

1106

S623022

Centre for Ecology
& Hydrology
Library Service
Lancaster

The

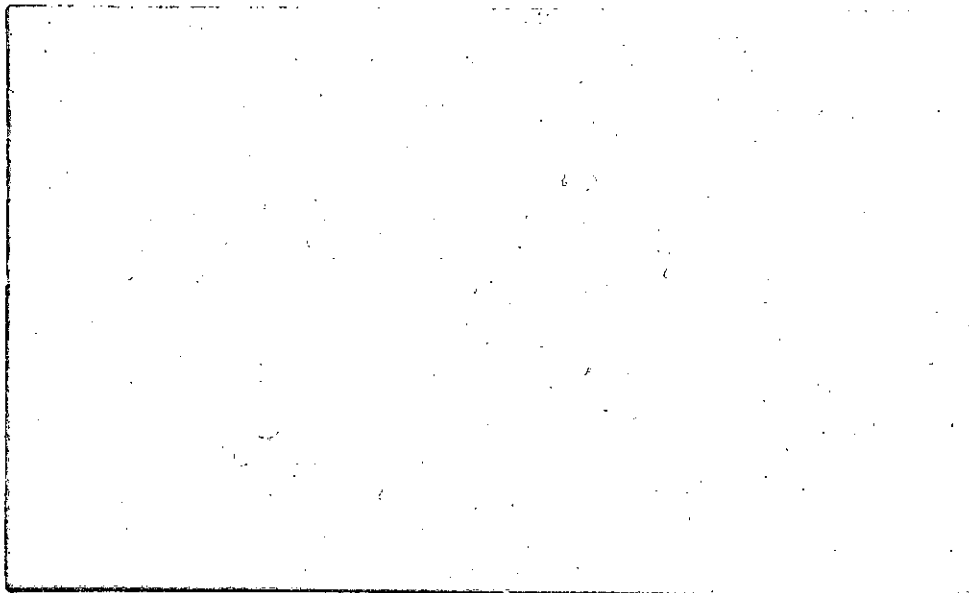
Centre for Ecology & Hydrology



Centre for
Ecology & Hydrology

NATURAL ENVIRONMENT RESEARCH COUNCIL

The **Centre for Ecology and Hydrology** is one of the Centres and Surveys of the Natural Environment Research Council (NERC). It was established in 1994 by the grouping together of four NERC Institutes, the Institute of Hydrology (IH), the Institute of Terrestrial Ecology (ITE), the Institute of Freshwater Ecology (IFE) and the Institute of Virology and Environmental Microbiology (IVEM). In 2000, the four component institutes were merged into a single research organisation.



The CEH mission

- To advance the sciences of ecology, environmental microbiology (including virology) and hydrology through high-quality and internationally recognised research leading to a better understanding and quantification of the physical, chemical and biological processes relating to land and freshwater and living organisms within these environments.
- To investigate, through monitoring and modelling, natural changes in the ecological, microbiological and hydrological environments, to assess both past and future changes and to predict man's impact on these environments.
- To secure, expand and provide ecologically and hydrologically relevant data to further scientific research and provide the basis for advice on environmental conservation and sustainable development to governments and industry.
- To promote the use of the Centre's research facilities and data, to provide research training of the highest quality and to enhance the United Kingdom's research base, industrial competitiveness and quality of life.



**Centre for
Ecology & Hydrology**

NATURAL ENVIRONMENT RESEARCH COUNCIL

CEH Dorset

Winfrith Technology Centre
Winfrith Newburgh
Dorchester
Dorset DT2 8ZD

Telephone (01305) 213500
Main Fax (01305 213600)
www.ceh.ac.uk

**Macroinvertebrates from the
Environmental Change Network Sites
On the R. Faughan, Garvary River
And Owenkillew River in 2003 - 2005**

**R J M Gunn, J H Blackburn, N T Kneebone
M W Neale, T A Corbin, J Davy-Bowker
J F Murphy and H M Vincent**

Report to:	Environment & Heritage Service, Northern Ireland
CEH Project No:	C01175NEW
Report Reference No:	C01175/03
Date:	January 2006

INTELLECTUAL PROPERTY RIGHTS

CONFIDENTIALITY STATEMENT

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

CONTENTS

	Page
1. Introduction	1
2. The sites	1
2.1 River Faughan, Mobuoy Bridge (IGR C476193)	1
2.2 Garvary River, Larkhill (IGR H009630)	2
2.3 Owenkillew River, Monanameal Bridge (IGR H613847)	2
3. Methods	2
4. BMWP indices for samples from the three ECN sites	3
5. References	4
APPENDIX	5
The taxa found in each sample from the ECN sites:	7

1. INTRODUCTION

The United Kingdom Environmental Change Network (ECN) was set up in 1992, largely due to the efforts of the Natural Environment Research Council (NERC), to provide long-term, integrated environmental monitoring, especially in relation to the effect that humans have on their surroundings (Sykes *et al* 1999). The initial network of terrestrial sites was expanded to include a linked network of freshwater sites, which included rivers and lakes. There are currently 43 freshwater sites in ECN. These sites have been monitored by various organisations with varying skills in the identification of freshwater macro-invertebrates. Staff from the Centre for Ecology and Hydrology (CEH) in Dorset, formerly the Institute of Freshwater Ecology (IFE), have been contracted since 1993 by some of these organisations to analyse samples from their ECN sites. More recently, it was recognised that although the biologists providing data from ECN freshwater sites were experienced in collecting biological samples, many were inexperienced in the species level identification of macro-invertebrates. Since 1998, CEH has been contracted more widely to provide a consistent standard of identification of these ECN macro-invertebrate samples. This report details the macro-invertebrates found at the ECN sites sponsored by The Environment & Heritage Service, in Northern Ireland. These are the River Faughan at Mobuoy Bridge in County Londonderry, the Garvary River at Larkhill in County Fermanagh and the Owenkillew River at Monanameal Bridge in County Tyrone. Following the collection of the spring 2004 sample from the Mobuoy Bridge site, further sampling here was considered unsafe and the site was dropped from the ECN programme. The site at Monanameal Bridge was introduced as a replacement in spring 2005.

2. THE SITES

2.1 River Faughan, Mobuoy Bridge (IGR C476193)

The River Faughan originates on the north western slopes of the Sperrin Mountains and flows in a north westerly direction before discharging into Lough Foyle. The sample site at Mobuoy Bridge is approximately 40 km downstream of the source and some 5 km downstream of the Drumahoe industrial estate, the first significant urbanisation on the river.

Sample dates:

	Spring	Summer	Autumn
2003	17.04.2003	14.08.2003	13.10.2003
2004	04.05.2004	No sample	No sample
2005	No sample	No sample	No sample

2.2 Garvary River, Larkhill (IGR H009630)

The Garvary River has its source in the outflows from Loughs Vearty and Tullyasiddagh. It flows in a south easterly direction and discharges to Lower Lough Erne. The sample site at Larkhill is approximately 5 km downstream of the outflow from Lough Vearty, below the confluence with the Crossowen River but upstream of the outflow from Lough Scolban. There are no major urban influences upstream of the sample site.

Sample dates:

	Spring	Summer	Autumn
2003	12.04.2003	08.08.2003	10.11.2003
2004	28.04.2004	11.08.2004	26.10.2004
2005	21.04.2005	03.08.2005	25.10.2005

2.3 Owenkillew River, Monanameal Bridge (IGR H613847).

The Owenkillew River originates on the north western side of Fir Mountain in the lower Sperrins. It flows in a westerly direction into the River Strule before discharging into Lough Foyle. The sample site at Monanameal Bridge is approximately 21 km downstream of the source of the river and some 15Km upstream of the village of Gortin which is the only element of urbanisation in this river system.

Sample dates:

	Spring	Summer	Autumn
2003	No sample	No sample	No sample
2004	No sample	No sample	No sample
2005	25.04.2005	02.08.2005	21.09.2005

3. METHODS

The Environment and Heritage Service (EHS) collected all of the samples detailed above using a kick/sweep technique with a pond-net for 3 minutes, following the standard protocols for ECN freshwater sites (Sykes *et al.* 1999). The samples were fixed in 4% formaldehyde and sent to CEH for analysis.

The samples were analysed according to the detailed methodology outlined in the Environment Agency's biological methods manual BT001 (Environment Agency 1999). Although a qualitative sampling methodology was used, the ECN analysis required that CEH provide the absolute abundance of each taxon at species level. Indices for the Biological Monitoring Working Party (BMWP) system are calculated for each sample.

The methods employed adhere closely to those developed in the production of RIVPACS, a model derived by staff from CEH that predicts the occurrence of the fauna expected at a particular river site from the environmental characteristics of that site (Furse *et al* 1981, Wright *et al* 1984). This permits the RIVPACS program to be used to predict the fauna that would be expected to occur at a particular ECN site. From this, an index of environmental quality may be derived as the ratio of the observed community, as found in the sample, to that expected for the site, as predicted by the program (Wright *et al* 1993).

4. BMWP INDICES FOR SAMPLES FROM THE TWO ECN SITES

River Faughan, Mobuoy Bridge

	BMWP Score	No. of Scoring Taxa	ASPT
17.03.2003	62	12	5.17
14.08.2003	100	20	5.00
13.10.2003	115	23	5.00
04.05.2004	58	12	4.83

Garvary River, Larkhill

	BMWP Score	No. of Scoring Taxa	ASPT
12.04.2003	144	22	6.55
08.08.2003	126	20	6.30
10.11.2003	149	24	6.21
28.04.2004	128	19	6.74
11.08.2004	106	18	5.89
26.10.2004	118	18	6.56
21.04.2005	135	21	6.43
03.08.2005	101	17	5.94
25.10.2005	86	15	5.73

Owenkillew River, Monanameal Bridge

	BMWP Score	No. of Scoring Taxa	ASPT
25.04.2005	187	28	6.68
02.08.2005	121	20	6.05
21.09.2005	112	19	5.89

5. REFERENCES

- Environment Agency 1999. Procedures for collecting and analysing macro-invertebrate samples. Quality Management Systems for Environmental monitoring: Biological Techniques, BT001. Bristol: Environment Agency. 176 pp.
- Furse M T, Wright J F, Armitage P D and Moss D, 1981. An appraisal of pond-net samples for biological monitoring of lotic macro-invertebrates. *Water Research*, **15**, 679-689.
- Sykes J M, Lane M J and George D G (Eds), 1999. The United Kingdom Environmental Change Network: Protocols for standard measurements at Freshwater sites. Natural Environment Research Council. 134 pp.
- Wright J F, Furse M T and Armitage P D, 1993. RIVPACS – a technique for evaluating the biological quality of rivers in the U.K. *European Water Pollution Control*, **3** (4), 15-25.
- Wright J F, Moss D, Armitage P D and Furse M T, 1984. A preliminary classification of running-water sites in Great Britain based on macro-invertebrate species and the prediction of community type using environmental data. *Freshwater Biology*, **14**, 221-256.

APPENDIX

The taxa found in each sample collected between 2003 and 2005 from the ECN sites at Mobuoy Bridge on the River Faughan, at Larkhill on the Garvary River and at Monanameal Bridge on the Owenkillew River

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Faughan
 Site: Mobuoy Bridge
 Method: Kick/Sweep

ECN Site Code: R19
 ECN Location Code: 01
 Sample Date: 17 April 2003

CEH RIVER_ID: 202000
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 49
 CEH SEASON_ID: 1
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Spongillidae	1	Spongillidae	1	
Potamopyrgus jenkinsi (Smith)	2	Hydrobiidae (incl. Bithyniidae)	1	3
Ancylus fluviatilis Muller	5	Ancylidae (incl. Acroloxidae)	1	6
Lumbriculidae	7	Oligochaeta	4	1
Enchytraeidae	4	Lumbriculidae	1	
Naididae	2880	Enchytraeidae	1	
Tubificidae	28	Naididae	4	
Hydracarina	48	Tubificidae	2	
Gammarus duebeni Liljeborg	94	Hydracarina	2	
Baetis rhodani (Pictet)	2	Gammaridae (incl. Crangonyctidae & Niphargidae)	2	6
Chloroperla torrentium (Pictet)	1	Baetidae	1	4
Oreodytes sanmarkii (Sahlberg)	1	Chloroperlidae	1	10
Elmis aenea (Muller)	1	Dytiscidae (incl. Noteridae)	1	5
Limnius volckmari (Panzer)	6	Elmidae	1	5
Psychomyia pusilla (Fabricius)	1	Psychomyiidae (incl. Ecnomidae)	1	8
Tinodes waeneri (L.)	1	Limnephilidae	1	7
Limnephilidae	1	Tipulidae	1	5
Antocha vitripennis (Meigen)	4	Chironomidae	3	2
Chironomidae	832	Empididae	2	
Chelifera group sp.	3			
Hemerodromia group sp.	4			
Clinocerinae	6			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	62
Number of scoring taxa	12
ASPT	5.17

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Faughan
 Site: Mobuoy Bridge
 Method: Kick/Sweep

ECN Site Code: R19
 ECN Location Code: 01
 Sample Date: 14 August 2003

CEH RIVER_ID: 202900
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 50
 CEH_SEASON_ID: 2
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	42	Hydrobiidae (incl. Bithyniidae)	2	3
Physa acuta group	1	Physidae	1	3
Lymnaea peregra (Muller)	2	Lymnaeidae	1	3
Ancylus fluviatilis Muller	2	Ancylidae (incl. Acroloxidae)	1	6
Pisidium sp.	1	Sphaeriidae	1	3
Lumbriculidae	8	Oligochaeta	3	1
Naididae	16	Lumbriculidae	1	
Tubificidae	86	Naididae	2	
Glossiphonia complanata (L.)	1	Tubificidae	2	
Hydracarina	16	Glossiphoniidae	1	3
Asellus aquaticus (L.)	8	Hydracarina	2	
Gammarus duebeni Liljeborg	18	AseIIDae	1	3
Baetis scambus group	4	Gammaridae (incl. Crangonyctidae & Niphargidae)	2	6
Ecdyonurus sp.	1	Baetidae	1	4
Ephemerella ignita (Poda)	18	Heptageniidae	1	10
Leuctra fusca (L.)	1	Ephemerellidae	2	10
Velia sp.	1	Leuctridae	1	10
Corixidae	2	Veliidae	1	
Sigara dorsalis (Leach)	2	Corixidae	1	5
Stictotarsus duodecimpustulatus (Fabricius)	1	Dytiscidae (incl. Noteridae)	1	5
Oreodytes sanmarkii (Sahlberg)	1	Elmidae	1	5
Ilybius sp.	1	Hydroptilidae	1	6
Elmis aenea (Muller)	1	Limnephilidae	1	7
Limnius volckmari (Panzer)	1	Tipulidae	2	5
Hydroptila sp.	1	Chironomidae	3	2
Potamophylax cingulatus group	1	Ephydriidae	1	
Dicranota sp.	12			
Chironomidae	272			
Ephydriidae	1			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	100
Number of scoring taxa	20
ASPT	5.00

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Faughan
 Site: Mobuoy Bridge
 Method: Kick/Sweep

ECN Site Code: R19
 ECN Location Code: 01
 Sample Date: 13 October 2003

CEH RIVER_ID: 202000
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 51
 CEH_SEASON_ID: 3
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Polycelis nigra group	4	Planariidae (incl. Dugesiidae)	1	5
Dugesia polychroa group	1	Hydrobiidae (incl. Bithyniidae)	3	3
Potamopyrgus jenkinsi (Smith)	760	Physidae	1	3
Physa fontinalis (L.)	1	Lymnaeidae	2	3
Lymnaea peregra (Muller)	12	Ancylidae (incl. Acroloxidae)	2	6
Ancylus fluviatilis Muller	18	Sphaeriidae	1	3
Pisidium sp.	7	Oligochaeta	3	1
Lumbriculidae	8	Lumbriculidae	1	
Enchytraeidae	16	Enchytraeidae	2	
Tubificidae	184	Tubificidae	3	
Pisicola geometra (L.)	8	Piscicolidae	1	4
Hydracarina	136	Hydracarina	3	
Asellus aquaticus (L.)	9	Asellidae	1	3
Gammarus duebeni Liljeborg	32	Gammaridae (incl. Crangonyctidae & Niphargidae)	2	6
Baetis rhodani (Pictet)	16	Baetidae	2	4
Baetis scambus group	4	Heptageniidae	1	10
Rhithrogena semicolorata (Curtis)	2	Ephemerellidae	1	10
Ephemerella ignita (Poda)	2	Caenidae	1	7
Caenis rivulorum Eaton	1	Corixidae	1	5
Sigara dorsalis (Leach)	2	Halipidae	1	5
Halipus sp.	1	Dytiscidae (incl. Noteridae)	2	5
Halipus immaculatus Gerhardt	1	Hydrophilidae (incl. Hydraenidae)	1	5
Stictotarsus duodecimpustulatus (Fabricius)	1	Elmidae	1	5
Oreodytes sanmarkii (Sahlberg)	3	Psychomyiidae (incl. Ecnomidae)	1	8
Ilybius fuliginosus (Fabricius)	8	Limnephilidae	2	7
Hydraena gracilis Germar	1	Tipulidae	2	5
Elmis aenea (Muller)	2	Chironomidae	3	2
Esolus parallelepipedus (Muller)	1	Empididae	1	
Limnius volckmari (Panzer)	4			
Oulimnius sp.	1			
Oulimnius tuberculatus (Muller)	1			
Tinodes waeneri (L.)	4			
Limnephilidae	4			
Potamophylax cingulatus (Stephens)	1			
Potamophylax latipennis (Curtis)	2			
Potamophylax cingulatus group	9			
Tipula montium group	6			
Dicranota sp.	12			
Chironomidae	120			
Clinocerinae	1			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	115
Number of scoring taxa	23
ASPT	5.00

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Faughan
 Site: Mobuoy Bridge
 Method: Kick/Sweep

ECN Site Code: R19
 ECN Location Code: 01
 Sample Date: 04 May 2004

CEH RIVER_ID: 202000
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 52
 CEH_SEASON_ID: 1
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	9	Hydrobiidae (incl. Bithyniidae)	1	3
Ancylus fluviatilis Muller	1	Ancylidae (incl. Acroloxidae)	1	6
Pisidium sp.	2	Sphaeriidae	1	3
Lumbriculidae	1	Oligochaeta	2	1
Enchytraeidae	2	Lumbriculidae	1	
Naididae	4	Enchytraeidae	1	
Tubificidae	3	Naididae	1	
Piscicola geometra (L.)	1	Tubificidae	1	
Hydracarina	18	Piscicolidae	1	4
Gammarus duebeni Liljeborg	8	Hydracarina	2	
Baetis sp.	1	Gammaridae (incl. Crangonyctidae & Niphargidae)	1	6
Caenis rivulorum Eaton	2	Baetidae	1	4
Chloroperla torrentium (Pictet)	1	Caenidae	1	7
Halesus digitatus (Schrank)	2	Chloroperlidae	1	10
Dicranota sp.	1	Limnephilidae	1	7
Ceratopogonidae	1	Tipulidae	1	5
Chironomidae	77	Ceratopogonidae	1	
Chelifera group sp.	1	Chironomidae	2	2
		Empididae	1	

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score 58
 Number of scoring taxa 12
 ASPT 4.83

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 01
 Sample Date: 12 April 2003

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 49
 CEH_SEASON_ID: 1
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	84	Hydrobiidae (incl. Bithyniidae)	2	3
Ancylus fluviatilis Muller	5	Ancylidae (incl. Acroloxidae)	1	6
Tubificidae	11	Oligochaeta	2	1
Gammarus duebeni Liljeborg	1	Tubificidae	2	
Baetis muticus (L.)	16	Gammaridae (incl. Crangonyctidae & Niphargidae)	1	6
Baetis rhodani (Pictet)	57	Baetidae	2	4
Rhithrogena semicolorata (Curtis)	26	Heptageniidae	2	10
Heptagenia sulphurea (Muller)	11	Taeniopterygidae	1	10
Ecdyonurus sp.	6	Nemouridae	2	7
Brachyptera risi (Morton)	5	Leuctridae	2	10
Protonemura meyeri (Pictet)	12	Chloroperlidae	1	10
Amphinemura sulcicollis (Stephens)	2	Hydrophilidae (incl. Hydraenidae)	1	5
Leuctra hippopus (Kempny)	1	Elmidae	2	5
Leuctra inermis Kempny	12	Hydroptilidae	1	6
Chloroperla torrentium (Pictet)	1	Rhyacophilidae (incl. Glossosomatidae)	3	7
Hydraena gracilis Germar	1	Hydropsychidae	2	5
Elmis aenea (Muller)	23	Lepidostomatidae	1	10
Esolus parallelepipedus (Muller)	5	Limnephilidae	1	7
Limnius volckmari (Panzer)	11	Goeridae	2	10
Rhyacophila sp.	1	Sericostomatidae	1	10
Rhyacophila dorsalis (Curtis)	1	Tipulidae	1	5
Glossosomatidae	1	Psychodidae	1	
Glossosoma boltoni Curtis	7	Simuliidae	1	5
Agapetus sp.	93	Chironomidae	2	2
Ithytrichia sp.	3	Empididae	1	
Hydropsyche sp.	1			
Hydropsyche pellucidula (Curtis)	7			
Hydropsyche siltalai Dohler	37			
Lepidostoma hirtum (Fabricius)	9			
Potamophylax latipennis (Curtis)	1			
Silo pallipes (Fabricius)	10			
Sericostoma personatum (Spence)	1			
Dicranota sp.	1			
Pericoma sp.	1			
Simulium argyreatum group	2			
Chironomidae	26			
Hemerodromia group sp.	4			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	144
Number of scoring taxa	22
ASPT	6.55

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 01
 Sample Date: 08 August 2003

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 50
 CEH SEASON_ID: 2
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	376	Hydrobiidae (incl. Bithyniidae)	3	3
Ancylus fluviatilis Muller	5	Ancylidae (incl. Acroloxidae)	1	6
Pisidium sp.	1	Sphaeriidae	1	3
Lumbriculidae	2	Oligochaeta	2	1
Enchytraeidae	3	Lumbriculidae	1	
Naididae	1	Enchytraeidae	1	
Tubificidae	1	Naididae	1	
Lumbricidae	4	Tubificidae	1	
Gammarus duebeni Liljeborg	12	Lumbricidae	1	
Baetis rhodani (Pictet)	15	Gammaridae (incl. Crangonyctidae & Niphargidae)	2	6
Rhithrogena semicolorata (Curtis)	1	Baetidae	2	4
Heptagenia sulphurea (Muller)	1	Heptageniidae	1	10
Ecdyonurus sp.	2	Ephemerellidae	1	10
Ephemerella ignita (Poda)	2	Nemouridae	1	7
Protonemura meyeri (Pictet)	4	Leuctridae	1	10
Leuctra fusca (L.)	5	Elmidae	2	5
Elmis aenea (Muller)	49	Rhyacophilidae (incl. Glossosomatidae)	2	7
Esolus parallelepipedus (Muller)	2	Polycentropodidae	1	7
Limnius volckmari (Panzer)	41	Hydropsychidae	2	5
Rhyacophila dorsalis (Curtis)	5	Goeridae	1	10
Glossosoma sp.	4	Sericostomatidae	1	10
Agapetus sp.	5	Odontoceridae	1	10
Polycentropodidae	1	Tipulidae	1	5
Hydropsyche pellucidula (Curtis)	2	Simuliidae	1	5
Hydropsyche siltalai Dohler	8	Chironomidae	3	2
Silo pallipes (Fabricius)	1	Empididae	2	
Sericostoma personatum (Spence)	1			
Odontocerum albicorne (Scopoli)	1			
Dicranota sp.	1			
Simulium ornatum group	1			
Simulium variegatum Meigen	1			
Chironomidae	255			
Chelifera group sp.	1			
Hemerodromia group sp.	10			
Clinocerinae	1			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	126
Number of scoring taxa	20
ASPT	6.30

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 1
 Sample Date: 10 November 2003

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 51
 CEH SEASON_ID: 3
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	58	Hydrobiidae (incl. Bithyniidae)	2	3
Ancylus fluviatilis Muller	1	Ancylidae (incl. Acroloxidae)	1	6
Lumbriculidae	1	Oligochaeta	2	1
Naididae	1	Lumbriculidae	1	
Tubificidae	18	Naididae	1	
Hydracarina	1	Tubificidae	2	
Asellus aquaticus (L.)	3	Hydracarina	1	
Gammarus duebeni Liljeborg	5	Asellidae	1	3
Baetis muticus (L.)	2	Gammaridae (incl. Crangonyctidae & Niphargidae)	1	6
Baetis rhodani (Pictet)	20	Baetidae	2	4
Rhithrogena semicolorata (Curtis)	33	Heptageniidae	2	10
Heptagenia sulphurea (Muller)	4	Caenidae	1	7
Ecdyonurus sp.	9	Nemouridae	2	7
Caenis luctuosa group	2	Leuctridae	1	10
Protonemura meyeri (Pictet)	21	Chloroperlidae	1	10
Leuctra hippopus (Kempny)	9	Gyrinidae	1	5
Chloroperla torrentium (Pictet)	1	Hydrophilidae (incl. Hydraenidae)	1	5
Orectochilus villosus (Muller)	1	Elmidae	2	5
Hydraena gracilis Germar	2	Hydroptilidae	1	6
Elmis aenea (Muller)	52	Rhyacophilidae (incl. Glossosomatidae)	2	7
Esolus parallelepipedus (Muller)	3	Polycentropodidae	1	7
Limnius volckmari (Panzer)	42	Hydropsychidae	2	5
Rhyacophila dorsalis (Curtis)	1	Psychomyiidae (incl. Ecnomidae)	1	8
Glossosoma sp.	2	Lepidostomatidae	1	10
Agapetus sp.	27	Limnephilidae	1	7
Ithytrichia sp.	1	Goeridae	1	10
Lype sp.	1	Tipulidae	1	5
Polycentropus flavomaculatus (Pictet)	1	Chironomidae	1	2
Hydropsyche sp.	1	Empididae	1	
Hydropsyche pellucidula (Curtis)	4			
Hydropsyche siltalai Dohler	7			
Lepidostoma hirtum (Fabricius)	3			
Limnephilidae	1			
Silo nigricornis (Pictet)	1			
Tipula sp.	1			
Limnophila (Eloeophila) sp.	1			
Chironomidae	3			
Hemerodromia group sp.	2			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	149
Number of scoring taxa	24
ASPT	6.21

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 01
 Sample Date: 28 April 2004

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 52
 CEH SEASON_ID: 1
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	76	Hydrobiidae (incl. Bithyniidae)	2	3
Enchytraeidae	1	Oligochaeta	1	1
Tubificidae	3	Enchytraeidae	1	
Lumbricidae	1	Tubificidae	1	
Gammarus duebeni Liljeborg	7	Lumbricidae	1	
Baetis muticus (L.)	12	Gammaridae (incl. Crangonyctidae & Niphargidae)	1	6
Baetis rhodani (Pictet)	72	Baetidae	2	4
Rhithrogena sp.	54	Heptageniidae	2	10
Heptagenia sulphurea (Muller)	16	Taeniopterygidae	1	10
Ecdyonurus sp.	2	Nemouridae	1	7
Brachyptera risi (Morton)	3	Leuctridae	1	10
Amphinemura sulcicollis (Stephens)	3	Chloroperlidae	1	10
Leuctra inermis Kempny	3	Elmidae	2	5
Chloroperla torrentium (Pictet)	4	Hydroptilidae	1	6
Elmis aenea (Muller)	50	Rhyacophilidae (incl. Glossosomatidae)	2	7
Esolus parallelepipedus (Muller)	3	Hydropsychidae	2	5
Limnius volckmari (Panzer)	33	Lepidostomatidae	2	10
Glossosoma sp.	1	Limnephilidae	1	7
Agapetus sp.	92	Goeridae	1	10
Ithytrichia sp.	5	Sericostomatidae	1	10
Hydropsyche pellucidula (Curtis)	4	Tipulidae	1	5
Hydropsyche siltalai Dohler	8	Chironomidae	2	2
Lepidostoma hirtum (Fabricius)	14	Empididae	2	
Limnephilidae	1			
Potamophylax cingulatus (Stephens)	1			
Potamophylax latipennis (Curtis)	1			
Anabolia nervosa (Curtis)	3			
Silo pallipes (Fabricius)	9			
Sericostoma personatum (Spence)	4			
Dicranota sp.	1			
Chironomidae	26			
Hemerodromia group sp.	25			
Clinocerinae	1			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	128
Number of scoring taxa	19
ASPT	6.74

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Owenkillew River
 Site: Monanameal Bridge
 Method: Kick/Sweep

ECN Site Code: R28
 ECN Location Code: 01
 Sample Date: 21 September 2005

CEH RIVER_ID: 201007
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 57
 CEH SEASON_ID: 3
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Phagocata vitta (Duges)	1	Planariidae (incl. Dugesiidae)	1	5
Lymnaea peregra (Muller)	2	Lymnaeidae	1	3
Ancylus fluviatilis Muller	2	Ancylidae (incl. Acroloxidae)	1	6
Lumbriculidae	7	Oligochaeta	2	1
Enchytraeidae	1	Lumbriculidae	1	
Naididae	22	Enchytraeidae	1	
Lumbricidae	6	Naididae	2	
Hydracarina	1	Lumbricidae	1	
Baetis muticus (L.)	16	Hydracarina	1	
Baetis rhodani (Pictet)	445	Baetidae	3	4
Baetis scambus group	32	Heptageniidae	2	10
Rhithrogena sp.	3	Ephemerellidae	1	10
Heptagenia sulphurea (Muller)	14	Caenidae	2	7
Ecdyonurus sp.	46	Nemouridae	1	7
Ephemerella ignita (Poda)	1	Leuctridae	1	10
Caenis rivulorum Eaton	10	Gyrinidae	1	5
Protonemura meyeri (Pictet)	1	Hydrophilidae (incl. Hydraenidae)	1	5
Leuctra sp.	2	Elmidae	3	5
Orectochilus villosus (Muller)	3	Rhyacophilidae (incl. Glossosomatidae)	1	7
Hydraena gracilis Germar	2	Hydropsychidae	2	5
Elmis aenea (Muller)	84	Lepidostomatidae	1	10
Esolus parallelepipedus (Muller)	6	Tipulidae	1	5
Limnius volckmari (Panzer)	33	Simuliidae	3	5
Oulimnius sp.	17	Chironomidae	3	2
Oulimnius tuberculatus (Muller)	2	Empididae	2	
Rhyacophila sp.	7			
Rhyacophila dorsalis (Curtis)	1			
Rhyacophila munda McLachlan	1			
Hydropsyche sp.	1			
Hydropsyche pellucidula (Curtis)	19			
Hydropsyche siltalai Döhler	37			
Lepidostoma hirtum (Fabricius)	8			
Dicranota sp.	3			
Simulium cryophilum group	4			
Simulium aureum group	11			
Simulium reptans (L.)	4			
Simulium argyreatum group	15			
Simulium ornatum group	156			
Chironomidae	695			
Chelifera group sp.	1			
Hemerodromia group sp.	6			
Clinocerinae	4			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score 112
 Number of scoring taxa 19
 ASPT 5.89

DISTRIBUTION SHEET

To be completed by all Project Leaders producing commissioned research project reports. Please bind a copy of this distribution sheet as the final page in all internal CEH Dorset copies of the report.

1.	Title: Macroinvertebrates from the Environmental Change Network sites on the River Faughan, Garvary River & Owenkillew River in 2003 - 2005 Authors: R J M Gunn, J H Blackburn, N T Kneebone, M W Neale, T A Corbin J Davy-Bowker, J F Murphy and H M Vincent Report ref: C01175/03 Master copy held by: R J M Gunn Report access code (assign a suitable code from list below): N		
2.	DISTRIBUTION LIST [A-E standard, F other]	No. copies	Date
A.	Contract customer: Environment & Heritage Service, N. Ireland	2	Jan 2006
B.	CEH Library, Celia Cook, Merlewood	1	Jan 2006
C.	CEH Dorset Library	1	Jan 2006
D.	Project leader: R J M Gunn	1	Jan 2006
E.	Prof P Nuttall/Prof J Hilton (front cover only)	(2)	Jan 2006
F.	Other (list below and indicate no. copies in RH column)		
1.	J H Blackburn, N T Kneebone, M W Neale,	3	Jan 2006
2.	J Davy-Bowker, T A Corbin, H M Vincent,	3	Jan 2006
	Total number of copies made	11	

REPORT ACCESS CODES

- S** **In strict confidence - restricted access** - Access to named customer(s) - (could be named restricted access individuals), IFE Directorate, Project Leader and all authors.
- C** **In confidence - restricted access** - Access to customer, IFE Directorate, Project Leader, all authors, and IFE staff with permission of Project Leader.
- N** **Normal access** - Access to customer and all IFE staff. Access to visitors and general public with permission of Project Leader.
- G** **General access** - General access to anyone as required.

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Owenkillew River
 Site: Monanameal Bridge
 Method: Kick/Sweep

ECN Site Code: R28
 ECN Location Code: 01
 Sample Date: 02 August 2005

CEH RIVER_ID: 201007
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 56
 CEH SEASON_ID: 2
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Nematoda	1	Nematoda	1	
Potamopyrgus jenkinsi (Smith)	1	Hydrobiidae (incl. Bithyniidae)	1	3
Lymnaea sp.	6	Lymnaeidae	2	3
Lymnaea peregra (Muller)	5	Ancylidae (incl. Acroloxidae)	1	6
Ancylus fluviatilis Muller	3	Oligochaeta	2	1
Lumbriculidae	3	Lumbriculidae	1	
Enchytraeidae	5	Enchytraeidae	1	
Naididae	2	Naididae	1	
Tubificidae	5	Tubificidae	1	
Helobdella stagnalis (L.)	7	Glossiphoniidae	1	3
Hydracarina	11	Hydracarina	2	
Baetis muticus (L.)	6	Baetidae	2	4
Baetis rhodani (Pictet)	13	Heptageniidae	2	10
Baetis scambus group	10	Leptophlebiidae	1	10
Cloeon simile Eaton	2	Ephemerellidae	2	10
Heptagenia sulphurea (Muller)	2	Leuctridae	2	10
Ecdyonurus sp.	13	Hydrometridae	1	5
Paraleptophlebia cincta (Retzius)	1	Dytiscidae (incl. Noteridae)	1	5
Ephemerella ignita (Poda)	39	Elmidae	2	5
Leuctra fusca (L.)	17	Rhyacophilidae (incl. Glossosomatidae)	1	7
Hydrometra sp.	1	Polycentropodidae	1	7
Oreodytes sanmarkii (Sahlberg)	5	Hydropsychidae	1	5
Elmis aenea (Muller)	27	Lepidostomatidae	1	10
Esolus parallelepipedus (Muller)	10	Goeridae	1	10
Limnius volckmari (Panzer)	40	Simuliidae	1	5
Oulimnius sp.	6	Chironomidae	2	2
Oulimnius tuberculatus (Muller)	2	Empididae	1	
Rhyacophila dorsalis (Curtis)	3			
Glossosoma sp.	2			
Plectrocnemia conspersa (Curtis)	1			
Polycentropus flavomaculatus (Pictet)	6			
Hydropsyche sp.	2			
Hydropsyche pellucidula (Curtis)	2			
Lepidostoma hirtum (Fabricius)	1			
Goera pilosa (Fabricius)	1			
Simulium sp.	2			
Chironomidae	60			
Clinocerinae	5			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	121
Number of scoring taxa	20
ASPT	6.05

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Owenkillew River
 Site: Monanameal Bridge
 Method: Kick/Sweep

ECN Site Code: R28
 ECN Location Code: 01
 Sample Date: 25 April 2005

CEH RIVER_ID: 201007
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 55
 CEH SEASON_ID: 1
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Lymnaea peregra (Muller)	3	Lymnaeidae	1	3
Ancylus fluviatilis Muller	1	Ancylidae (incl. Acroloxidae)	1	6
Enchytraeidae	1	Oligochaeta	1	1
Tubificidae	2	Enchytraeidae	1	
Helobdella stagnalis (L.)	2	Tubificidae	1	
Hydracarina	8	Glossiphoniidae	1	3
Baetis muticus (L.)	5	Hydracarina	1	
Baetis rhodani (Pictet)	10	Baetidae	2	4
Rhithrogena sp.	3	Heptageniidae	1	10
Heptagenia sulphurea (Muller)	1	Leptophlebiidae	2	10
Ecdyonurus sp.	2	Caenidae	2	7
Leptophlebia vespertina (L.)	19	Nemouridae	1	7
Paraleptophlebia sp.	17	Perlodidae	1	10
Paraleptophlebia cincta (Retzius)	2	Chloroperlidae	1	10
Caenis rivulorum Eaton	40	Coenagriidae	1	6
Nemoura cinerea (Retzius)	1	Calopterygidae	1	8
Isoperla grammatica (Poda)	3	Gerridae	1	5
Chloroperla torrentium (Pictet)	3	Dytiscidae (incl. Noteridae)	1	5
Pyrhosoma nymphula (Sulzer)	2	Hydrophilidae (incl. Hydraenidae)	1	5
Calopteryx splendens (Harris)	5	Elmidae	2	5
Gerris lacustris (L.)	1	Hydroptilidae	1	6
Oreodytes sanmarkii (Sahlberg)	2	Polycentropodidae	1	7
Hydraena gracilis Germar	1	Hydropsychoidea	1	5
Elmis aenea (Muller)	16	Lepidostomatidae	2	10
Esolus parallelepipedus (Muller)	6	Limnephilidae	1	7
Limnius volckmari (Panzer)	26	Goeridae	1	10
Oulimnius tuberculatus (Muller)	9	Beraeidae	1	10
Hydroptila sp.	1	Sericostomatidae	1	10
Ithytrichia sp.	1	Leptoceridae	1	10
Cymus trimaculatus (Curtis)	1	Tipulidae	1	5
Polycentropus flavomaculatus (Pictet)	2	Chironomidae	1	2
Hydropsyche pellucidula (Curtis)	1	Empididae	1	
Lepidostoma hirtum (Fabricius)	10			
Limnephilidae	3			
Halesus radiatus (Curtis)	1			
Anabolia nervosa (Curtis)	5			
Goera pilosa (Fabricius)	1			
Beraeodes minutus (L.)	2			
Sericostoma personatum (Spence)	3			
Athripsodes bilineatus (L.)	1			
Limnophila (Eloeophila) sp.	1			
Chironomidae	7			
Hemerodromia group sp.	5			
Clinocerinae	1			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	187
Number of scoring taxa	28
ASPT	6.68

DISTRIBUTION SHEET

To be completed by all Project Leaders producing commissioned research project reports. Please bind a copy of this distribution sheet as the final page in all internal CEH Dorset copies of the report.

1.	Title: Macroinvertebrates from the Environmental Change Network sites on the River Faughan, Garvary River & Owenkillew River in 2003 - 2005 Authors: R J M Gunn, J H Blackburn, N T Kneebone, M W Neale, T A Corbin J Davy-Bowker, J F Murphy and H M Vincent Report ref: C01175/03 Master copy held by: R J M Gunn Report access code (assign a suitable code from list below): N		
2.	DISTRIBUTION LIST [A-E standard, F other]	No. copies	Date
A.	Contract customer: Environment & Heritage Service, N. Ireland	2	Jan 2006
B.	CEH Library, Celia Cook, Merlewood	1	Jan 2006
C.	CEH Dorset Library	1	Jan 2006
D.	Project leader: R J M Gunn	1	Jan 2006
E.	Prof P Nuttall/Prof J Hilton (front cover only)	(2)	Jan 2006
F	Other (list below and indicate no. copies in RH column)		
1.	J H Blackburn, N T Kneebone, M W Neale,	3	Jan 2006
2.	J Davy-Bowker, T A Corbin, H M Vincent,	3	Jan 2006
Total number of copies made		11	

REPORT ACCESS CODES

- S** **In strict confidence - restricted access** - Access to named customer(s) - (could be named restricted access individuals), IFE Directorate, Project Leader and all authors.
- C** **In confidence - restricted access** - Access to customer, IFE Directorate, Project Leader, all authors, and IFE staff with permission of Project Leader.
- N** **Normal access** - Access to customer and all IFE staff. Access to visitors and general public with permission of Project Leader.
- G** **General access** - General access to anyone as required.

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 02
 Sample Date: 11 August 2004

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 53
 CEH SEASON_ID: 2
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	83	Hydrobiidae (incl. Bithyniidae)	2	3
Enchytraeidae	1	Oligochaeta	2	1
Tubificidae	8	Enchytraeidae	1	
Lumbricidae	4	Tubificidae	1	
Hydracarina	1	Lumbricidae	1	
Gammarus duebeni Lilieborg	14	Hydracarina	1	
Baetis rhodani (Pictet)	3	Gammaridae (incl. Crangonyctidae & Niphargidae)	2	6
Rhithrogena sp.	1	Baetidae	1	4
Heptagenia sulphurea (Muller)	1	Heptageniidae	1	10
Ecdyonurus sp.	2	Caenidae	1	7
Caenis rivulorum Eaton	2	Nemouridae	2	7
Protonemura meyeri (Pictet)	21	Leuctridae	1	10
Leuctra fusca (L.)	2	Hydrophilidae (incl. Hydraenidae)	1	5
Hydraena gracilis Germar	2	Elmidae	2	5
Elmis aenea (Muller)	42	Rhyacophilidae (incl. Glossosomatidae)	1	7
Esolus parallelepipedus (Muller)	14	Polycentropodidae	1	7
Limnius volckmari (Panzer)	35	Hydropsychidae	1	5
Rhyacophila sp.	1	Limnephilidae	1	7
Rhyacophila dorsalis (Curtis)	2	Goeridae	1	10
Glossosoma sp.	6	Tipulidae	1	5
Polycentropus flavomaculatus (Pictet)	2	Simuliidae	2	5
Hydropsyche sp.	2	Chironomidae	3	2
Hydropsyche pellucidula (Curtis)	1	Empididae	2	
Hydatophylax infumatus (Mclachlan)	1			
Silo pallipes (Fabricius)	1			
Dicranota sp.	1			
Simulium argyreatum group	2			
Simulium ornatum group	10			
Chironomidae	150			
Chelifera group sp.	2			
Hemerodromia group sp.	8			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	106
Number of scoring taxa	18
ASPT	5.89

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 03
 Sample Date: 26 October 2004

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 54
 CEH_SEASON_ID: 3
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	47	Hydrobiidae (incl. Bithyniidae)	2	3
Ancylus fluviatilis Muller	3	Ancylidae (incl. Acroloxidae)	1	6
Enchytraeidae	2	Oligochaeta	2	1
Tubificidae	15	Enchytraeidae	1	
Lumbricidae	4	Tubificidae	2	
Gammarus duebeni Liljeborg	34	Lumbricidae	1	
Rhithrogena sp.	8	Gammaridae (incl. Crangonyctidae & Niphargidae)	2	6
Heptagenia sulphurea (Muller)	13	Heptageniidae	2	10
Ecdyonurus sp.	15	Nemouridae	2	7
Protonemura meyeri (Pictet)	13	Leuctridae	1	10
Leuctra sp.	1	Chloroperlidae	1	10
Chloroperla torrentium (Pictet)	1	Scirtidae	1	5
Elodes sp.	1	Elmidae	2	5
Elmis aenea (Muller)	39	Hydroptilidae	1	6
Esolus parallelepipedus (Muller)	2	Rhyacophilidae (incl. Glossosomatidae)	2	7
Limnius volckmari (Panzer)	31	Hydropsychidae	1	5
Rhyacophila dorsalis (Curtis)	2	Psychomyiidae (incl. Ecnomidae)	1	8
Glossosoma sp.	1	Limnephilidae	1	7
Agapetus sp.	34	Goeridae	1	10
Hydroptila sp.	1	Sericostomatidae	1	10
Lype sp.	1	Chironomidae	1	2
Hydropsyche pellucidula (Curtis)	6	Empididae	1	
Hydropsyche siltalai Dohler	2			
Limnephilidae	7			
Silo nigricornis (Pictet)	2			
Silo pallipes (Fabricius)	4			
Sericostoma personatum (Spence)	3			
Chironomidae	1			
Chelifera group sp.	2			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score 118
 Number of scoring taxa 18
 ASPT 6.56

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 1
 Sample Date: 21 April 2005

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 55
 CEH_SEASON_ID: 1
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	131	Hydrobiidae (incl. Bithyniidae)	3	3
Ancylus fluviatilis Muller	1	Ancylidae (incl. Acroloxidae)	1	6
Pisidium sp.	1	Sphaeriidae	1	3
Tubificidae	42	Oligochaeta	2	1
Theromyzon tessulatum (Muller)	1	Tubificidae	2	
Gammarus duebeni Liljeborg	10	Glossiphoniidae	1	3
Baetis muticus (L.)	2	Gammaridae (incl. Crangonyctidae & Niphargidae)	2	6
Baetis rhodani (Pictet)	9	Baetidae	2	4
Rhithrogena sp.	53	Heptageniidae	3	10
Heptagenia sulphurea (Muller)	47	Leuctridae	1	10
Ecdyonurus sp.	9	Perlodidae	1	10
Leuctra inermis Kempny	3	Chloroperlidae	1	10
Isoperla grammatica (Poda)	1	Elmidae	2	5
Chloroperla torrentium (Pictet)	4	Hydroptilidae	2	6
Elmis aenea (Muller)	31	Rhyacophilidae (incl. Glossosomatidae)	3	7
Esolus parallelepipedus (Muller)	4	Polycentropodidae	1	7
Limnius volckmari (Panzer)	6	Hydropsychidae	2	5
Rhyacophila dorsalis (Curtis)	1	Lepidostomatidae	1	10
Glossosoma sp.	17	Limnephilidae	1	7
Agapetus sp.	232	Goeridae	1	10
Ithytrichia sp.	21	Sericostomatidae	1	10
Polycentropus flavomaculatus (Pictet)	1	Chironomidae	1	2
Hydropsyche pellucidula (Curtis)	13	Empididae	1	
Hydropsyche siltalai Dohler	20			
Lepidostoma hirtum (Fabricius)	7			
Limnephilidae	6			
Silo pallipes (Fabricius)	1			
Sericostoma personatum (Spence)	5			
Chironomidae	6			
Hemerodromia group sp.	1			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	135
Number of scoring taxa	21
ASPT	6.43

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 1
 Sample Date: 03 August 2005

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 56
 CEH SEASON_ID: 2
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	215	Hydrobiidae (incl. Bithyniidae)	3	3
Ancylus fluviatilis Muller	12	Ancylidae (incl. Acroloxidae)	2	6
Erpobdellidae	3	Erpobdellidae	1	3
Hydracarina	1	Hydracarina	1	
Gammarus duebeni Liljeborg	6	Gammaridae (incl. Crangonyctidae & Niphargidae)	1	6
Baetis rhodani (Pictet)	15	Baetidae	2	4
Rhithrogena sp.	1	Heptageniidae	1	10
Heptagenia sulphurea (Muller)	1	Ephemerellidae	1	10
Ecdyonurus sp.	2	Nemouridae	1	7
Ephemerella ignita (Poda)	7	Leuctridae	1	10
Protonemura meyeri (Pictet)	2	Gerridae	1	5
Leuctra fusca (L.)	4	Elmidae	2	5
Gerris sp.	1	Hydroptilidae	1	6
Elmis aenea (Muller)	19	Rhyacophilidae (incl. Glossosomatidac)	1	7
Limnius volckmari (Panzer)	10	Hydropsychidae	1	5
Rhyacophila sp.	2	Limnephilidae	1	7
Rhyacophila dorsalis (Curtis)	3	Simuliidae	1	5
Glossosomatidae	1	Chironomidae	3	2
Glossosoma sp.	2			
Agapetus sp.	1			
Ithytrichia sp.	1			
Hydropsyche sp.	6			
Hydropsyche siltalai Dohler	1			
Limnephilidae	1			
Potamophylax cingulatus (Stephens)	1			
Simulium sp.	2			
Simulium cryophilum group	1			
Simulium argyreatum group	1			
Simulium ornatum group	4			
Chironomidae	251			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	101
Number of scoring taxa	17
ASPT	5.94

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Garvary River
 Site: Larkhill
 Method: Kick/Sweep

ECN Site Code: R20
 ECN Location Code: 01
 Sample Date: 25 October 2005

CEH RIVER_ID: 236002
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 57
 CEH SEASON_ID: 3
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Potamopyrgus jenkinsi (Smith)	186	Hydrobiidae (incl. Bithyniidae)	3	3
Lymnaea sp.	1	Lymnaeidae	1	3
Ancylus fluviatilis Muller	4	Ancylidae (incl. Acroloxidae)	1	6
Lumbriculidae	1	Oligochaeta	1	1
Tubificidae	5	Lumbriculidae	1	
Lumbricidae	1	Tubificidae	1	
Gammarus duebeni Liljeborg	11	Lumbricidae	1	
Heptageniidae	8	Gammaridae (incl. Crangonyctidae & Niphargidae)	2	6
Rhithrogena sp.	1	Heptageniidae	2	10
Heptagenia sulphurea (Muller)	10	Leuctridae	1	10
Ecdyonurus sp.	4	Elmidae	2	5
Leuctra hippopus (Kempny)	2	Hydroptilidae	1	6
Elmis aenea (Muller)	39	Rhyacophilidae (incl. Glossosomatidae)	2	7
Limnius volckmari (Panzer)	15	Hydropsychidae	1	5
Agapetus sp.	24	Limnephilidae	1	7
Ithytrichia sp.	2	Goeridae	1	10
Hydropsyche pellucidula (Curtis)	2	Simuliidae	1	5
Hydropsyche siltalai Dohler	1	Chironomidae	1	2
Limnephilidae	3	Empididae	1	
Potamophylax cingulatus group	1			
Silo sp.	2			
Silo nigricornis (Pictet)	1			
Simulium sp.	2			
Chironomidae	3			
Chelifera group sp.	1			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	86
Number of scoring taxa	15
ASPT	5.73

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Owenkillew River
 Site: Monanameal Bridge
 Method: Kick/Sweep

ECN Site Code: R28
 ECN Location Code: 01
 Sample Date: 25 April 2005

CEH RIVER_ID: 201007
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 55
 CEH SEASON_ID: 1
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Lymnaea peregra (Muller)	3	Lymnaeidae	1	3
Ancylus fluviatilis Muller	1	Ancylidae (incl. Acroloxidae)	1	6
Enchytraeidae	1	Oligochaeta	1	1
Tubificidae	2	Enchytraeidae	1	
Helobdella stagnalis (L.)	2	Tubificidae	1	
Hydracarina	8	Glossiphoniidae	1	3
Baetis muticus (L.)	5	Hydracarina	1	
Baetis rhodani (Pictet)	10	Baetidae	2	4
Rhithrogena sp.	3	Heptageniidae	1	10
Heptagenia sulphurea (Muller)	1	Leptophlebiidae	2	10
Ecdyonurus sp.	2	Caenidae	2	7
Leptophlebia vespertina (L.)	19	Nemouridae	1	7
Paraleptophlebia sp.	17	Perlodidae	1	10
Paraleptophlebia cincta (Retzius)	2	Chloroperlidae	1	10
Caenis rivulorum Eaton	40	Coenagriidae	1	6
Nemoura cinerea (Retzius)	1	Calopterygidae	1	8
Isoperla grammatica (Poda)	3	Gerridae	1	5
Chloroperla torrentium (Pictet)	3	Dytiscidae (incl. Noteridae)	1	5
Pyrrhosoma nymphula (Sulzer)	2	Hydrophilidae (incl. Hydraenidae)	1	5
Calopteryx splendens (Harris)	5	Elmidae	2	5
Gerris lacustris (L.)	1	Hydroptilidae	1	6
Oreodytes sanmarkii (Sahlberg)	2	Polycentropodidae	1	7
Hydraena gracilis Germar	1	Hydroptilidae	1	5
Elmis aenea (Muller)	16	Lepidostomatidae	2	10
Esolus parralepipipedus (Muller)	6	Limnephilidae	1	7
Limnius volckmari (Panzer)	26	Goeridae	1	10
Oulimnius tuberculatus (Muller)	9	Beraeidae	1	10
Hydroptila sp.	1	Sericostomatidae	1	10
Ithytrichia sp.	1	Leptoceridae	1	10
Cynurus trimaculatus (Curtis)	1	Tipulidae	1	5
Polycentropus flavomaculatus (Pictet)	2	Chironomidae	1	2
Hydropsyche pellucidula (Curtis)	1	Empididae	1	
Lepidostoma hirtum (Fabricius)	10			
Limnephilidae	3			
Halesus radiatus (Curtis)	1			
Anabolia nervosa (Curtis)	5			
Goera pilosa (Fabricius)	1			
Beraeodes minutus (L.)	2			
Sericostoma personatum (Spence)	3			
Athripsodes bilineatus (L.)	1			
Limnophila (Elocophila) sp.	1			
Chironomidae	7			
Hemerodromia group sp.	5			
Clinocerinae	1			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	187
Number of scoring taxa	28
ASPT	6.68

Environmental Change Network (ECN) Freshwater Invertebrate Sample Data

River: Owenkillew River
 Site: Monanameal Bridge
 Method: Kick/Sweep

ECN Site Code: R28
 ECN Location Code: 01
 Sample Date: 02 August 2005

CEH RIVER_ID: 201007
 CEH SITE_ID: 3
 CEH SAMPLE_ID: 56
 CEH SEASON_ID: 2
 CEH PROJECT_ID: ENVCHA

Species List	Species abundance	RIVPACS 'families'	log ₁₀ abundance	BMWP score
Nematoda	1	Nematoda	1	
Potamopyrgus jenkinsi (Smith)	1	Hydrobiidae (incl. Bithyniidae)	1	3
Lymnaea sp.	6	Lymnaeidae	2	3
Lymnaea peregra (Muller)	5	Ancylidae (incl. Acroloxidae)	1	6
Ancylus fluviatilis Muller	3	Oligochaeta	2	1
Lumbriculidae	3	Lumbriculidae	1	
Enchytraeidae	5	Enchytraeidae	1	
Naididae	2	Naididae	1	
Tubificidae	5	Tubificidae	1	
Helobdella stagnalis (L.)	7	Glossiphoniidae	1	3
Hydracarina	11	Hydracarina	2	
Baetis muticus (L.)	6	Baetidae	2	4
Baetis rhodani (Pictet)	13	Heptageniidae	2	10
Baetis scambus group	10	Leptophlebiidae	1	10
Cloeon simile Eaton	2	Ephemerellidae	2	10
Heptagenia sulphurea (Muller)	2	Leuctridae	2	10
Ecdyonurus sp.	13	Hydrometridae	1	5
Paraleptophlebia cincta (Retzius)	1	Dytiscidae (incl. Noteridae)	1	5
Ephemerella ignita (Poda)	39	Elmidae	2	5
Leuctra fusca (L.)	17	Rhyacophilidae (incl. Glossosomatidae)	1	7
Hydrometra sp.	1	Polycentropodidae	1	7
Oreodytes sanmarkii (Sahlberg)	5	Hydropsychidae	1	5
Elmis aenea (Muller)	27	Lepidostomatidae	1	10
Esolus parallelepipedus (Muller)	10	Goeridae	1	10
Limnius volckmari (Panzer)	40	Simuliidae	1	5
Oulimnius sp.	6	Chironomidae	2	2
Oulimnius tuberculatus (Muller)	2	Empididae	1	
Rhyacophila dorsalis (Curtis)	3			
Glossosoma sp.	2			
Plectrocnemia conspersa (Curtis)	1			
Polycentropus flavomaculatus (Pictet)	6			
Hydropsyche sp.	2			
Hydropsyche pellucidula (Curtis)	2			
Lepidostoma hirtum (Fabricius)	1			
Goera pilosa (Fabricius)	1			
Simulium sp.	2			
Chironomidae	60			
Clinocerinae	5			

Summary Information

NB Species abundance as counts unless otherwise stated

BMWP score	121
Number of scoring taxa	20
ASPT	6.05

The Centre for Ecology and Hydrology is the UK's Centre of Excellence for research in the land-based and freshwater environmental science.

This report is an official document prepared under contract between the customer and the Natural Environment Research Council. It should not be quoted without the permission of both the Centre for Ecology and Hydrology and the customer.

CEH Sites

Director's Office

CEH Swindon
NERC, Polaris House,
North Star Avenue
Swindon, Wiltshire SN2 1EU
Telephone +44(0) 1793 442516
Main Fax +44(0) 1793 411528

CEH Swindon
NERC, Polaris House,
North Star Avenue
Swindon, Wiltshire SN2 1EU
Telephone +44(0) 1793 411500
Main Fax +44(0) 1793 411528

CEH Banchory

Hill of Brathens,
Banchory,
Aberdeenshire AB31 4BY
Telephone +44(0) 1330 826300
Main Fax +44(0) 1330 823303

CEH Bangor

University of Wales, Bangor,
Deiniol Road,
Bangor, Gwynedd LL57 2UP
Telephone +44(0) 1248 370045
Main Fax +44(0) 1248 355365

CEH Dorset

Winfrith Technology Centre,
Winfrith Newburgh, Dorchester,
Dorset DT2 8ZD
Telephone +44(0) 1305 213500
Main Fax +44(0) 1305 213600

CEH Edinburgh

Bush Estate,
Penicuik,
Midlothian EH26 0QB
Telephone +44(0) 131 4454343
Main Fax +44(0) 131 4453943

CEH Lancaster

Lancaster Environment Centre,
Library Avenue, Bailrigg,
Lancaster LA1 4AP
Telephone +44(0) 1524 595800
Main Fax +44(0) 1524 61536

CEH Monks Wood

Abbots Ripton,
Huntingdon,
Cambridgeshire PE28 2LS
Telephone +44(0) 1487 772400
Main Fax +44(0) 1487 773467

CEH Oxford

Mansfield Road,
Oxford,
Oxfordshire OX1 3SR
Telephone +44(0) 1865 281630
Main Fax +44(0) 1865 281696

CEH Wallingford

Maclean Building, Crowmarsh Gifford,
Wallingford,
Oxfordshire OX10 8BB
Telephone +44(0) 1491 838800
Main Fax +44(0) 1491 692424

Further information about CEH
is available at www.ceh.ac.uk

