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Invertebrate survey and classification
of rivers for nature conservation

1990/91 report

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1. INTRODUCTION

In 1986 the Freshwater Biological Association (now the Institute of Freshwater Ecology) was contracted by the Nature Conservancy Council to undertake an examination of the macroinvertebrate fauna of a series of river systems in Great Britain. The project was entitled 'Invertebrate Survey and Classification of Rivers for Nature Conservation' and initially the funding was for a period of three years (contract number HF3-03-340). The NCC had previously carried out a national survey of river vegetation (Holmes 1983) but in order to choose a series of rivers which merit notification as Sites of Special Scientific Interest, the macroinvertebrates, in addition to the vegetation, must be taken into account. Hence, a major objective of the project on macroinvertebrates was to fill in some of the gaps in the biological data-base. In 1988 the NCC decided to extend the contract to March 1992. Further details are given in Section 3.

2. PROGRAMME OF WORK

Four elements were specified in the original contract:

1. A sampling programme for invertebrates in each year of the project on a series of rivers selected by the NCC. The field sampling techniques to be compatible with the IFE 'River Communities Project' but also to take into account the further requirements of the NCC (see methods section).
2. Identification of the fauna, transfer of the data to computer and reporting of results in the form of species lists at the end of each year.
3. In the final year, the invertebrate species lists to be used to classify each site, using the latest IFE classification system.
4. The conservation value of the sites on all rivers sampled to be assessed in the final year, using criteria provided by the NCC. These criteria to include presence of rare species and/or rare communities, species richness at the site and the occurrence of representative communities. These attributes to be assessed by reference to information on the distribution of species and communities throughout Britain, held within the 'River Communities Project'.

3. SYNOPSIS OF PROGRESS 1986-1990

In 1986 seven river systems in Scotland (20 sites) were sampled for macroinvertebrates (Wright *et al.* 1987) whilst in 1987, sampling was confined to five river systems (21 sites) in England and Wales (Wright *et al.* 1988).

Prior to the 1988 sampling operation, the NCC took a policy decision to put additional resources into the conservation of rivers. As part of this policy, new funds were made available to undertake further survey work to enlarge the biological data-base. Under a new research project entitled 'Survey of Rivers for Conservation' a coordinated programme of river corridor, macrophyte and macroinvertebrate survey was developed. The IFE was asked to undertake the macroinvertebrate survey element of the work, using the existing methodology and new funding was provided for the period April 1988 to February 1992 (contract number HF3-08-33).

As a consequence, the funding for 1988/89 was higher than in the two previous years because it included funds from the final year of the initial contract plus funds from the new contract. In 1988, nine river systems (28 sites) in England and Wales were sampled (Wright *et al.* 1989), whilst in 1989 five river systems (16 sites) in Scotland and England were examined (Wright *et al.* 1990).

4. STRATEGY FOR 1990-92

In February 1990 the NCC nominated officer for the project suggested a modification to the current sampling strategy in order to increase the number of sites for which data could be acquired in the final two years of the project. Essentially, the plan was to eliminate the need for IFE staff to undertake sampling at the rivers and sites of interest to the NCC by enlisting the help of National Rivers Authority (NRA) and River Purification Board (RPB) biologists.

The quinquennial River Quality Survey, planned for 1990, involved the collection of macroinvertebrate data by NRA/RPB staff in spring, summer and autumn using the same procedures as used by IFE in taking the 'main' samples in this NCC project. Thus, by enlisting the collaboration of NRA/RPB staff who were planning to sample most of the rivers of interest to NCC, more time would be available for IFE

staff to identify samples in 1990/91 and 1991/92 and undertake items 3 and 4 of the programme of work in 1991/92. Using a list of rivers in England, Wales and Scotland already sampled by the NCC for macrophytes and for which macroinvertebrate data would be of interest, the relevant NRA/RPB regions were contacted by letter in early March 1990. For this new strategy to be workable, a small number of points relating to site locations and detailed sampling protocol would need to be accepted by NRA/RPB staff in order to retain the procedures undertaken by IFE staff over the previous four years. These were as follows:

- a) The location of the sites should, where possible, be coincident with previous macrophyte surveys and should always avoid badly polluted/impacted locations.
- b) An IFE 'Sample Area Form' should be completed in each season, together with a 'Survey Area Form' in summer only.
- c) Although the standard 3 minute kick/sweep plus 1 minute (maximum) search undertaken in the 1990 River Quality Survey forms the 'main' sample in each season, there is a further requirement for a 'supplementary' sample for the NCC from each site in each season.
- d) If possible a photograph (35 mm colour slide) should be taken of each site in one season.

A list of the grid references of the sites to be sampled in the 1990 River Quality Survey was requested from the regions which indicated that they were prepared to collaborate. After further consultation between IFE and the NCC nominated officer on the suitability of the sites to be sampled within the 1990 RQS and the need for any additional sampling sites, a list of rivers and sites was drawn up. Some sites were designated as higher priority than others and ~20 were chosen for examination in 1990/91 with others to be examined in 1991/92 as time allows.

It was agreed that the NRA/RPB biologists who took samples for the project would be given listings of the species identified by IFE staff at the sites they sampled.

The strategy has undoubtedly meant that information on a larger number of sites will be available for assessment than would have been possible if IFE staff had been involved in field sampling. This is particularly relevant to the final year of the project when an appraisal of all the results obtained over the six year project will

be carried out (items 3 and 4 of the programme of work). However, there have been some problems.

First, all samples taken for the 1990 River Quality Survey (including those of interest to the NCC) have been examined at BMWP family level by the local biologists before the full samples have been sent to the IFE River Laboratory. The work load on NRA/RPB biologists to undertake the 1990 River Quality Survey has been considerable and hence samples have reached us later than when IFE staff sample in spring, summer and autumn. This has resulted in a minor delay in completing the sample identifications in 1990/91, but will not affect the 1991/92 programme, since all samples for processing are now at the River Laboratory.

Second, and of greater concern, is the fact that some regions found themselves under such a heavy workload that they were unable to comply with all aspects of the sampling protocol. In particular, supplementary samples were not obtained for 13 of the 60 samples (i.e. 20 sites x 3 seasons) examined in 1990/91. Although this means a loss of information on additional taxa found in the vicinity of the main sampling site, it will not affect the site classifications to be undertaken in 1991/92, since these are based on the results obtained from the 3-minute main samples only. Further information relating to the absence of some supplementary samples is given in the next section.

5. STUDY SITES FOR 1990/91

A total of 20 sites on five river systems in Scotland and England were selected for study. Information on the site names and locations, together with the dates on which samples were taken, are given in Table 1.

In Scotland two tributaries of the R. Tweed, which is a grade 1 NCR site (Ratcliffe 1977), were sampled. These were the Whiteadder (4 sites) and the Blackadder (3 sites) which drain the Lammermuir Hills in the north-east of the catchment before they join the R. Tweed just upstream of Berwick-on-Tweed. Three suitable sites on each tributary were being examined within the framework of the 1990 River Quality Survey and the Tweed RPB biologist agreed to sample at a

Table 1. Rivers and sites sampled in 1990. "M" refers to the main sample and "S" to the supplementary sample. See methods section of text for further details.

River	Site name	M/S	Method	NGR	Sampling Dates		
					Spr	Sum	Aut
Whiteadder	Cranshaws	M	Pond-net	NT 689626	20 Apr	21 Aug	15 Nov
	Cranshaws	S	Pond-net	NT 689626	20 Apr	21 Aug	15 Nov
	Preston Haugh	M	Pond-net	NT 774577	20 Apr	27 Aug	15 Nov
	Preston Haugh	S	Pond-net	NT 774577	20 Apr	27 Aug	15 Nov
	U/S Allanton	M	Pond-net	NT 864547	19 Apr	24 Aug	12 Nov
	U/S Allanton	S	Pond-net	NT 864547	20 Apr	24 Aug	12 Nov
	Chesterfield Ford	M	Pond-net	NT 937536	20 Apr	24 Aug	12 Nov
	Chesterfield Ford	S	Pond-net	NT 937536	20 Apr	24 Aug	12 Nov
Blackadder	Halliburton Bridge	M	Pond-net	NT 677478	18 Apr	23 Aug	9 Nov
	Halliburton Bridge	S	Pond-net	NT 677478	18 Apr	23 Aug	9 Nov
	Fogo	M	Pond-net	NT 770491	18 Apr	23 Aug	9 Nov
	Fogo	S	Pond-net	NT 770491	18 Apr	23 Aug	9 Nov
	Blackadder Water Foot	M	Pond-net	NT 864545	18 Apr	24 Aug	12 Nov
	Blackadder Water Foot	S	Pond-net	NT 864545	18 Apr	24 Aug	12 Nov
R. Wissey	North Pickenham	M	Pond-net	TF 866067	26 Mar	9 Jul	19 Nov
	North Pickenham	S	Pond-net	TF 866067	26 Apr	None	None
	Linghills Farm	M	Pond-net	TF 834009	26 Mar	9 Jul	19 Nov
	Linghills Farm	S	Pond-net	TF 834009	26 Apr	None	None
	Didlington Lodge	M	Pond-net	TL 771967	29 Mar	23 Aug	26 Nov
	Didlington Lodge	S	Pond-net	TL 771967	26 Apr	None	None
	Five Mile House	M	Pond-net	TL 664977	29 Mar	20 Aug	21 Nov
	Five Mile House	S	Pond-net	TL 664977	26 Apr	None	None
R. Walkham	Merrivale	M	Pond-net	SX 550751	19 Apr	20 Jul	16 Oct
	Merrivale	S	Pond-net	SX 550751	19 Apr	20 Jul	16 Oct
	Grenofen	M	Pond-net	SX 489710	19 Apr	20 Jul	16 Oct
	Grenofen	S	Pond-net	SX 489710	19 Apr	20 Jul	16 Oct
R. Lathkill	Alport	M	Pond-net	SK 220646	26 Apr	1 Aug	5 Nov
	Alport	S	Pond-net	SK 220646	26 Apr	1 Aug	5 Nov
	Congreave	M	Pond-net	SK 242657	26 Apr	1 Aug	5 Nov
	Congreave	S	Pond-net	SK 242657	26 Apr	1 Aug	5 Nov
R. Coquet	Carshope	M	Pond-net	NT 851109	11 Apr	12 Jul	17 Oct
	Carshope	S	Pond-net	NT 851109	None	None	None
	Linshiels	M	Pond-net	NT 894062	11 Apr	12 Jul	17 Oct
	Linshiels	S	Pond-net	NT 894062	11 Apr	12 Jul	17 Oct
	Sharperton	M	Pond-net	NT 954038	11 Apr	12 Jul	17 Oct
	Sharperton	S	Pond-net	NT 954038	None	12 Jul	17 Oct
	Pauperhaugh	M	Pond-net	NZ 101995	11 Apr	12 Jul	17 Oct
	Pauperhaugh	S	Pond-net	NZ 101995	11 Apr	12 Jul	17 Oct
	Coquet Lodge	M	Pond-net	NU 238061	1 May	12 Jul	25 Oct
	Coquet Lodge	S	Pond-net	NU 238061	None	12 Jul	25 Oct

further upstream site on the Whiteadder to provide additional information.

Four sites were examined on the R. Wissey, a tributary of the Great Ouse in East Anglia. The Wissey joins the main river in its lower reaches, downstream of the confluence of the Great Ouse and the Little Ouse. Unfortunately, pressure of work prevented supplementary samples being taken in summer and autumn on this river, but supplementaries were collected and processed in spring.

The R. Walkham (2 sites) in the south-west of England flows off Dartmoor to join the R. Tavy to the south of Tavistock. Whereas the upper site drains acidic grassland the lower site is in an area of beech woodland.

The R. Lathkill in the Derbyshire Dales is an NCR site (Ratcliffe 1977) and flows through calcareous grassland and woodland. It is a tributary of the Derbyshire Wye, itself a tributary of the R. Derwent which eventually flows into the R. Trent. The river has a high alkalinity and in its upper reaches it is a winterbourne. The upper of the two sites originally chosen for sampling was found to be dry in spring and a new site was selected further downstream at Alport. The river experienced drought conditions during the summer and in fact the lower of the two sites sampled (Congreave) dried out to a series of pools in late August/September, although it was flowing again when autumn samples were taken.

Finally, five sites were examined on the R. Coquet, which has its source in the Cheviots, in the north-east of England. Four of these sites were being examined as part of the 1990 River Quality Survey and the NRA Northumbrian Region biologist agreed to take samples at a fifth site, further upstream. Samples from this top site were limited to 3-minute main samples only, and supplementary samples could not be taken at two further sites in spring, but otherwise both main and supplementary samples were collected at all sites. Note that the most downstream site at Coquet Lodge, just upstream of Warkworth was tidal and that this influenced the composition of the macroinvertebrate fauna.

METHODS

Two types of sample were requested from NRA/RPB biologists at each site in spring, summer and autumn. They were designated the 'main' sample and the 'supplementary' sample.

The field sampling technique used for the main sample ensured compatibility with the data-base held by the IFE within the 'River Communities Project'. Prior to the 1990 River Quality Survey the biologists had access to a video which demonstrated the field techniques required for compatibility. At each site a 3-minute pond-net sample was taken which encompassed all available habitats in order to capture the widest range of invertebrates within the allotted time.

Supplementary samples were taken in an attempt to increase the species lists further by examining additional habitats. Typically, the river bank was walked, both upstream and downstream of the main sampling location, in order to locate unsampled habitats. Supplementary samples taken by kicking or sweeping with a pond-net were untimed, but up to 30 minutes was spent picking out invertebrates in the field before the specimens were preserved for later identification in the laboratory.

At each sampling location, a 'Sample Area' form was completed in each season. The form includes information on site location and sampling method, stream dimensions, surface velocity and substratum type, together with a space for a sketch map and information on macrophytes etc. At main sampling sites in summer only a 'Survey Area' form was also completed. This was used for recording features whose values are less prone to seasonal variation and for collating further background data on each site. Examples of these forms and notes for their completion can be found in Furse *et al.* (1986).

On receipt of the main and supplementary samples from the NRA/RPB regions, IFE staff sorted and identified the material as far as current taxonomic keys allow (normally to species/genus) with the exception of the Oligochaeta (true worms) and Chironomidae (non-biting midges) which were not identified further. However, all the material, including the Oligochaeta and Chironomidae, have been

retained. The listings of taxa recorded at each site were then transferred to computer and validated.

In the results section, the printouts are given in two separate formats. The first gives details of the sampling procedures used at each site to obtain the main and the supplementary samples, followed by a single listing of all the species recorded at each site. The second printout is the species by sites matrix and this presents the invertebrate fauna recorded at each site in each season (spring, summer, autumn) for each river in turn. On this printout, species recorded in the main sample (+) are distinguished from additional species recorded in the supplementary sample (S) within any one season.

The report also includes a brief statement on any notable features of the macroinvertebrate fauna of each river. (Section 7.3.)

Finally, the information on the invertebrate fauna recorded at each site has been used to calculate an index of river quality which is now widely used within the National Rivers Authority. The Biological Monitoring Working Party (BMWP) score system was first used in a major survey of river quality in England and Wales in 1980 (National Water Council 1981). Scores are allocated to 'families' of invertebrates (range 1-10) according to their known tolerance to organic pollution. Addition of the scores for all scoring families at a site gives the total BMWP Score. The Average Score Per Taxon (ASPT), that is, total score divided by the number of scoring taxa, is also used in the appraisal of river quality. BMWP scores, number of scoring taxa, and ASPT values are provided for each sampling site in each season and also for the three seasons combined. Note that these indices have been calculated using the 'main' samples only this year, since supplementary samples were not available for all sites in all seasons. Hence, the results are not strictly compatible with previous years, when the main and supplementary samples were pooled prior to the calculation of biotic indices.

7. RESULTS

7.1 Species lists for each site

In the pages which follow, a species list is provided for each of the 20 sampling sites. The listings incorporate all species found in spring, summer and autumn 1990 in both the main and supplementary samples. Details of the procedures used for collecting the main and supplementary samples, the dates of collection and grid references are given at the head of each printout. Note that at a few sites, supplementary samples were not taken.

For more detailed information on the species recorded in particular seasons and additional species confined to the supplementary samples, see section 7.2.

	Pages
Whiteadder	11-14
Blackadder	15-17
Wissey	18-21
Walkham	22-23
Lathkill	24-25
Coquet	26-30

NT 689 626	20 Apr	Main sample	3 minute kick/sweep
NT 689 626	20 Apr	Supplementary	Kick/sweep
NT 689 626	21 Aug	Main Sample	3 minute kick/sweep
NT 689 626	21 Aug	Supplementary	Kick/sweep
NT 689 626	15 Nov	Main Sample	3 minute kick/sweep
NT 689 626	15 Nov	Supplementary	Kick/sweep

Potamopyrgus jenkinsi (Smith)
Lymnaea peregra (Muller)
Ancylus fluviatilis Muller
Pisidium sp.
Pisidium personatum Malm
Oligochaeta
Glossiphonia complanata (L.)
Helobdella stagnalis (L.)
 Erpobdellidae
Erpobdella octoculata (L.)
Hydracarina
Gammarus pulex (L.)
Baetis scambus group
Baetis rhodani (Pictet)
Baetis muticus (L.)
Centroptilum luteolum (Muller)
Centroptilum pennulatum Eaton
Rhithrogena semicolorata group
Heptagenia lateralis (Curtis)
Ecdyonurus sp.
Paraleptophlebia sp.
Paraleptophlebia submarginata (Stephens)
Ephemerella ignita (Poda)
Caenis rivulorum Eaton
Amphinemura sulcicollis (Stephens)
Leuctra geniculata (Stephens)
Leuctra inermis Kempny
Leuctra hippopus (Kempny)
Leuctra fusca (L.)
Capnia bifrons (Newman)
Perlodes microcephala (Pictet)
Isoperla grammatica (Poda)
Dinocras cephalotes (Curtis)
Perla bipunctata Pictet
Chloroperla torrentium (Pictet)
 Corixidae
Haliphus sp.
Haliphus lineatocollis (Marsham)
Potamonectes depressus (Fabricius)
Orectochilus villosus (Muller)
Hydraena gracilis Germar
Elmis aenea (Muller)
Esolus parallelepipedus (Muller)
Limnius volckmari (Panzer)
Oulimnius sp.
Oulimnius tuberculatus (Muller)
Sialis lutaria (L.)
Rhyacophila dorsalis (Curtis)
Polycentropus flavomaculatus (Pictet)
Psychomyia pusilla (Fabricius)

Hydropsyche pellucidula (Curtis)
Hydropsyche siltalai Dohler
 Limnephilidae
Anabolia nervosa (Curtis)
Potamophylax latipennis (Curtis)
Allogamus auricollis (Pictet)
Sericostoma personatum (Spence)
Tipula montium group
Dicranota sp.
 Chironomidae
Simulium (*Eusimulium*) *aureum* group
Simulium (*Simulium*) *reptans* group
Simulium (*Simulium*) *argyreatum* group
 Chelifera group
Wiedemannia group
Atherix ibis (Fabricius)
Limnophora sp.

NT 774 577	20 Apr	Main sample	3 minute kick/sweep
NT 774 577	20 Apr	Supplementary	Kick/sweep
NT 774 577	27 Aug	Main sample	3 minute kick/sweep
NT 774 577	27 Aug	Supplementary	Kick/sweep
NT 774 577	15 Nov	Main sample	3 minute kick/sweep
NT 774 577	15 Nov	Supplementary	Kick/sweep

Polycelis nigra group	Polycentropodidae
Polycelis felina (Dalyell)	Polycentropus flavomaculatus (Pictet)
Dendrocoelum lacteum (Muller)	Hydropsyche pellucidula (Curtis)
Potamopyrgus jenkinsi (Smith)	Hydropsyche siltalai Dohler
Lymnaea peregra (Muller)	Hydroptila sp.
Ancylus fluviatilis Muller	Limnephilidae
Pisidium sp.	Drusus annulatus Stephens
Pisidium nitidum Jenyns	Anabolia nervosa (Curtis)
Oligochaeta	Potamophylax sp.
Glossiphonia complanata (L.)	Halesus sp.
Helobdella stagnalis (L.)	Allogamus auricollis (Pictet)
Erpobdella octoculata (L.)	Athripsodes sp.
Hydracarina	Mystacides azurea (L.)
Asellus meridianus Racovitza	Lepidostoma hirtum (Fabricius)
Gammarus pulex (L.)	Sericostoma personatum (Spence)
Baetis scambus group	Tipula montium group
Baetis rhodani (Pictet)	Antocha vitripennis Meigen
Baetis muticus (L.)	Dicranota sp.
Centroptilum luteolum (Muller)	Ceratopogonidae
Centroptilum pennulatum Eaton	Chironomidae
Proclleon bifidum Bengtsson	Simulium (Eusimulium) aureum group
Rhithrogena semicolorata group	Simulium (Wilhelmia) sp.
Heptagenia sulphurea (Muller)	Simulium (Simulium) argyreatum group
Ecdyonurus sp.	Simulium (Simulium) ornatum group
Paraleptophlebia submarginata (Stephens)	Wiedemannia group
Ephemerella ignita (Poda)	Atherix ibis (Fabricius)
Caenis rivulorum Eaton	Limnophora sp.
Amphinemura sulcicollis (Stephens)	
Leuctra geniculata (Stephens)	
Leuctra fusca (L.)	
Perlodes microcephala (Pictet)	
Isoperla grammatica (Poda)	
Dinocras cephalotes (Curtis)	
Perla bipunctata Pictet	
Chloroperla torrentium (Pictet)	
Chloroperla tripunctata (Scopoli)	
Sigara sp.	
Sigara falleni (Fieber)	
Potamonectes depressus (Fabricius)	
Platambus maculatus (L.)	
Orectochilus villosus (Muller)	
Hydraena gracilis Germar	
Elmis aenea (Muller)	
Esolus parallelepipedus (Muller)	
Limnius volckmari (Panzer)	
Oulimnius sp.	
Oulimnius tuberculatus (Muller)	
Rhyacophila dorsalis (Curtis)	
Agapetus sp.	

NT 864 547	19 Apr	Main sample	3 minute kick/sweep
NT 864 547	20 Apr	Supplementary	Kick/sweep
NT 864 547	24 Aug	Main sample	3 minute kick/sweep
NT 864 547	24 Aug	Supplementary	Kick/sweep
NT 864 547	12 Nov	Main sample	3 minute kick/sweep
NT 864 547	12 Nov	Supplementary	Kick/sweep

Polycelis nigra group
Dendrocoelum lacteum (Muller)
Valvata cristata Muller
Potamopyrgus jenkinsi (Smith)
Lymnaea peregra (Muller)
Physa fontinalis (L.)
Armiger crista (L.)
Bathyomphalus contortus (L.)
Ancylus fluviatilis Muller
Sphaerium corneum (L.)
Pisidium milium Held
Pisidium subtruncatum Malm
Pisidium nitidum Jenyns
Oligochaeta
Glossiphonia heteroclita (L.)
Glossiphonia complanata (L.)
Helobdella stagnalis (L.)
Erpobdella octoculata (L.)
Hydracarina
Asellus meridianus Racovitza
Gammarus pulex (L.)
Baetis scambus group
Baetis rhodani (Pictet)
Centroptilum luteolum (Muller)
Cloeon dipterum (L.)
Rhithrogena semicolorata group
Heptagenia sulphurea (Muller)
Ecdyonurus sp.
Ephemerella ignita (Poda)
Caenis luctuosa group
Caenis rivulorum Eaton
Isoperla grammatica (Poda)
Sigara falleni (Fieber)
Brychius elevatus (Panzer)
Haliphus sp.
Haliphus fluviatilis Aube
Potamonectes depressus (Fabricius)
Platambus maculatus (L.)
Orectochilus villosus (Muller)
Elmis aenea (Muller)
Esolus parallelepipedus (Muller)
Limnius volckmari (Panzer)
Oulimnius sp.
Sialis lutaria (L.)
Rhyacophila dorsalis (Curtis)
Hydropsyche pellucidula (Curtis)
Hydropsyche siltalai Dohler
Hydroptila sp.
Anabolia nervosa (Curtis)
Potamophylax sp.

Athripsodes sp.
Athripsodes cinereus (Curtis)
Athripsodes albifrons (L.)
Mystacides sp.
Mystacides azurea (L.)
Ceraclea nigronervosa (Retzius)
Ceraclea annulicornis (Stephens)
Ceraclea dissimilis (Stephens)
Lepidostoma hirtum (Fabricius)
Sericostoma personatum (Spence)
Tipula montium group
Ceratopogonidae
Chironomidae
Simulium (*Eusimulium*) *aureum* group
Simulium (*Wilhelmia*) sp.
Simulium (*Wilhelmia*) *equinum* L.
Simulium (*Simulium*) *reptans* group
Simulium (*Simulium*) *ornatum* group
Hemerodromia group
Wiedemannia group
Atherix ibis (Fabricius)
Limnophora sp.

NT 937 536	20 Apr	Main sample	3 minute kick/sweep
NT 937 536	20 Apr	Supplementary	Kick/sweep
NT 937 536	24 Aug	Main sample	3 minute kick/sweep
NT 937 536	24 Aug	Supplementary	Kick/sweep
NT 937 536	12 Nov	Main sample	3 minute kick/sweep
NT 937 536	12 Nov	Supplementary	Kick/sweep

Polycelis nigra group
Polycelis felina (Dalyell)
Dendrocoelum lacteum (Muller)
Valvata piscinalis (Muller)
Potamopyrgus jenkinsi (Smith)
Lymnaea peregra (Muller)
Physa fontinalis (L.)
Gyraulus albus (Muller)
Armiger crista (L.)
Bathynomphalus contortus (L.)
Ancylus fluviatilis Muller
Sphaerium corneum (L.)
Pisidium casertanum (Poli)
Pisidium subtruncatum Malm
Pisidium nitidum Jenyns
Oligochaeta
Piscicola geometra (L.)
Theromyzon tessulatum (Muller)
Hemiclepsis marginata (Muller)
Glossiphonia heteroclita (L.)
Glossiphonia complanata (L.)
Helobdella stagnalis (L.)
Erpobdella octoculata (L.)
Trocheta bykowskii Gedroyc
Hydracarina
Asellus aquaticus (L.)
Crangonyx pseudogracilis Bousfield
Gammarus pulex (L.)
Baetis scambus group
Baetis rhodani (Pictet)
Baetis muticus (L.)
Centroptilum luteolum (Muller)
Procloeon bifidum Bengtsson
Rhithrogena semicolorata group
Heptagenia sulphurea (Muller)
Ecdyonurus sp.
Ephemerella ignita (Poda)
Caenis luctuosa group
Caenis rivulorum Eaton
Protonemura meyeri (Pictet)
Amphinemura sulcicollis (Stephens)
Leuctra fusca (L.)
Isoperla grammatica (Poda)
Perla bipunctata Pictet
Corixidae
Sigara (*Sigara*) sp.
Sigara falleni (Fieber)
Haliphus sp.
Haliphus fluviatilis Aube
Haliphus wehnckei Gerhardt

Potamonectes depressus (Fabricius)
Oreodytes sanmarkii (Sahlberg)
Oreodytes septentrionalis (Sahlberg)
Orectochilus villosus (Muller)
Elmis aenea (Muller)
Esolus parallelepipedus (Muller)
Limnius volckmari (Panzer)
Oulimnius sp.
Oulimnius tuberculatus (Muller)
Riolus subviolaceus (Muller)
Sialis lutaria (L.)
Rhyacophila dorsalis (Curtis)
Glossosoma sp.
Agapetus sp.
Polycentropus flavomaculatus (Pictet)
Tinodes waeneri (L.)
Hydropsyche pellucidula (Curtis)
Hydropsyche contubernalis McLachlan
Hydropsyche siltalai Dohler
Hydroptila sp.
Anabolia nervosa (Curtis)
Potamophylax latipennis (Curtis)
Athripsodes sp.
Athripsodes cinereus (Curtis)
Athripsodes albifrons (L.)
Mystacides azurea (L.)
Ceraclea annulicornis (Stephens)
Lepidostoma hirtum (Fabricius)
Sericostoma personatum (Spence)
Tipula montium group
Antocha vitripennis Meigen
Dicranota sp.
Psychodidae
Ceratopogonidae
Chironomidae
Simulium (*Wilhelmia*) sp.
Simulium (*Wilhelmia*) *equinum* L.
Simulium (*Wilhelmia*) *lineatum* (Meigen)
Simulium (*Simulium*) *ornatum* group
Hemerodromia group
Atherix ibis (Fabricius)
Limnophora sp.

NT 677 478	18 Apr	Main sample	3 minute kick/sweep
NT 677 478	18 Apr	Supplementary	Kick/sweep
NT 677 478	23 Aug	Main sample	3 minute kick/sweep
NT 677 478	23 Aug	Supplementary	Kick/sweep
NT 677 478	9 Nov	Main sample	3 minute kick/sweep
NT 677 478	9 Nov	Supplementary	Kick/sweep

Polycelis nigra group
Polycelis felina (Dalyell)
Lymnaea peregra (Muller)
Gyraulus albus (Muller)
Acroloxus lacustris (L.)
Ancylus fluviatilis Muller
 Sphaeriidae
Pisidium subtruncatum Malm
Pisidium nitidum Jenyns
 Oligochaeta
Glossiphonia complanata (L.)
Helobdella stagnalis (L.)
Erpobdella octoculata (L.)
 Hydracarina
Asellus aquaticus (L.)
Gammarus pulex (L.)
Baetis scambus group
Baetis rhodani (Pictet)
Procloeon bifidum Bengtsson
Rhithrogena semicolorata group
Heptagenia sulphurea (Muller)
Ecdyonurus sp.
 Leptophlebiidae
Paraleptophlebia submarginata (Stephens)
Ephemerella ignita (Poda)
Caenis rivulorum Eaton
Taeniopteryx nebulosa (L.)
Amphinemura standfussi Ris
Capnia bifrons (Newman)
Isoperla grammatica (Poda)
Sigara (*Sigara*) sp.
Brychius elevatus (Panzer)
Haliphus fluviatilis Aube
Potamonectes depressus (Fabricius)
Oreodytes sanmarkii (Sahlberg)
Platambus maculatus (L.)
Hydraena gracilis Germar
Elmis aenea (Muller)
Limnius volckmari (Panzer)
Oulimnius sp.
Oulimnius tuberculatus (Muller)
Sialis lutaria (L.)
Rhyacophila dorsalis (Curtis)
Rhyacophila munda McLachlan
Polycentropus flavomaculatus (Pictet)
Hydropsyche pellucidula (Curtis)
Hydropsyche siltalai Dohler
Hydroptila sp.
 Limnephilidae
Drusus annulatus Stephens

Limnephilus lunatus group
Tipula montium group
Dicranota sp.
 Ceratopogonidae
 Chironomidae
Simulium (*Eusimulium*) *aureum* group
Simulium (*Wilhelmia*) sp.
Simulium (*Simulium*) *ornatum* group
 Chelifera group
Limnophora sp.

4991 Blackadder

Fogo

1990

NT 770 491	18 Apr	Main sample	3 minute kick/sweep
NT 770 491	18 Apr	Supplementary	Kick/sweep
NT 770 491	23 Aug	Main sample	3 minute kick/sweep
NT 770 491	23 Aug	Supplementary	Kick/sweep
NT 770 491	9 Nov	Main sample	3 minute kick/sweep
NT 770 491	9 Nov	Supplementary	Kick/sweep

Planariidae (incl. Dugesiidae)
 Polycelis nigra group
 Polycelis felina (Dalyell)
 Potamopyrgus jenkinsi (Smith)
 Lymnaea peregra (Muller)
 Physa fontinalis (L.)
 Gyraulus albus (Muller)
 Armiger crista (L.)
 Ancyclus fluviatilis Muller
 Pisidium subtruncatum Malm
 Pisidium hibernicum Westerlund
 Pisidium nitidum Jenyns
 Pisidium pulchellum Jenyns
 Oligochaeta
 Theromyzon tessulatum (Muller)
 Glossiphonia complanata (L.)
 Helobdella stagnalis (L.)
 Erpobdella octocolata (L.)
 Hydracarina
 Asellus meridianus Racovitza
 Gammarus pulex (L.)
 Baetis scambus group
 Baetis rhodani (Pictet)
 Centroptilum luteolum (Muller)
 Procloeon bifidum Bengtsson
 Rhithrogena semicolorata group
 Heptagenia sulphurea (Muller)
 Ecdyonurus sp.
 Leptophlebiidae
 Ephemerella ignita (Poda)
 Ephemera danica Muller
 Caenis luctuosa group
 Caenis rivulorum Eaton
 Taeniopteryx nebulosa (L.)
 Protonemura meyeri (Pictet)
 Amphinemura sulcicollis (Stephens)
 Leuctra geniculata (Stephens)
 Leuctra fusca (L.)
 Isoperla grammatica (Poda)
 Dinocras cephalotes (Curtis)
 Chloroperla torrentium (Pictet)
 Sigara (Sigara) sp.
 Haliplus fluviatilis Aube
 Potamonectes depressus (Fabricius)
 Oreodytes sanmarkii (Sahlberg)
 Platambus maculatus (L.)
 Ilybius sp.
 Gyrinus natator group
 Orectochilus villosus (Muller)
 Elmis aenea (Muller)

Esolus parallelepipedus (Muller)
 Limnius volckmari (Panzer)
 Oulimnius sp.
 Oulimnius tuberculatus (Muller)
 Riolus subviolaceus (Muller)
 Sialis lutaria (L.)
 Rhyacophila dorsalis (Curtis)
 Glossosoma sp.
 Polycentropus flavomaculatus (Pictet)
 Tinodes waeneri (L.)
 Hydropsyche pellucidula (Curtis)
 Hydropsyche siltalai Dohler
 Hydroptila sp.
 Limnephilidae
 Potamophylax sp.
 Potamophylax latipennis (Curtis)
 Halesus radiatus (Curtis)
 Athripsodes sp.
 Athripsodes cinereus (Curtis)
 Mystacides azurea (L.)
 Lepidostoma hirtum (Fabricius)
 Sericostoma personatum (Spence)
 Tipula montium group
 Dicranota sp.
 Pericoma exquisita Eaton
 Ceratopogonidae
 Chironomidae
 Simulium (Eusimulium) aureum group
 Simulium (Wilhelmia) sp.
 Simulium (Simulium) reptans group
 Simulium (Simulium) ornatum group
 Oxycera sp.
 Hemerodromia group
 Atherix ibis (Fabricius)
 Limnophora sp.

NT 864 545	18 Apr	Main sample	3 minute kick/sweep
NT 864 545	18 Apr	Supplementary	Kick/sweep
NT 864 545	24 Aug	Main sample	3 minute kick/sweep
NT 864 545	24 Aug	Supplementary	Kick/sweep
NT 864 545	12 Nov	Main sample	3 minute kick/sweep
NT 864 545	12 Nov	Supplementary	Kick/sweep

Polycelis nigra group
Polycelis felina (Dalyell)
Dendrocoelum lacteum (Muller)
Potamopyrgus jenkinsi (Smith)
Lymnaea peregra (Muller)
Physa fontinalis (L.)
Gyraulus albus (Muller)
Armiger crista (L.)
Bathyomphalus contortus (L.)
Ancylus fluviatilis Muller
Pisidium sp.
Pisidium subtruncatum Malm
Pisidium nitidum Jenyns
Oligochaeta
Piscicola geometra (L.)
Theromyzon tessulatum (Muller)
Hemiclepsis marginata (Muller)
Glossiphonia complanata (L.)
Helobdella stagnalis (L.)
Erpobdella octoculata (L.)
Hydracarina
Asellus meridianus Racovitza
Baetis scambus group
Baetis rhodani (Pictet)
Centroptilum luteolum (Muller)
Rhithrogena semicolorata group
Heptagenia sp.
Heptagenia sulphurea (Muller)
Ephemerella ignita (Poda)
Caenis luctuosa group
Caenis rivulorum Eaton
Taeniopteryx nebulosa (L.)
Sigara (*Sigara*) sp.
Sigara falleni (Fieber)
Halipus sp.
Halipus lineatocollis (Marsham)
Halipus fluviatilis Aube
Potamonectes depressus (Fabricius)
Oreodytes sanmarkii (Sahlberg)
Oreodytes septentrionalis (Sahlberg)
Hydraena riparia Kugelann
Elmis aenea (Muller)
Esolus parallelepipedus (Muller)
Limnius volckmari (Panzer)
Oulimnius sp.
Oulimnius tuberculatus (Muller)
Sialis lutaria (L.)
Rhyacophila dorsalis (Curtis)
Glossosoma sp.
Hydropsyche pellucidula (Curtis)
Hydropsyche contubernalis McLachlan

Hydropsyche siltalai Dohler
Hydroptila sp.
Limnephilus lunatus group
Anabolia nervosa (Curtis)
Athripsodes sp.
Mystacides azurea (L.)
Ceraclea annulicornis (Stephens)
Ceraclea dissimilis (Stephens)
Lepidostoma hirtum (Fabricius)
Sericostoma personatum (Spence)
Tipula montium group
Pericoma blandula Eaton
Pericoma exquisita Eaton
Pericoma neglecta Eaton
Ceratopogonidae
Chironomidae
Simulium (*Eusimulium*) *aureum* group
Simulium (*Wilhelmia*) sp.
Simulium (*Wilhelmia*) *equinum* L.
Simulium (*Wilhelmia*) *lineatum* (Meigen)
Simulium (*Simulium*) *reptans* group
Simulium (*Simulium*) *ornatum* group
Wiedemannia group
Atherix ibis (Fabricius)
Limnophora sp.

TF 866 067	26 Mar	Main sample	3 minute kick/sweep
TF 866 067	26 Apr	Supplementary	Kick/sweep
TF 866 067	9 Jul	Main sample	3 minute kick/sweep
TF 866 067		Supplementary	No sample taken
TF 866 067	19 Nov	Main sample	3 minute kick/sweep
TF 866 067		Supplementary	No sample taken

Polycelis nigra group
 Lymnaea palustris (Muller)
 Lymnaea stagnalis (L.)
 Lymnaea peregra (Muller)
 Physa fontinalis (L.)
 Planorbis carinatus Muller
 Anisus vortex (L.)
 Gyraulus albus (Muller)
 Sphaerium corneum (L.)
 Pisidium subtruncatum Malm
 Pisidium nitidum Jenyns
 Oligochaeta
 Theromyzon tessulatum (Muller)
 Glossiphonia complanata (L.)
 Helobdella stagnalis (L.)
 Erpobdella octoculata (L.)
 Hydracarina
 Asellus aquaticus (L.)
 Gammarus pulex (L.)
 Baetis vernus Curtis
 Baetis rhodani (Pictet)
 Cloeon sp.
 Habrophlebia fusca (Curtis)
 Ephemerella ignita (Poda)
 Caenis luctuosa group
 Caenis horaria (L.)
 Ischnura elegans (Van der Linden)
 Enallagma cyathigerum (Charpentier)
 Sigara (Sigara) sp.
 Sigara falleni (Fieber)
 Haliphus sp.
 Potamonectes depressus (Fabricius)
 Agabus sp.
 Agabus didymus (Olivier)
 Ilybius fuliginosus (Fabricius)
 Elmis aenea (Muller)
 Oulimnius sp.
 Sialis lutaria (L.)
 Hydropsyche angustipennis (Curtis)
 Hydropsyche siltalai Dohler
 Tipula montium group
 Dicranota sp.
 Pericoma exquisita Eaton
 Ceratopogonidae
 Chironomidae
 Simulium (Nevermannia) vernum group
 Simulium (Nevermannia) cryophilum group

TF 834 009	26 Mar	Main sample	3 minute kick/sweep
TF 834 009	26 Apr	Supplementary	Kick/sweep
TF 834 009	9 Jul	Main sample	3 minute kick/sweep
TF 834 009		Supplementary	No sample taken
TF 834 009	19 Nov	Main sample	3 minute kick/sweep
TF 834 009		Supplementary	No sample taken

Valvata cristata Muller
Valvata macrostoma Morch
Valvata piscinalis (Muller)
Potamopyrgus jenkinsi (Smith)
Bithynia tentaculata (L.)
Lymnaea peregra (Muller)
Physa fontinalis (L.)
Planorbis carinatus Muller
Anisus vortex (L.)
Gyraulus albus (Muller)
Armiger crista (L.)
Bathyomphalus contortus (L.)
Acroloxus lacustris (L.)
Ancylus fluviatilis Muller
Sphaerium corneum (L.)
Pisidium subtruncatum Malm
Pisidium henslowanum (Sheppard)
Pisidium nitidum Jenyns
Oligochaeta
Piscicola geometra (L.)
Theromyzon tessulatum (Muller)
Hemiclepsis marginata (Muller)
Glossiphonia heteroclita (L.)
Glossiphonia complanata (L.)
Helobdella stagnalis (L.)
Erpobdella octoculata (L.)
Hydracarina
Asellus aquaticus (L.)
Asellus meridianus Racovitza
Crangonyx pseudogracilis Bousfield
Gammarus pulex (L.)
Baetis vernus Curtis
Baetis rhodani (Pictet)
Centroptilum luteolum (Muller)
Cloeon dipterum (L.)
Ephemerella ignita (Poda)
Ephemera danica Muller
Caenis luctuosa group
Nemoura avicularis Morton
Leuctra geniculata (Stephens)
Leuctra fusca (L.)
Ischnura elegans (Van der Linden)
Micronecta sp.
Hesperocorixa sahlbergi (Fieber)
Sigara (*Sigara*) sp.
Haliphus sp.
Potamonectes depressus (Fabricius)
Hydroporus palustris (L.)
Agabus didymus (Olivier)

Hydrophilidae (incl. *Hydraenidae*)
Elmis aenea (Muller)
Limnius volckmari (Panzer)
Oulimnius sp.
Sialis lutaria (L.)
Tinodes waeneri (L.)
Hydropsyche angustipennis (Curtis)
Hydropsyche siltalai Dohler
Hydroptila sp.
Limnephilus lunatus group
Halesus radiatus (Curtis)
Mystacides azurea (L.)
Ceraclea dissimilis (Stephens)
Goera pilosa (Fabricius)
Tipula montium group
Tipula oleracea L.
Dicranota sp.
Pericoma fallax Eaton
Ceratopogonidae
Chironomidae
Simulium (*Nevermannia*) *angustitarse* group
Simulium (*Eusimulium*) *aureum* group
Simulium (*Wilhelmia*) sp.
Simulium (*Simulium*) *ornatum* group
Oxycera sp.
Atalanta group

TL 771 967	29 Mar	Main sample	3 minute kick/sweep
TL 771 967	26 Apr	Supplementary	Kick/sweep
TL 771 967	23 Aug	Main sample	3 minute kick/sweep
TL 771 967		Supplementary	No sample taken
TL 771 967	26 Nov	Main sample	3 minute kick/sweep
TL 771 967		Supplementary	No sample taken

Polycelis nigra group	Hygrotus versicolor (Schaller)
Dugesia tigrina (Girard)	Potamonectes depressus (Fabricius)
Dendrocoelum lacteum (Muller)	Ilybius sp.
Potamopyrgus jenkinsi (Smith)	Orectochilus villosus (Muller)
Bithynia tentaculata (L.)	Hydraena riparia Kugelann
Bithynia leachi (Sheppard)	Limnebius truncatellus (Thunberg)
Lymnaea stagnalis (L.)	Anacaena globulus (Paykull)
Lymnaea auricularia (L.)	Anacaena limbata (Fabricius)
Lymnaea peregra (Muller)	Elmis aenea (Muller)
Physa fontinalis (L.)	Limnius volckmari (Panzer)
Planorbis carinatus Muller	Oulimnius tuberculatus (Muller)
Anisus vortex (L.)	Oulimnius major (Rey)
Gyraulus albus (Muller)	Sialis lutaria (L.)
Armiger crista (L.)	Agapetus sp.
Ancylus fluviatilis Muller	Polycentropus flavomaculatus (Pictet)
Anodonta group	Lype sp.
Sphaerium corneum (L.)	Hydropsyche pellucidula (Curtis)
Pisidium amnicum (Muller)	Hydropsyche siltalai Dohler
Pisidium subtruncatum Malm	Hydroptila sp.
Pisidium henslowanum (Sheppard)	Limnophilus lunatus group
Pisidium hibernicum Westerlund	Potamophylax sp.
Pisidium nitidum Jenyns	Potamophylax cingulatus (Stephens)
Oligochaeta	Potamophylax latipennis (Curtis)
Piscicola geometra (L.)	Halesus radiatus (Curtis)
Theromyzon tessulatum (Muller)	Chaetopteryx villosa (Fabricius)
Glossiphonia complanata (L.)	Molanna angustata Curtis
Helobdella stagnalis (L.)	Athripsodes sp.
Erpobdella octoculata (L.)	Athripsodes cinereus (Curtis)
Hydracarina	Athripsodes albifrons (L.)
Asellus aquaticus (L.)	Mystacides azurea (L.)
Crangonyx pseudogracilis Bousfield	Goera pilosa (Fabricius)
Gammarus pulex (L.)	Silo nigricornis (Pictet)
Baetis rhodani (Pictet)	Lepidostoma hirtum (Fabricius)
Centroptilum luteolum (Muller)	Sericostoma personatum (Spence)
Ephemerella ignita (Poda)	Tipula montium group
Ephemera danica Muller	Dicranota sp.
Caenis luctuosa group	Pilaria (Neolimnomyia) sp.
Caenis horaria (L.)	Ceratopogonidae
Leuctra geniculata (Stephens)	Chironomidae
Leuctra fusca (L.)	Simulium (Nevermannia) angustitarse group
Ischnura elegans (Van der Linden)	Simulium (Eusimulium) aureum group
Calopteryx sp.	Simulium (Wilhelmia) sp.
Calopteryx splendens (Harris)	Simulium (Simulium) reptans group
Gerris sp.	Simulium (Boophthora) erythrocephalum De Geer
Corixa panzeri (Fieber)	Simulium (Simulium) ornatum group
Hesperocorixa sahlbergi (Fieber)	Oxycera sp.
Sigara (Sigara) sp.	Hemerodromia group
Sigara falleni (Fieber)	Chrysops sp.
Sigara venusta (Douglas & Scott)	Ephydridae
Haliphus fluviatilis Aube	Muscidae
Laccophilus sp.	Limnophora sp.

TL 664 977	29 Mar	Main sample	3 minute kick/sweep
TL 664 977	26 Apr	Supplementary	Kick/sweep
TL 664 977	20 Aug	Main sample	3 minute kick/sweep
TL 664 977		Supplementary	No sample taken
TL 664 977	21 Nov	Main sample	3 minute kick/sweep
TL 664 977		Supplementary	No sample taken

Planaria torva (Muller)	Notonecta glauca L.
Polycelis nigra group	Corixa dentipes (Thomson)
Dugesia tigrina (Girard)	Corixa punctata (Illiger)
Dugesia polychroa group	Sigara (Sigara) sp.
Viviparus viviparus (L.)	Sigara falleni (Fieber)
Valvata cristata Muller	Sigara lateralis (Leach)
Valvata piscinalis (Muller)	Haliphus lineatocollis (Marsham)
Potamopyrgus jenkinsi (Smith)	Haliphus fluviatilis Aube
Bithynia tentaculata (L.)	Haliphus immaculatus Gerhardt
Bithynia leachi (Sheppard)	Haliphus flavicollis Sturm
Lymnaea stagnalis (L.)	Noterus clavicornis (Degeer)
Lymnaea auricularia (L.)	Laccophilus hyalinus (Degeer)
Lymnaea peregra (Muller)	Hyphydrus ovatus (L.)
Physa fontinalis (L.)	Potamonectes depressus (Fabricius)
Planorbis carinatus Muller	Stictotarsus duodecimpustulatus (Fabricius)
Planorbis planorbis (L.)	Platambus maculatus (L.)
Anisus vortex (L.)	Anacaena globulus (Paykull)
Gyraulus albus (Muller)	Anacaena limbata (Fabricius)
Armiger crista (L.)	Anacaena bipustulatus (Marsham)
Bathymphalus contortus (L.)	Laccobius biguttatus Gerhardt
Hippeutis complanatus (L.)	Enochrus testaceus (Fabricius)
Acroloxus lacustris (L.)	Elmis aenea (Muller)
Anodonta group	Oulimnius tuberculatus (Muller)
Sphaerium corneum (L.)	Sialis lutaria (L.)
Pisidium subtruncatum Malm	Cyrnus flavidus McLachlan
Pisidium henslowanum (Sheppard)	Lype sp.
Pisidium hibernicum Westerlund	Phryganea grandis group
Pisidium nitidum Jenyns	Limnephilus marmoratus Curtis
Dreissena polymorpha (Pallas)	Limnephilus lunatus group
Oligochaeta	Anabolia nervosa (Curtis)
Piscicola geometra (L.)	Molanna angustata Curtis
Theromyzon tessulatum (Muller)	Athripsodes aterrimus (Stephens)
Hemiclepsis marginata (Muller)	Mystacides nigra (L.)
Glossiphonia heteroclita (L.)	Mystacides longicornis (L.)
Glossiphonia complanata (L.)	Ceraclea fulva (Rambur)
Helobdella stagnalis (L.)	Chaoborus flavicans (Meigen)
Erpobdella testacea (Savigny)	Ceratopogonidae
Erpobdella octoculata (L.)	Chironomidae
Hydracarina	Ephydridae
Asellus aquaticus (L.)	Muscidae
Crangonyx pseudogracilis Bousfield	Limnophora sp.
Gammarus pulex (L.)	
Cloeon dipterum (L.)	
Caenis luctuosa group	
Caenis robusta Eaton	
Caenis horaria (L.)	
Ischnura elegans (Van der Linden)	
Gerris sp.	
Nepa cinerea L.	

SX 550 751	19 Apr	Main sample	3 minute kick/sweep
SX 550 751	19 Apr	Supplementary	Kick/sweep
SX 550 751	20 Jul	Main sample	3 minute kick/sweep
SX 550 751	20 Jul	Supplementary	Kick/sweep
SX 550 751	16 Oct	Main sample	3 minute kick/sweep
SX 550 751	16 Oct	Supplementary	Kick/sweep

Planariidae (incl. Dugesiiidae)	Adicella reducta (McLachlan)
Oligochaeta	Oecetis testacea (Curtis)
Hydracarina	Sericostoma personatum (Spence)
Baetis vernus Curtis	Tipula montium group
Baetis rhodani (Pictet)	Dicranota sp.
Heptagenia lateralis (Curtis)	Pericoma sp.
Ecdyonurus sp.	Dixa puberula Loew
Leptophlebiidae	Ceratopogonidae
Leptophlebia sp.	Chironomidae
Leptophlebia marginata (L.)	Simulium (Nevermannia) venum group
Paraleptophlebia cincta (Retzius)	Simulium (Nevermannia) cryophilum group
Ephemera ignita (Poda)	Simulium (Nevermannia) cryophilum (Rubtsov)
Protonemura meyeri (Pictet)	Simulium (Simulium) ornatum group
Amphinemura sulcicollis (Stephens)	Atherix marginata (Fabricius)
Leuctra inermis Kempny	Limnophora sp.
Leuctra hippopus (Kempny)	
Leuctra fusca (L.)	
Perlodes microcephala (Pictet)	
Isoperla grammatica (Poda)	
Dinocras cephalotes (Curtis)	
Chloroperla torrentium (Pictet)	
Pyrrhosoma nymphula (Sulzer)	
Calopteryx virgo (L.)	
Velia sp.	
Gerris sp.	
Gerris gibbifer Schummel	
Oreodytes septentrionalis (Sahlberg)	
Orectochilus villosus (Muller)	
Helophorus sp.	
Helophorus flavipes (Fabricius)	
Elodes sp.	
Elmis aenea (Muller)	
Limnius volckmari (Panzer)	
Oulimnius tuberculatus (Muller)	
Rhyacophila dorsalis (Curtis)	
Rhyacophila munda McLachlan	
Plectrocnemia conspersa (Curtis)	
Plectrocnemia geniculata McLachlan	
Polycentropus flavomaculatus (Pictet)	
Polycentropus kingi McLachlan	
Hydropsyche siltalai Dohler	
Hydroptila sp.	
Oxyethira sp.	
Limnephilidae	
Drusus annulatus Stephens	
Anabolia nervosa (Curtis)	
Potamophylax cingulatus (Stephens)	
Halesus radiatus (Curtis)	
Chaetopteryx villosa (Fabricius)	

SX 489 710	19 Apr	Main sample	3 minute kick/sweep
SX 489 710	19 Apr	Supplementary	Kick/sweep
SX 489 710	20 Jul	Main sample	3 minute kick/sweep
SX 489 710	20 Jul	Supplementary	Kick/sweep
SX 489 710	16 Oct	Main sample	3 minute kick/sweep
SX 489 710	16 Oct	Supplementary	Kick/sweep

Planariidae (incl. Dugesiidae)
 Polycelis felina (Dalyell)
 Potamopyrgus jenkinsi (Smith)
 Lymnaea peregra (Muller)
 Ancylus fluviatilis Muller
 Pisidium sp.
 Pisidium personatum Malm
 Oligochaeta
 Hydracarina
 Gammarus pulex (L.)
 Baetis scambus group
 Baetis rhodani (Pictet)
 Baetis muticus (L.)
 Baetis niger (L.)
 Rhithrogena semicolorata group
 Ecdyonurus sp.
 Ephemerella ignita (Poda)
 Caenis rivulorum Eaton
 Brachyptera risi (Morton)
 Protonemura sp.
 Protonemura meyeri (Pictet)
 Amphinemura sulcicollis (Stephens)
 Perlodes microcephala (Pictet)
 Isoperla grammatica (Poda)
 Dinocras cephalotes (Curtis)
 Chloroperla torrentium (Pictet)
 Calopteryx sp.
 Calopteryx virgo (L.)
 Cordulegaster boltonii (Donovan)
 Velia sp.
 Gerris sp.
 Potamonectes depressus (Fabricius)
 Stictotarsus duodecimpustulatus (Fabricius)
 Oreodytes sanmarkii (Sahlberg)
 Orectochilus villosus (Muller)
 Hydraena gracilis Germar
 Elmis aenea (Muller)
 Esolus parallelepipedus (Muller)
 Limnius volckmari (Panzer)
 Oulimnius sp.
 Oulimnius tuberculatus (Muller)
 Rhyacophila dorsalis (Curtis)
 Rhyacophila munda McLachlan
 Glossosoma sp.
 Agapetus sp.
 Plectrocnemia conspersa (Curtis)
 Polycentropus flavomaculatus (Pictet)
 Hydropsyche sp.
 Hydropsyche pellucidula (Curtis)
 Hydropsyche siltalai Dohler

Drusus annulatus Stephens
 Potamophylax group
 Halesus radiatus (Curtis)
 Chaetopteryx villosa (Fabricius)
 Mystacides azurea (L.)
 Adicella reducta (McLachlan)
 Oecetis sp.
 Oecetis testacea (Curtis)
 Silo pallipes (Fabricius)
 Lepidostoma hirtum (Fabricius)
 Lasiocephala basalis (Kolenati)
 Brachycentrus subnubilus Curtis
 Sericostoma personatum (Spence)
 Tipula montium group
 Dicranota sp.
 Dixia sp.
 Ceratopogonidae
 Chironomidae
 Simulium (Nevermannia) vernal group
 Simulium (Nevermannia) angustitarse group
 Simulium (Eusimulium) aureum group
 Simulium (Simulium) reptans group
 Simulium (Simulium) argyreatum group
 Simulium (Simulium) variegatum Meigen
 Simulium (Simulium) ornatum group
 Wiedemannia group
 Atherix marginata (Fabricius)
 Tabanus group

SK 220 646	26 Apr	Main sample	3 minute kick/sweep
SK 220 646	26 Apr	Supplementary	Kick/sweep
SK 220 646	1 Aug	Main sample	3 minute kick/sweep
SK 220 646	1 Aug	Supplementary	Kick/sweep
SK 220 646	5 Nov	Main sample	3 minute kick/sweep
SK 220 646	5 Nov	Supplementary	Kick/sweep

Potamopyrgus jenkinsi (Smith)	Sericostoma personatum (Spence)
Ancylus fluviatilis Muller	Tipula montium group
Pisidium casertanum (Poli)	Tipula oleracea L.
Pisidium personatum Malm	Antocha vitripennis Meigen
Oligochaeta	Pericoma diversa Tonnoir
Helobdella stagnalis (L.)	Pericoma exquisita Eaton
Hydracarina	Pericoma neglecta Eaton
Gammarus pulex (L.)	Ceratopogonidae
Baetis vernus Curtis	Chironomidae
Baetis rhodani (Pictet)	Simulium (Simulium) ornatum group
Baetis muticus (L.)	Oxycera sp.
Centroptilum luteolum (Muller)	Hemerodromia group
Ephemerella ignita (Poda)	Wiedemannia group
Ephemera danica Muller	Limnophora sp.
Caenis rivulorum Eaton	
Protonemura meyeri (Pictet)	
Amphinemura sulcicollis (Stephens)	
Leuctra geniculata (Stephens)	
Leuctra fusca (L.)	
Isoperla grammatica (Poda)	
Dinocras cephalotes (Curtis)	
Platambus maculatus (L.)	
Helophorus brevipalpis Bedel	
Elmis aenea (Muller)	
Esolus parallelepipedus (Muller)	
Limnius volckmari (Panzer)	
Riolus cupreus (Muller)	
Riolus subviolaceus (Muller)	
Rhyacophila dorsalis (Curtis)	
Rhyacophila munda McLachlan	
Agapetus sp.	
Wormaldia sp.	
Polycentropus flavomaculatus (Pictet)	
Hydropsyche pellucidula (Curtis)	
Hydropsyche instabilis (Curtis)	
Hydropsyche siltalai Dohler	
Hydroptila sp.	
Ithytrichia sp.	
Oxyethira sp.	
Limnephilidae	
Limnephilus lunatus group	
Potamophylax latipennis (Curtis)	
Halesus radiatus (Curtis)	
Melampophylax mucoreus (Hagen)	
Chaetopteryx villosa (Fabricius)	
Athripsodes sp.	
Athripsodes bilineatus (L.)	
Silo nigricornis (Pictet)	
Lepidostoma hirtum (Fabricius)	
Lasiocephala basalis (Kolenati)	

SK 242 657	26 Apr	Main sample	3 minute kick/sweep
SK 242 657	26 Apr	Supplementary	Kick/sweep
SK 242 657	1 Aug	Main sample	3 minute kick/sweep
SK 242 657	1 Aug	Supplementary	Kick/sweep
SK 242 657	5 Nov	Main sample	3 minute kick/sweep
SK 242 657	5 Nov	Supplementary	Kick/sweep

Potamopyrgus jenkinsi (Smith)	Hemerodromia group
Ancylus fluviatilis Muller	Wiedemannia group
Pisidium casertanum (Poli)	Muscidae
Pisidium personatum Malm	
Pisidium subtruncatum Malm	
Oligochaeta	
Hydracarina	
Gammarus pulex (L.)	
Astacidae	
Baetidae	
Centroptilum luteolum (Muller)	
Rhithrogena semicolorata group	
Paraleptophlebia submarginata (Stephens)	
Ephemerella ignita (Poda)	
Ephemera danica Muller	
Caenis rivulorum Eaton	
Protonemura meyeri (Pictet)	
Amphinemura sulcicollis (Stephens)	
Leuctra geniculata (Stephens)	
Leuctra fusca (L.)	
Isoperla grammatica (Poda)	
Brychius elevatus (Panzer)	
Helophorus brevipalpis Bedel	
Elmis aenea (Muller)	
Riolus cupreus (Muller)	
Riolus subviolaceus (Muller)	
Rhyacophila dorsalis (Curtis)	
Rhyacophila munda McLachlan	
Polycentropus flavomaculatus (Pictet)	
Tinodes unicolor (Pictet)	
Metalype fragilis (Pictet)	
Psychomyia pusilla (Fabricius)	
Hydropsyche instabilis (Curtis)	
Hydropsyche siltalai Dohler	
Hydroptila sp.	
Limnephilus lunatus group	
Athripsodes sp.	
Mystacides azurea (L.)	
Goera pilosa (Fabricius)	
Silo pallipes (Fabricius)	
Lepidostoma hirtum (Fabricius)	
Tipula sp.	
Tipula montium group	
Tipula oleracea L.	
Antocha vitripennis Meigen	
Helius sp.	
Gonempeda group	
Psychodidae	
Ceratopogonidae	
Chironomidae	
Chelifera group	

NT 851 109	11 Apr	Main sample	3 minute kick/sweep
NT 851 109		Supplementary	No sample taken
NT 851 109	12 Jul	Main sample	3 minute kick/sweep
NT 851 109		Supplementary	No sample taken
NT 851 109	17 Oct	Main sample	3 minute kick/sweep
NT 851 109		Supplementary	No sample taken

Planariidae (incl. Dugesiidae)
 Polycelis felina (Dalyell)
 Crenobia alpina (Dana)
 Potamopyrgus jenkinsi (Smith)
 Lymnaea peregra (Muller)
 Ancyclus fluviatilis Muller
 Oligochaeta
 Glossiphonia complanata (L.)
 Helobdella stagnalis (L.)
 Hydracarina
 Gammarus pulex (L.)
 Baetis scambus group
 Baetis rhodani (Pictet)
 Rhithrogena semicolorata group
 Ecdyonurus sp.
 Paraleptophlebia submarginata (Stephens)
 Ephemerella ignita (Poda)
 Caenis rivulorum Eaton
 Amphinemura sulcicollis (Stephens)
 Leuctra inermis Kempny
 Leuctra fusca (L.)
 Capnia bifrons (Newman)
 Perlodes microcephala (Pictet)
 Isoperla grammatica (Poda)
 Dinocras cephalotes (Curtis)
 Chloroperla torrentium (Pictet)
 Velia sp.
 Velia caprai Tamanini
 Oreodytes sanmarkii (Sahlberg)
 Oreodytes septentrionalis (Sahlberg)
 Platambus maculatus (L.)
 Hydraena gracilis Germar
 Elmis aenea (Muller)
 Esolus parallelepipedus (Muller)
 Limnius volckmari (Panzer)
 Oulimnius tuberculatus (Muller)
 Rhyacophila dorsalis (Curtis)
 Polycentropus flavomaculatus (Pictet)
 Hydropsyche pellucidula (Curtis)
 Hydropsyche siltalai Dohler
 Limnephilidae
 Drusus annulatus Stephens
 Halesus radiatus (Curtis)
 Melampophylax mucoreus (Hagen)
 Odontocerum albicorne (Scopoli)
 Sericostoma personatum (Spence)
 Tipula montium group
 Dicranota sp.
 Chironomidae
 Simulium (Simulium) argyreatum group
 Empididae
 Limnophora sp.

NT 894 062	11 Apr	Main sample	3 minute kick/sweep
NT 894 062	11 Apr	Supplementary	Kick/sweep
NT 894 062	12 Jul	Main sample	3 minute kick/sweep
NT 894 062	12 Jul	Supplementary	Kick/sweep
NT 894 062	17 Oct	Main sample	3 minute kick/sweep
NT 894 062	17 Oct	Supplementary	Kick/sweep

Potamopyrgus jenkinsi (Smith)
Lymnaea peregra (Muller)
Ancylus fluviatilis Muller
Oligochaeta
Glossiphonia complanata (L.)
Hydracarina
Gammarus pulex (L.)
Baetis scambus group
Baetis rhodani (Pictet)
Baetis muticus (L.)
Rhithrogena semicolorata group
Ecdyonurus sp.
Ephemerella ignita (Poda)
Ephemera danica Muller
Caenis rivulorum Eaton
Protonemura meyeri (Pictet)
Amphinemura sulcicollis (Stephens)
Leuctra sp.
Leuctra geniculata (Stephens)
Leuctra inermis Kempny
Leuctra fusca (L.)
Capnia bifrons (Newman)
Isoperla grammatica (Poda)
Dinocras cephalotes (Curtis)
Chloroperla torrentium (Pictet)
Micronecta sp.
Potamonectes sp.
Oreodytes sanmarkii (Sahlberg)
Hydraena gracilis Germar
Elmis aenea (Muller)
Esolus parallelepipedus (Muller)
Limnius volckmari (Panzer)
Oulimnius tuberculatus (Muller)
Riolus sp.
Rhyacophila dorsalis (Curtis)
Polycentropus flavomaculatus (Pictet)
Hydropsyche pellucidula (Curtis)
Hydropsyche siltalai Dohler
Ecclisopteryx guttulata (Pictet)
Melampophylax mucoreus (Hagen)
Odontocerum albicorne (Scopoli)
Athripsodes sp.
Lepidostoma hirtum (Fabricius)
Tipula montium group
Dicranota sp.
Pericoma exquisita Eaton
Chironomidae
Simulium (*Eusimulium*) *aureum* group
Simulium (*Simulium*) *reptans* group
Simulium (*Simulium*) *argyreatum* group
Empididae
Wiedemannia group

NT 954 038	11 Apr	Main sample	3 minute kick/sweep
NT 954 038		Supplementary	No sample taken
NT 954 038	12 Jul	Main sample	3 minute kick/sweep
NT 954 038	12 Jul	Supplementary	Kick/sweep
NT 954 038	17 Oct	Main sample	3 minute kick/sweep
NT 954 038	17 Oct	Supplementary	Kick/sweep

Crenobia alpina (Dana)
Potamopyrgus jenkinsi (Smith)
Lymnaea peregra (Muller)
Ancylus fluviatilis Muller
Pisidium sp.
Oligochaeta
Glossiphonia complanata (L.)
Helobdella stagnalis (L.)
Hydracarina
Gammarus pulex (L.)
Baetis scambus group
Baetis rhodani (Pictet)
Baetis muticus (L.)
Centroptilum luteolum (Muller)
Rhithrogena semicolorata group
Ecdyonurus sp.
Ephemerella ignita (Poda)
Ephemera danica Muller
Caenis rivulorum Eaton
Taeniopteryx nebulosa (L.)
Amphinemura sulcicollis (Stephens)
Leuctra sp.
Leuctra geniculata (Stephens)
Leuctra fusca (L.)
Perlodes microcephala (Pictet)
Isoperla grammatica (Poda)
Dinocras cephalotes (Curtis)
Perla bipunctata Pictet
Chloroperla sp.
Chloroperla torrentium (Pictet)
Chloroperla tripunctata (Scopoli)
Potamonectes sp.
Oreodytes sanmarkii (Sahlberg)
Orectochilus villosus (Muller)
Hydraena gracilis Germar
Elmis aenea (Muller)
Esolus parallelepipedus (Muller)
Limnius volckmari (Panzer)
Oulimnius sp.
Oulimnius tuberculatus (Muller)
Rhyacophila dorsalis (Curtis)
Polycentropus flavomaculatus (Pictet)
Psychomyia pusilla (Fabricius)
Hydropsyche pellucidula (Curtis)
Hydropsyche siltalai Dohler
Hydroptila sp.
Ecclisopteryx guttulata (Pictet)
Halesus radiatus (Curtis)
Athripsodes sp.
Athripsodes cinereus (Curtis)

Mystacides azurea (L.)
Lepidostoma hirtum (Fabricius)
Sericostoma personatum (Spence)
Tipula montium group
Dicranota sp.
Psychodidae
Pericoma exquisita Eaton
Pericoma trivialis group
Ceratopogonidae
Chironomidae
Simulium (Nevermannia) *cryophilum* group
Simulium (Wilhelmia) sp.
Simulium (Simulium) *reptans* group
Simulium (Simulium) *argyreatum* group
Simulium (Simulium) *ornatum* group
Chelifera group
Wiedemannia group
Atherix ibis (Fabricius)
Limnophora sp.

NZ 101 995	11 Apr	Main sample	3 minute kick/sweep
NZ 101 995	11 Apr	Supplementary	Kick/sweep
NZ 101 995	12 Jul	Main sample	3 minute kick/sweep
NZ 101 995	12 Jul	Supplementary	Kick/sweep
NZ 101 995	17 Oct	Main sample	3 minute kick/sweep
NZ 101 995	17 Oct	Supplementary	Kick/sweep

Polycelis nigra group
Polycelis felina (Dalyell)
Dendrocoelum lacteum (Muller)
Potamopyrgus jenkinsi (Smith)
Lymnaea peregra (Muller)
Physa fontinalis (L.)
Armiger crista (L.)
Bathynomphalus contortus (L.)
Ancylus fluviatilis Muller
Sphaerium corneum (L.)
Pisidium milium Held
Pisidium subtruncatum Malm
Pisidium nitidum Jenyns
Oligochaeta
Theromyzon tessulatum (Muller)
Glossiphonia complanata (L.)
Helobdella stagnalis (L.)
Erpobdella octoculata (L.)
Hydracarina
Asellus aquaticus (L.)
Asellus meridianus Racovitza
Gammarus pulex (L.)
Baetis scambus group
Baetis rhodani (Pictet)
Baetis muticus (L.)
Centroptilum luteolum Eaton
Rhithrogena semicolorata group
Heptagenia sulphurea (Muller)
Ecdyonurus sp.
Ephemerella ignita (Poda)
Ephemerella notata Eaton
Ephemera danica Muller
Caenis rivulorum Eaton
Taeniopteryx nebulosa (L.)
Protonemura praecox (Morton)
Leuctra geniculata (Stephens)
Leuctra fusca (L.)
Isoperla grammatica (Poda)
Perla bipunctata Pictet
Velia sp.
Sigara (*Sigara*) sp.
Brychius elevatus (Panzer)
Haliplus sp.
Haliplus lineatocollis (Marsham)
Oreodytes sp.
Oreodytes sanmarkii (Sahlberg)
Agabus sp.
Platambus maculatus (L.)
Orectochilus villosus (Muller)

Hydraena gracilis Germar
Elmis aenea (Muller)
Esolus parallelepipedus (Muller)
Limnius volckmari (Panzer)
Oulimnius tuberculatus (Muller)
Rhyacophila dorsalis (Curtis)
Glossosoma sp.
Polycentropus flavomaculatus (Pictet)
Hydropsyche pellucidula (Curtis)
Hydropsyche siltalai Dohler
Limnephilidae
Anabolia nervosa (Curtis)
Halesus radiatus (Curtis)
Melampophylax mucoreus (Hagen)
Athripsodes cinereus (Curtis)
Athripsodes albifrons (L.)
Lepidostoma hirtum (Fabricius)
Sericostoma personatum (Spence)
Tipula montium group
Dicranota sp.
Hexatoma sp.
Pericoma exquisita Eaton
Chironomidae
Simulium (*Eusimulium*) *aureum* group
Simulium (*Wilhelmia*) sp.
Simulium (*Wilhelmia*) *equinum* L.
Simulium (*Simulium*) *reptans* group
Simulium (*Simulium*) *argyreatum* group
Simulium (*Simulium*) *ornatum* group
Chelifera group
Wiedemannia group
Atherix ibis (Fabricius)
Limnophora sp.

NU 238 061	1 May	Main sample	3 minute kick/sweep
NU 238 061		Supplementary	No sample taken
NU 238 061	12 Jul	Main sample	3 minute kick/sweep
NU 238 061	12 Jul	Supplementary	Kick/sweep
NU 238 061	25 Oct	Main sample	3 minute kick/sweep
NU 238 061	25 Oct	Supplementary	Kick/sweep

Hydridae

Dugesia polychroa group*Hydrobia ulvae* (Pennant)*Potamopyrgus jenkinsi* (Smith)*Lymnaea peregra* (Muller)*Sphaerium corneum* (L.)

Oligochaeta

Hydracarina

Asellus sp.

Asellus aquaticus (L.)

Gammarus sp.

Gammarus zaddachi Sexton*Baetis rhodani* (Pictet)*Centroptilum luteolum* (Muller)*Ecdyonurus* sp.*Ephemerella ignita* (Poda)*Caenis luctuosa* group*Leuctra geniculata* (Stephens)

Corixidae

Potamonectes sp.*Potamonectes depressus* (Fabricius)*Oreodytes septentrionalis* (Sahlberg)*Helophorus brevipalpis* Bedel*Elmis aenea* (Muller)*Limnius volckmari* (Panzer)*Oulimnius* sp.*Oulimnius tuberculatus* (Muller)*Polycentropus flavomaculatus* (Pictet)*Anabolia nervosa* (Curtis)*Melampophylax mucoreus* (Hagen)*Athripsodes cinereus* (Curtis)*Athripsodes albifrons* (L.)*Lepidostoma hirtum* (Fabricius)

Ceratopogonidae

Chironomidae

Species x site matrix for each river in each season

The following printouts list the species recorded in each of the river systems sampled in 1990. Site names for each river (or tributary) are given at the head of each printout, together with grid references and sampling dates. To the left of each river and site name appears a site code (e.g. 71 Whiteadder, Cranshaws). The code 71 then acts as a heading for the three columns of data relating to that site.

The three columns are, from left to right

Spring (20 April at this site)

Summer (21 August)

Autumn (15 November)

+ indicates present in main sample

S indicates additional species recorded in the supplementary sample

O indicates absent in main and supplementary sample

	Pages
Whiteadder	32-34
Blackadder	35-37
Wissey	38-40
Walkham	41-42
Lathkill	43-44
Coquet	45-47

RIVER SYSTEM 49 TWEED 1990

71 Whiteadder	Cranshaws	NT 689 626	20 Apr	21 Aug	15 Nov
75 Whiteadder	Preston Haugh	NT 774 577	20 Apr	27 Aug	15 Nov
79 Whiteadder	U/S Allanton	NT 864 547	19/20 Apr	24 Aug	12 Nov
83 Whiteadder	Chesterfield Ford	NT 937 536	20 Apr	24 Aug	12 Nov

71 75 79 83

Polycelis nigra group	000	+00	0++	+++
Polycelis felina	000	SSS	000	S00
Dendrocoelum lacteum	000	+S0	0++	0++
Valvata cristata	000	000	+00	000
Valvata piscinalis	000	000	000	0++
Potamopyrgus jenkinsi	+++	+++	+++	+++
Lymnaea peregra	+++	+S0	+++	+++
Physa fontinalis	000	000	+++	+++
Gyraulus albus	000	000	000	00+
Armiger crista	000	000	++0	+++
Bathyomphalus contortus	000	000	+++	+00
Ancylus fluviatilis	+++	++S	+++	+++
Sphaerium corneum	000	000	+++	++0
Pisidium sp.	+00	+00	000	000
Pisidium casertanum	000	000	000	00+
Pisidium personatum	0+0	000	000	000
Pisidium milium	000	000	+00	000
Pisidium subtruncatum	000	000	+++	00+
Pisidium nitidum	000	0+S	+++	+++
Oligochaeta	+++	+++	+++	+++
Piscicola geometra	000	000	000	0SS
Theromyzon tessulatum	000	000	000	0S0
Hemiclepsis marginata	000	000	000	00+
Glossiphonia heteroclita	000	000	00+	00+
Glossiphonia complanata	0S+	++S	+++	0++
Helobdella stagnalis	S+0	++0	S++	SS+
Erpobdellidae	00+	000	000	000
Erpobdella octoculata	++0	+++	+++	+++
Trocheta bykowskii	000	000	000	S+S
Hydracarina	0+S	00S	++0	+++
Asellus aquaticus	000	000	000	+++
Asellus meridianus	000	0++	0++	000
Crangonyx pseudogracilis	000	000	000	00+
Gammarus pulex	+++	+++	00+	0+0
Baetis scambus group	0+0	0+0	0+0	0++
Baetis rhodani	+++	+++	+++	+++
Baetis muticus	+00	+S0	000	+00
Centroptilum luteolum	S0S	SSS	0SS	SS0
Centroptilum pennulatum	0SS	0S0	000	000
Cloeon dipterum	000	000	0S0	000
Procloeon bifidum	000	0S0	000	0S0
Rhithrogena semicolorata group	+++	+++	+0+	+0+
Heptagenia sulphurea	000	++S	0++	+++
Heptagenia lateralis	S00	000	000	000
Ecdyonurus sp.	+++	+++	S++	++0
Paraleptophlebia sp.	0+0	000	000	000
Paraleptophlebia submarginata	S0+	00S	000	000
Ephemerella ignita	0+0	0+0	0+0	0+0
Caenis luctuosa group	000	000	00+	S++

Caenis rivulorum	+++	+++	+++	+++
Protonemura meyeri	000	000	000	00+
Amphinemura sulcicollis	+0+	+0+	000	+00
Leuctra geniculata	+00	+00	000	000
Leuctra inermis	+00	000	000	000
Leuctra hippopus	00+	000	000	000
Leuctra fusca	0+0	0+0	000	0+0
Capnia bifrons	S00	000	000	000
Perlodes microcephala	0++	00S	000	000
Isoperla grammatica	+0+	+0+	S00	+00
Dinocras cephalotes	+++	+++	000	000
Perla bipunctata	+++	00+	000	0+0
Chloroperla torrentium	+00	+00	000	000
Chloroperla tripunctata	000	+00	000	000
Corixidae	0S0	000	000	0S0
Sigara sp.	000	0S0	000	000
Sigara (Sigara) sp.	000	000	000	S0S
Sigara falleni	000	00S	SSS	S00
Brychius elevatus	000	000	+00	000
Haliphus sp.	00+	000	+++	00+
Haliphus lineatocollis	SS0	000	000	000
Haliphus fluviatilis	000	000	0S0	0S0
Haliphus wehnckeii	000	000	000	S00
Potamonectes depressus	S0S	0SS	S0S	+S0
Oreodytes sanmarkii	000	000	000	0+S
Oreodytes septentrionalis	000	000	000	S+0
Platambus maculatus	000	0S0	0S0	000
Orectochilus villosus	+0S	+++	+++	0S+
Hydraena gracilis	0+0	0+0	000	000
Elmis aenea	+++	+++	+++	+++
Esolus parallelepipedus	+++	+++	+++	+++
Limnius volckmari	+++	+++	+++	+++
Oulimnius sp.	0++	00S	+0+	0+0
Oulimnius tuberculatus	+00	+00	000	+0+
Riolus subviolaceus	000	000	000	0+0
Sialis lutaria	SSS	000	00+	00S
Rhyacophila dorsalis	+++	+++	+++	+++
Glossosoma sp.	000	000	000	+++
Agapetus sp.	000	+00	000	0++
Polycentropodidae	000	+00	000	000
Polycentropus flavomaculatus	+++	0+0	000	++0
Tinodes waeneri	000	000	000	S00
Psychomyia pusilla	+00	000	000	000
Hydropsyche pellucidula	+++	+++	+++	+++
Hydropsyche contubernalis	000	000	000	+++
Hydropsyche siltalai	+++	+++	+++	+++
Hydroptila sp.	000	+++	0++	0+0
Limnephilidae	00S	00+	000	000
Drusus annulatus	000	+00	000	000
Anabolia nervosa	S00	+00	S00	S00
Potamophylax sp.	000	00S	00S	000
Potamophylax latipennis	+00	000	000	++0
Halesus sp.	000	+00	000	000
Allogamus auricollis	S00	+00	000	000
Athripsodes sp.	000	0+0	+00	+S0
Athripsodes cinereus	000	000	00+	S++
Athripsodes albifrons	000	000	0+0	0++

Mystacides sp.	000	000	00S	000
Mystacides azurea	000	0S0	0S+	S0S
Ceraclea nigronervosa	000	000	0+0	000
Ceraclea annulicornis	000	000	+++	+00
Ceraclea dissimilis	000	000	++0	000
Lepidostoma hirtum	000	+++	+++	+++
Sericostoma personatum	+00	++S	+++	+++
Tipula montium group	0+0	0++	00+	0+0
Antocha vitripennis	000	+00	000	+00
Dicranota sp.	+++	00+	000	00+
Psychodidae	000	000	000	+00
Ceratopogonidae	000	0+0	+00	+0+
Chironomidae	+++	+++	+++	+++
Simulium (Eusimulium) aureum group	0+0	0+0	0+0	000
Simulium (Wilhelmia) sp.	000	0+0	0++	+0+
Simulium (Wilhelmia) equinum	000	000	+00	++0
Simulium (Wilhelmia) lineatum	000	000	000	++0
Simulium (Simulium) reptans group	++0	000	++0	000
Simulium (Simulium) argyreatum group	0+0	+0+	000	000
Simulium (Simulium) ornatum group	000	0++	+++	+++
Chelifera group	0+0	000	000	000
Hemerodromia group	000	000	+00	+00
Wiedemannia group	0+0	+00	0++	000
Atherix ibis	++S	++S	+00	00+
Limnophora sp.	0++	00+	00+	+++

SYSTEM 49 TWEED 1990

87 Blackadder	Halliburton Bridge	NT 677 478	18 Apr	23 Aug	9 Nov
91 Blackadder	Fogo	NT 770 491	18 Apr	23 Aug	9 Nov
95 Blackadder	Blackadder Water Foot	NT 864 545	18 Apr	24 Aug	12 Nov

	87	91	95
Planariidae (incl. Dugesiidae)	000	S00	000
Polycelis nigra group	+++	0++	0++
Polycelis felina	+00	00+	00+
Dendrocoelum lacteum	000	000	0S+
Potamopyrgus jenkinsi	000	+++	+++
Lymnaea peregra	+S+	+++	+++
Physa fontinalis	000	0++	0++
Gyraulus albus	0+0	0S+	0++
Armiger crista	000	+00	0++
Bathyomphalus contortus	000	000	0++
Acroloxus lacustris	SS0	000	000
Ancylus fluviatilis	++S	+++	+++
Sphaeriidae	0+0	000	000
Pisidium sp.	000	000	S00
Pisidium subtruncatum	+00	0++	00S
Pisidium hibernicum	000	00+	000
Pisidium nitidum	0S+	+++	+++
Pisidium pulchellum	000	00+	000
Oligochaeta	+++	+++	+++
Piscicola geometra	000	000	S0S
Theromyzon tessulatum	000	0+S	S+0
Hemiclepsis marginata	000	000	0S0
Glossiphonia complanata	+++	S++	+++
Helobdella stagnalis	+++	+++	+++
Erpobdella octoculata	+++	+++	+++
Hydracarina	+++	+0	S++
Asellus aquaticus	00+	000	000
Asellus meridianus	000	S00	+++
Gammarus pulex	+++	+++	000
Baetis scambus group	0S0	0+0	0++
Baetis rhodani	+++	+++	+++
Centroptilum luteolum	000	SSS	SSS
Procloeon bifidum	0+0	0S0	000
Rhithrogena semicolorata group	+0+	+++	+00
Heptagenia sp.	000	000	+00
Heptagenia sulphurea	++0	+++	00+
Ecdyonurus sp.	+++	+++	000
Leptophlebiidae	+00	S00	000
Paraleptophlebia submarginata	00+	000	000
Ephemerella ignita	0+0	0+0	0+0
Ephemera danica	000	00S	000
Caenis luctuosa group	000	0++	0++
Caenis rivulorum	+++	+++	+++
Taeniopteryx nebulosa	00+	00+	00+
Protonemura meyeri	000	00+	000
Amphinemura standfussi	+00	000	000
Amphinemura sulcicollis	000	+00	000
Leuctra geniculata	000	0+0	000
Leuctra fusca	000	0+0	000
Capnia bifrons	+00	000	000
Isoperla grammatica	+0+	+0S	000

Dinocras cephalotes	000	0S0	000
Chloroperla torrentium	000	+00	000
Sigara (Sigara) sp.	S+S	SSS	SSS
Sigara falleni	000	000	0S0
Brychius elevatus	0+0	000	000
Haliplus sp.	000	000	0++
Haliplus lineatocollis	000	000	SS0
Haliplus fluviatilis	0S0	0S0	0S0
Potamonectes depressus	S00	SS0	SSS
Oreodytes sanmarkii	S+0	S+0	+00
Oreodytes septentrionalis	000	000	0+0
Platambus maculatus	0++	00+	000
Ilybius sp.	000	00S	000
Gyrinus natator group	000	0S0	000
Orectochilus villosus	000	+00	000
Hydraena riparia	000	000	+00
Hydraena gracilis	+00	000	000
Elmis aenea	+++	+++	+++
Esolus parallelepipedus	000	+00	+++
Limnius volckmari	+++	+++	+++
Oulimnius sp.	00+	0S0	00S
Oulimnius tuberculatus	+00	+++	+++
Riolus subviolaceus	000	+0+	000
Sialis lutaria	0S+	0SS	0SS
Rhyacophila dorsalis	+00	+++	0+0
Rhyacophila munda	S+0	000	000
Glossosoma sp.	000	+00	+00
Polycentropus flavomaculatus	00+	0++	000
Tinodes waeneri	000	00S	000
Hydropsyche pellucidula	+++	+++	+++
Hydropsyche contubernalis	000	000	0+0
Hydropsyche siltalai	+++	+++	+++
Hydroptila sp.	0+0	+00	0++
Limnephilidae	00+	0+0	000
Drusus annulatus	+00	000	000
Limnephilus lunatus group	S00	000	S00
Anabolia nervosa	000	000	S00
Potamophylax sp.	000	00S	000
Potamophylax latipennis	000	+00	000
Halesus radiatus	000	S00	000
Athripsodes sp.	000	+0+	00+
Athripsodes cinereus	000	0S0	000
Mystacides azurea	000	0S0	0S0
Ceraclea annulicornis	000	000	+S+
Ceraclea dissimilis	000	000	0+0
Lepidostoma hirtum	000	+++	0++
Sericostoma personatum	000	+++	00S
Tipula montium group	+00	+++	+++
Dicranota sp.	0+S	+++	000
Pericoma blandula	000	000	+00
Pericoma exquisita	000	+00	00+
Pericoma neglecta	000	000	0++
Ceratopogonidae	+00	+00	+++
Chironomidae	+++	+++	+++
Simulium (Eusimulium) aureum group	0+0	0+0	0+0
Simulium (Wilhelmia) sp.	0+0	0++	00+

Simulium (Wilhelmia) equinum	000	000	+00
Simulium (Wilhelmia) lineatum	000	000	0+0
Simulium (Simulium) reptans group	000	+00	+00
Simulium (Simulium) ornatum group	+++	0++	+++
Oxycera sp.	000	00+	000
Chelifera group	+++	000	000
Hemerodromia group	000	+00	000
Wiedemannia group	000	000	+00
Atherix ibis	000	+0+	+0S
Limnophora sp.	0+0	+++	0++

RIVER SYSTEM 62 GREAT OUSE 1990

81 R. Wissey	North Pickenham	TF 866 067	26 Mar/26 Apr	9 Jul	19 Nov
85 R. Wissey	Linghills Farm	TF 834 009	26 Mar/26 Apr	9 Jul	19 Nov
89 R. Wissey	Didlington Lodge	TL 771 967	29 Mar/26 Apr	23 Aug	26 Nov
93 R. Wissey	Five Mile House	TL 664 977	29 Mar/26 Apr	20 Aug	21 Nov

	81	85	89	93
Planaria torva	000	000	000	00+
Polycelis nigra group	S00	000	0++	+0+
Dugesia tigrina	000	000	0+0	+0+
Dugesia polychroa group	000	000	000	+0+
Dendrocoelum lacteum	000	000	00+	000
Viviparus viviparus	000	000	000	0+0
Valvata cristata	000	+00	000	+++
Valvata macrostoma	000	0+0	000	000
Valvata piscinalis	000	+0+	000	+++
Potamopyrgus jenkinsi	000	+0+	+++	+++
Bithynia tentaculata	000	00+	+0+	+++
Bithynia leachii	000	000	00+	+0+
Lymnaea palustris	S00	000	000	000
Lymnaea stagnalis	00+	000	0+0	00+
Lymnaea auricularia	000	000	0+0	0+0
Lymnaea peregra	0++	0+0	0+0	+++
Physa fontinalis	0++	0++	S++	+++
Planorbis carinatus	0++	00+	+00	+++
Planorbis planorbis	000	000	000	0+0
Anisus vortex	0++	S+0	+++	+++
Gyraulus albus	0+0	S++	0+0	+0+
Armiger crista	000	0+0	0+0	0++
Bathyomphalus contortus	000	+++	000	+00
Hippeutis complanatus	000	000	000	0++
Acroloxus lacustris	000	S00	000	+++
Ancylus fluviatilis	000	0+0	0++	000
Zonitoides nitidus	000	000	+00	000
Anodonta group	000	000	S00	+00
Sphaerium corneum	+++	S0+	+++	+++
Pisidium amnicum	000	000	S00	000
Pisidium subtruncatum	00+	+0+	+00	0++
Pisidium henslowanum	000	+00	+00	0++
Pisidium hibernicum	000	000	00+	0+0
Pisidium nitidum	0++	+++	+++	+++
Dreissena polymorpha	000	000	000	0+0
Oligochaeta	+++	+++	+++	+++
Piscicola geometra	000	00+	0+0	+00
Theromyzon tessulatum	0++	00+	0++	+0+
Hemiclepsis marginata	000	S00	000	+++
Glossiphonia heteroclita	000	0+0	000	+0+
Glossiphonia complanata	+0+	+++	+0+	+++
Helobdella stagnalis	+++	+++	+++	+++
Erpobdella testacea	000	000	000	S00
Erpobdella octoculata	+++	+++	+++	+++
Hydracarina	+++	S++	+++	0++
Asellus aquaticus	+++	+++	+0+	+++
Asellus meridianus	000	+00	000	000
Crangonyx pseudogracilis	000	S0+	+0+	+++
Gammarus pulex	+++	+++	+++	+00
Baetis vernus	0+0	S0+	000	000
Baetis rhodani	S00	+0+	+0+	000

Centroptilum luteolum	000	00+	+++	000
Cloeon sp.	0+0	000	000	000
Cloeon dipterum	000	S0+	000	+++
Habrophlebia fusca	S00	000	000	000
Ephemerella ignita	0+0	0+0	0+0	000
Ephemera danica	000	+++	+++	000
Caenis luctuosa group	00+	0++	+++	0+0
Caenis robusta	000	000	000	+++
Caenis horaria	00+	000	+00	00+
Nemoura avicularis	000	00+	000	000
Leuctra geniculata	000	0+0	+00	000
Leuctra fusca	000	0+0	0+0	000
Ischnura elegans	S+0	+00	S00	+++
Enallagma cyathigerum	0+0	000	000	000
Coenagrion puella group	000	000	000	+00
Calopteryx sp.	000	000	+0+	000
Calopteryx splendens	000	000	+00	000
Gerris sp.	000	000	0+0	0+0
Nepa cinerea	000	000	000	0+0
Notonecta glauca	000	000	000	+++
Micronecta sp.	000	S+0	000	000
Corixa dentipes	000	000	000	+++
Corixa punctata	000	000	000	0+0
Corixa panzeri	000	000	0+0	000
Hesperocorixa sahlbergi	000	S00	00+	000
Sigara (Sigara) sp.	S++	S++	+00	+++
Sigara falleni	S++	000	+0+	+++
Sigara lateralis	000	000	000	00+
Sigara venusta	000	000	+00	000
Haliplus sp.	00+	0+0	000	000
Haliplus lineatocollis	000	000	000	+00
Haliplus fluviatilis	000	000	S+0	+00
Haliplus immaculatus	000	000	000	+00
Haliplus flavicollis	000	000	000	+0+
Noterus clavicornis	000	000	000	+00
Laccophilus sp.	000	000	0+0	000
Laccophilus hyalinus	000	000	000	+00
Hyphidrus ovatus	000	000	000	S++
Hygrotus versicolor	000	000	0+0	000
Potamonectes depressus	+++	0++	0++	0++
Stictotarsus duodecimpustulatus	000	000	000	0++
Hydroporus palustris	000	+00	000	000
Agabus sp.	S00	000	000	000
Agabus didymus	0+0	0+0	000	000
Platambus maculatus	000	000	000	0+0
Ilybius sp.	000	000	00+	000
Ilybius fuliginosus	0+0	000	000	000
Orectochilus villosus	000	000	+++	000
Hydrophilidae (incl. Hydraenidae)	000	0++	000	000
Hydraena riparia	000	000	00+	000
Limnebius truncatellus	000	000	S00	000
Anacaena globulus	000	000	S00	S00
Anacaena limbata	000	000	S00	S00
Anacaena bipustulata	000	000	000	S00
Laccobius biguttatus	000	000	000	S00
Enochrus testaceus	000	000	000	0+0
Elmis aenea	+0+	+++	+++	0++
Limnius volckmari	000	0+0	+++	000

Oulimnius sp.	00+	00+	000	000
Oulimnius tuberculatus	000	000	+++	0++
Oulimnius major	000	000	++0	000
Sialis lutaria	0++	0++	++0	+++
Agapetus sp.	000	000	00+	000
Polycentropus flavomaculatus	000	000	+++	000
Cyrnus flavidus	000	000	000	+00
Tinodes waeneri	000	+0+	000	000
Lype sp.	000	000	00+	+00
Hydropsyche pellucidula	000	000	+++	000
Hydropsyche angustipennis	+00	00+	000	000
Hydropsyche siltalai	+00	+++	+00	000
Hydroptila sp.	000	0+0	0+0	000
Phryganea grandis group	000	000	000	0+0
Limnephilus marmoratus	000	000	000	+00
Limnephilus lunatus group	000	0+0	+00	++0
Anabolia nervosa	000	000	000	0+0
Potamophylax sp.	000	000	00+	000
Potamophylax cingulatus	000	000	+00	000
Potamophylax latipennis	000	000	++0	000
Halesus radiatus	000	+00	+00	000
Chaetopteryx villosa	000	000	+00	000
Molanna angustata	000	000	+00	0+0
Athripsodes sp.	000	000	00+	000
Athripsodes aterrimus	000	000	000	++0
Athripsodes cinereus	000	000	+00	000
Athripsodes albifrons	000	000	0+0	000
Mystacides nigra	000	000	000	0+0
Mystacides azurea	000	00+	+++	000
Mystacides longicornis	000	000	000	S++
Ceraclea fulva	000	000	000	0+0
Ceraclea dissimilis	000	0+0	000	000
Goera pilosa	000	00+	+++	000
Silo nigricornis	000	000	00+	000
Lepidostoma hirtum	000	000	+0+	000
Sericostoma personatum	000	000	+0+	000
Tipula montium group	+0+	++0	00+	000
Tipula oleracea	000	0+0	000	000
Dicranota sp.	+++	0++	+++	000
Pilaria (Neolimnomyia) sp.	000	000	+00	000
Pericoma exquisita	00+	000	000	000
Pericoma fallax	000	+00	000	000
Chaoborus flavicans	000	000	000	00+
Ceratopogonidae	+00	++0	+0+	++0
Chironomidae	+++	+++	+++	+++
Simulium (Nevermannia) venum group	+00	000	000	000
Simulium (Nevermannia) cryophilum group	+00	000	000	000
Simulium (Nevermannia) angustitarse group	000	0++	+0+	000
Simulium (Eusimulium) aureum group	000	0+0	+0+	000
Simulium (Wilhelma) sp.	000	0+0	00+	000
Simulium (Simulium) reptans group	000	000	+00	000
Simulium (Boophthora) erythrocephalum	000	000	+0+	000
Simulium (Simulium) ornatum group	000	0+0	+0+	000
Oxycera sp.	000	0+0	+00	000
Hemerodromia group	000	000	+00	000
Atalanta group	000	0+0	000	000
Chrysops sp.	000	000	++0	000
Ephydriidae	000	000	0+0	0+0
Phaeonia group	000	000	0+0	00+
Limnophora sp.	000	000	00+	00+

RIVER SYSTEM 94 TAVY 1990

81 R. Walkham	Merrivale	SX 550 751	19 Apr	20 Jul	16 Oct
85 R. Walkham	Grenofen	SX 489 710	19 Apr	20 Jul	16 Oct

81 85

Planariidae (incl. Dugesiidae)	+0+	+00
Polycelis felina	000	S+0
Potamopyrgus jenkinsi	000	+++
Lymnaea peregra	000	+++
Ancylus fluviatilis	000	+++
Pisidium sp.	000	+0
Pisidium personatum	000	00+
Oligochaeta	+++	+++
Hydracarina	0++	0+S
Gammarus pulex	000	00S
Baetis scambus group	000	+00
Baetis vernus	0S+	000
Baetis rhodani	00S	+++
Baetis muticus	000	+00
Baetis niger	000	S00
Rhithrogena semicolorata group	000	+++
Heptagenia lateralis	+00	000
Ecdyonurus sp.	S0+	+++
Leptophlebiidae	00+	000
Leptophlebia sp.	00S	000
Leptophlebia marginata	S00	000
Paraleptophlebia cincta	+00	000
Ephemerella ignita	0+0	+++
Caenis rivulorum	000	+0+
Brachyptera risi	000	+00
Protonemura sp.	000	00+
Protonemura meyeri	+++	00S
Amphinemura sulcicollis	+00	+00
Leuctra inermis	+00	000
Leuctra hippopus	+0+	000
Leuctra fusca	++0	000
Perlodes microcephala	00+	00+
Isoperla grammica	+0+	+00
Dinocras cephalotes	0+0	0+0
Chloroperla torrentium	+00	+00
Pyrhosoma nymphula	S0S	000
Calopteryx sp.	000	S00
Calopteryx virgo	S00	++S
Cordulegaster boltonii	000	0+S
Velia sp.	SS0	S00
Gerris sp.	0+0	0+0
Gerris gibbifer	0S0	000
Potamonectes depressus	000	00S
Stictotarsus duodecimpustulatus	000	00S
Oreodytes sanmarkii	000	0+S
Oreodytes septentrionalis	0+0	000
Orectochilus villosus	+0+	S0+
Hydraena gracilis	000	+++
Helophorus sp.	0S0	000
Helophorus flavipes	0+0	000
Elodes sp.	00+	000

<i>Elmis aenea</i>	+++	+++
<i>Esolus parallelepipedus</i>	000	0++
<i>Limnius volckmari</i>	+++	+++
<i>Oulimnius sp.</i>	000	0S0
<i>Oulimnius tuberculatus</i>	+++	00+
<i>Rhyacophila dorsalis</i>	+++	+++
<i>Rhyacophila munda</i>	0S0	+00
<i>Glossosoma sp.</i>	000	0++
<i>Agapetus sp.</i>	000	+0+
<i>Plectrocnemia conspersa</i>	+00	+00
<i>Plectrocnemia geniculata</i>	00+	000
<i>Polycentropus flavomaculatus</i>	+++	+0+
<i>Polycentropus kingi</i>	0+0	000
<i>Hydropsyche sp.</i>	000	0+0
<i>Hydropsyche pellucidula</i>	000	00+
<i>Hydropsyche siltalai</i>	+++	+++
<i>Hydroptila sp.</i>	00+	000
<i>Oxyethira sp.</i>	0++	000
Limnephilidae	00S	000
<i>Drusus annulatus</i>	0S0	+00
<i>Anabolia nervosa</i>	S00	000
Potamophylax group	000	+00
<i>Potamophylax cingulatus</i>	S0+	000
<i>Halesus radiatus</i>	+00	+00
<i>Chaetopteryx villosa</i>	++0	S00
<i>Mystacides azurea</i>	000	00S
<i>Adicella reducta</i>	0+0	00S
<i>Oecetis sp.</i>	000	00+
<i>Oecetis testacea</i>	+00	+00
<i>Silo pallipes</i>	000	+++
<i>Lepidostoma hirtum</i>	000	+++
<i>Lasiocephala basalis</i>	000	S00
<i>Brachycentrus subnubilus</i>	000	0S0
<i>Sericostoma personatum</i>	+++	+++
Tipula montium group	+00	0+0
<i>Dicranota sp.</i>	0++	0++
<i>Pericoma sp.</i>	0++	000
<i>Dixa sp.</i>	000	0S0
<i>Dixa puberula</i>	00S	000
Ceratopogonidae	0+0	0+0
Chironomidae	+++	+++
<i>Simulium (Nevermannia) vernalis</i> group	S00	+00
<i>Simulium (Nevermannia) cryophilum</i> group	00+	000
<i>Simulium (Nevermannia) cryophilum</i>	++0	000
<i>Simulium (Nevermannia) angustitarse</i> group	000	0+0
<i>Simulium (Eusimulium) aureum</i> group	000	00+
<i>Simulium (Simulium) reptans</i> group	000	++0
<i>Simulium (Simulium) argyreatum</i> group	000	++0
<i>Simulium (Simulium) variegatum</i>	000	00+
<i>Simulium (Simulium) ornatum</i> group	0+S	0+0
Wiedemannia group	000	0++
<i>Atherix marginata</i>	+++	+++
Tabanus group	000	+00
<i>Limnophora sp.</i>	+0+	000

RIVER SYSTEM 95 DERWENT(DERBYSHIRE)

1990

81 R. Lathkill Alport
85 R. Lathkill Congreave

SK 220 646
SK 242 657

26 Apr
26 Apr

1 Aug
1 Aug

5 Nov
5 Nov

81 85

Potamopyrgus jenkinsi	+++	+++
Ancylus fluviatilis	S00	+00
Pisidium casertanum	00+	0+0
Pisidium personatum	00+	00+
Pisidium subtruncatum	000	+00
Oligochaeta	+S+	+0+
Helobdella stagnalis	00+	000
Hydracarina	+++	+00
Gammarus pulex	+++	++0
Astacidae	000	0+0
Baetidae	000	0+0
Baetis vernus	+00	000
Baetis rhodani	+00	000
Baetis muticus	+00	000
Centroptilum luteolum	S++	+S0
Rhithrogena semicolorata group	000	+00
Paraleptophlebia submarginata	000	+00
Ephemerella ignita	++0	++0
Ephemera danica	00+	++0
Caenis rivulorum	+0+	+00
Protonemura meyeri	S00	+00
Amphinemura sulcicollis	+00	+00
Leuctra geniculata	0+0	++0
Leuctra fusca	0+0	0+0
Isoperla grammatica	+00	+00
Dinocras cephalotes	00+	000
Brychius elevatus	000	0+0
Platambus maculatus	00+	000
Helophorus brevipalpis	0+0	0+0
Elmis aenea	+++	+++
Esolus parallelepipedus	0+0	000
Limnius volckmari	00+	000
Riolus cupreus	0++	S+0
Riolus subviolaceus	+++	+++
Rhyacophila dorsalis	S+0	S+0
Rhyacophila munda	+00	S00
Agapetus sp.	S00	000
Wormaldia sp.	0+0	000
Polycentropus flavomaculatus	+++	++0
Tinodes unicolor	000	+00
Metalype fragilis	000	+00
Psychomyia pusilla	000	+00
Hydropsyche pellucidula	S00	000
Hydropsyche instabilis	+00	+00
Hydropsyche siltalai	+0+	+00
Hydroptila sp.	+++	++0
Ithytrichia sp.	00+	000
Oxyethira sp.	0+0	000
Limnephilidae	00+	000
Limnephilus lunatus group	+00	+00
Potamophylax latipennis	S00	000

Halesus radiatus	300	000
Melampophylax mucoreus	300	000
Chaetopteryx villosa	+00	000
Athripsodes sp.	0+0	+00
Athripsodes bilineatus	+0+	000
Mystacides azurea	000	+00
Goera pilosa	000	0++
Silo pallipes	000	++0
Silo nigricornis	+0+	000
Lepidostoma hirtum	+++	+00
Lasiocephala basalis	00+	000
Sericostoma personatum	+++	000
Tipula sp.	000	00S
Tipula montium group	30+	00+
Tipula oleracea	00+	00+
Antocha vitripennis	+00	+00
Helius sp.	000	00+
Gonempeda group	000	00+
Psychodidae	000	+00
Pericoma diversa	00+	000
Pericoma exquisita	00+	000
Pericoma neglecta	0S+	000
Ceratopogonidae	+00	+0+
Chironomidae	+++	++0
Simulium (Simulium) ornatum group	0+0	000
Oxycera sp.	+0+	000
Chelifera group	000	++0
Hemerodromia group	+00	+00
Wiedemannia group	00+	+00
Phaenonia group	000	00+
Limnophora sp.	+++	000

RIVER SYSTEM 96 COQUET 1990

03 R. Coquet	Carshope	NT 851 109	11 Apr	12 Jul	17 Oct
07 R. Coquet	Linshiels	NT 894 062	11 Apr	12 Jul	17 Oct
11 R. Coquet	Sharperton	NT 954 038	11 Apr	12 Jul	17 Oct
15 R. Coquet	Pauperhaugh	NZ 101 995	11 Apr	12 Jul	17 Oct
19 R. Coquet	Coquet Lodge	NU 238 061	1 May	12 Jul	25 Oct

03 07 11 15 19

Hydridae	000	000	000	000	00S
Planariidae (incl. Dugesiidae)	0+0	000	000	000	000
Polycelis nigra group	000	000	000	+++	000
Polycelis felina	00+	000	000	00S	000
Dugesia polychroa group	000	000	000	000	0+0
Crenobia alpina	+00	000	+00	000	000
Dendrocoelum lacteum	000	000	000	0++	000
Hydrobia ulvae	000	000	000	000	0S0
Potamopyrgus jenkinsi	+++	+S+	+S+	+++	0++
Lymnaea peregra	0++	0++	00+	+++	++0
Physa fontinalis	000	000	000	0++	000
Armiger crista	000	000	000	0+0	000
Bathymphalus contortus	000	000	000	00+	000
Ancylus fluviatilis	0++	+++	+++	+++	000
Sphaerium corneum	000	000	000	S++	00+
Pisidium sp.	000	000	00+	000	000
Pisidium milium	000	000	000	00+	000
Pisidium subtruncatum	000	000	000	+0+	000
Pisidium nitidum	000	000	000	0+0	000
Oligochaeta	+++	+++	+++	+++	+++
Theromyzon tessulatum	000	000	000	0S0	000
Glossiphonia complanata	+00	+00	00+	0++	000
Helobdella stagnalis	0++	000	0+0	+++	000
Erpobdella octoculata	000	000	000	+++	000
Hydracarina	0+0	+S0	+S+	++S	++0
Asellus sp.	000	000	000	000	00+
Asellus aquaticus	000	000	000	0S+	00S
Asellus meridianus	000	000	000	00+	000
Gammarus sp.	000	000	000	000	0S0
Gammarus pulex	+++	+++	+S+	+++	000
Gammarus zaddachi	000	000	000	000	+++
Baetis scambus group	0+0	0+0	0+0	0++	000
Baetis rhodani	+++	+++	+++	+++	0+0
Baetis muticus	000	+00	+00	+00	000
Centroptilum luteolum	000	000	0S0	000	++0
Centroptilum pennulatum	000	000	000	0S0	000
Rhithrogena semicolorata group	+0+	+0+	+0+	+0+	000
Heptagenia sulphurea	000	000	000	0+0	000
Ecdyonurus sp.	+++	+++	+++	+++	+00
Paraleptophlebia submarginata	+0+	000	000	000	000
Ephemerella ignita	0+0	0+0	0++	0++	0+0
Ephemerella notata	000	000	000	+00	000
Ephemerella danica	000	0S0	0S0	00+	000
Caenis luctuosa group	000	000	000	000	+++
Caenis rivulorum	+++	+++	+++	+0+	000
Taeniopteryx nebulosa	000	000	00S	00+	000
Protonemura praecox	000	000	000	00+	000
Protonemura meyeri	000	00+	000	000	000

Amphinemura sulcicollis	+00	+0+	+0+	000	000	000	000
Leuctra sp.	000	00+	00+	000	000	000	000
Leuctra geniculata	000	00+	+0+	+0+	000	000	000
Leuctra inermis	+00	+00	000	000	000	000	000
Leuctra fusca	00+	0+	0+	0+	000	000	000
Capnia bifrons	+00	000	000	000	000	000	000
Perlodes microcephala	00+	00S	00+	000	000	000	000
Isoperla grammatica	+0+	+0+	+0+	+0+	000	000	000
Dinocras cephalotes	00+	+++	+++	+++	000	000	000
Perla bipunctata	000	000	+++	+0+	000	000	000
Chloroperla sp.	000	000	00+	000	000	000	000
Chloroperla torrentium	00+	+00	+00	000	000	000	000
Chloroperla tripunctata	000	000	+00	000	000	000	000
Velia sp.	0+	0	0	0	000	000	000
Velia caprai	00+	000	000	000	000	000	000
Corixidae	000	000	000	000	000	000	000
Micronecta sp.	000	00+	000	000	000	000	000
Sigara (Sigara) sp.	000	000	000	00+	000	000	000
Brychius elevatus	000	000	000	000	000	000	000
Halipus sp.	000	000	000	00+	000	000	000
Halipus lineatocollis	000	000	000	00S	000	000	000
Potamonectes depressus	000	000	000	000	000	000	+0+
Potamonectes sp.	000	000	000	000	000	000	000
Oreodytes septentrionalis	0+	0	0	0	000	000	0+
Oreodytes sanmarkii	0+	+0	+0	+0	000	000	000
Oreodytes sp.	000	000	000	000	000	000	000
Platambus maculatus	+0+	000	000	00S	000	000	000
Orectochilus villosus	000	000	+0+	+0+	000	000	000
Hydraena gracilis	00+	+++	+0+	0S+	000	000	000
Helophorus brevipalpis	000	000	000	000	000	000	000
Limis aenea	+++	+++	+++	+++	+++	+++	0+
Esolus parallelepipedus	00+	+++	+++	+++	+++	+++	000
Limnius volckmari	+++	+++	+++	+++	+++	+++	0+
Limnius sp.	000	000	+00	000	000	000	0+
Oulimnius tuberculatus	+0+	+0+	00+	+++	+++	+++	+00
Rionus sp.	000	0+	000	000	000	000	000
Rhyacophila dorsalis	+0+	+++	+++	+++	+++	+++	000
Glossosoma sp.	000	000	+00	000	000	000	000
Polycentropus flavomaculatus	0+	+++	+++	+++	+++	+++	+++
Psychomyia pusilla	000	000	+00	000	000	000	000
Hydropsyche pellucidula	00+	+0+	+0+	00+	000	000	000
Hydropsyche siltalai	+++	+++	+++	+++	+++	+++	000
Hydroptila sp.	000	000	00+	000	000	000	000
Limnephilidae	00+	0S0	000	00+	000	000	000
Drusus annulatus	0+	0	0	0	000	000	000
Ecclisopteryx guttulata	000	00+	00+	00+	000	000	000
Anabolia nervosa	000	000	000	+00	+00	000	000
Halesus radialis	+00	000	+00	+00	000	000	000
Melampophylax mucoreus	+0+	S+	000	+00	+00	000	000
Odontocerum albicorne	0+	0	S	0	000	000	000
Athripsodes sp.	000	00S	00+	000	000	000	000
Athripsodes cinereus	000	000	00S	00+	+00	000	000
Athripsodes albifrons	000	000	000	000	0+	0+	000
Mytastoides azurea	000	000	000	00+	000	000	000
Lepidostoma hirtum	000	00+	+++	+++	+++	+++	0+
Sericostoma personatum	00+	000	00+	000	000	000	000

Tipula montium group	00+	SS+	+0+	+0+	000
Dicranota sp.	0++	+++	+++	0++	000
Hexatoma sp.	000	000	000	+00	000
Psychodidae	000	000	0+0	000	000
Pericoma exquisita	000	+0+	00+	00+	000
Pericoma trivialis group	000	000	00+	000	000
Ceratopogonidae	000	000	+0+	000	+00
Chironomidae	+++	+++	+++	+++	+++
Simulium (Nevermannia) cryophilum group	000	000	0+0	000	000
Simulium (Eusimulium) aureum group	000	00+	000	00+	000
Simulium (Wilhelmia) sp.	000	000	0++	0+0	000
Simulium (Wilhelmia) equinum	000	000	000	+0+	000
Simulium (Simulium) reptans group	000	0+0	+0+	+00	000
Simulium (Simulium) argyreatum group	0+0	0+0	+00	300	000
Simulium (Simulium) ornatum group	000	000	0+0	+++	000
Empididae	0+0	0+0	000	000	000
Chelifera group	000	000	0+0	0+0	000
Wiedemannia group	000	00S	0++	0+0	000
Atherix ibis	000	000	+0+	0++	000
Limnophora sp.	00+	000	+0+	00+	000

In this section of the report we offer a brief commentary on the invertebrate fauna of the rivers sampled in 1990. A full appraisal of the fauna at all sites sampled within the contract will be given in the final year of the project (1991/92). The purpose here is to highlight rivers which support rich species assemblages in particular taxonomic groups and to draw attention to the occurrence of some rare or notable species.

In Table 2 the number of different taxa recorded within each major taxonomic group is given for each river sampled. The data have been abstracted from the species x sites matrices in section 7.2 and only include demonstrably different taxa. That is, in cases where a list includes identifications at two taxonomic levels (e.g. *Silo* sp. and *Silo pallipes*) only one taxon is counted.

Since the number of sites examined on each river or stream varied between two and five, caution is required in the interpretation of the results. Nevertheless, a number of features are clearly apparent.

The two tributaries of the R. Tweed in Scotland, the Whiteadder and the Blackadder, both held an interesting variety of non-insect taxa in view of their northerly locations. In particular, the number of different species of Hirudinea in the Whiteadder was unexpected. Amongst the major taxonomic groups of insects, Ephemeroptera, Plecoptera, Coleoptera, Trichoptera and Diptera featured in both rivers as expected, but no groups were exceptionally species rich.

The R. Wissey supports a wide range of non-insect taxa including a notable variety of mollusca. Amongst the insect groups, the Coleoptera in particular, and to a lesser extent the Trichoptera and Hemiptera, are well represented. In many ways, the relative importance of the major taxonomic groups is closely similar to the R. Hull and Kelk Beck, sampled in 1989, although the R. Wissey appears to be more species rich.

In contrast, the R. Walkham has a very restricted range of non-insect taxa as a result of the harsh environmental conditions on

Table 2. Number of different taxa recorded in each major taxonomic group for the running-water sites examined in 1990.

River No. sites	Whiteadder 4	Blackadder 3	Wissey 4	Walkham 2	Lathkill 2	Coquet 5
Hydridae	-	-	-	-	-	1
Tricladida	3	3	5	2	-	5
Gastropoda	9	8	22	3	2	7
Bivalvia	6	4	8	1	3	4
Oligochaeta	1	1	1	1	1	1
Hirudinea	8	6	8	-	1	4
Hydracarina	1	1	1	1	1	1
Crustacea	4	3	4	1	2	4
Ephemeroptera	15	12	10	12	9	14
Plecoptera	13	10	3	10	6	14
Odonata	-	-	4	3	-	-
Hemiptera	2	2	12	2	-	3
Coleoptera	15	17	27	12	8	15
Megaloptera	1	1	1	-	-	-
Trichoptera	23	20	30	25	27	18
Diptera	17	18	24	18	18	18

Dartmoor. The fauna is dominated by several insect groups, of which the Trichoptera is the most taxon-rich group, given that within the Diptera the Chironomidae have not been identified further.

The R. Lathkill also had a restricted range of non-insect taxa. This was unexpected in view of its high alkalinity, but Ratcliffe (1977) noted that it included a mixture of upland species together with lowland chalk stream invertebrates and that there were few Gastropoda. Again, the fauna was dominated by insects, with the Trichoptera being particularly species-rich.

Finally, the five sites on the R. Coquet in the north-east of England supported between them a fair, but unexceptional, range of taxa in most major taxonomic groups, although the trichopteran fauna appeared to be rather restricted.

This section concludes with a brief commentary on the macroinvertebrate fauna of each river, with emphasis on the occurrence of rare or notable taxa. One source for evaluating the status of taxa is Report No. 66 of the NCC Chief Scientist Directorate, compiled by Ball (1986), which lists some groups of freshwater invertebrates with Red Data Book (RDB) or Nationally Notable (N) status. The relevant codes for this report are:-

Na: less than 30 known occurrences in 10 km squares of the national grid

Nb: less than 100 known occurrences in 10 km squares of the national grid

Refer to Ball (1986) for further details.

In addition, the Nature Conservancy Council has recently published reviews of the Ephemeroptera and Plecoptera (Bratton 1990) and Trichoptera (Wallace 1991) which provide up to date information on the status of the less common species.

Clearly, the designated status of a species may change over time in the light of new information on distribution, or as a result of environmental changes which may have either beneficial or adverse effects on distribution and abundance.

The IFE data-base, used in the latest classification and prediction system, currently holds information on 438 sites from almost 80 river systems throughout Great Britain. It is also a valuable source of information on rare and infrequent taxa at running water sites and will be particularly useful when a full evaluation is undertaken at the end of the contract.

R. Whiteadder

Rich assemblage of Hirudinea, including *Trocheta bykowskii*, regarded as rare in Scotland (Elliott & Tullett, 1982). Recorded at 15 (3.4%) of the 438 IFE sites. One nationally notable coleopteran.

Coleoptera: *Riolus subviolaceus* (Nb)

[Recorded at 36 (8.2%) of the 438 IFE sites]

R. Blackadder

The Bivalvia include one species which is scarce in the north of Britain (Ellis, 1978).

Bivalvia: *Pisidium pulchellum*

[Recorded at 11 (2.5%) of the 438 IFE sites.]

Like the Whiteadder, this river also has a nationally notable coleopteran.

Coleoptera: *Riolus subviolaceus* (Nb)

[Recorded at 36 (8.2%) of the 438 IFE sites.]

R. Wissey

Rich assemblages of Gastropoda and Coleoptera, mainly comprised of commonly occurring species but also including two rare species.

Gastropoda: *Valvata macrostoma* (pRDB 3, Ball 1986)

[Recorded at 4 (0.9% of the 438 IFE sites.)]

Coleoptera: *Oulimnius major* (RDB3, Ball 1986).

[Recorded at 3 (0.7%) of the 438 IFE sites.]

Although the diverse trichopteran fauna lacked rarities, the occurrence of eight species within the Leptoceridae was notable.

R. Walkham

No nationally rare species. Species-rich assemblage of Trichoptera, but only *Lasiocephala basalis* is regarded as local by Wallace (1991). This species has been found at 12 (2.7%) of the 438 IFE sites.

R. Lathkill

Two nationally notable (Nb) Coleoptera.

Coleoptera: *Riolus cupreus* (Nb)

Riolus subviolaceus (Nb)

[*R. cupreus* recorded at 14 (3.2%) and

R. subviolaceus at 36 (8.2%) of the 438 IFE sites.]

Rich assemblages of Trichoptera, including two species classed as notable by Wallace (1991). These are *Tinodes unicolor* which is characteristic of highly calcareous small streams (recorded in just one (0.2%) of IFE sites) and *Metalype fragilis* (not in the IFE data-set, but recorded in Cowside and Gordale Beck in 1989 (Wright *et al.* 1990). The list of Trichoptera also includes three species (*Melampophylax mucoreus*, *Silo nigricornis* and *Lasiocephala basalis*) classed by Wallace (1991) as local in northern England.

R. Coquet

No rare species but the ephemeropteran, *Ephemerella notata* (8 IFE records), was regarded as uncommon by Bratton (1990) and the trichopteran, *Melampophylax mucoreus* (15 IFE records) as local by Wallace (1991).

7.4 BMWP Scores (SCR), number of scoring taxa (TX) and Average Score per Taxon (ASPT) at each site for single seasons and for 3 seasons data combined. This year, the values are based on the number of BMWP families recorded in the 'main' sample only because supplementary samples were not available for all sites in all seasons.

River	Site Name	Spring			Summer			Autumn			Combined		
		SCR	TX	ASPT	SCR	TX	ASPT	SCR	TX	ASPT	SCR	TX	ASPT
WHITEADDER	CRANSHAWS	159	26	6.12	140	24	5.83	129	22	5.86	192	31	6.19
WHITEADDER	PRESTON HAUGH	180	30	6.00	161	27	5.96	121	21	5.76	208	34	6.12
WHITEADDER	U/S ALLANTON	116	23	5.04	142	27	5.26	147	29	5.07	160	31	5.16
WHITEADDER	CHESTERFIELD FORD	149	27	5.52	185	33	5.61	147	29	5.07	212	37	5.73
BLACKADDER	HALLIBURTON BRIDGE	129	23	5.61	116	23	5.04	118	22	5.36	187	33	5.67
BLACKADDER	FOGO	156	27	5.78	151	27	5.59	148	27	5.48	206	34	6.06
BLACKADDER	BLACKADDER WATER FOOT	95	20	4.75	122	25	4.88	125	25	5.00	152	29	5.24
R. WISSEY	NORTH PICKENHAM	46	12	3.83	69	17	4.06	66	17	3.88	96	22	4.36
R. WISSEY	LINGHILLS FARM	85	19	4.47	150	30	5.00	132	27	4.89	179	34	5.26
R. WISSEY	DIDLINGTON LODGE	164	28	5.86	178	33	5.39	184	33	5.58	241	42	5.74
R. WISSEY	FIVE MILE HOUSE	130	28	4.64	146	30	4.87	103	24	4.29	176	35	5.03
R. WALKHAM	MERRIVALE	131	19	6.89	122	19	6.42	126	20	6.30	181	27	6.70
R. WALKHAM	GRENOFEN	180	27	6.67	145	24	6.04	150	24	6.25	218	33	6.61
R. LATHKILL	ALPORT	132	20	6.60	108	16	6.75	129	21	6.14	191	29	6.59
R. LATHKILL	CONGREAVE	172	25	6.88	106	17	6.24	27	6	4.50	197	29	6.79
R. COQUET	CARSHOPE	117	19	6.16	146	24	6.08	149	24	6.21	198	30	6.60
R. COQUET	LINSHIELS	128	21	6.10	130	21	6.19	140	23	6.09	178	28	6.36
R. COQUET	SHARPERTON	165	26	6.35	112	18	6.22	192	30	6.40	210	33	6.36
R. COQUET	PAUPERHAUGH	157	27	5.81	149	27	5.52	233	39	5.97	233	39	5.97
R. COQUET	COQUET LODGE	67	12	5.58	88	15	5.87	30	8	3.75	111	19	5.84

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