA Routine Biological Monitoring Programmes. A full quality control for sampling, sorting, identification and analysis was considered, however costs and time did not allow this to be introduced. It would have involved independent sampling, sorting and analysis. Instead, a quality audit programme was instigated following advice from the Institute of Freshwater Ecology (IFE).

It was not considered practical to audit the quality of sample collection, which would have been too costly. Instead, considerable effort was made to ensure that all staff taking biological samples received adequate training to ensure that uniform sampling methods were used. To this end, a training video on sample collection (National Rivers Authority, 1990) was produced and shown to all involved in sampling.

A small percentage of the samples were re-sorted and identified by IFE to audit the quality of the sample sorting and the identification of the macro-invertebrates.

The same quality audit procedure was undertaken by all NRA Regions, Scottish River Purification Boards (RPBs), and the Department of Economic Development in Northern Ireland (DED). Although the IFE's contract was managed centrally by the NRA's National Biological Survey Liaison Group (and subsequently by the NRA's National Freshwater Biology Sub-group), each NRA Region, RPB, and

the DED financed the work individually. Because of large number of staff involved in sample processing in 1990, more samples were audited than was originally estimated. The extra auditing was underwritten by NRA Thames Region, which also underwrote an independent evaluation of the audit results by WRC (Kinley & Ellis, 1991).

The quality audit procedure implemented in 1990 has been used for subsequent National NRA Biological Monitoring Surveys and RPB surveys in 1991 and 1992. The audit will be used in future surveys, pending a review of quality control and quality audit procedures based on the results of this series of quality audits and experience with them [NRA R&D Project A08(92)1]. It is hoped that a full quality control programme may be introduced following this review.

1.3 Aims of the biological quality audit

- ♦ To provide an independent assurance of the quality of the routine biological monitoring programme and the 1990 National Biological River Quality Survey.
- ♦ To provide a first step towards a national quality control system for biological samples, and information to help with its development.
- ♦ To help determine suitable control limits for future quality control systems, and to help define the acceptable quality limits for biological sample processing.
- ♦ To provide information to assist with estimating the precision of the results of biological survey.
- ♦ To provide an objective method for improving the quality of biological surveys work, in particular by identifying those components of sample processing that cause most frequent errors.
- ♦ To provide an indication of the precision of data obtained from standard NRA sampling and sample processing procedures, whether or not the samples are for the routine monitoring programme.

2. METHODS

2.1 Sampling and sample processing

Samples of macro-invertebrates were collected in each of three seasons:

Spring	March-May
Summer	June-August
Autumn	September-November.

The samples were collected using the Standard NRA methods for routine invertebrate monitoring surveys, which is compatible with RIVPACS and ensures comparability between samples. In shallow water, the samples were obtained by a three minute kick with a 1 mm mesh pond-net, followed by a one minute manual search. Deeper waters were sampled using a medium naturalist's dredge, also with a 1 mm mesh collecting net. These samples each comprised from three to five dredges, plus a one minute search in the shallows close to the river banks.

The invertebrate samples were preserved in 70% alcohol (industrial methylated spirit) to which 5% glycerol was added, either in the field, or immediately on returning to the laboratory at the end of the day. Later in the year, the strength of alcohol added to the samples was increased to 90%. This was because there had been inadequate preservation in some of the earlier samples, possibly due to dilution with liquids held in sediment and plant material, and lack of fixation in formaldehyde.

There was a national requirement to fix the samples in formaldehyde before preservation in alcohol, to ensure that the samples were in good condition for auditing, and because the samples were to be deposited in long-term storage afterwards. The samples from the South West Region were not fixed in formaldehyde owing to the absence of adequate laboratory facilities. This was the only major deviation from the standard NRA sample processing procedures.

The samples were stored in the laboratory prior to sorting and identification. All samples were sorted in the laboratory. Invertebrates were identified to family, except for oligochaetes and water mites which were not identified further. The results were recorded on sample data sheets (see figure 2.1), which were sent to NRA Thames Region for entry onto a database and for analysis.

To help clear a backlog of samples at the end of the programme, approximately 50 samples were processed by biologists in NRA Thames Region. The backlog was largely the result of insufficient staff and laboratory resources being available in the first few months of the programme. These samples were sent directly to IFE for auditing and storage by NRA Thames Region.

2.2 Additional sample processing for the quality audit

To assist the quality audit one or two specimens of each invertebrate family were placed in a small vial containing 70% alcohol preservative. When sorting had been completed, the sample and vial were returned to a standard 1.3 litre polythene screw-topped container to which 70% alcohol preservative had been added. The screw-topped jars were placed in standard sized plastic

TAXA LIST

Site Reference NRA _ _ _ : _ _ _ _

GROUP 1 TAXA (10)				GROUP 4 TAXA (5)				GROUP 6 TAXA (4)				
Siphonuridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Neritidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Boettidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Heptageniidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Viviparidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stalidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Leptophlebiidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ancyridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Placoidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ephemeroidea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(Acroloxidae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUB-TOTAL TAXA			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Potamanthidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hydroptilidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Ephemeridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unonidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GROUP 7 TAXA (3)				
Toenopterigidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Corophidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Valvidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Leuctridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gammaridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hydrobiidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Capnidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(Orangonyctidae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(Blithynidae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Perioidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Platycnemidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lymnaeidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Perilidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Coenagrionidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Physidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Chloroperlidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUB-TOTAL TAXA			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Planorbidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Aphelochelidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					Sphaeriidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Phryganeidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GROUP 5 TAXA (5)				Glossiphoniidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Melaniidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mesoveliidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hydrulnidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Beracidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hydrometridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Erpobdellidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Odontoceridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gerridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aseidae			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Leptoceridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nepidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUB-TOTAL TAXA			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Coaridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nauacidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Lepidostomatidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Notanectidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GROUP 8 TAXA (2)				
Brochoceridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pleidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chironomidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sericostomatidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cortidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUB-TOTAL TAXA			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
SUB-TOTAL TAXA				<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Helophidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
				Hydrobiidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GROUP 9 TAXA (1)				
GROUP 2 TAXA (8)				Dytiscidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Oligochaeta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Aesacidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(Noteridae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUB-TOTAL TAXA			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Leuctidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gyrinidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Agriidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hydrophilidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TOTAL TAXA				
Gomphidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(Hydraenidae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
Cordulegasteridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clambidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BMWP SCORE				
Aeshnidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Scirtidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
Cordulidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dryopidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Libellulidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Elmidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other Taxa				
Psychomyiidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chrysomelidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
(Ecnomidae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curculionidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Philopotamidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hydroptilidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SUB-TOTAL TAXA				<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Tipulidae	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>
				Simuliidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
GROUP 3 TAXA (7)				Planariidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Coenidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(Dugesidae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Nemouridae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dendrocoelidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Rhyacophiliidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUB-TOTAL TAXA			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
(Glossosomatidae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>									
Polycentropodidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>									
Limnephilidae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>									
SUB-TOTAL TAXA												
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>												

Figure 2.1 Standard sample data form used to record macro-invertebrate sample data

containers (lidded trays) for transport to IFE Wareham, for quality audit and long-term storage. A copy of the completed sample data sheet

2.3 The quality audit procedures

A portion of the samples collected in each season were re-sorted and identified by IFE. An attempt was made to audit at least four samples processed by each NRA biologist. The number of samples audited in 1990 was to a largely determined by the number of staff involved in sample processing, and because of large number of staff involved, more samples were audited than was originally estimated.

The audited samples were subject to the following:

- the taxonomic families present in the sample (not in the vial, see Section 2.2) were recorded;
- the specimens in the vial were identified without reference to the sample data sheet produced by NRA;
- families found in the sample by IFE which did not appear in the NRA's sample data sheet were counted as 'gains'
- families listed on the NRA's sample data sheet but not found by IFE were counted as losses.

The re-identification of specimens in the vial provided a check on the quality of identification, whilst the comparison of specimens in the vial and in the rest of the sample provided a check on the quality of sorting.

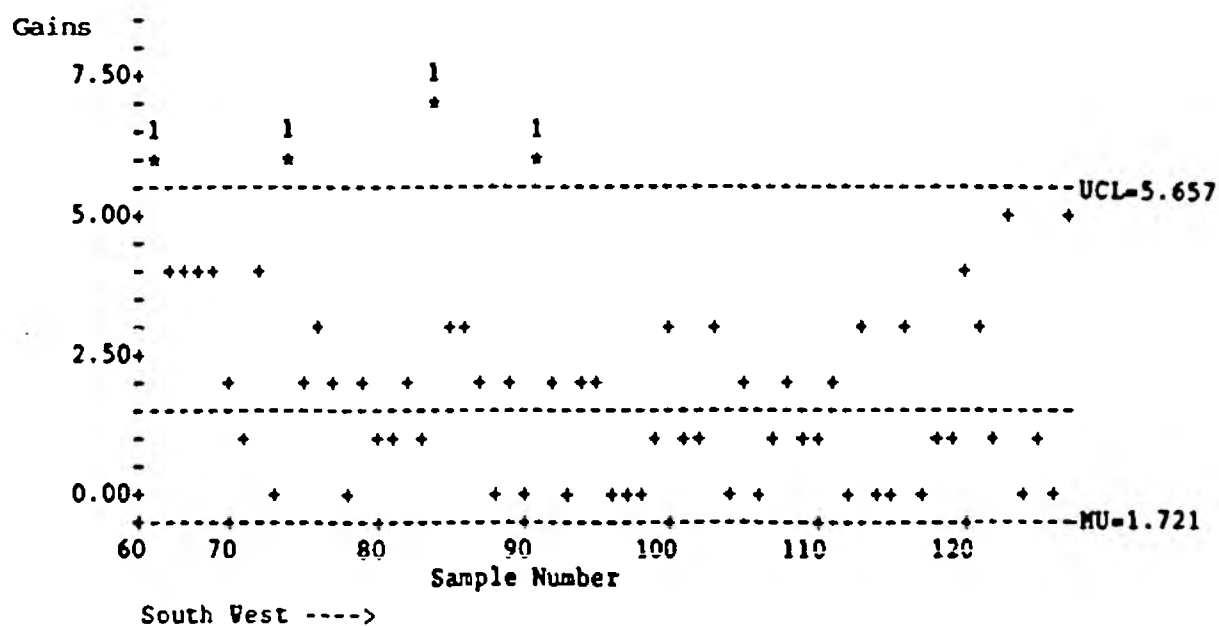
The results of the quality audit are reported in detail in Appendix 1, and have been discussed in the wider context by Kinley & Ellis (1991). A summary of the results is shown in Table 3.1. There were more 'gains' than 'losses' (see Section 2.3), which was also typical of the audit results for other NRA Regions and RPBs. A small number of recording errors were noted by the auditors, where NRA biologists had recognised the presence of a taxon and added an example to the vial, but failed to record its presence on the data sheets. These errors were termed 'omissions'.

Table 3.1 Summary of the quality audit results

Total number of samples taken	number of samples checked	mean losses	mean gains	mean omissions
1479	63	0.48	1.83	0.01

The audit results for NRA South West Region were good compared to the results from other NRA Regions (see Kinley & Ellis, 1991) and RPBs (see Scottish Office, 1992). South West Region was one of three NRA Regions whose audit results were considered suitable for defining a target distribution in Kinley & Ellis, 1991.

Figure 3.1 shows the variations between consecutive samples that were audited. Poorer results early in the programme reflect the lack of experience and training of staff. Very quickly the results improved as staff gained competence, and this was reflected clearly in the results for individual staff.



The results of the biological quality audit for the South West Region in 1990 were very reassuring.

Some concern was expressed during 1990 that too much effort was placed on reducing processing errors, at the expense of processing the samples expeditiously. IFE recommended that no more than 2 hours should be spent in sorting and identifying each sample (equivalent to 3.5 samples per day): NRA South West Region achieved only 1.5 samples per day. This was partly explained by the fact that samples collected in this Region were particularly rich, containing much plant material which impeded sorting, and many different invertebrate taxa which slowed both the sorting and identification. The sorting rate is more rapid now than it was in 1990 as the biologists are more experienced, although most samples still take longer to process than IFE's recommendation. The establishment of quality control limits, which are being derived from the results of the quality audits, should help to identify the best balance between accuracy and speed.

Concern was also expressed that the quality audit was being used in the Region as a measure of the performance of individual members of staff, and of the Region as a whole. Neither of these were included in the original aims of the quality audit. In 1990 an attempt was made to audit some samples for each member of staff involved in sample processing, to help them improve their own accuracy by identifying where most of their errors occurred. This may have contributed to the impression that the audit was to monitor individuals' performance. To obviate this, and to enable the audit results to give a better estimate of the precision of the survey as a whole, samples subject to audit in 1991 and in 1992 have been chosen at random, using random number tables. Equal numbers of samples have been audited in each season.

The results of the quality audit in 1990 were analyzed by WRc, as will the results of the 1991 audit. An NRA R&D Project is to start this year (1992) to develop improved auditing and quality control systems, based on data and experience of the auditing procedures described in this report [NRA R&D Project A08(92)01].

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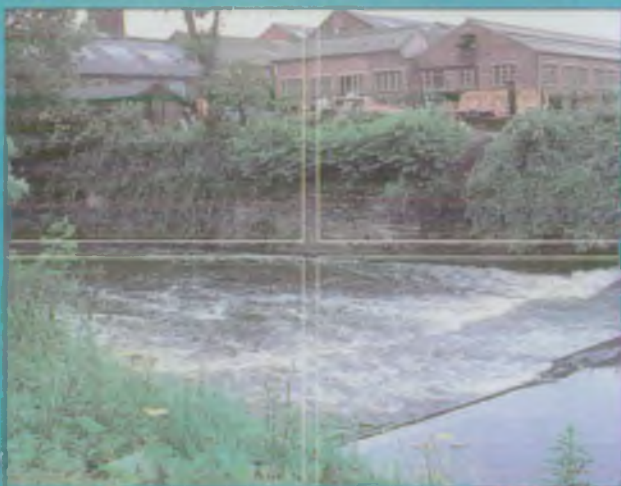
Quality audit of biological samples for the 1990 River Quality Survey NRA South West Region

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NRA South West Region**

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Report date:	December 1991
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Contract No:	
IFE Report Ref:	RL/T04053q1
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The Institute of Freshwater Ecology is part of the Terrestrial and Freshwater Sciences Directorate of the Natural Environment Research Council.

1. INTRODUCTION

The 1990 River Quality Survey included the sampling of aquatic macro-invertebrates for biological assessment of river quality throughout the United Kingdom. In England and Wales the survey was undertaken by the National Rivers Authority (NRA), the River Purification Boards (RPBs) sampled in Scotland and the Department of Economic Development (DED) undertook the work in Northern Ireland.

Approximately 7750 sites were surveyed, the majority of which were sampled in spring, summer and autumn. Standard collection procedures were used and the sampling strategy was compatible with RIVPACS (River InVertebrate Prediction And Classification System), which has been developed by the Institute of Freshwater Ecology (IFE). Most of the remaining sites were sampled in a single season only, in order to extend the scope of the survey. For a variety of reasons, a few locations were sampled in just two seasons.

Samples were sorted for the families of macro-invertebrates included in the Biological Monitoring Working Party (BMWP) system. Taxa present were recorded on site data sheets. Sample processing and recording techniques varied from region to region.

In order to undertake this massive programme of fieldwork and sample processing, a large number of new staff were employed by the surveying agencies. In view of the number of staff involved and the variability of sample processing techniques, it was recognised that an independent quality control exercise was necessary to promote a consistently high level of reliability.

The IFE was contracted to undertake an audit of the sample sorting and identification performance of each NRA region, RPB and the DED. This report collates the results of 63 samples audited for South West Region of the NRA. The IFE was not required to perform any statistical analyses nor interpretation of the results of the audit.

2. SAMPLE SELECTION

Nearly all samples from the 1990 River Quality Survey were sent to IFE for storage. They were catalogued on arrival and placed in crates, such that individual samples were readily accessible. A stratified random selection of samples for each sample processor was then made. Selection was undertaken by IFE staff and no selection was made before each sample had been received by IFE. Thus, sample processors had no means of knowing which of their samples would be audited.

The total number of sample processors employed nationally during the survey was considerably higher than that anticipated at the outset. As a consequence, the number of samples audited per processor was limited by the need to keep within the contracted overall total of 700 samples. A minimum of 4 samples was audited per processor, except where individuals processed very few samples or did not process material from each of the 3 seasons.

Sample selection was weighted towards spring samples in order to give early feedback on the blindspots of particular sorters and problems of identification.

3. SAMPLE PROCESSING

Biologists processing samples for the 1990 Survey were instructed to sort their samples, ideally within the laboratory, and 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 selection for audit should have included:

- i) a list of the BMWP FAMILIES FOUND IN THE SAMPLE
- ii) a vial containing representatives from each family
- iii) the preserved sample

When these three elements were present, the sequence of operations at IFE was as follows:

- a) The remainder of the sample was sorted and the BMWP families listed
- b) The families contained within the vial were identified and listed
- c) A comparison was made between the NRA listing of families and those identified from the vial by IFE
- d) A comparison was made between the NRA listing of families and those found in the sample by IFE
- e) "Losses" or "gains" from the NRA listing of families were noted. In the case of "gains", each additional family was identified, where possible, to species level, in order to clarify any specific repetitive errors.

For a number of different reasons, some samples did not include a vial containing representative examples of the families listed on the NRA data sheet. These samples were avoided for audit, where possible. When selection of such samples was unavoidable (eg where a particular sorter would otherwise have been excluded from the audit exercise), only operations a), d) and e) above were appropriate.

Several directives were issued to IFE relating to the treatment of BMWP taxa. Terrestrial representatives of BMWP scoring families, animals deemed to have been dead at the time of sampling, cast insect skins, pupal exuviae, empty mollusc shells and tail ends of "living" specimens were to be excluded from the listing of families present. Trichopteran pupae, although not routinely identified by many biologists, were to be included in the listing of families.

4. REPORTING

The results of each sample audit were recorded on a standard report form (Table 1). For audit samples where a vial of animals was included, the comparison between the NRA listing and the taxa found in the vial by IFE was shown in box A of the report form. Discrepancies could be due to carelessness, misidentifications or errors in completing the NRA data sheet. Families not on the NRA listing but found by IFE in the remainder of the sample were entered in box B of the report form under "additional families". When the families listed as "losses" in section A of the report form were compared with the full list of families recorded in the sample by IFE, some apparent losses from the vial were offset by the presence of those families in the remainder of the sample. These taxa were therefore listed in the "losses" box of section A and the "gains" box of section B and were neither a net loss nor a net gain. In these cases, the families were marked with an asterisk in both boxes. Such errors are noted as "omissions" in the tables which summarise the results for each season (Tables 2, 3 and 4).

Species identifications, state of development (eg adult or larval coleopterans) and the presence of a single representative of a family within the remainder of the sample were recorded in the notes section of the report form. Where the NRA data sheet indicated that a family was noted and released at the site, this was recorded in the notes section but not included as a "loss", even though the family was not found in the vial.

For those samples which did not contain a vial of animals, box A of the report form was not applicable (N/a). Families not on the NRA list but present in the sample were listed in box B under "additional families" as before. Families recorded on the NRA list but not found by IFE were indicated on the left hand side of box B. If the vial of animals was retained by the NRA, entries in this box could include the sole representative of a family which was removed by the NRA, a family seen at the site which escaped or was released (without mention being made on the NRA data sheet), inaccurate identification, the wrong family box being ticked on the NRA data sheet or the family being present in the sample but missed by IFE.

Results of the audits of individual samples are presented in Table 5.

ACKNOWLEDGEMENTS

Thanks to Mrs Jessica Winder and Mrs Kay Symes for assistance with cataloguing and storage of samples and Mrs Valerie Palmer for typing the manuscript.

TABLE 1. The IFE Report form

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	<input type="text"/>	RIVER	<input type="text"/>
SEASON	<input type="text"/>	SITE	<input type="text"/>
SORTER	<input type="text"/>	SAMPLE CODE	<input type="text"/>
AQC OF BMWP FAMILIES		A. IN VIAL <input type="checkbox"/>	B. IN SAMPLE <input type="checkbox"/>

		LOSSES	GAINS
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample)	ADDITIONAL FAMILIES FOUND BY IFE

NET LOSSES NET GAINS

NOTES

TABLE 2. The 39 spring samples audited for South West Region, with sample sorter initials and numbers of taxa 'lost', 'gained' and 'omitted'

River	Site	Sorter	Losses	Gains	Omissions
Hawkridge Brook	Hawkridge Bridge	JBS	0	1	1
Venn	Venn Bridge	LMB	1	6	0
Sterridge	Old Sawmill Inn	RG	0	4	0
Lamorna Stream	Lamorna	TJR	0	4	0
Helford Gweek	Mether-Uny Mill	NB	0	4	0
Porth Navas Stream	Trenarth Bridge	MAV	0	5	0
Bray	Meethe Barton	RG	0	0	0
Newlyn	Buryas Bridge	MAV	0	2	0
Abbey	Hartland Abbey	LB	1	1	0
Hayle	St Erth GS	TJR	0	1	0
Hayle	Godolphin Bridge	NB	0	2	0
Crooked Oak Stream	Yeo Barton Br	JBS	0	1	0
Helford	Mellangoose	TJR	0	7	0
Mylor Creek	Mylor Bridge	DJP	0	3	0
Tonridge	Woodford Bridge	PG	0	2	0
Taw	Park Mill Bridge	AA	0	1	0
Tonridge	Rothem Bridge	PG	0	4	0
Neet	A39 Hele Bridge	PAB	4	6	0
Porthleven	U/s Harbour	PAB	1	0	1
Helford	U/s Gweek Mill	MAV	0	2	0
Okement	South Dornaford	AA	0	3	0
Lapford Yeo	Bow Bridge	PG	1	2	0
Allen	Idless Bridge	DJP	0	3	0
Otter	Otterton Bridge	AA	1	2	0
Clyst	A38 Broadclyst Br	RG	3	0	0
Otter	Weston	DH/JS	1	0	0
Lynher	Notter Bridge	PAB	0	6	0
Offwell Brook	Offwell Footbridge	EP	1	2	0
Exe	Exebridge	RG	1	0	0
Corry Brook	Old Corryton	LAW	2	2	0
Inny	St Clether Bridge	NB	0	2	0
Penpont Water	Two Bridges	DJP	1	0	0
Lowman	A373 Tiverton Bridge	RG	0	0	0
Waldon	Sutcombe Bridge	LMB	0	0	0
Coly	Woodbridge	EP	0	1	0
Culm	Skinners Fm Br	LAW	1	3	0
Yeo (Creedy)	Binneford	JBS	0	1	0
Brockey	Brooksbridge Cot	EP	1	1	0
Haddeo	Pixycopse	LAW	0	3	0

TABLE 3. The 21 summer samples audited for South West Region, with sample sorter initials and numbers of taxa 'lost', 'gained' and 'omitted'

River	Site	Sorter	Losses	Gains	Omissions
Aller Brook	U/s Edginswell PS	PG	1	2	1
Bratton Brook	Bratton Clovelly	PAB	0	1	0
Baldhu Stream	Bissoe Bridge	DJP	0	0	0
Millpool Stream	Millpool	DJP	3	2	0
Torridge	Woodford Bridge	JF	0	3	1
Torridge	Newbridge	JF	0	1	0
Newlyn	Skimmel Bridge	TJR	0	0	0
Newlyn	Newlyn Bridge	NB	1	1	0
Erme	Sequers Bridge	JF	0	2	0
Oare Water	Oare Bridge	AA	0	2	0
Barbrook	D/s PS Dean	RG	1	0	0
Yeo (Molland)	Bish Mill Bridge	JBS	1	0	0
Offwell Brook	Roadpitt Farm	LAW	0	3	0
Beaford/Wooleigh	B3220 Bridge	LAW	1	1	0
Rye Stream	Loxhore Cross Br	LB	0	1	0
Holewater Stream	Linkleyham Bridge	EP	0	0	0
Synderford	Beere Farm	RP	0	4	0
Bovey	Blackaller Bridge	TB	0	3	0
Glaze Brook	Higher Turtley	TRG	0	1	0
Whatley stream	Ammerham	TB	1	1	0
Clyst	Withy Bridge	TRG	1	0	0

TABLE 4. The 3 autumn samples audited for South West Region, with sample sorter initials and numbers of taxa 'lost', 'gained' and 'omitted'.

River	Site	Sorter	Losses	Gains	Omissions
Dart	Dart Bridge	JF	0	0	0
Mole	Head Barton	TRG	0	0	0
Oare Water	Oare Bridge	TB	0	5	0

TABLE 5
Results of individual sample audits

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION RIVER SEASON SITE SORTER SAMPLE CODE AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Planorbidae*	2 Leptophlebiidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	3 Planorbidae*

NET LOSSES NET GAINS

NOTES

- 1 Empty Zonitidae? shell in vial
- 2 Paraleptophlebia sp.
- 3 Hippeutis complanatus

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Venn
SEASON	Spring	SITE	U/S Venn Bridge
SORTER	LMB	SAMPLE CODE	NRA06 3004
AQC OF BMWP FAMILIES		A. IN VIAL	<input type="checkbox"/>
		B. IN SAMPLE	<input type="checkbox"/>

LOSSES		GAINS
A	VIAL	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		1 Nemouridae
		2 Leptophlebiidae 3 Taeniopterygidae 4 Hydrophilidae
B	SAMPLE	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		(This box only completed when no vial supplied with sample)
		5 Ephemerellidae 6 Goeridae 7 Lepidostomatidae

NET LOSSES

1

NET GAINS

6

NOTES

2 Paraleptophlebia sp. 1 only
 3 Brachyptera risi?
 4 Hydracna gracilis
 5 Ephemerella ignita 1 only
 6 Silo nigricornis 1 only
 7 Grunoecia irrorata 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Sterridge

SEASON Spring

SITE Old Sawmill Inn

SORTER RG

SAMPLE CODE NRA06 3101

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		None	None
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE		

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box only completed when no vial supplied with sample)	1 Nemouridae 2 Chloroperlidae 3 Hydrophilidae 4 Leptoceridae
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE		

NET LOSSES

0

NET GAINS

4

NOTES

- 1 Nemoura cambrica group 1 only
- 2 Chloroperla tripunctata 1 only
- 3 Hydraena gracilis
- 4 Adicella reducta

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Ephemerellidae 2 Lepidostomatidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	3 Hydrophilidae 4 Hydroptilidae

NET LOSSES

NET GAINS

NOTES

- 1 Ephemerella ignita
- 2 Lepidostoma hirtum
- 3 Hydracna gracilis
- 4 Ithytrichia sp. 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Helford Gweek River

SEASON Spring

SITE Metherr-Uny Mill Bridge

SORTER NB

SAMPLE CODE NRA06 1907

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Lepidostomatidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	2 Sphaeriidae 3 Hydroptilidae 4 Goeridae

NET LOSSES

0

NET GAINS

4

NOTES

- 1 Lepidostoma hirtum
- 2 Pisidium sp. 1 only
- 3 Ithytrichia sp. 1 only
- 4 Silo pallipes

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Porth Navas Stream
SEASON	Spring	SITE	Trenarth Bridge
SORTER	MAV	SAMPLE CODE	NRA06 1905

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS	
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE None	ADDITIONAL FAMILIES FOUND BY IFE 1 Gyrinidae

B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample)	ADDITIONAL FAMILIES FOUND BY IFE 2 Planariidae 3 Leptophlebiidae 4 Goeridae 5 Lepidostomatidae
---	---	--	---

NET LOSSES

NET GAINS

NOTES

- 1 Orectochilus villosus (larvae)
- 2 Polycelis felina
- 3 Paraleptophlebia sp.
- 4 Silo pallipes 1 only
- 5 Lepidostoma hirtum 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Bray**

SEASON **Spring**

SITE **U/s Meethe Barton Bridge**

SORTER **RG**

SAMPLE CODE **NRA06 3031**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Newlyn
SEASON	Spring	SITE	Buryas Bridge
SORTER	MAY	SAMPLE CODE	NRA06 2111

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS	
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None
B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Lyanaeidae 2 Lepidostomatidae

NET LOSSES

NET GAINS

NOTES

1 *Lymnaea peregra* 1 only
2 *Lepidostoma hirtum* 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Abbey**SEASON **Spring**SITE **Hartland Abbey**SORTER **LB**SAMPLE CODE **NRA06 2802**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Aphelocheiridae	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	2 Odontoceridae

NET LOSSES

1

NET GAINS

1

NOTES

1 Nymph of terrestrial Hemipteran in vial
2 Odontocerum albicorne 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Hayle
SEASON	Spring	SITE	St Erth G.S.
SORTER	TJR	SAMPLE CODE	NRA06 2205

AQC OF BMWP FAMILIES A. IN VIAL

B. IN SAMPLE

LOSSES		GAINS	
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Lepidostomatidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

0

NET GAINS

1

NOTES

1 *Lepidostoma hirtum*

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Sphaeriidae 2 Hydroptilidae

NET LOSSES

NET GAINS

NOTES

1 Pisidium sp.
2 Oxyethira sp. 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS
A	<u>VIAL</u>	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		None
		1 Leptophlebiidae

B	<u>SAMPLE</u>	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		(This box only completed when no vial supplied with sample)
		None

NET LOSSES

NET GAINS

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Helford**

SEASON **Spring**

SITE **Mellangoose**

SORTER **TJR**

SAMPLE CODE **NRA06 1909**

AQC OF BMWP FAMILIES A. IN VIAL **+**

B. IN SAMPLE **+**

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Liannephilidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	2 Planariidae 3 Hydrobiidae 4 Glossiphoniidae 5 Perlodidae 6 Polycentropodidae 7 Goeridae

NET LOSSES **0**

NET GAINS **7**

NOTES

- 1 Potamophylax sp., Micropterna squax
- 2 Polycelis felina
- 3 Potamopyrgus jenkinsi 1 only
- 4 Helobdella stagnalis 1 only
- 5 Isoperla grammatica 1 only
- 6 Plectrocnemia sp. 1 only
- 7 Silo pallipes 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Mylor Creek**

SEASON **Spring**

SITE **Mylor Bridge**

SORTER **DJP**

SAMPLE CODE **NRA06 1902**

AQC OF BMWP FAMILIES A. IN VIAL **+**

B. IN SAMPLE **+**

LOSSES		GAINS	
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE None	ADDITIONAL FAMILIES FOUND BY IFE None

B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample)	ADDITIONAL FAMILIES FOUND BY IFE 1 Elmidae 2 Psychomyiidae 3 Lepidostomatidae
---	---	--	---

NET LOSSES **0**

NET GAINS **3**

NOTES
1 *Elmis aenea* (larva) 1 only
2 *Lype* sp. 1 only
3 *Lepidostoma hirtum*

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION RIVER SEASON SITE SORTER SAMPLE CODE AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Leptophlebiidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	2 Caenidae

NET LOSSES NET GAINS

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION RIVER SEASON SITE SORTER SAMPLE CODE AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS	
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE None	ADDITIONAL FAMILIES FOUND BY IFE 1 Elmidae
B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample)	ADDITIONAL FAMILIES FOUND BY IFE None

NET LOSSES NET GAINS

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Torridge**SEASON **Spring**SITE **D/s Rothern Bridge**SORTER **PG**SAMPLE CODE **NRA06 2908**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Leuctridae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	2 Gammaridae 3 Nemouridae 4 Lepidostomatidae

NET LOSSES

0

NET GAINS

4

NOTES

- 1 Leuctra geniculata
- 2 Crangonyx pseudogracilis 1 only
- 3 Amphinemura sulcicollis
- 4 Lepidostoma hirtum

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

South West

RIVER

Neet

SEASON

Spring

SITE

Hele Bridge (A39 Rd Br)

SORTER

PAB

SAMPLE CODE

NRA06 2706

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Siphonuridae 2 Rhyacophilidae 3 Lepidostomatidae 4 Sericostomatidae	5 Ephemerellidae 6 Hydrophilidae 7 Hydropsychidae 8 Leptoceridae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	9 Perlodidae 10 Chloroperlidae

NET LOSSES

4

NET GAINS

6

NOTES

6 *Hydraena gracilis*, 11. *rufipes*
 7 *Hydropsyche pellucidula*
 8 *Athripsodes albifrons*
 9 *Isoperla grammatica* 1 only
 10 *Chloroperla torrentium* 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Porthleven

SEASON Spring

SITE U/s from Harbour

SORTER PAB

SAMPLE CODE NRA06 2101

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Scricostomatidae 2 Simuliidae*	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	3 Simuliidae*

NET LOSSES

1

NET GAINS

0

NOTES

1 Empty cases
3 1 only in sample

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South WestRIVER HelfordSEASON SpringSITE U/s Gweek MillSORTER MAVSAMPLE CODE NRA06 1910

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Oligochaeta 2 Hydrophilidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES 0NET GAINS 2

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Okement**SEASON **Spring**SITE **South Dornaford**SORTER **AA**SAMPLE CODE **NRA06 2926**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Leptophlebiidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	2 Dytiscidae 3 Simuliidae

NET LOSSES

0

NET GAINS

3

NOTES

2 *Oreodytes sanmarkii* (adult) 1 only
3 *Simulium ornatum* group 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Lapford Yeo**

SEASON **Spring**

SITE **U/s Bow Bridge**

SORTER **PG**

SAMPLE CODE **NRA06 3015**

AQC OF BMWP FAMILIES A. IN VIAL **+**

B. IN SAMPLE **+**

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Leuctridae	2 Chloroperlidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	3 Psychomyiidae

NET LOSSES **1**

NET GAINS **2**

NOTES

2 Chloroperla torrentium 1 only
3 Lype sp. 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Allen

SEASON Spring

SITE Idless Bridge

SORTER DJP

SAMPLE CODE NRA06 1935

AQC OF BMWP FAMILIES A. IN VIAL +

B. IN SAMPLE +

LOSSES		GAINS	
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE None	ADDITIONAL FAMILIES FOUND BY IFE None

B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample)	ADDITIONAL FAMILIES FOUND BY IFE 1 Hydroptilidae 2 Leptoceridae 3 Lepidostomatidae
---	---	--	--

NET LOSSES 0

NET GAINS 3

NOTES

1 Ithytrichia sp.
2 Athripsodes sp. 1 only
3 Lepidostoma hirtum

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Otter
SEASON	Spring	SITE	D/s Otterton Bridge
SORTER	AA	SAMPLE CODE	NRA06 0406

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS
A	VIAL	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		1 Notonectidae
		2 Corixidae
B	SAMPLE	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		(This box only completed when no vial supplied with sample)
		3 Planariidae

NET LOSSES

NET GAINS

NOTES 2 Sigara distincta
3 Polycelis sp. 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Clyst

SEASON Spring

SITE A38 Bridge, Broadclyst

SORTER RG

SAMPLE CODE NRA06 0510

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

		LOSSES	GAINS
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Dendrococlidae 2 Platycnemididae 3 Curculionidae	None
B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

3

NET GAINS

0

NOTES

3 Terrestrial species (Anthonomus sp.)

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	<div>South West</div>	RIVER	<div>Otter</div>
SEASON	<div>Spring</div>	SITE	<div>Weston</div>
SORTER	<div>DH/JS</div>	SAMPLE CODE	<div>NRA06 0403</div>
AQC OF BMWP FAMILIES		A. IN VIAL	<div>+</div>
		B. IN SAMPLE	<div>+</div>

LOSSES		GAINS	
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE 1 Lymnaeidae	ADDITIONAL FAMILIES FOUND BY IFE None

B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample)	ADDITIONAL FAMILIES FOUND BY IFE None
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NET LOSSES

1

 NET GAINS

0

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Lynher
SEASON	Spring	SITE	Notter Bridge
SORTER	PAB	SAMPLE CODE	NRA06 1270

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	<div>BMWP FAMILIES NOT FOUND BY IFE</div> <div>None</div> <div>ADDITIONAL FAMILIES FOUND BY IFE</div> <div>1 Brachycentridae 2 Simuliidae</div>

B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	<div>BMWP FAMILIES NOT FOUND BY IFE</div> <div>(This box only completed when no vial supplied with sample)</div> <div>ADDITIONAL FAMILIES FOUND BY IFE</div> <div>3 Planariidae 4 Ancyliidae 5 Calopterygidae 6 Goeridae</div>
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NET LOSSES NET GAINS

NOTES

- 1 Brachycentrus subnubilus (pupae)
- 2 Simulium vernum group 1 only
- 3 Polycelis felina 1 only
- 4 Ancylos fluviatilis 1 only
- 5 Calopteryx sp. (juvenile) 1 only
- 6 Silo pallipes 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

South West

RIVER

Offwell Brook

SEASON

Spring

SITE

Offwell Footbridge

SORTER

EP

SAMPLE CODE

NRA06 0206

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Corduliidae	2 Cordulegasteridae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	3 Goeridae

NET LOSSES

1

NET GAINS

2

NOTES

2 Cordulegaster boltonii 1 only
3 Silo pallipes

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Exe

SEASON Spring

SITE Exebridge

SORTER RG

SAMPLE CODE NRA06 0535

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Curculionidae	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

1

NET GAINS

0

NOTES

1 Terrestrial species (Apion sp.)

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Corry Brook

SEASON Spring

SITE Old Corryton

SORTER LAW

SAMPLE CODE NRA06 0229

AQC OF BMWP FAMILIES A. IN VIAL +

B. IN SAMPLE +

LOSSES		GAINS
A	<u>VIAL</u>	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		1 Dytiscidae 2 Limnephilidae
		3 Lepidostomatidae
B	<u>SAMPLE</u>	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		(This box only completed when no vial supplied with sample)
		4 Ephemerellidae

NET LOSSES 2

NET GAINS 2

NOTES 3 Lepidostoma hirtum
4 Ephemerella ignita

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Inny
SEASON	Spring	SITE	St Clether Bridge
SORTER	NB	SAMPLE CODE	NRA06 1263

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS
A	VIAL	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		None
		1 Taeniopterygidae 2 Brachycentridae
B	SAMPLE	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		(This box only completed when no vial supplied with sample)
		None

NET LOSSES NET GAINS

NOTES 1 Brachyptera risi
2 Brachycentrus subnubilus (pupa)

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

		LOSSES	GAINS
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Curculionidae	None
B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

NET GAINS

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South WestRIVER LowmanSEASON SpringSITE A373 Bridge, TivertonSORTER RGSAMPLE CODE NRA06 0544

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES		GAINS
A	<u>VIAL</u>	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		None

B	<u>SAMPLE</u>	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE
		(This box only completed when no vial supplied with sample)
		ADDITIONAL FAMILIES FOUND BY IFE
		None

NET LOSSES

0

NET GAINS

0

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

NET GAINS

NOTES

Psychomyiidae? confirmed = Tinodes waeneri

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION RIVER SEASON SITE SORTER SAMPLE CODE AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	1 Tipulidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES NET GAINS

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Culm
SEASON	Spring	SITE	Skidders Farm Bridge
SORTER	LAW	SAMPLE CODE	NRA06 0518

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS
A	VIAL	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		1 Agriidae
		2 Lepidostomatidae
B	SAMPLE	
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
		(This box only completed when no vial supplied with sample)
		3 Hydrobiidae
		4 Psychomyiidae

NET LOSSES

NET GAINS

NOTES

- 1 Cast skin in vial
- 2 Lepidostoma hirtum
- 3 Potamopyrgus jenkinsi 1 only
- 4 Psychomyia pusilla 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

South West

RIVER

Yeo (Creedy)

SEASON

Spring

SITE

Binneford

SORTER

JBS

SAMPLE CODE

NRA06 0562

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Gammaridae

NET LOSSES

0

NET GAINS

1

NOTES

1 Gammarus pulex

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	<div>South West</div>	RIVER	<div>Brockey</div>
SEASON	<div>Spring</div>	SITE	<div>Brooksbridge Collage Br.</div>
SORTER	<div>EP</div>	SAMPLE CODE	<div>NRA06 0540</div>

AQC OF BMWP FAMILIES A. IN VIAL

+

 B. IN SAMPLE

+

LOSSES		GAINS	
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Planorbidae	2 Leptophlebiidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

1

NET GAINS

1

NOTES
1 Zonitoides sp. in vial
2 Indet Leptophlebiid juvenile

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Planariidae 2 Ephemerellidae 3 Brachycentridae

NET LOSSES

NET GAINS

NOTES

- 1 Polycelis felina 1 only
- 2 Ephemerella ignita
- 3 Brachycentrus subnubilus (pupae)

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Aller Brook

SEASON Summer

SITE U/s Edginswell PS

SORTER PG

SAMPLE CODE NRA06 0601

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Hydrobiidae* 2 Lymnaeidae	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	3 Hydrobiidae* 4 Planorbidae 5 Gammaridae

NET LOSSES

1

NET GAINS

2

NOTES

- 1,2 Empty shells
3 Polamopyrgus jenkinsi 1 only
4 Gyraulus albus 1 only
5 Crangonyx pseudogracilis 1 only

Other taxa

Libellulid(?) not found in vial but large Psocopteran (book louse)
found in sample

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION RIVER SEASON SITE SORTER SAMPLE CODE AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Odontoceridae

NET LOSSES NET GAINS NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	<div>South West</div>	RIVER	<div>Baldhu Stream</div>
SEASON	<div>Summer</div>	SITE	<div>Bissoe Bridge</div>
SORTER	<div>DJP</div>	SAMPLE CODE	<div>NRA06 1941</div>

AQC OF BMWP FAMILIES A. IN VIAL

+

 B. IN SAMPLE

+

LOSSES		GAINS	
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION RIVER SEASON SITE SORTER SAMPLE CODE AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		1 Platycnemididae 2 Scirtidae 3 Dryopidae	4 Coenagriidae 5 Gyrinidae

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
		(This box only completed when no vial supplied with sample)	None

NET LOSSES NET GAINS

NOTES

- 2 Indet. Terrestrial larva
- 3 Terrestrial species Xyleborus dryographus (Scolytidae)
- 4 Ischnura elegans
- 5 Gyrinus sp. (larvae)

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	 BMWP FAMILIES NOT FOUND BY IFE 1 Chloroperlidae* ADDITIONAL FAMILIES FOUND BY IFE None

B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	 BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample) ADDITIONAL FAMILIES FOUND BY IFE 2 Piscicolidac 3 Glossiphoniidae 4 Chloroperlidae* 5 Polycentropodidac
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NET LOSSES

NET GAINS

NOTES

2 Piscicola geometra 1 only
3 Helobdella stagnalis 1 only
4 Chloroperla torrentium
5 Polycentropus flavomaculatus 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION RIVER SEASON SITE SORTER SAMPLE CODE AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Tipulidac

NET LOSSES NET GAINS

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL

B. IN SAMPLE

LOSSES

GAINS

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

NET GAINS

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION

RIVER

SEASON

SITE

SORTER

SAMPLE CODE

AQC OF BMWP FAMILIES A. IN VIAL

B. IN SAMPLE

LOSSES		GAINS				
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	<table><tr><th>BMWP FAMILIES NOT FOUND BY IFE</th><th>ADDITIONAL FAMILIES FOUND BY IFE</th></tr><tr><td>1 Mesoveliidae</td><td>None</td></tr></table>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE	1 Mesoveliidae	None
BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE					
1 Mesoveliidae	None					

B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	<table><tr><th>BMWP FAMILIES NOT FOUND BY IFE</th><th>ADDITIONAL FAMILIES FOUND BY IFE</th></tr><tr><td>(This box only completed when no vial supplied with sample)</td><td>2 Asellidae</td></tr></table>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE	(This box only completed when no vial supplied with sample)	2 Asellidae
BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE					
(This box only completed when no vial supplied with sample)	2 Asellidae					

NET LOSSES

NET GAINS

NOTES
1 Velia sp. (nymph) in vial
2 Asellus meridianus 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Erne
SEASON	Summer	SITE	Sequers Bridge
SORTER	JF	SAMPLE CODE	NRA06 0903

AQC OF BMWP FAMILIES A. IN VIAL B. IN SAMPLE

LOSSES		GAINS
A	<u>VIAL</u>	
		BMWP FAMILIES NOT FOUND BY IFE
		ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None
		None

B	SAMPLE		
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample)	ADDITIONAL FAMILIES FOUND BY IFE 1 Nemouridae 2 Perlodidae

NET LOSSES NET GAINS

NOTES 1 Protonemura sp. 1 only
2 Perlodes microcephala, Isoperla grammica

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Oare Water**

SEASON **Summer**

SITE **Oare Bridge**

SORTER **AA**

SAMPLE CODE **NRA06 3205**

AQC OF BMWP FAMILIES A. IN VIAL **+**

B. IN SAMPLE **+**

LOSSES		GAINS	
A	<u>VIAL</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	BMWP FAMILIES NOT FOUND BY IFE None	ADDITIONAL FAMILIES FOUND BY IFE 1 Rhyacophilidae

B	<u>SAMPLE</u> Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	BMWP FAMILIES NOT FOUND BY IFE (This box only completed when no vial supplied with sample)	ADDITIONAL FAMILIES FOUND BY IFE 2 Dytiscidae
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NET LOSSES **0**

NET GAINS **2**

NOTES

1 Rhyacophila dorsalis, Glossosoma sp. (pupa)
2 Oreodytes sanmarkii (adult)

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Barbrook**SEASON **Summer**SITE **D/s P.S. Dean**SORTER **RG**SAMPLE CODE **NRA06 3202**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Leptoceridae	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

1

NET GAINS

0

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Yeo (Molland)**

SEASON **Summer**

SITE **U/s Bish Mill Bridge**

SORTER **JBS**

SAMPLE CODE **NRA06 3028**

AQC OF BMWP FAMILIES A. IN VIAL **+**

B. IN SAMPLE **+**

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Hydroptilidae	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES **1**

NET GAINS **0**

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Offwell Brook**SEASON **Summer**SITE **Roadpitt Farm**SORTER **LAW**SAMPLE CODE **NRA06 0207**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Planariidae 2 Planorbidae 3 Dytiscidae

NET LOSSES

0

NET GAINS

3

NOTES

1 Polycelis nigra/tenuis
2Bathymphalus contortus 1 only
3 Agabus sp. (larva) 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Beaford/Wooleigh**SEASON **Summer**SITE **B3220 Road Bridge**SORTER **LAW**SAMPLE CODE **NRA06 2909**AQC OF BMWP FAMILIES A. IN VIAL **+**B. IN SAMPLE **+**

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 <i>Lymnaeidae</i>	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	2 <i>Brachycentridae</i>

NET LOSSES **1**NET GAINS **1**

NOTES

2 *Brachycentrus subnubilus* 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Rye Stream**

SEASON **Summer**

SITE **Loxhore Cross Bridge**

SORTER **LB**

SAMPLE CODE **NRA06 3035**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

		LOSSES	GAINS
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None
B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Hydroptilidae

NET LOSSES

0

NET GAINS

1

NOTES

1 Agraylea sp. (pupa) 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Holewater Stream**

SEASON **Summer**

SITE **Linkleyham Bridge**

SORTER **EP**

SAMPLE CODE **NRA06 3032**

AQC OF BMWP FAMILIES A. IN VIAL **+**

B. IN SAMPLE **+**

LOSSES		GAINS	
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES **0**

NET GAINS **0**

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Synderford**SEASON **Summer**SITE **Beere Farm**SORTER **RP**SAMPLE CODE **NRA06 0218**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Sphaeriidae 2 Glossiphoniidae 3 Leptophlebiidae 4 Chloroperlidae

NET LOSSES

0

NET GAINS

4

NOTES

- 1 Pisidium sp.
- 2 Glossiphonia complanata 1 only
- 3 Habrophlebia fusca 1 only
- 4 Chloroperla torrentium 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Bovey**

SEASON **Summer**

SITE **Blackaller Bridge**

SORTER **TB**

SAMPLE CODE **NRA06 0617**

AQC OF BMWP FAMILIES A. IN VIAL **+**

B. IN SAMPLE **+**

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Hydrobiidae 2 Leptophlebiidae 3 Leptoceridae

NET LOSSES **0**

NET GAINS **3**

NOTES

1 Potamopyrgus jenkinsi
2 Paraleptophlebia cincta 1 only
3 Mystacides sp. (pupa) 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Glaze Brook**SEASON **Summer**SITE **Higher Turtley**SORTER **TRG**SAMPLE CODE **NRA06 0812**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	1 Nemouridae

NET LOSSES

0

NET GAINS

1

NOTES

1 **Protonemura** sp. (juvenile) 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION	South West	RIVER	Whatley Stream
SEASON	Summer	SITE	Ammerham
SORTER	TB	SAMPLE CODE	NRA06 0219

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	VIAL	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Planorbidae	None

B	SAMPLE	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	2 Glossiphoniidae

NET LOSSES

1

NET GAINS

1

NOTES

1 Zonitoides found in vial
2 Glossiphonia complanata 1 only

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Clyst**SEASON **Summer**SITE **Withy Bridge**SORTER **TRG**SAMPLE CODE **NRA06 0511**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

LOSSES

GAINS

A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	1 Mesoveliidae	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

1

NET GAINS

0

NOTES

1 *Velia* sp. (nymphs) in vial

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**RIVER **Dart**SEASON **Autumn**SITE **Dart Bridge**SORTER **JF**SAMPLE CODE **NRA06 0708**

AQC OF BMWP FAMILIES

A. IN VIAL

+

B. IN SAMPLE

+

		LOSSES	GAINS
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None
B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES

0

NET GAINS

0

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION **South West**

RIVER **Mole**

SEASON **Autumn**

SITE **Head Barton**

SORTER **TRG**

SAMPLE CODE **NRA06 3024**

AQC OF BMWP FAMILIES A. IN VIAL **+**

B. IN SAMPLE **+**

LOSSES		GAINS	
A	<u>VIAL</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE	None	None

B	<u>SAMPLE</u>	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE	(This box only completed when no vial supplied with sample)	None

NET LOSSES **0**

NET GAINS **0**

NOTES

1990 RIVER QUALITY SURVEY

AQC - BIOLOGICAL SAMPLES

REGION South West

RIVER Oare Water

SEASON Autumn

SITE Oare Bridge

SORTER TB

SAMPLE CODE NBA06 3205

AQC OF BMWP FAMILIES A. IN VIAL +

B. IN SAMPLE +

LOSSES		GAINS
A	VIAL	
	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	None	None
Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in VIAL by IFE		

B	SAMPLE	
	BMWP FAMILIES NOT FOUND BY IFE	ADDITIONAL FAMILIES FOUND BY IFE
	(This box only completed when no vial supplied with sample)	1 Planariidae 2 Hydrobiidae 3 Leptophlebiidae 4 Nemouridae 5 Lepidostomatidae
Differences between: i) BMWP families listed on sample data sheet and ii) BMWP families found in SAMPLE by IFE		

NET LOSSES 0

NET GAINS 5

NOTES

- 1 Crenobia alpina
- 2 Potamopyrgus jenkinsi
- 3 Paraleptophlebia sp. 1 only
- 4 Protonemura sp. (juveniles)
- 5 Lepidostoma hirtum