Monitoring Invertebrate Features on SSSIs: Aquatic Invertebrates on Gwent Levels: Whitson SSSI
2009
D C Boyce
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CRYNODEB GWEITHREDOL

Mae'r adroddiad hwn yn disgrifio rhaglen samplo anifeiliaid di-asgwrn-cefn dyfrol, a gynhaliwyd ar ran Cyngor Cefn Gwlad Cymru mewn ffosydd corsydd pori yn Safle o Ddiddordeb Gwyddonol Arbennig Whitson, Gwastadeddau Gwent yn 2009. Mae'n angenrheidiol i'r Cyngor Cefn Gwlad ddatblygu strategaeth fonitro ar gyfer ffawna di-asgwrn-cefn dyfrol, er mwyn bodloni ei ymrwymiadau dan y rhaglen Monitro Safonau Cyffredin. Nod y prosiect hwn yw darparu data gwaelodlin a fydd yn galluogi'r Cyngor Cefn Gwlad i asesu cyflwr y Nodwedd Anifeiliaid Di-asgwrn-cefn Dyfrol yn Safle o Ddiddordeb Gwyddonol Arbennig Whitson (Gwastadeddau Gwent).

Roedd y contract hwn yn ei gwneud yn ofynnol i 12 o rannau rhewyn gael eu samplo'n unol â dulliau safonol a ddatblygwyd ar gyfer arolwg cenedlaethol o ecoleg systemau ffosydd gan Buglife (Palmer et al. 2007). Cynhaliwyd yr arolwg rhwng 26 Gorffennaf ac 1 Awst, a chanolbwyntiwyd ar samplo chwilod, pryfed a malwod dyfrol.

O'u cyfrif i gyd, cofnodwyd naw deg o rywogaethau anifeiliaid di-asgwrn-cefn dyfrol yn ystod y rhaglen samplo, ac roedd dwy rywogaeth, y chwilod dŵr *Hydaticus transversalis* a *Hydrophilus piceus*, yn rhywogaethau sydd yn y Llyfr Data Coch. Nodwyd chwe rhywogaeth arall sy'n brin ar lefel genedlaethol, ac 16 y credir eu bod yn hoff iawn o gynefinoedd corsydd pori. Roedd nifer y rhywogaethau yn y deuddeg sampl yn amrywio o 20 i 43 o rywogaethau. Roedd y Mynegai Ansawdd Rhywogaethau rhwng 1.19 a 1.47 a'r Sgôr Ansawdd Cynefinoedd rhwng 1.56 a 9.72.

Roedd y ffigurau hyn yn isel o'u cymharu â ffosydd corsydd pori a samplwyd mewn rhannau eraill o dde Prydain, megis Gwastadeddau Gwlad yr Haf. Credir ei bod yn debygol bod dau brif ffactor yn cyfrannu at yr amrywiaeth eithaf bach o anifeiliaid di-asgwrn-cefn yn Whitson. Yn gyntaf, roedd llawer o'r ffosydd yn llawn tyfiant rhywogaethau'r llinad *Lemna*, gan gynnwys y rhywogaeth o America sydd wedi cytrefu yma'n ddiweddar, sef y *Lemna minuta*. Credir bod presenoldeb cymaint o linad yn arwydd o lefel uchel o ewtroffeiddio. Mae matiau trwchus o linad hefyd yn atal twf gwelyau tanddwr o facroffytau dyfrol, sy'n *niche* pwysig iawn ar gyfer anifeiliaid di-asgwrn-cefn dyfrol.

Yn ail, caiff y rhan fwyaf o'r ffosydd eu clirio'n rheolaidd iawn, sydd hefyd yn atal datblygiad cynefinoedd mwy parhaol, lle ceir llystyfiant dyfrol a newydd amrywiol sy'n cynnal yr amrywiaeth fwyaf o rywogaethau anifeiliaid di-asgwrn-cefn.

EXECUTIVE SUMMARY

This report describes a programme of aquatic invertebrate sampling undertaken for the Countryside Council for Wales (CCW) in grazing marsh ditches on the Whitson SSSI, Gwent Levels in 2009. It is necessary for CCW to develop a monitoring strategy for the aquatic invertebrate fauna in order to meet its commitments under the Common Standards Monitoring (CSM) programme. The aim of this project is to provide baseline data that will enable CCW to assess the condition of the Aquatic Invertebrate Feature on Whitson (Gwent Levels) SSSI.

This contract required 12 reen sections to be sampled according to standard methods developed for a national survey of the ecology of ditch systems by Buglife (Palmer et al. 2007). Survey was carried out between 26 July and 1 August and concentrated on sampling aquatic beetles, bugs and snails.

In all, ninety aquatic invertebrate species were recorded during the sampling programme, with two, the water beetles *Hydaticus transversalis* and *Hydrophilus piceus* being Red Data Book species. A further six nationally scarce species and 16 that are thought to have a high fidelity to grazing marsh habitats were noted. Species richness in the twelve samples ranged from 20 to 43 species. The Species Quality Index and the Habitat Quality Score were in the range from 1.19-1.47 and 1.56-9.72 respectively.

These figures were low compared to grazing marsh ditches sampled in other parts of southern Britain, such as the Somerset Levels. Two main causes are thought likely to contribute to the relatively low invertebrate diversity at Whitson. Firstly, many of the ditches were choked with growth of duckweeds *Lemna* spp., including the recent American colonist *Lemna minuta*. The presence of abundant duckweed is thought to indicate a high degree of eutrophication. Dense mats of duckweed also suppress the growth of submerged beds of aquatic macrophytes, theswe being a very important niche for aquatic invertebrates.

Secondly, most of the ditches are subject to a very regular programme of clearing out, which also prevents the development of late-successional ditch habitats with diverse aquatic and emergent vegetation that support the greatest diversity of invertebrate species.

1 INTRODUCTION

This report describes a programme of aquatic invertebrate sampling undertaken for the Countryside Council for Wales (CCW) in grazing marsh ditches (known locally as reens) on the Whitson Site of Special Scientific Interest (SSSI), Gwent Levels, Monmouth in 2009. The work aims to provide baseline information that can be used to inform the development of a monitoring strategy for the aquatic invertebrate fauna of the site. The Whitson SSSI covers an area of 937.4 hectares (ha) of grazing marsh, and is one of seven SSSI, which together cover 5734ha. of the Gwent Levels. There have been a number of invertebrate suveys of the aquatic ditch fauna of the Levels, with these being summarised by Bratton (2002). They demonstrate that the area hosts an aquatic invertebrate fauna of exceptional importance.

It is necessary for CCW to develop a monitoring strategy for the aquatic invertebrate fauna in order to meet its commitments under the Common Standards Monitoring (CSM) programme. CSM provides a framework by which the condition of features can be rapidly assessed against targets that define the desired state of appropriate attributes. These attributes (2-5 per feature) should generally be capable of being monitored by non-specialist staff, whilst also being ecologically relevant to the feature. Further details on the principles behind CSM can be found on the Joint Nature Conservation Committee (JNCC) website.

The aim of this project is to provide baseline data that will enable CCW to assess the condition of the Aquatic Invertebrate Feature on Whitson (Gwent Levels) SSSI. This will be achieved through the collection of standardised samples from a suite of main ditches and then evaluating the data using indices developed recently for ditch habitats by Palmer et al. (2007).

2 METHODOLOGY

Whitson SSSI is one of six component SSSIs of the Gwent Levels, situated to the south-east of Newport at ST380835. The SSSI is 937.4ha. in area and contains 18 main reens (in addition to an extensive network of field ditches), amounting to approximately 25kms. in length, managed by the Environment Agency (EA) and Internal Drainage Boards (IDB). EA reens are managed regularly (every 1-3 years) whilst IDB ditches are generally cleared on a seven-year cycle.

For conservation purposes CCW has delineated twenty 'field blocks' within the SSSI, each of which is bounded by the intersecting main reens, forming 35 main reen sections. This contract required 12 of the reen sections to be sampled according to standard methods developed for a national survey of the ecology of ditch systems by Buglife (Palmer et al. 2007). For each of the reen sections the contractor identified three sub-sample points containing habitat conditions likely to support rich invertebrate assemblages. These three sub-sections were together considered to constitute a single sample station. Information about each of the sub-sample stations is presented in Table 2.1, and their location is also shown in the map at Figure 2.1.

Before beginning to collect invertebrates, an eight-figure GPS reading of the location of each sub-sample station was recorded and a photograph of the ditch length to be sampled was taken. Note that at sub-sample stations 6C and 8C, I inadvertently omitted to take a photograph. In each sub-sample, a pond net was used to collect material from patches of vegetation that exhibited the greatest small-scale mosaic structure until the net began to fill to the point that it became more difficult to push. This generally took between 1-3 minutes and the net was usually about a quarter to a third full of plant material (about 2-3 litres by volume). The sample was then spread out onto a white polythene sheet and invertebrates were recorded/collected for 8 minutes as the material was teased apart. Part of the debris was then put into a white tray with c. 2cm of water, so that feeble animals could swim free and be collected using a tea strainer. The latter element of the sub-sample only took about 1 minute.

Finally, all of the debris was tipped into a bucket of water, the larger pieces quickly being removed (dunking them up and down while doing so to release caught-up animals), most of the water was then decanted, with the heavy residue being tipped into the white tray (with c. 1cm of water). By tipping the contents to one end of the tray, then slowly tipping it back again, the snails were left stranded in a pile. They could then be scooped up for preservation or sorted quickly for tiny species (*Gyraulus*, *Hippeutis*, *Valvata*, etc.). Further details of the sampling method can be found in Palmer et al. (2007).

Taxonomic groups to be covered by this contract were: Coleoptera, Hemiptera and Mollusca, but in the latter case, excluding small bivalve molluscs such as the various *Pisidium* spp. In addition, larvae of either the hairy dragonfly *Brachytron pratense,* or soldierflies (Stratiomyidae) were collected and identified to species. The contract stipulated that the water spider *Argyroneta aquatica* should also be recorded, but this species was not noted in 2009.

Fieldwork was carried out on 26, 27, 28, 31 July and 1 August. An additional visit was made to the site on 21 August to provide some training and a demonstration to local CCW staff on the techniques used to carry out the work. Samples collected were preserved in either 70% alcohol (molluscs and very small and/or delicate insects) or by freezing (larger and/or less fragile insects). All material was identified to species level, with voucher specimens of any rarities, or species that had not previously been recorded from the Gwent Levels being retained. In the latter case, the only addition to the list from this well-recorded site was the nationally scarce water beetle *Laccobius sinuatus*, noted in sample station 2.

Table 2.1: Sample stations, Whitson SSSI aquatic invertebrate survey - 2009

Sub-sample	Grid ref.	Bank sampled from
1A	ST37778509	South
1B	ST37568487	South
1C	ST37438476	South
2A	ST39178389	East
2B	ST39088424	East
2C	ST39028455	East
3A	ST38198286	South
3B	ST38778289	North
3C	ST39048304	Bridge at east end
4A	ST37748301	East
4B	ST37008294	North
4C	ST37188499	North
5A	ST39738299	South
5B	ST39918303	South
5C	ST40188302	South
6A	ST40878335	East
6B	ST40748360	East
6C	ST40698369	East
7A	ST39408528	East
7B	ST39578501	West
7C	ST39718482	East
8A	ST38408465	West
8B	ST38298478	West
8C	ST38208488	West
9A	ST39078302	East
9B	ST39008313	East
9C	ST38818354	West
10A	ST39678460	South
10B	ST39618440	South
10C	ST39588422	West
11A	ST39998339	South
11B	ST39588313	South
11C	ST39688320	North
12A	ST38388413	West
12B	ST38498395	West
12C	ST38438405	West

Data from the three sub-samples was amalgamated into a table for each sample station (see Tables 3.1.1.1. to 3.1.12.1). Also included in these tables was an indication of the abundance of the taxon in each sub-sample, where D = 1-10, C = 11-100, B = >100 and A = >1000.

Further columns in these tables give the species status and marsh fidelity scores for each species as listed by Palmer et al. (2007). Using these figures, a Species Quality Score (SQS), Species Quality Index (SQI) and Habitat Quality Score (HQS) have been calculated for each of the 12 sample stations. Further information on the calculation of these scores can be found in Palmer et al. (ibid.). In addition, the total number of aquatic species recorded during sampling has also been added up, to give a Species Richness Score (SRS) for each of the sample stations. These various scores can be found at the bottom of the relevant sample station tables (Tables 3.1.1.1 to 3.1.12.1) and also in the data summary at Table 3.1.

Map 1: Sample stations, Whitson SSSI aquatic invertebrate survey - 2009

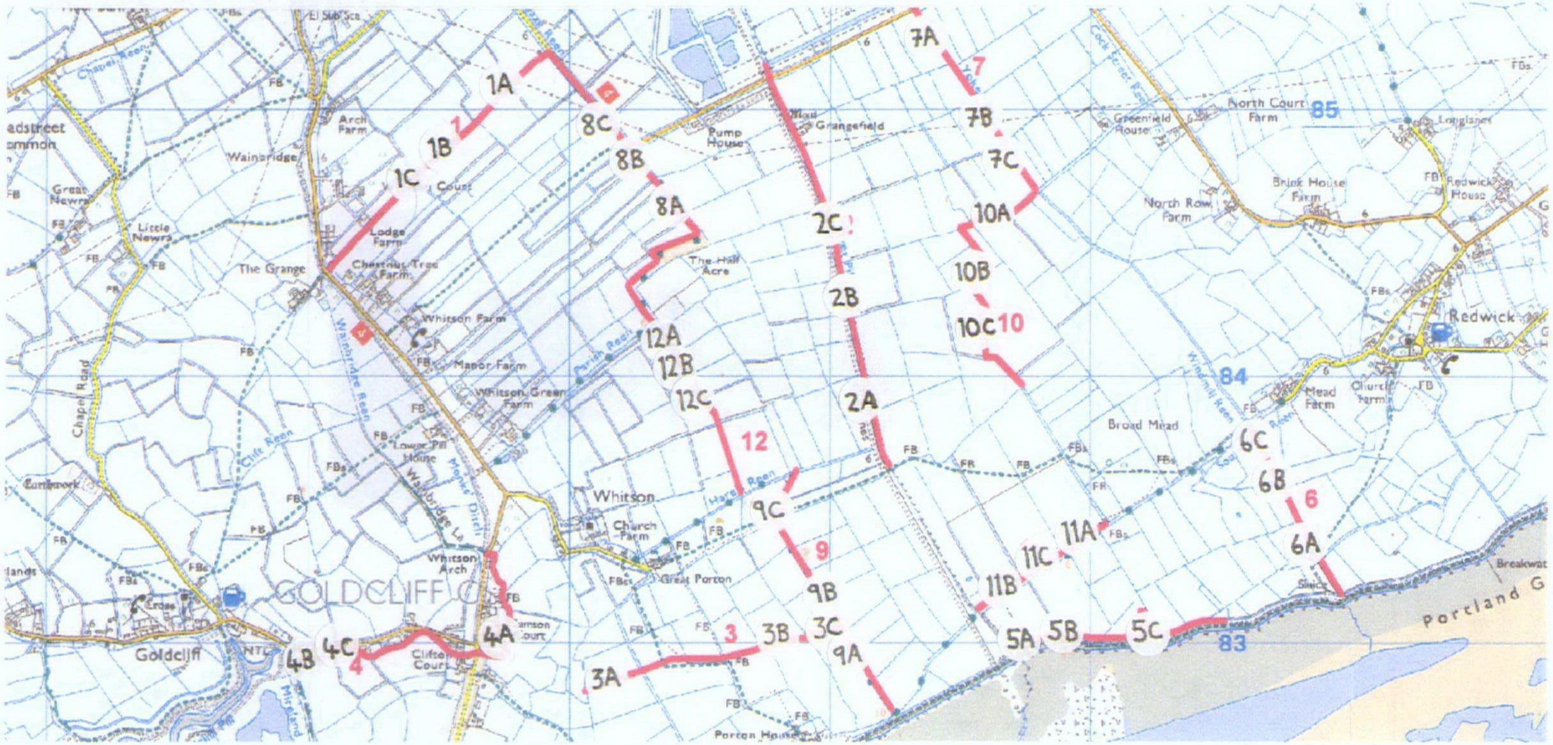

Figure 2.1: Sample stations, Whitson SSSI aquatic invertebrate survey - 2009

3 RESULTS

Tables 3.1 and 3.2 provide a summary of the results of the 2009 monitoring exercise. Table 3.1 gives the Species Richness Score, Species Quality Score, Species Quality Index and Habitat Quality Score for the twelve sample stations. Note that all these scores are arrived at by pooling the results from the three sub-samples collected at each station. Following on from this Table 3.2 lists all of the invertebrate species recorded during the 2009 monitoring exercise, along with the station(s) they were recorded from, their national conservation status and the marsh fidelity and status scores allotted to them in Palmer et al. (2007).

Table 3.1. Summary of invertebrate monitoring, Gwent Levels, Whitson SSSI, 2009

Sample station	SRS	SQS	SQI	HQS
Whitson 01	35	48	1.37	5.71
Whitson 02	27	37	1.37	5.55
Whitson 03	38	56	1.47	7.89
Whitson 04	20	27	1.35	5.00
Whitson 05	36	50	1.39	9.72
Whitson 06	35	47	1.34	5.71
Whitson 07	43	56	1.30	3.48
Whitson 08	32	40	1.25	1.56
Whitson 09	28	39	1.39	3.57
Whitson 10	39	52	1.33	3.85
Whitson 11	21	25	1.19	2.38
Whitson 12	25	34	1.36	8.00

The main part of this section of the report comprises a series of site reports that give the full data for the 12 sample stations, along with a short description of each. A photograph of all sub-sample sites (except for 6C and 8C) can be found at Appendix 1.

Lastly, there follows a list of all nationally scarce or Red Data Book species as defined by Falk (1991) and Foster (in press) that were recorded during the 2009 survey of Whitson. The species accounts include brief notes on ecology, UK and Welsh distribution.

Table 3.2. Checklist of invertebrates from Gwent Levels, Whitson SSSI, 2009

Species	Cons. Status	Marsh fidelity	Status score	Sample station(s)
Valvata cristata Muller			2	2,6,7,8,9,10,12
Valvata piscinalis (Muller)			2	2,7,8,10
Potamopyrgus antipodarum (Gray)			1	4,5,11
Bithynia tentaculata (Linnaeus)			1	1,2,3,4,5,6,7,8,9,10,11,12
Physa/Physella sp.			1	1,2,3,4,5,6,7,8,9,10,11
Lymnaea palustris (Muller)			1	2,6,7,8
Lymnaea stagnalis (Linnaeus)			1	1,2,4,5,6,7,9
Lymnaea auricularia (Linnaeus)			2	4
Lymnaea peregra (Muller)			1	1,2,3,4,5,6,7,8,9,10,11
Planorbis planorbis (Linnaeus)			1	1,2,3,4,5,6,7,8,9,10,11,12
Anisus vortex (Linnaeus)			1	1,2,3,4,5,6,7,8,9,10,11,12
Bathyomphalus contortus (Linnaeus)			2	6,10
Gyraulus albus (Muller)			2	4
Hippeutis complanatus (Linnaeus)			2	2,3,6,7,8,11
Planorbarius corneus (Linnaeus)			1	1,3,6,7,9
Succinea putris (Linnaeus)			1	5,6,7,8,9,10,11
Oxyloma pfeifferi (Rossmassler)			1	2,8,11
Sphaerium corneum (Linnaeus)			1	1,12
Musculium lacustre (Muller)			1	1
Brachytron pratense Muller	**Nb.**	B	4	3,7
Mesovelia furcata Mulsant & Rey			2	7
Hydrometra stagnorum (Linnaeus)			1	1,4,5,8
Microvelia reticulata (Burmeister)			1	1,5,6,7
Gerris lacustris (Linnaeus)			1	1,5,6,7,8
Gerris odontogaster (Zetterstedt)			1	5,6,7
Gerris thoracicus Schummel			1	5
Nepa cinerea Linnaeus			1	2,3,5,6,7,10
Ilyocoris cimicoides (Linnaeus)			1	1,2,3,5,6,7,8,10,11
Plea minutissima Leach			1	5,7
Notonecta glauca Linnaeus			1	1,3,4,5,6,8,10,11,12
Corixa affinis Leach		B	2	3,4
Corixa punctata (Illiger)			1	1,12
Hesperocorixa linnaei (Fieber)			1	1,2,3,7,10,12
Hesperocorixa sahlbergi (Fieber)			1	1,2,3,5,7,8,10,12
Sigara dorsalis (Leach)			1	1,2,3,4,5,6,7,12
Sigara falleni (Fieber)			1	4
Sigara fossarum (Leach)			1	4,12
Gyrinus caspius Menetries		B	2	5
Gyrinus substriatus Stephens			1	1
Peltodytes caesus (Duftschmid)	**Nb.**	A	4	1
Haliplus lineatocollis (Marsham)			1	2,3
Haliplus heydeni Wehncke	**Nb.**		4	1,3
Haliplus immaculatus Gerhardt		B	2	6
Haliplus ruficollis (De Geer)			1	1,2,3,4,5,6,7,8,9,10,11
Haliplus sibiricus Motschulsky			2	1,3,4,5,7
Haliplus flavicollis Sturm			2	7
Noterus clavicornis (De Geer)			2	1,2,3,4,5,6,7,8,9,10,12
Agabus sturmii (Gyllenhal)			1	3,5,7,8,9,10,11,12
Agabus bipustulatus (Linnaeus)			1	2,3,7,8,9,10,11,12
Agabus nebulosus (Forster)			1	10

Ilybius quadriguttatus (Lacordaire)		B	1	2,3,7,10
Colymbetes fuscus (Linnaeus)			1	3,10
Rhantus grapii (Gyllenhal)	**Nb.**	B	4	1,10
Rhantus suturalis (Macleay)	**Nb.**	B	2	3,12
Dytiscus marginalis Linnaeus			1	2,10
Hydaticus transversalis (Pontoppidan)	**RDB3.**	A	8	2
Graptodytes pictus (Fabricius)		B	2	5,7
Hydroporus angustatus Sturm			1	1,3,6,7,8,9,10,11,12
Hydroporus incognitus Sharp			2	3,9,10
Hydroporus palustris (Linnaeus)			1	1,3,7,8,9,10,11
Hydroporus planus (Fabricius)			1	10,12
Hydroporus pubescens (Gyllenhal)			1	1,2,3,7,8,9,10,11,12
Hydroporus tessellatus (Drapiez)			1	2,9,10,11
Hygrotus inaequalis (Fabricius)			1	1,2,3,5,7,8,9,10,11,12
Hygrotus versicolor (Schaller)			2	7
Hyphydrus ovatus (Linnaeus)			1	1,2,3,5,6,7
Laccophilus hyalinus (De Geer)			1	6,7
Laccophilus minutus (Linnaeus)		B	2	6
Helophorus aequalis Thomson			1	8,12
Helophorus grandis Illiger			1	4,12
Helophorus brevipalpis Bedel			1	1,3,5,6,7,8,9,10
Helophorus griseus Herbst	**Nb.**		2	6
Helophorus minutus Fabricius			1	1,2,3,5,6,8,9,10,12
Anacaena globulus (Paykull)			1	10
Anacaena limbata (Fabricius)			1	5,6,7,9,10
Anacaena lutescens (Stephens)			1	1,2,3,5,6,7,8,9,10,11,12
Cymbiodyta marginellus (Stephens)			2	3
Enochrus coarctatus (Gredler)		B	2	5,10,12
Enochrus ochropterus (Marsham)	**Nb.**		4	8,9,10
Enochrus testaceus (Fabricius)			2	3,6,9,10,12
Helochares lividus (Forster)		B	2	1,3,5,8,9,12
Hydrobius fuscipes (Linnaeus)			1	5,7,8,11
Hydrophilus piceus (Linnaeus)	**RDB3.**	A	8	5
Laccobius bipunctatus (Fabricius)			1	3,7,8,9,10
Laccobius minutus (Linnaeus)		B	2	5,6
Laccobius sinuatus Motschulsky	**Nb.**		2	1
Scirtes hemisphaericus (Linnaeus)			0	8,9,10
Stenopelmus rufinasus Gyllenhal			0	7
Tanysphyrus lemnae (Paykull)			0	9
Odotomyia tigrina (Fabricius)	**N.**	B	4	3,4,6,9,11,12

3.1 Site reports

3.1.1 Sample station 1

A large ditch with some water flow, which appears to have been cleaned out very recently. There is a thin strip of tall emergent *Typha latifolia*, *Glyceria maxima*, *Sparganium erectum*, *Carex* sp. and *Iris pseudacorus*, though this is not shading the water to an appreciable extent (5-10%). Low emergent cover is similarly sparse, with just a little *Glyceria fluitans* and *Berula erecta* (2-5%). *Lemna* is much less abundant than in most other sample stations, with cover of this species and floating leaves of *Hydrocharis morsus-ranae* being in the range from 8 to 25% in the three sub-samples.

Table 3.1.1.1. Invertebrates from sample station 1, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Bithynia tentaculata	Bithyniidae		C	1	8	2009	1A	ST37778509		1
Bithynia tentaculata	Bithyniidae		C	1	8	2009	1B	ST37568487		
Bithynia tentaculata	Bithyniidae		D	1	8	2009	1C	ST37438476		
Physa/Physella sp.	Physidae		B	1	8	2009	1A	ST37778509		1
Physa/Physella sp.	Physidae		C	1	8	2009	1B	ST37568487		
Physa/Physella sp.	Physidae		C	1	8	2009	1C	ST37438476		
Lymnaea stagnalis	Lymnaeidae		D	1	8	2009	1A	ST37778509		1
Lymnaea peregra	Lymnaeidae		C	1	8	2009	1B	ST37568487		1
Lymnaea peregra	Lymnaeidae		C	1	8	2009	1C	ST37438476		
Planorbis planorbis	Planorbidae		C	1	8	2009	1A	ST37778509		1
Planorbis planorbis	Planorbidae		C	1	8	2009	1B	ST37568487		
Anisus vortex	Planorbidae		C	1	8	2009	1A	ST37778509		1
Anisus vortex	Planorbidae		C	1	8	2009	1B	ST37568487		
Anisus vortex	Planorbidae		C	1	8	2009	1C	ST37438476		
Planorbarius corneus	Planorbidae		C	1	8	2009	1A	ST37778509		1
Planorbarius corneus	Planorbidae		C	1	8	2009	1B	ST37568487		
Sphaerium corneum	Sphaeriidae		D	1	8	2009	1A	ST37778509		1
Musculium lacustre	Sphaeriidae		D	1	8	2009	1A	ST37778509		1
Hydrometra stagnorum	Hydrometridae		D	1	8	2009	1B	ST37568487		1
Microvelia reticulata	Veliidae		D	1	8	2009	1B	ST37568487		1
Gerris lacustris	Gerridae		D	1	8	2009	1A	ST37778509		1
Ilyocoris cimicoides	Naucoridae		D	1	8	2009	1A	ST37778509		1
Ilyocoris cimicoides	Naucoridae		D	1	8	2009	1B	ST37568487		

Ilyocoris cimicoides	Naucoridae		D	1	8	2009	1C	ST37438476		
Notonecta glauca	Notonectidae		D	1	8	2009	1A	ST37778509		1
Notonecta glauca	Notonectidae		D	1	8	2009	1B	ST37568487		
Corixa punctata	Corixidae		D	1	8	2009	1A	ST37778509		1
Hespercorixa linnaei	Corixidae		D	1	8	2009	1A	ST37778509		1
Hespercorixa linnaei	Corixidae		D	1	8	2009	1B	ST37568487		
Hespercorixa linnaei	Corixidae		D	1	8	2009	1C	ST37438476		
Hespercorixa sahlbergi	Corixidae		D	1	8	2009	1C	ST37438476		1
Sigara dorsalis	Corixidae		D	1	8	2009	1A	ST37778509		1
Sigara dorsalis	Corixidae		D	1	8	2009	1C	ST37438476		
Gyrinus substriatus	Gyrinidae		D	1	8	2009	1B	ST37568487		1
Peltodytes caesus	Haliplidae	**Nb.**	D	1	8	2009	1B	ST37568487	A	4
Haliplus heydeni	Haliplidae	**Nb.**	D	1	8	2009	1B	ST37568487		4
Haliplus ruficollis	Haliplidae		C	1	8	2009	1A	ST37778509		1
Haliplus ruficollis	Haliplidae		C	1	8	2009	1B	ST37568487		
Haliplus sibiricus	Haliplidae		D	1	8	2009	1C	ST37438476		2
Noterus clavicornis	Noteridae		C	1	8	2009	1A	ST37778509		2
Noterus clavicornis	Noteridae		D	1	8	2009	1B	ST37568487		
Rhantus grapii	Dytiscidae	**Nb.**	D	1	8	2009	1B	ST37568487	B	4
Hydroporus angustatus	Dytiscidae		D	1	8	2009	1B	ST37568487		1
Hydroporus palustris	Dytiscidae		C	1	8	2009	1A	ST37778509		1
Hydroporus palustris	Dytiscidae		D	1	8	2009	1B	ST37568487		
Hydroporus palustris	Dytiscidae		D	1	8	2009	1C	ST37438476		
Hydroporus pubescens	Dytiscidae		D	1	8	2009	1A	ST37778509		1
Hygrotus inaequalis	Dytiscidae		D	1	8	2009	1A	ST37778509		1
Hygrotus inaequalis	Dytiscidae		D	1	8	2009	1B	ST37568487		
Hygrotus inaequalis	Dytiscidae		D	1	8	2009	1C	ST37438476		
Hyphydrus ovatus	Dytiscidae		D	1	8	2009	1A	ST37778509		1
Hyphydrus ovatus	Dytiscidae		D	1	8	2009	1B	ST37568487		
Helophorus brevipalpis	Helophoridae		D	1	8	2009	1A	ST37778509		1
Helophorus minutus	Helophoridae		D	1	8	2009	1A	ST37778509		1
Helophorus minutus	Helophoridae		D	1	8	2009	1B	ST37568487		
Anacaena lutescens	Hydrophilidae		D	1	8	2009	1B	ST37568487		1
Helochares lividus	Hydrophilidae		D	1	8	2009	1B	ST37568487	B	2

Laccobius sinuatus	Hydrophilidae	**Nb.**	D	1	8	2009	1C	ST37438476		2

SRS	**35**
SQS	**48**
SQI	**1.37**
HQS	**5.71**

3.1.2 Sample station 2

A large ditch running along the route of the pipeline. Tall emergent *Phragmites australis*, *Glyceria maxima*, *Juncus effusus* and *J. inflexus* was causing minimal shading of the waterbody (5 to 20% shading in the three sub-samples). There was between 25 and 5% low emergent *Berula erecta*, *Glyceria fluitans* and *G. maxima* and an almost continuous mat of floating vegetation in which *Hydrocharis morsus-ranae*, was unusually abundant. Though *Lemna* was also abundant, it did not form such a deep, thick mat as in many of the smaller ditches sampled. There were also good quantities of submerged pondweeds, averaging approximately 40% cover in the three sub-samples. The eastern bank, from which all of the sub-samples were collected was grazed, and cattle poaching of this bank had created some excellent shallow, poached marginal habitats.

Table 3.1.2.1. Invertebrates from sample station 2, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Valvata cristata	Valvatidae		C	31	7	2009	2A	ST39178389		2
Valvata cristata	Valvatidae		C	31	7	2009	2B	ST39088424		
Valvata cristata	Valvatidae		C	31	7	2009	2C	ST39028455		
Bithynia tentaculata	Bithyniidae		D	31	7	2009	2A	ST39178389		1
Bithynia tentaculata	Bithyniidae		C	31	7	2009	2B	ST39088424		
Bithynia tentaculata	Bithyniidae		C	31	7	2009	2C	ST39028455		
Physa/Physella sp.	Physidae		D	31	7	2009	2A	ST39178389		1
Physa/Physella sp.	Physidae		C	31	7	2009	2B	ST39088424		
Physa/Physella sp.	Physidae		B	31	7	2009	2C	ST39028455		
Lymnaea palustris	Lymnaeidae		C	31	7	2009	2A	ST39178389		1
Lymnaea palustris	Lymnaeidae		D	31	7	2009	2C	ST39028455		
Lymnaea stagnalis	Lymnaeidae		D	31	7	2009	2A	ST39178389		1
Lymnaea peregra	Lymnaeidae		D	31	7	2009	2A	ST39178389		1
Lymnaea peregra	Lymnaeidae		C	31	7	2009	2B	ST39088424		
Lymnaea peregra	Lymnaeidae		C	31	7	2009	2C	ST39028455		
Planorbis planorbis	Planorbidae		C	31	7	2009	2A	ST39178389		1
Planorbis planorbis	Planorbidae		B	31	7	2009	2B	ST39088424		
Planorbis planorbis	Planorbidae		B	31	7	2009	2C	ST39028455		
Anisus vortex	Planorbidae		C	31	7	2009	2A	ST39178389		1
Anisus vortex	Planorbidae		C	31	7	2009	2B	ST39088424		
Anisus vortex	Planorbidae		B	31	7	2009	2C	ST39028455		

Hippeutis complanatus	Planorbidae		D	31	7	2009	2A	ST39178389		2
Hippeutis complanatus	Planorbidae		D	31	7	2009	2B	ST39088424		
Hippeutis complanatus	Planorbidae		C	31	7	2009	2C	ST39028455		
Oxyloma pfeifferi	Succineidae		D	31	7	2009	2B	ST39088424		
Nepa cinerea	Nepidae		D	31	7	2009	2B	ST39088424		1
Ilyocoris cimicoides	Naucoridae		D	31	7	2009	2A	ST39178389		1
Ilyocoris cimicoides	Naucoridae		D	31	7	2009	2B	ST39088424		
Ilyocoris cimicoides	Naucoridae		D	31	7	2009	2C	ST39028455		
Hespercorixa linnaei	Corixidae		D	31	7	2009	2A	ST39178389		1
Hespercorixa linnaei	Corixidae		D	31	7	2009	2B	ST39088424		
Hespercorixa sahlbergi	Corixidae		D	31	7	2009	2A	ST39178389		1
Hespercorixa sahlbergi	Corixidae		D	31	7	2009	2C	ST39028455		
Sigara dorsalis	Corixidae		D	31	7	2009	2A	ST39178389		1
Sigara dorsalis	Corixidae		D	31	7	2009	2B	ST39088424		
Haliplus lineatocollis	Haliplidae		D	31	7	2009	2A	ST39178389		1
Haliplus ruficollis	Haliplidae		D	31	7	2009	2A	ST39178389		1
Haliplus ruficollis	Haliplidae		D	31	7	2009	2B	ST39088424		
Haliplus ruficollis	Haliplidae		D	31	7	2009	2C	ST39028455		
Noterus clavicornis	Noteridae		D	31	7	2009	2A	ST39178389		2
Noterus clavicornis	Noteridae		C	31	7	2009	2B	ST39088424		
Agabus bipustulatus	Dytiscidae		D	31	7	2009	2A	ST39178389		1
Agabus bipustulatus	Dytiscidae		D	31	7	2009	2B	ST39088424		
Agabus bipustulatus	Dytiscidae		D	31	7	2009	2C	ST39028455		
Ilybius quadriguttatus	Dytiscidae		D	31	7	2009	2A	ST39178389	B	1
Dytiscus marginalis	Dytiscidae		D	31	7	2009	2C	ST39028455		1
Hydaticus transversalis	Dytiscidae	**RDB3.**	D	31	7	2009	2B	ST39088424	A	8
Hydroporus pubescens	Dytiscidae		D	31	7	2009	2A	ST39178389		1
Hydroporus pubescens	Dytiscidae		D	31	7	2009	2B	ST39088424		
Hydroporus tessellatus	Dytiscidae		D	31	7	2009	2B	ST39088424		1
Hygrotus inaequalis	Dytiscidae		D	31	7	2009	2C	ST39028455		1
Hyphydrus ovatus	Dytiscidae		D	31	7	2009	2A	ST39178389		1
Hyphydrus ovatus	Dytiscidae		D	31	7	2009	2B	ST39088424		
Helophorus minutus	Helophoridae		D	31	7	2009	2A	ST39178389		1
Helophorus minutus	Helophoridae		D	31	7	2009	2B	ST39088424		

Helophorus minutus	Helophoridae	D	31	7	2009	2C	ST39028455	
Anacaena lutescens	Hydrophilidae	B	31	7	2009	2A	ST39178389	1
Anacaena lutescens	Hydrophilidae	B	31	7	2009	2B	ST39088424	
Anacaena lutescens	Hydrophilidae	C	31	7	2009	2C	ST39028455	

SRS	**27**
SQS	**37**
SQI	**1.37**
HQS	**5.55**

3.1.3 Sample station 3

A small ditch with approximately 20% cover of tall emergent *Phragmites australis*, *Sparganium erectum*, *Oenanthe crocata* and *Epilobium hirsutum*. There were also frequent low emergent stands of *Glyceria fluitans* and *Berula erecta*. Thick, continuous mats of *Lemna* were present, except in sub-sample 3A, where shade from overhanging hawthorn *Crataegus monogyna* was suppressing its growth. There were hawthorns along much of the north bank of this ditch. Submerged aquatics were relatively frequent in the first two sub-samples, but were absent in 3C.

Table 3.1.3.1. Invertebrates from sample station 3, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Bithynia tentaculata	Bithyniidae		C	26	7	2009	3A	ST38198286		1
Bithynia tentaculata	Bithyniidae		C	26	7	2009	3B	ST38778299		
Bithynia tentaculata	Bithyniidae		C	26	7	2009	3C	ST39048304		
Physa/Physella sp	Physidae		D	26	7	2009	3A	ST38198286		1
Physa/Physella sp	Physidae		C	26	7	2009	3B	ST38778299		
Lymnaea peregra	Lymnaeidae		C	26	7	2009	3A	ST38198286		1
Lymnaea peregra	Lymnaeidae		C	26	7	2009	3B	ST38778299		
Planorbis planorbis	Planorbidae		C	26	7	2009	3A	ST38198286		1
Planorbis planorbis	Planorbidae		B	26	7	2009	3B	ST38778299		
Anisus vortex	Planorbidae		B	26	7	2009	3A	ST38198286		1
Anisus vortex	Planorbidae		B	26	7	2009	3B	ST38778299		
Anisus vortex	Planorbidae		D	26	7	2009	3C	ST39048304		
Hippeutis complanatus	Planorbidae		D	26	7	2009	3A	ST38198286		2
Planorbarius corneus	Planorbidae		C	26	7	2009	3A	ST38198286		1
Planorbarius corneus	Planorbidae		C	26	7	2009	3B	ST38778299		
Planorbarius corneus	Planorbidae		D	26	7	2009	3C	ST39048304		
Brachytron pratense	Odonata	**Nb.**	D	26	7	2009	3A	ST38198286	B	4
Nepa cinerea	Nepidae		D	26	7	2009	3B	ST38778299		1
Ilyocoris cimicoides	Naucoridae		D	26	7	2009	3A	ST38198286		1
Notonecta glauca	Notonectidae		D	26	7	2009	3A	ST38198286		1
Notonecta glauca	Notonectidae		D	26	7	2009	3B	ST38778299		
Corixa affinis	Corixidae		D	26	7	2009	3A	ST38198286	B	2
Hespercorixa linnaei	Corixidae		C	26	7	2009	3A	ST38198286		1
Hespercorixa linnaei	Corixidae		D	26	7	2009	3B	ST38778299		

Hespercorixa sahlbergi	Corixidae		C	26	7	2009	3A	ST38198286		1
Sigara dorsalis	Corixidae		D	26	7	2009	3A	ST38198286		1
Haliplus lineatocollis	Haliplidae		D	26	7	2009	3A	ST38198286		
Haliplus heydeni	Haliplidae	**Nb.**	D	26	7	2009	3A	ST38198286		4
Haliplus heydeni	Haliplidae	**Nb.**	D	26	7	2009	3B	ST38778299		
Haliplus ruficollis	Haliplidae		C	26	7	2009	3A	ST38198286		1
Haliplus ruficollis	Haliplidae		C	26	7	2009	3B	ST38778299		
Haliplus sibiricus	Haliplidae		C	26	7	2009	3A	ST38198286		2
Noterus clavicornis	Noteridae		C	26	7	2009	3A	ST38198286		2
Agabus sturmii	Dytiscidae		D	26	7	2009	3A	ST38198286		1
Agabus sturmii	Dytiscidae		D	26	7	2009	3B	ST38778299		
Agabus sturmii	Dytiscidae		D	26	7	2009	3C	ST39048304		
Agabus bipustulatus	Dytiscidae		D	26	7	2009	3B	ST38778299		1
Agabus bipustulatus	Dytiscidae		D	26	7	2009	3C	ST39048304		
Ilybius quadriguttatus	Dytiscidae		D	26	7	2009	3B	ST38778299	B	1
Colymbetes fuscus	Dytiscidae		D	26	7	2009	3B	ST38778299		1
Rhantus suturalis	Dytiscidae	**Nb.**	D	26	7	2009	3B	ST38778299	B	2
Hydroporus angustatus	Dytiscidae		D	26	7	2009	3C	ST39048304		1
Hydroporus incognitus	Dytiscidae		C	26	7	2009	3B	ST38778299		2
Hydroporus incognitus	Dytiscidae		D	26	7	2009	3C	ST39048304		
Hydroporus palustris	Dytiscidae		D	26	7	2009	3B	ST38778299		1
Hydroporus palustris	Dytiscidae		C	26	7	2009	3C	ST39048304		
Hydroporus pubescens	Dytiscidae		D	26	7	2009	3C	ST39048304		1
Hygrotus inaequalis	Dytiscidae		C	26	7	2009	3B	ST38778299		1
Hyphydrus ovatus	Dytiscidae		D	26	7	2009	3A	ST38198286		1
Hyphydrus ovatus	Dytiscidae		D	26	7	2009	3B	ST38778299		
Helophorus brevipalpis	Helophoridae		C	26	7	2009	3A	ST38198286		1
Helophorus brevipalpis	Helophoridae		D	26	7	2009	3B	ST38778299		
Helophorus minutus	Helophoridae		C	26	7	2009	3A	ST38198286		1
Helophorus minutus	Helophoridae		C	26	7	2009	3B	ST38778299		
Anacaena lutescens	Hydrophilidae		C	26	7	2009	3A	ST38198286		1
Anacaena lutescens	Hydrophilidae		C	26	7	2009	3B	ST38778299		
Anacaena lutescens	Hydrophilidae		D	26	7	2009	3C	ST39048304		
Cymbiodyta marginellus	Hydrophilidae		D	26	7	2009	3C	ST39048304		2

Enochrus testaceus	Hydrophilidae		D	26	7	2009	3C	ST39048304		2
Helochares lividus	Hydrophilidae		D	26	7	2009	3C	ST39048304	B	2
Laccobius bipunctatus	Hydrophilidae		D	26	7	2009	3B	ST38778299		1
Laccobius bipunctatus	Hydrophilidae		D	26	7	2009	3C	ST39048304		
Odontomyia tigrina	Stratiomyidae	**N.**	D	26	7	2009	3B	ST38778299	B	4

SRS	**38**
SQS	**56**
SQI	**1.47**
HQS	**7.89**

3.1.4 Sample station 4

A very large ditch with an appreciable flow of water. This ditch had been cleared out very recently and there was only a very small amount of tall emergent *Phalaris arundinacea* and *Glyceria maxima*. Low emergent vegetation was similarly sparse, with just a little *Polygonum* sp. and *Stachys palustris* in sub-sample 4A. The large size and flow in this ditch meant that it had no growth of *Lemna* and there was no other floating vegetation. There was just a little submerged aquatic vegetation in 4A. The latter sub-sample was cattle grazed on the east bank from which the sample was collected and this had created some shallower margins. Elsewhere ditch clearance has created uniformly steep, sparsely vegetated banks. There was much hawthorn scrub along the far bank of 4A and 4B and scattered scrub on the near bank of 4C.

Table 3.1.4.1. Invertebrates from sample station 4, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Potamopyrgus antipodarum	Hydrobiidae		D	26	7	2009	4A	ST37748301		1
Bithynia tentaculata	Bithyniidae		D	26	7	2009	4A	ST37748301		1
Bithynia tentaculata	Bithyniidae		D	26	7	2009	4B	ST37008294		
Bithynia tentaculata	Bithyniidae		C	26	7	2009	4C	ST37188499		
Physa/Physella sp	Physidae		C	26	7	2009	4A	ST37748301		1
Physa/Physella sp	Physidae		D	26	7	2009	4B	ST37008294		
Lymnaea stagnalis	Lymnaeidae		D	26	7	2009	4A	ST37748301		1
Lymnaea auricularia	Lymnaeidae		D	26	7	2009	4A	ST37748301		2
Lymnaea auricularia	Lymnaeidae		D	26	7	2009	4B	ST37008294		
Lymnaea peregra	Lymnaeidae		C	26	7	2009	4A	ST37748301		1
Lymnaea peregra	Lymnaeidae		C	26	7	2009	4B	ST37008294		
Planorbis planorbis	Planorbidae		D	26	7	2009	4A	ST37748301		1
Anisus vortex	Planorbidae		B	26	7	2009	4A	ST37748301		1
Anisus vortex	Planorbidae		D	26	7	2009	4B	ST37008294		
Anisus vortex	Planorbidae		D	26	7	2009	4C	ST37188499		
Gyraulus albus	Planorbidae		C	26	7	2009	4A	ST37748301		2
Hydrometra stagnorum	Hydrometridae		C	26	7	2009	4C	ST37188499		1
Notonecta glauca	Notonectidae		C	26	7	2009	4A	ST37748301		1
Notonecta glauca	Notonectidae		C	26	7	2009	4B	ST37008294		
Corixa affinis	Corixidae		D	26	7	2009	4A	ST37748301	B	2
Sigara falleni	Corixidae		B	26	7	2009	4A	ST37748301		1
Sigara falleni	Corixidae		C	26	7	2009	4B	ST37008294		

Sigara falleni	Corixidae		D	26	7	2009	4C	ST37188499		
Sigara fossarum	Corixidae		C	26	7	2009	4A	ST37748301		1
Sigara fossarum	Corixidae		D	26	7	2009	4B	ST37008294		
Sigara fossarum	Corixidae		D	26	7	2009	4C	ST37188499		
Sigara dorsalis	Corixidae		D	26	7	2009	4A	ST37748301		1
Sigara dorsalis	Corixidae		D	26	7	2009	4B	ST37008294		
Sigara dorsalis	Corixidae		D	26	7	2009	4C	ST37188499		
Haliplus ruficollis	Haliplidae		D	26	7	2009	4A	ST37748301		1
Haliplus sibiricus	Haliplidae		C	26	7	2009	4A	ST37748301		2
Haliplus sibiricus	Haliplidae		D	26	7	2009	4B	ST37008294		
Haliplus sibiricus	Haliplidae		C	26	7	2009	4C	ST37188499		
Hyphydrus ovatus	Dytiscidae		D	26	7	2009	4A	ST37748301		1
Helophorus grandis	Helophoridae		D	26	7	2009	4B	ST37008294		1
Odontomyia tigrina	Stratiomyidae	**N.**	D	26	7	2009	4A	ST37748301	B	4

No. species	**20**
SQS	**27**
SQI	**1.35**
HQS	**5**

3.1.5 Sample station 5

A large meandering ditch running along the back of the seawall. Tall emergent *Phragmites australis* and *Glyceria maxima* has become quite abundant in the ditch, with cover in the three sub-samples ranging from between 40 and 80%. Another feature of this excellent ditch was the presence of frequent low emergent *Alisma plantago-aquatica* and *Sagittaria sagittifolia*. *Lemna* cover was relatively high in 5A and 5B at 70 and 65% respectively, but only 10% in 5C. Growth of duckweed was nowhere in the form of a thick choking mat. There were also frequent floating leaves of *Hydrocharis morsus-ranae* and dense submerged pondweed growth (60-90% cover). The south bank of the ditch from which all sampling was carried out was cattle grazed, which had created some excellent, shallow, poached margins. The north bank of sub-samples 5A and 5B had scattered hawthorn bushes.

Table 3.1.5.1. Invertebrates from sample station 5, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Potamopyrgus antipodarum	Hydrobiidae		D	27	7	2009	5A	ST39738299		1
Potamopyrgus antipodarum	Hydrobiidae		C	27	7	2009	5B	ST39918303		
Bithynia tentaculata	Bithyniidae		C	27	7	2009	5A	ST39738299		1
Bithynia tentaculata	Bithyniidae		B	27	7	2009	5B	ST39918303		
Bithynia tentaculata	Bithyniidae		C	27	7	2009	5C	ST40188302		
Physa/Physella sp	Physidae		C	27	7	2009	5A	ST39738299		1
Physa/Physella sp	Physidae		B	27	7	2009	5B	ST39918303		
Physa/Physella sp	Physidae		B	27	7	2009	5C	ST40188302		
Lymnaea stagnalis	Lymnaeidae		D	27	7	2009	5B	ST39918303		1
Lymnaea stagnalis	Lymnaeidae		D	27	7	2009	5C	ST40188302		
Lymnaea peregra	Lymnaeidae		B	27	7	2009	5A	ST39738299		1
Lymnaea peregra	Lymnaeidae		C	27	7	2009	5B	ST39918303		
Lymnaea peregra	Lymnaeidae		B	27	7	2009	5C	ST40188302		
Planorbis planorbis	Planorbidae		B	27	7	2009	5A	ST39738299		1
Planorbis planorbis	Planorbidae		B	27	7	2009	5B	ST39918303		
Planorbis planorbis	Planorbidae		B	27	7	2009	5C	ST40188302		
Anisus vortex	Planorbidae		C	27	7	2009	5A	ST39738299		1
Anisus vortex	Planorbidae		B	27	7	2009	5C	ST40188302		
Succinea putris	Succineidae		D	27	7	2009	5B	ST39918303		1
Hydrometra stagnorum	Hydrometridae		D	27	7	2009	5C	ST40188302		1
Microvelia reticulata	Veliidae		D	27	7	2009	5B	ST39918303		1

Gerris lacustris	Gerridae	D	27	7	2009	5C	ST40188302		1
Gerris odontogaster	Gerridae	D	27	7	2009	5B	ST39918303		1
Gerris odontogaster	Gerridae	D	27	7	2009	5C	ST40188302		
Gerris thoracicus	Gerridae	C	27	7	2009	5B	ST39918303		1
Nepa cinerea	Nepidae	D	27	7	2009	5C	ST40188302		1
Ilyocoris cimicoides	Naucoridae	D	27	7	2009	5A	ST39738299		1
Ilyocoris cimicoides	Naucoridae	C	27	7	2009	5C	ST40188302		
Notonecta glauca	Notonectidae	D	27	7	2009	5B	ST39918303		1
Notonecta glauca	Notonectidae	D	27	7	2009	5C	ST40188302		
Plea minutissima	Pleidae	D	27	7	2009	5C	ST40188302		1
Hespercorixa sahlbergi	Corixidae	D	27	7	2009	5A	ST39738299		1
Hespercorixa sahlbergi	Corixidae	D	27	7	2009	5B	ST39918303		
Sigara dorsalis	Corixidae	C	27	7	2009	5A	ST39738299		1
Sigara dorsalis	Corixidae	C	27	7	2009	5B	ST39918303		
Sigara dorsalis	Corixidae	C	27	7	2009	5C	ST40188302		
Gyrinus caspius	Gyrinidae	D	27	7	2009	5C	ST40188302	B	2
Haliplus ruficollis	Haliplidae	D	27	7	2009	5A	ST39738299		1
Haliplus ruficollis	Haliplidae	C	27	7	2009	5B	ST39918303		
Haliplus ruficollis	Haliplidae	C	27	7	2009	5C	ST40188302		
Haliplus sibiricus	Haliplidae	D	27	7	2009	5B	ST39918303		2
Noterus clavicornis	Noteridae	D	27	7	2009	5A	ST39738299		2
Noterus clavicornis	Noteridae	C	27	7	2009	5B	ST39918303		
Noterus clavicornis	Noteridae	C	27	7	2009	5C	ST40188302		
Agabus sturmii	Dytiscidae	D	27	7	2009	5B	ST39918303		1
Graptodytes pictus	Dytiscidae	D	27	7	2009	5B	ST39918303	B	2
Hygrotus inaequalis	Dytiscidae	C	27	7	2009	5A	ST39738299		1
Hygrotus inaequalis	Dytiscidae	C	27	7	2009	5C	ST40188302		
Hyphydrus ovatus	Dytiscidae	D	27	7	2009	5A	ST39738299		1
Hyphydrus ovatus	Dytiscidae	D	27	7	2009	5B	ST39918303		
Hyphydrus ovatus	Dytiscidae	D	27	7	2009	5C	ST40188302		
Helophorus brevipalpis	Helophoridae	C	27	7	2009	5A	ST39738299		1
Helophorus brevipalpis	Helophoridae	D	27	7	2009	5B	ST39918303		
Helophorus brevipalpis	Helophoridae	D	27	7	2009	5C	ST40188302		
Helophorus minutus	Helophoridae	C	27	7	2009	5A	ST39738299		1

Helophorus minutus	Helophoridae		C	27	7	2009	5B	ST39918303		
Helophorus minutus	Helophoridae		D	27	7	2009	5C	ST40188302		
Anacaena limbata	Hydrophilidae		D	27	7	2009	5B	ST39918303		1
Anacaena lutescens	Hydrophilidae		C	27	7	2009	5A	ST39738299		1
Anacaena lutescens	Hydrophilidae		D	27	7	2009	5B	ST39918303		
Anacaena lutescens	Hydrophilidae		D	27	7	2009	5C	ST40188302		
Enochrus coarctatus	Hydrophilidae		D	27	7	2009	5B	ST39918303	B	2
Helochares lividus	Hydrophilidae		D	27	7	2009	5A	ST39738299	B	2
Helochares lividus	Hydrophilidae		D	27	7	2009	5B	ST39918303		
Hydrobius fuscipes	Hydrophilidae		D	27	7	2009	5B	ST39918303		1
Hydrobius fuscipes	Hydrophilidae		D	27	7	2009	5C	ST40188302		
Hydrophilus piceus	Hydrophilidae	**RDB3.**	D	27	7	2009	5A	ST39738299	A	8
Laccobius minutus	Hydrophilidae		D	27	7	2009	5B	ST39918303	B	2

No. species	**36**
SQS	**50**
SQI	**1.39**
HQS	**9.72**

3.1.6 Sample station 6

The Windmill Reen. A very large main drain, which looks to be very regularly cleared out. As a consequence, tall emergent cover of the watercourse is quite low at about 10-20%, with the main species involved being *Phragmites australis*, *Glyceria maxima*, *Oenanthe crocata* and *Epilobium hirsutum*. Low emergents are extremely scarce, with just a tiny amount of *Glyceria fluitans*, *Veronica* sp. and *Berula erecta*. The considerable wind action and flow in the reen ensures that *Lemna* is sparse at only 10-15%. Otherwise the main floating vegetation is occasional mats of floating *Hydrocharis morsus-ranae* and a very little *Azolla filiculoides*. There is also some growth (c10-20%) of submerged pondweeds, mostly in the marginal areas of the reen where it has avoided being cleared out.

Table 3.1.6.1. Invertebrates from sample station 6, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Valvata cristata	Valvatidae		D	27	7	9	6A	ST40878335		2
Valvata cristata	Valvatidae		D	27	7	9	6B	ST40748360		
Valvata cristata	Valvatidae		D	27	7	9	6C	ST40698369		
Bithynia tentaculata	Bithyniidae		C	27	7	9	6A	ST40878335		1
Bithynia tentaculata	Bithyniidae		D	27	7	9	6B	ST40748360		
Bithynia tentaculata	Bithyniidae		D	27	7	9	6C	ST40698369		
Physa/Physella sp	Physidae		C	27	7	9	6A	ST40878335		1
Physa/Physella sp	Physidae		D	27	7	9	6B	ST40748360		
Physa/Physella sp	Physidae		D	27	7	9	6C	ST40698369		
Lymnaea palustris	Lymnaeidae		D	27	7	9	6A	ST40878335		1
Lymnaea stagnalis	Lymnaeidae		D	27	7	9	6A	ST40878335		1
Lymnaea peregra	Lymnaeidae		C	27	7	9	6A	ST40878335		1
Lymnaea peregra	Lymnaeidae		C	27	7	9	6B	ST40748360		
Lymnaea peregra	Lymnaeidae		C	27	7	9	6C	ST40698369		
Planorbis planorbis	Planorbidae		D	27	7	9	6A	ST40878335		1
Planorbis planorbis	Planorbidae		D	27	7	9	6C	ST40698369		
Planorbis planorbis	Planorbidae		D	27	7	9	6C	ST40698369		
Anisus vortex	Planorbidae		C	27	7	9	6A	ST40878335		1

Anisus vortex	Planorbidae	C	27	7	9	6C	ST40698369		
Anisus vortex	Planorbidae	C	27	7	9	6C	ST40698369		
Bathyomphalus contortus	Planorbidae	D	27	7	9	6B	ST40748360		2
Hippeutis complanatus	Planorbidae	C	27	7	9	6C	ST40698369		2
Planorbarius corneus	Planorbidae	C	27	7	9	6C	ST40698369		1
Succinea putris	Succineidae	C	27	7	9	6B	ST40748360		1
Succinea putris	Succineidae	D	27	7	9	6C	ST40698369		
Microvelia reticulata	Veliidae	D	27	7	9	6B	ST40748360		1
Gerris lacustris	Gerridae	D	27	7	9	6B	ST40748360		1
Gerris odontogaster	Gerridae	D	27	7	9	6A	ST40878335		1
Nepa cinerea	Nepidae	D	27	7	9	6A	ST40878335		1
Nepa cinerea	Nepidae	D	27	7	9	6B	ST40748360		
Ilyocoris cimicoides	Naucoridae	C	27	7	9	6A	ST40878335		1
Ilyocoris cimicoides	Naucoridae	D	27	7	9	6B	ST40748360		
Ilyocoris cimicoides	Naucoridae	C	27	7	9	6C	ST40698369		
Notonecta glauca	Notonectidae	D	27	7	9	6A	ST40878335		1
Notonecta glauca	Notonectidae	D	27	7	9	6B	ST40748360		
Notonecta glauca	Notonectidae	D	27	7	9	6C	ST40698369		
Sigara dorsalis	Corixidae	D	27	7	9	6A	ST40878335		1
Sigara dorsalis	Corixidae	C	27	7	9	6B	ST40748360		
Sigara dorsalis	Corixidae	D	27	7	9	6C	ST40698369		
Haliplus immaculatus	Haliplidae	D	27	7	9	6A	ST40878335	B	2
Haliplus ruficollis	Haliplidae	B	27	7	9	6A	ST40878335		1
Haliplus ruficollis	Haliplidae	C	27	7	9	6B	ST40748360		
Haliplus ruficollis	Haliplidae	C	27	7	9	6C	ST40698369		
Noterus clavicornis	Noteridae	D	27	7	9	6B	ST40748360		2
Noterus clavicornis	Noteridae	D	27	7	9	6C	ST40698369		
Hydroporus angustatus	Dytiscidae	D	27	7	9	6C	ST40698369		1
Hyphydrus ovatus	Dytiscidae	D	27	7	9	6A	ST40878335		1
Hyphydrus ovatus	Dytiscidae	D	27	7	9	6B	ST40748360		

Hyphydrus ovatus	Dytiscidae		D	27	7	9	6C	ST40698369		
Laccophilus hyalinus	Dytiscidae		C	27	7	9	6A	ST40878335		1
Laccophilus hyalinus	Dytiscidae		D	27	7	9	6B	ST40748360		
Laccophilus hyalinus	Dytiscidae		D	27	7	9	6C	ST40698369		
Laccophilus minutus	Dytiscidae		D	27	7	9	6A	ST40878335	B	2
Helophorus brevipalpis	Helophoridae		D	27	7	9	6A	ST40878335		1
Helophorus brevipalpis	Helophoridae		C	27	7	9	6B	ST40748360		
Helophorus griseus	Helophoridae	**Nb.**	D	27	7	9	6A	ST40878335		2
Helophorus minutus	Helophoridae		C	27	7	9	6A	ST40878335		1
Helophorus minutus	Helophoridae		D	27	7	9	6B	ST40748360		
Anacaena limbata	Hydrophilidae		C	27	7	9	6B	ST40748360		1
Anacaena lutescens	Hydrophilidae		D	27	7	9	6A	ST40878335		1
Anacaena lutescens	Hydrophilidae		D	27	7	9	6B	ST40748360		
Enochrus testaceus	Hydrophilidae		D	27	7	9	6B	ST40748360		2
Hydrobius fuscipes	Hydrophilidae		D	27	7	9	6C	ST40698369		1
Laccobius minutus	Hydrophilidae		D	27	7	9	6B	ST40748360	B	2
Odontomyia tigrina	Stratiomyidae	**N.**	D	27	7	9	6C	ST40698369	B	4

No. species	**35**
SQS	**47**
SQI	**1.34**
HQS	**5.71**

3.1.7 Sample station 7

A large and interesting reen with a strong through-flow of water. Sub-samples 7B and 7C were cattle grazed on both banks, which has created a number of shallow, cattle poached bays that diversify the range of invertebrate microhabitats. Tall emergents were present as quite a thick marginal band that occupied approximately 30% of the water area along the ungrazed reen length sampled at 7A. However, in the cattle grazed section, the band of tall fen was much more fragmented, with cover of approximately10-15%. Tall fen was dominated by *Phragmites australis*, *Glyceria maxima* and *Sparganium erectum*. There was a well-represented band of low emergent vegetation in which *Sagittaria sagittifolia* and *Rorippa nasturtium-aquaticum* were the main constituents. The strong flow and wind action on this large ditch ensured that *Lemna* was restricted to marginal areas, where it occured at approximately 10-15% cover of the water area. There were also frequent mats of *Hydrocharis morsus-ranae* and some *Azolla filiculoides*. Submerged pondweeds were only present at low cover in sub-samples 7B and 7C, at approximately 10 and 5% cover respectively.

Table 3.1.7.1. Invertebrates from sample station 7, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Valvata cristata	Valvatidae		C	31	7	2009	7A	ST39408528		2
Valvata cristata	Valvatidae		C	31	7	2009	7B	ST39578501		
Valvata cristata	Valvatidae		C	31	7	2009	7C	ST39718482		
Valvata piscinalis	Valvatidae		D	31	7	2009	7A	ST39408528		2
Bithynia tentaculata	Bithyniidae		C	31	7	2009	7A	ST39408528		1
Bithynia tentaculata	Bithyniidae		D	31	7	2009	7B	ST39578501		
Bithynia tentaculata	Bithyniidae		C	31	7	2009	7C	ST39718482		
Physa/Physella sp	Physidae		C	31	7	2009	7A	ST39408528		1
Physa/Physella sp	Physidae		C	31	7	2009	7B	ST39578501		
Physa/Physella sp	Physidae		B	31	7	2009	7C	ST39718482		
Lymnaea palustris	Lymnaeidae		D	31	7	2009	7A	ST39408528		1
Lymnaea palustris	Lymnaeidae		D	31	7	2009	7B	ST39578501		
Lymnaea palustris	Lymnaeidae		D	31	7	2009	7C	ST39718482		
Lymnaea stagnalis	Lymnaeidae		D	31	7	2009	7A	ST39408528		1
Lymnaea stagnalis	Lymnaeidae		D	31	7	2009	7B	ST39578501		

Lymnaea stagnalis	Lymnaeidae		D	31	7	2009	7C	ST39718482		
Lymnaea peregra	Lymnaeidae		D	31	7	2009	7A	ST39408528		1
Lymnaea peregra	Lymnaeidae		C	31	7	2009	7B	ST39578501		
Lymnaea peregra	Lymnaeidae		C	31	7	2009	7C	ST39718482		
Planorbis planorbis	Planorbidae		C	31	7	2009	7A	ST39408528		1
Planorbis planorbis	Planorbidae		C	31	7	2009	7B	ST39578501		
Planorbis planorbis	Planorbidae		C	31	7	2009	7C	ST39718482		
Anisus vortex	Planorbidae		C	31	7	2009	7A	ST39408528		1
Anisus vortex	Planorbidae		D	31	7	2009	7B	ST39578501		
Anisus vortex	Planorbidae		D	31	7	2009	7C	ST39718482		
Hippeutis complanatus	Planorbidae		D	31	7	2009	7C	ST39718482		2
Planorbarius corneus	Planorbidae		C	31	7	2009	7B	ST39578501		1
Planorbarius corneus	Planorbidae		D	31	7	2009	7C	ST39718482		
Succinea putris	Succineidae		C	31	7	2009	7A	ST39408528		1
Succinea putris	Succineidae		D	31	7	2009	7B	ST39578501		
Brachytron pratense	Odonata	**Nb.**	D	31	7	2009	7B	ST39578501	B	4
Mesovelia furcata	Mesoveliidae		C	31	7	2009	7B	ST39578501		2
Mesovelia furcata	Mesoveliidae		D	31	7	2009	7C	ST39718482		
Microvelia reticulata	Veliidae		D	31	7	2009	7A	ST39408528		1
Microvelia reticulata	Veliidae		C	31	7	2009	7B	ST39578501		
Microvelia reticulata	Veliidae		D	31	7	2009	7C	ST39718482		
Gerris lacustris	Gerridae		D	31	7	2009	7B	ST39578501		1
Gerris lacustris	Gerridae		C	31	7	2009	7C	ST39718482		
Gerris odontogaster	Gerridae		D	31	7	2009	7A	ST39408528		1
Nepa cinerea	Nepidae		D	31	7	2009	7B	ST39578501		1
Ilyocoris cimicoides	Naucoridae		C	31	7	2009	7A	ST39408528		1
Ilyocoris cimicoides	Naucoridae		C	31	7	2009	7B	ST39578501		
Ilyocoris cimicoides	Naucoridae		D	31	7	2009	7C	ST39718482		
Notonecta glauca	Notonectidae		D	31	7	2009	7A	ST39408528		1
Notonecta glauca	Notonectidae		C	31	7	2009	7B	ST39578501		

Notonecta glauca	Notonectidae	D	31	7	2009	7C	ST39718482		
Plea minutissima	Pleidae	D	31	7	2009	7B	ST39578501		1
Hespercorixa linnaei	Corixidae	C	31	7	2009	7A	ST39408528		1
Hespercorixa linnaei	Corixidae	D	31	7	2009	7B	ST39578501		
Hespercorixa linnaei	Corixidae	D	31	7	2009	7C	ST39718482		
Hespercorixa sahlbergi	Corixidae	D	31	7	2009	7B	ST39578501		1
Sigara dorsalis	Corixidae	C	31	7	2009	7A	ST39408528		1
Sigara dorsalis	Corixidae	D	31	7	2009	7B	ST39578501		
Sigara dorsalis	Corixidae	C	31	7	2009	7C	ST39718482		
Haliplus ruficollis	Haliplidae	B	31	7	2009	7A	ST39408528		1
Haliplus ruficollis	Haliplidae	B	31	7	2009	7B	ST39578501		
Haliplus ruficollis	Haliplidae	C	31	7	2009	7C	ST39718482		
Haliplus sibiricus	Haliplidae	B	31	7	2009	7A	ST39408528		2
Haliplus flavicollis	Haliplidae	D	31	7	2009	7A	ST39408528		2
Noterus clavicornis	Noteridae	C	31	7	2009	7A	ST39408528		2
Noterus clavicornis	Noteridae	C	31	7	2009	7B	ST39578501		
Noterus clavicornis	Noteridae	C	31	7	2009	7C	ST39718482		
Agabus sturmii	Dytiscidae	D	31	7	2009	7A	ST39408528		1
Agabus bipustulatus	Dytiscidae	D	31	7	2009	7B	ST39578501		1
Agabus bipustulatus	Dytiscidae	D	31	7	2009	7C	ST39718482		
Ilybius quadriguttatus	Dytiscidae	D	31	7	2009	7B	ST39578501	B	1
Graptodytes pictus	Dytiscidae	D	31	7	2009	7A	ST39408528	B	2
Hydroporus angustatus	Dytiscidae	D	31	7	2009	7B	ST39578501		1
Hydroporus palustris	Dytiscidae	D	31	7	2009	7A	ST39408528		1
Hydroporus pubescens	Dytiscidae	D	31	7	2009	7A	ST39408528		1
Hydroporus pubescens	Dytiscidae	D	31	7	2009	7B	ST39578501		
Hygrotus inaequalis	Dytiscidae	D	31	7	2009	7A	ST39408528		1
Hygrotus versicolor	Dytiscidae	B	31	7	2009	7A	ST39408528		2
Hygrotus versicolor	Dytiscidae	C	31	7	2009	7B	ST39578501		
Hygrotus versicolor	Dytiscidae	D	31	7	2009	7C	ST39718482		

Hyphydrus ovatus	Dytiscidae	D	31	7	2009	7B	ST39578501	1
Hyphydrus ovatus	Dytiscidae	D	31	7	2009	7C	ST39718482	
Laccophilus hyalinus	Dytiscidae	C	31	7	2009	7A	ST39408528	1
Laccophilus hyalinus	Dytiscidae	C	31	7	2009	7B	ST39578501	
Laccophilus hyalinus	Dytiscidae	C	31	7	2009	7C	ST39718482	
Helophorus brevipalpis	Helophoridae	C	31	7	2009	7C	ST39718482	1
Anacaena limbata	Hydrophilidae	D	31	7	2009	7A	ST39408528	1
Anacaena lutescens	Hydrophilidae	D	31	7	2009	7A	ST39408528	1
Anacaena lutescens	Hydrophilidae	D	31	7	2009	7B	ST39578501	
Hydrobius fuscipes	Hydrophilidae	D	31	7	2009	7C	ST39718482	1
Laccobius bipunctatus	Hydrophilidae	D	31	7	2009	7C	ST39718482	1
Stenopelmus rufinasus	Curculionidae	D	31	7	2009	7C	ST39718482	

No. species	**43**
SQS	**56**
SQI	**1.3**
HQS	**3.48**

3.1.8 Sample station 8

A relatively small, but interesting ditch, which was cattle poached along the entirety of its western margin, this being the bank from which all sampling was carried out. The activities of stock ensure that the tall emergent fringe is of limited extent, comprising a thin strip of *Carex* sp., *Juncus effusus*, *Iris pseudacorus*, *Glyceria maxima* and *Oenanthe crocata* at between approximately 8 and 15% cover of the water area. There is a reasonably well-developed low emergent strip of *Berula erecta*, *Alisma plantago-aquatica*, *Equisetum fluviatile*, *Glyceria fluitans* and grazed *G. maxima*, this zone being especially prominent in shallow bays created by cattle poaching. There is an almost continuous mat of floating *Lemna*, which is becoming very dense in some sections of the reen and there are also a few patches of *Hydrocharis morsus-ranae*. The duckweeds appear to be suppressing the growth of submerged aquatics, which are restricted to those areas where *Lemna* is a little less dense (sub-sample 8B).

Table 3.1.8.1. Invertebrates from sample station 8, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Valvata cristata	Valvatidae		D	26	7	2009	8A	ST38408465		2
Valvata cristata	Valvatidae		B	26	7	2009	8B	ST38298478		
Valvata cristata	Valvatidae		C	26	7	2009	8C	ST38208488		
Valvata piscinalis	Valvatidae		D	26	7	2009	8B	ST38298478		2
Bithynia tentaculata	Bithyniidae		D	26	7	2009	8A	ST38408465		1
Bithynia tentaculata	Bithyniidae		D	26	7	2009	8B	ST38298478		
Physa/Physella sp	Physidae		D	26	7	2009	8A	ST38408465		1
Lymnaea palustris	Lymnaeidae		D	26	7	2009	8B	ST38298478		1
Lymnaea peregra	Lymnaeidae		D	26	7	2009	8A	ST38408465		1
Lymnaea peregra	Lymnaeidae		D	26	7	2009	8B	ST38298478		
Planorbis planorbis	Planorbidae		B	26	7	2009	8A	ST38408465		1
Planorbis planorbis	Planorbidae		B	26	7	2009	8B	ST38298478		
Planorbis planorbis	Planorbidae		C	26	7	2009	8C	ST38208488		
Anisus vortex	Planorbidae		C	26	7	2009	8A	ST38408465		1
Anisus vortex	Planorbidae		B	26	7	2009	8B	ST38298478		
Anisus vortex	Planorbidae		C	26	7	2009	8C	ST38208488		

Hippeutis complanatus	Planorbidae	D	26	7	2009	8A	ST38408465	2
Succinea putris	Succineidae	D	26	7	2009	8A	ST38408465	1
Succinea putris	Succineidae	D	26	7	2009	8B	ST38298478	
Oxyloma pfeifferi	Succineidae	C	26	7	2009	8B	ST38298478	1
Hydrometra stagnorum	Hydrometridae	D	26	7	2009	8C	ST38208488	1
Gerris lacustris	Gerridae	C	26	7	2009	8B	ST38298478	1
Gerris lacustris	Gerridae	D	26	7	2009	8C	ST38208488	
Ilyocoris cimicoides	Naucoridae	D	26	7	2009	8A	ST38408465	1
Ilyocoris cimicoides	Naucoridae	D	26	7	2009	8B	ST38298478	
Ilyocoris cimicoides	Naucoridae	D	26	7	2009	8C	ST38208488	
Notonecta glauca	Notonectidae	D	26	7	2009	8A	ST38408465	1
Notonecta glauca	Notonectidae	D	26	7	2009	8B	ST38298478	
Hespercorixa sahlbergi	Corixidae	D	26	7	2009	8A	ST38408465	1
Hespercorixa sahlbergi	Corixidae	D	26	7	2009	8B	ST38298478	
Hespercorixa sahlbergi	Corixidae	C	26	7	2009	8C	ST38208488	
Haliplus ruficollis	Haliplidae	D	26	7	2009	8A	ST38408465	1
Haliplus ruficollis	Haliplidae	D	26	7	2009	8B	ST38298478	
Haliplus ruficollis	Haliplidae	C	26	7	2009	8C	ST38208488	
Noterus clavicornis	Noteridae	D	26	7	2009	8B	ST38408465	2
Agabus sturmii	Dytiscidae	D	26	7	2009	8B	ST38298478	1
Agabus sturmii	Dytiscidae	D	26	7	2009	8C	ST38208488	
Agabus bipustulatus	Dytiscidae	D	26	7	2009	8A	ST38408465	1
Agabus bipustulatus	Dytiscidae	D	26	7	2009	8B	ST38298478	
Agabus bipustulatus	Dytiscidae	D	26	7	2009	8C	ST38208488	
Hydroporus angustatus	Dytiscidae	C	26	7	2009	8A	ST38408465	1
Hydroporus angustatus	Dytiscidae	D	26	7	2009	8B	ST38298478	
Hydroporus palustris	Dytiscidae	C	26	7	2009	8A	ST38408465	1
Hydroporus palustris	Dytiscidae	D	26	7	2009	8B	ST38298478	
Hydroporus palustris	Dytiscidae	D	26	7	2009	8C	ST38208488	
Hydroporus pubescens	Dytiscidae	D	26	7	2009	8A	ST38408465	1

Hydroporus pubescens	Dytiscidae		D	26	7	2009	8B	ST38298478		
Hygrotus inaequalis	Dytiscidae		D	26	7	2009	8B	ST38298478		1
Hygrotus inaequalis	Dytiscidae		D	26	7	2009	8C	ST38208488		
Helophorus aequalis	Helophoridae		D	26	7	2009	8B	ST38298478		1
Helophorus aequalis	Helophoridae		D	26	7	2009	8C	ST38208488		
Helophorus brevipalpis	Helophoridae		D	26	7	2009	8A	ST38408465		1
Helophorus brevipalpis	Helophoridae		D	26	7	2009	8B	ST38298478		
Helophorus brevipalpis	Helophoridae		D	26	7	2009	8C	ST38208488		
Helophorus minutus	Helophoridae		D	26	7	2009	8B	ST38298478		1
Helophorus minutus	Helophoridae		D	26	7	2009	8C	ST38208488		
Anacaena lutescens	Hydrophilidae		B	26	7	2009	8A	ST38408465		1
Anacaena lutescens	Hydrophilidae		C	26	7	2009	8B	ST38298478		
Anacaena lutescens	Hydrophilidae		C	26	7	2009	8C	ST38208488		
Enochrus ochropterus	Hydrophilidae	**Nb.**	D	26	7	2009	8B	ST38298478		4
Enochrus ochropterus	Hydrophilidae		D	26	7	2009	8C	ST38208488		
Helochares lividus	Hydrophilidae		D	26	7	2009	8B	ST38298478	B	2
Hydrobius fuscipes	Hydrophilidae		D	26	7	2009	8A	ST38408465		1
Hydrobius fuscipes	Hydrophilidae		D	26	7	2009	8B	ST38298478		
Hydrobius fuscipes	Hydrophilidae		D	26	7	2009	8C	ST38208488		
Laccobius bipunctatus	Hydrophilidae		D	26	7	2009	8A	ST38408465		1
Laccobius bipunctatus	Hydrophilidae		D	26	7	2009	8B	ST38298478		
Laccobius bipunctatus	Hydrophilidae		D	26	7	2009	8C	ST38208488		
Scirtes hemisphaericus	Scirtidae		D	26	7	2009	8B	ST38298478		0
									No. species	**32**
									SQS	**40**
									SQI	**1.25**
									HQS	**1.56**

3.1.9 Sample station 9

A small ditch, which is choked with tall emergent *Phragmites australis* (10-50% cover) and low emergent *Berula erecta* and *Glyceria fluitans* (15-40% cover). The floating duckweed is intermixed with just a very small amount of *Hydrocharis morsus-ranae*. The dominance of duckweed precludes the development of any submerged aquatic vegetation.

Table 3.1.9.1. Invertebrates from sample station 9, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Valvata cristata	Valvatidae		C	26	7	2009	9A	ST39078302		2
Bithynia tentaculata	Bithyniidae		C	26	7	2009	9A	ST39078302		1
Bithynia tentaculata	Bithyniidae		C	26	7	2009	9B	ST39008313		
Physa/Physella sp	Physidae		D	26	7	2009	9A	ST39078302		1
Lymnaea stagnalis	Lymnaeidae		D	26	7	2009	9A	ST39078302		1
Lymnaea peregra	Lymnaeidae		D	26	7	2009	9B	ST39008313		1
Planorbis planorbis	Planorbidae		C	26	7	2009	9A	ST39078302		1
Planorbis planorbis	Planorbidae		C	26	7	2009	9B	ST39008313		
Planorbis planorbis	Planorbidae		D	26	7	2009	9C	ST38818354		
Anisus vortex	Planorbidae		C	26	7	2009	9A	ST39078302		1
Anisus vortex	Planorbidae		C	26	7	2009	9B	ST39008313		
Anisus vortex	Planorbidae		C	26	7	2009	9C	ST38818354		
Planorbarius corneus	Planorbidae		D	26	7	2009	9A	ST39078302		1
Planorbarius corneus	Planorbidae		C	26	7	2009	9B	ST39008313		
Planorbarius corneus	Planorbidae		C	26	7	2009	9C	ST38818354		
Succinea putris	Succineidae		D	26	7	2009	9C	ST38818354		1
Haliplus ruficollis	Haliplidae		D	26	7	2009	9A	ST39078302		1
Haliplus ruficollis	Haliplidae		D	26	7	2009	9B	ST39008313		
Noterus clavicornis	Noteridae		D	26	7	2009	9A	ST39078302		2
Noterus clavicornis	Noteridae		D	26	7	2009	9B	ST39008313		
Agabus sturmii	Dytiscidae		D	26	7	2009	9A	ST39078302		1

Agabus sturmii	Dytiscidae		C	26	7	2009	9C	ST38818354		
Agabus bipustulatus	Dytiscidae		C	26	7	2009	9A	ST39078302		1
Agabus bipustulatus	Dytiscidae		D	26	7	2009	9B	ST39008313		
Agabus bipustulatus	Dytiscidae		C	26	7	2009	9C	ST38818354		
Hydroporus angustatus	Dytiscidae		D	26	7	2009	9C	ST38818354		1
Hydroporus incognitus	Dytiscidae		C	26	7	2009	9A	ST39078302		2
Hydroporus palustris	Dytiscidae		D	26	7	2009	9A	ST39078302		1
Hydroporus palustris	Dytiscidae		D	26	7	2009	9B	ST39008313		
Hydroporus palustris	Dytiscidae		C	26	7	2009	9C	ST38818354		
Hydroporus pubescens	Dytiscidae		D	26	7	2009	9A	ST39078302		1
Hydroporus pubescens	Dytiscidae		D	26	7	2009	9B	ST39008313		
Hydroporus tessellatus	Dytiscidae		D	26	7	2009	9A	ST39078302		1
Hydroporus tessellatus	Dytiscidae		D	26	7	2009	9B	ST39008313		
Hygrotus inaequalis	Dytiscidae		D	26	7	2009	9A	ST39078302		1
Hygrotus inaequalis	Dytiscidae		D	26	7	2009	9C	ST38818354		
Helophorus brevipalpis	Helophoridae		D	26	7	2009	9A	ST39078302		1
Helophorus minutus	Helophoridae		D	26	7	2009	9B	ST39008313		1
Helophorus minutus	Helophoridae		D	26	7	2009	9C	ST38818354		
Anacaena limbata	Hydrophilidae		D	26	7	2009	9C	ST38818354		1
Anacaena lutescens	Hydrophilidae		C	26	7	2009	9B	ST39008313		1
Anacaena lutescens	Hydrophilidae		C	26	7	2009	9C	ST38818354		
Enochrus ochropterus	Hydrophilidae	**Nb.**	D	26	7	2009	9C	ST38818354		4
Enochrus testaceus	Hydrophilidae		D	26	7	2009	9A	ST39078302		2
Enochrus testaceus	Hydrophilidae		D	26	7	2009	9B	ST39008313		
Helochares lividus	Hydrophilidae		D	26	7	2009	9B	ST39008313	B	2
Laccobius bipunctatus	Hydrophilidae		D	26	7	2009	9B	ST39008313		1
Scirtes hemisphaericus	Scirtidae		D	26	7	2009	9C	ST38818354		0
Tanysphyrus lemnae	Curculionidae		D	26	7	2009	9B	ST39008313		0
Odontomyia tigrina	Stratiomyidae	**N.**	D	26	7	2009	9A	ST39078302	B	4
SQI = 1.39		**SQS = 39**				**HQS = 3.57**			**No. species = 28**	

3.1.10 Sample station 10

Vegetation structure and composition along this small field ditch was unusually heterogeneous. At its north-eastern end (10A and 10B), there is much tall emergent *Phragmites australis* and *Glyceria maxima* colonising the open water (30% and 75% cover respectively). There is no low emergent growth in either of these sub-samples and a dense and choking mat of *Lemna*, with a little *Hydrocharis morsus-ranae* in 10B. The density of the floating *Lemna* layer means there are no submerged aquatics in either of these sub-samples. However, to the south-west (10C), the reen has a more open character, with much less thick growth of *Lemna* and much *Hydrocharis morsus-ranae* over a very dense submerged aquatic flora. There is a little low emergent *Berula erecta* here and a narrow strip of tall emergent *G. maxima*, *Oenanthe crocata*, *Iris pseudacorus* and *Juncus inflexus* at approximately 20% cover.

Table 3.1.10.1. Invertebrates from sample station 10, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Valvata cristata	Valvatidae		C	31	7	2009	10B	ST39618440		2
Valvata cristata	Valvatidae		C	31	7	2009	10C	ST39588422		
Valvata piscinalis	Valvatidae		D	31	7	2009	10C	ST39588422		2
Bithynia tentaculata	Bithyniidae		C	31	7	2009	10B	ST39618440		1
Bithynia tentaculata	Bithyniidae		C	31	7	2009	10C	ST39588422		
Physa/Physella sp	Physidae		C	31	7	2009	10B	ST39618440		1
Physa/Physella sp	Physidae		B	31	7	2009	10C	ST39588422		
Lymnaea peregra	Lymnaeidae		C	31	7	2009	10B	ST39618440		1
Lymnaea peregra	Lymnaeidae		C	31	7	2009	10C	ST39588422		
Planorbis planorbis	Planorbidae		B	31	7	2009	10B	ST39618440		1
Planorbis planorbis	Planorbidae		B	31	7	2009	10C	ST39588422		
Anisus vortex	Planorbidae		D	31	7	2009	10B	ST39618440		1
Anisus vortex	Planorbidae		B	31	7	2009	10C	ST39588422		
Bathyomphalus contortus	Planorbidae		C	31	7	2009	10B	ST39618440		2
Bathyomphalus contortus	Planorbidae		C	31	7	2009	10C	ST39588422		
Succinea putris	Succineidae		D	31	7	2009	10C	ST39588422		1
Nepa cinerea	Nepidae		D	31	7	2009	10B	ST39618440		1

Ilyocoris cimicoides	Naucoridae		C	31	7	2009	10B	ST39618440		1
Ilyocoris cimicoides	Naucoridae		C	31	7	2009	10C	ST39588422		
Notonecta glauca	Notonectidae		D	31	7	2009	10B	ST39618440		1
Hespercorixa linnaei	Corixidae		D	31	7	2009	10C	ST39588422		1
Hespercorixa sahlbergi	Corixidae		D	31	7	2009	10A	ST39678460		1
Hespercorixa sahlbergi	Corixidae		C	31	7	2009	10B	ST39618440		
Haliplus ruficollis	Haliplidae		D	31	7	2009	10A	ST39678460		1
Haliplus ruficollis	Haliplidae		C	31	7	2009	10B	ST39618440		
Haliplus ruficollis	Haliplidae		C	31	7	2009	10C	ST39588422		
Noterus clavicornis	Noteridae		D	31	7	2009	10B	ST39618440		2
Noterus clavicornis	Noteridae		D	31	7	2009	10C	ST39588422		
Agabus sturmii	Dytiscidae		D	31	7	2009	10B	ST39618440		1
Agabus bipustulatus	Dytiscidae		D	31	7	2009	10A	ST39678460		1
Agabus bipustulatus	Dytiscidae		C	31	7	2009	10B	ST39618440		
Agabus nebulosus	Dytiscidae		D	31	7	2009	10C	ST39588422		1
Ilybius quadriguttatus	Dytiscidae		D	31	7	2009	10C	ST39588422	B	1
Colymbetes fuscus	Dytiscidae		D	31	7	2009	10C	ST39588422		1
Rhantus grapii	Dytiscidae	**Nb.**	D	31	7	2009	10C	ST39588422	B	4
Dytiscus marginalis	Dytiscidae		D	31	7	2009	10B	ST39618440		1
Dytiscus marginalis	Dytiscidae		D	31	7	2009	10C	ST39588422		
Hydroporus angustatus	Dytiscidae		C	31	7	2009	10A	ST39678460		1
Hydroporus angustatus	Dytiscidae		D	31	7	2009	10B	ST39618440		
Hydroporus angustatus	Dytiscidae		D	31	7	2009	10C	ST39588422		
Hydroporus incognitus	Dytiscidae		D	31	7	2009	10A	ST39678460		2
Hydroporus incognitus	Dytiscidae		D	31	7	2009	10B	ST39618440		
Hydroporus palustris	Dytiscidae		D	31	7	2009	10A	ST39678460		1
Hydroporus palustris	Dytiscidae		D	31	7	2009	10B	ST39618440		
Hydroporus palustris	Dytiscidae		D	31	7	2009	10C	ST39588422		
Hydroporus planus	Dytiscidae		D	31	7	2009	10B	ST39618440		1
Hydroporus pubescens	Dytiscidae		D	31	7	2009	10A	ST39678460		1

Hydroporus pubescens	Dytiscidae		D	31	7	2009	10B	ST39618440		
Hydroporus pubescens	Dytiscidae		D	31	7	2009	10C	ST39588422		
Hydroporus tessellatus	Dytiscidae		D	31	7	2009	10C	ST39588422		1
Hygrotus inaequalis	Dytiscidae		D	31	7	2009	10B	ST39618440		1
Helophorus brevipalpis	Helophoridae		D	31	7	2009	10B	ST39618440		1
Helophorus minutus	Helophoridae		D	31	7	2009	10A	ST39678460		1
Anacaena globulus	Hydrophilidae		D	31	7	2009	10A	ST39678460		1
Anacaena limbata	Hydrophilidae		D	31	7	2009	10A	ST39678460		1
Anacaena lutescens	Hydrophilidae		C	31	7	2009	10A	ST39678460		1
Anacaena lutescens	Hydrophilidae		C	31	7	2009	10B	ST39618440		
Anacaena lutescens	Hydrophilidae		C	31	7	2009	10C	ST39588422		
Enochrus coarctatus	Hydrophilidae		D	31	7	2009	10B	ST39618440	B	2
Enochrus ochropterus	Hydrophilidae	**Nb.**	D	31	7	2009	10C	ST39588422		4
Enochrus testaceus	Hydrophilidae		D	31	7	2009	10C	ST39588422		2
Laccobius bipunctatus	Hydrophilidae		D	31	7	2009	10B	ST39618440		1
Scirtes hemisphaericus	Scirtidae		D	31	7	2009	10A	ST39678460		0

No. species	**39**
SQS	**52**
SQI	**1.33**
HQS	**3.85**

3.1.11 Sample station 11

A small, and very poor ditch, with a dense and choking mat of *Lemna* and no submerged aquatic plants. There is a strip of tall emergent *Phragmites australis*, *Iris pseudacorus*, *Oenanthe crocata* and *Epilobium hirsutum* (15-30%). There is also a considerable amount of *Glyceria fluitans* in the low emergent layer in the first two sub-samples (60-40%). The northern bank of this ditch has a low, managed hedge of blackthorn and hawthorn.

Table 3.1.11.1. Invertebrates from sample station 11, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Potamopyrgus antipodarum	Hydrobiidae		D	27	7	2009	11C	ST39688320		1
Bithynia tentaculata	Bithyniidae		D	27	7	2009	11B	ST39588313		1
Lymnaea peregra	Lymnaeidae		D	27	7	2009	11B	ST39588313		1
Planorbis planorbis	Planorbidae		C	27	7	2009	11B	ST39588313		1
Planorbis planorbis	Planorbidae		C	27	7	2009	11C	ST39688320		
Anisus vortex	Planorbidae		C	27	7	2009	11B	ST39588313		1
Anisus vortex	Planorbidae		C	27	7	2009	11C	ST39688320		
Hippeutis complanatus	Planorbidae		D	27	7	2009	11B	ST39588313		2
Hippeutis complanatus	Planorbidae		D	27	7	2009	11C	ST39688320		
Succinea putris	Succineidae		D	27	7	2009	11A	ST39998339		1
Succinea putris	Succineidae		D	27	7	2009	11B	ST39588313		
Oxyloma pfeifferi	Succineidae		D	27	7	2009	11A	ST39998339		1
Ilyocoris cimicoides	Naucoridae		D	27	7	2009	11B	ST39588313		1
Ilyocoris cimicoides	Naucoridae		D	27	7	2009	11C	ST39688320		
Notonecta glauca	Notonectidae		D	27	7	2009	11B	ST39588313		1
Haliplus ruficollis	Haliplidae		D	27	7	2009	11B	ST39588313		1
Haliplus ruficollis	Haliplidae		D	27	7	2009	11C	ST39688320		
Agabus sturmii	Dytiscidae		D	27	7	2009	11B	ST39588313		1
Agabus bipustulatus	Dytiscidae		D	27	7	2009	11A	ST39998339		1
Agabus bipustulatus	Dytiscidae		C	27	7	2009	11B	ST39588313		

Hydroporus angustatus	Dytiscidae		D	27	7	2009	11A	ST39998339		1
Hydroporus angustatus	Dytiscidae		D	27	7	2009	11B	ST39588313		
Hydroporus angustatus	Dytiscidae		D	27	7	2009	11C	ST39688320		
Hydroporus palustris	Dytiscidae		C	27	7	2009	11B	ST39588313		1
Hydroporus palustris	Dytiscidae		D	27	7	2009	11C	ST39688320		
Hydroporus pubescens	Dytiscidae		D	27	7	2009	11B	ST39588313		1
Hydroporus tessellatus	Dytiscidae		D	27	7	2009	11B	ST39588313		1
Hygrotus inaequalis	Dytiscidae		D	27	7	2009	11A	ST39998339		1
Hygrotus inaequalis	Dytiscidae		C	27	7	2009	11B	ST39588313		
Hygrotus inaequalis	Dytiscidae		C	27	7	2009	11C	ST39688320		
Anacaena lutescens	Hydrophilidae		D	27	7	2009	11B	ST39588313		1
Hydrobius fuscipes	Hydrophilidae		D	27	7	2009	11B	ST39588313		1
Odontomyia tigrina	Stratiomyidae	**N.**	D	27	7	2009	11C	ST39688320	B	4

No. species	**21**
SQS	**25**
SQI	**1.19**
HQS	**2.38**

3.1.12 Sample station 12

A relatively small field drain with an open character, which is fenced on its east bank, but is open to cattle on the west edge from which all sampling was undertaken. Because of grazing pressure, tall emergent vegetation is of only low frequency, with just a little *Phragmites australis*, *Juncus effusus* and *J. inflexus*. There is a well-developed low emergent layer of *Berula erecta*, *Oenanthe fistulosa*, *Glyceria fluitans* and stunted *Phragmites*. The first sub-sample had a dense and choking mat of *Lemna* with no submerged aquatic vegetation. However, this species was much less dominant in the following two sub-samples, and here there was abundant submerged growth of *Potamogeton crispus*. Cattle poaching on the west bank had created shallow bays that diversified the range of invertebrate microhabitats.

Table 3.1.12.1. Invertebrates from sample station 12, Gwent Levels, Whitson SSSI

Species	Family	Cons. Status	Abundance	Dy	Mo	Yr	Sub-sample	Grid ref	Marsh fidelity	Status score
Valvata cristata	Valvatidae		C	1	8	9	12B	ST38498395		2
Valvata cristata	Valvatidae		C	1	8	9	12C	ST38438405		
Bithynia tentaculata	Bithyniidae		C	1	8	9	12B	ST38498395		1
Bithynia tentaculata	Bithyniidae		C	1	8	9	12C	ST38438405		
Planorbis planorbis	Planorbidae		C	1	8	9	12A	ST38388413		1
Planorbis planorbis	Planorbidae		C	1	8	9	12B	ST38498395		
Planorbis planorbis	Planorbidae		C	1	8	9	12C	ST38438405		
Anisus vortex	Planorbidae		C	1	8	9	12C	ST38438405		1
Sphaerium corneum	Sphaeriidae		C	1	8	9	12B	ST38498395		1
Sphaerium corneum	Sphaeriidae		C	1	8	9	12C	ST38438405		
Notonecta glauca	Notonectidae		C	1	8	9	12B	ST38498395		1
Corixa punctata	Corixidae		C	1	8	9	12B	ST38498395		1
Hespercorixa linnaei	Corixidae		D	1	8	9	12C	ST38438405		1
Hespercorixa sahlbergi	Corixidae		D	1	8	9	12A	ST38388413		1
Hespercorixa sahlbergi	Corixidae		D	1	8	9	12B	ST38498395		
Hespercorixa sahlbergi	Corixidae		D	1	8	9	12C	ST38438405		
Sigara dorsalis	Corixidae		D	1	8	9	12B	ST38498395		1
Sigara dorsalis	Corixidae		D	1	8	9	12C	ST38438405		

Sigara fossarum	Corixidae		D	1	8	9	12B	ST38498395		1
Noterus clavicornis	Noteridae		D	1	8	9	12A	ST38388413		2
Agabus sturmii	Dytiscidae		D	1	8	9	12C	ST38438405		1
Agabus bipustulatus	Dytiscidae		D	1	8	9	12C	ST38438405		1
Rhantus suturalis	Dytiscidae	**Nb.**	D	1	8	9	12B	ST38498395	B	2
Hydroporus angustatus	Dytiscidae		D	1	8	9	12A	ST38388413		1
Hydroporus angustatus	Dytiscidae		D	1	8	9	12C	ST38438405		
Hydroporus planus	Dytiscidae		D	1	8	9	12C	ST38438405		
Hydroporus pubescens	Dytiscidae		D	1	8	9	12B	ST38498395		1
Hydroporus pubescens	Dytiscidae		D	1	8	9	12C	ST38438405		
Hygrotus inaequalis	Dytiscidae		D	1	8	9	12A	ST38388413		1
Hygrotus inaequalis	Dytiscidae		D	1	8	9	12C	ST38438405		
Helophorus aequalis	Helophoridae		D	1	8	9	12B	ST38498395		1
Helophorus grandis	Helophoridae		D	1	8	9	12C	ST38438405		
Helophorus minutus	Helophoridae		C	1	8	9	12B	ST38498395		1
Helophorus minutus	Helophoridae		C	1	8	9	12C	ST38438405		
Anacaena lutescens	Hydrophilidae		C	1	8	9	12A	ST38388413		1
Anacaena lutescens	Hydrophilidae		C	1	8	9	12B	ST38498395		
Anacaena lutescens	Hydrophilidae		C	1	8	9	12C	ST38438405		
Enochrus coarctatus	Hydrophilidae		D	1	8	9	12A	ST38388413	B	2
Enochrus testaceus	Hydrophilidae		D	1	8	9	12A	ST38388413		2
Helochares lividus	Hydrophilidae		D	1	8	9	12B	ST38498395	B	2
Helochares lividus	Hydrophilidae		D	1	8	9	12C	ST38438405		
Odontomyia tigrina	Stratiomyidae	**N.**	D	1	8	9	12C	ST38438405	B	4

No. species	**25**
SQS	**34**
SQI	**1.36**
HQS	**8**

3.2 Important species recorded at Whitson in 2009

The national status categories given at the beginning of each species account can be found in the national reviews of Diptera and water beetles by Falk (1991) and Foster (in press) respectively.

3.2.1 Hairy dragonfly Brachytron pratense.

Nationally scarce B. A small hawker dragonfly that is on the wing earlier than most other large dragonflies. The hairy dragonfly is a local inhabitant of rich lowland bodies of still water, such as lakes and canals. It is a characteristic inhabitant of grazing marsh ditches. Though *B. pratense* remains a local species, it appears to be undergoing a considerable expansion of its British range currently, with sites now known across much of lowland England and Wales, as well as some localities in south-western Scotland. However, its stronghold remains in the fens and grazing marshes of south-east England and East Anglia. In Wales, it is primarily found in marshes and fens along the south coast and on Anglesey, though there are also scattered populations on other parts of the Welsh coast. At Whitson, larvae were found in sample stations 3 and 7.

3.2.2 A water beetle Peltodytes caesus.

Nationally scarce B. A small yellow-brown haliplid water beetle with diagnostic pointed tips to the coxal processes. It is a very characteristic species of coastal grazing marshes, where it favours richly vegetated ditches with a soft muddy bottom. It can also be found less frequently in rich bodies of still water at inland sites. Sometimes *P. caesus* can be found in mildly brackish conditions, though most sites are fresh water. Both adults and larvae feed on filamentous algae and possibly also stoneworts. *P. caesus* is a very scarce species, which is most frequent in grazing marsh ditches in south-east England and East Anglia. It is a southern species that has not been found north of Lancashire. In the west, its main strongholds are on the Somerset and Gwent Levels. Elsewhere in Wales, it is a great rarity with just a couple of sites. In 2009, this beetle was recorded from sample station 1.

3.2.3 A water beetle Haliplus heydeni.

Nationally scarce B. *H. heydeni* is a small yellow-brown water beetle with short furrows at each side of the base of the pronotum. It forms part of the *ruficollis* group, a complex of eight very similar *Haliplus* species, which require careful examination of the front tarsi and genitalia of males to ensure correct determination. This beetle has a wide, but local distribution across England and Wales, though it has not yet been confirmed as a Scottish insect. It favours eutrophic, stagnant waterbodies, such as ponds, fen pools and grazing marsh ditches. Both larvae and adults feed on filamentous algae. At Whitson adults were noted in sample stations 1 and 3.

3.2.4 A water beetle Rhantus grapii.

Nationally scarce B. A medium-sized diving beetle, which unlike other *Rhantus* species, is all black. It is a species of lowland still waters, usually those that are at least moderately nutrient-rich. It also tends to favour quite shaded conditions. This is a species of the southern half of England and Wales, which is not found further north

than Yorkshire. The beetle's main strongholds are in south-east England, the East Anglian fens, south Yorkshire and Lincolnshire, the New Forest, the Somerset and Gwent Levels and the Anglesey fens. Elsewhere in Wales it is known from a few coastal fens in south Wales and a handful of sites elsewhere. At Whitson, adults were found in sample stations 1 and 10.

3.2.5 A water beetle Rhantus suturalis.

Nationally scarce B. A medium-sized pitchy-yellow diving beetle with black mottling on the wing cases and distinctive black marks on the thorax. It is quite widely distributed across southern and eastern England, with more scattered sites in northern England, Scotland and Wales. The Gwent Levels is the main Welsh stronghold for this beetle, though it is also known from scattered sites elsewhere. *R. suturalis* is generally found in well-vegetated, still waterbodies, such as ponds and ditches. In 2009, it was noted in sample stations 3 and 12.

3.2.6 A water beetle Hydaticus transversalis.

Red Data Book 3. The yellow transverse lines across the base of the wing cases make this medium-sized black diving beetle unmistakeable. It is thought to favour stagnant pools and ditches with abundant macrophytes for breeding. *H. transversalis* is a very scarce insect in Britain, with surviving populations mostly being in the fens of Cambridgeshire, Huntingdonshire and Norfolk and the Somerset and Gwent Levels. Away from these main populations, there are a few isolated colonies and it has certainly become extinct from some localities in which it was known. Only a single adult *H. transversalis* was recorded at Whitson in 2009, in sample station 2.

3.2.7 A water beetle Helophorus griseus.

Nationally scarce B. This is one of a group of small, *Helophorus* species with metallic thorax and yellow-brown mottled elytrae that are very difficult to identify without recourse to examination of the male genitalia (sub-genus *Rhopalhelophorus*). It is a species of the southern and eastern half of England, being very scarce in Britain to the north and west. In Wales, it is only recorded with any frequency on the Gwent Levels, being known elsewhere from a handful of scattered localities. It is found in sparsely vegetated clayey pools, being especially associated with temporary waterbodies that dry out over the summer months. A single male was recorded in sample station 6 at Whitson.

3.2.8. *A water beetle Enochrus ochropterus.*

Nationally scarce B. A reddish-brown water beetle with the basal half of the head black. *E. ochropterus* is found in a range of generally eutrophic waterbodies, though it can also tolerate somewhat more nutrient-poor waters, and is also found in poor fen habitats around the fringes of acid bogs. This beetle has a wide, but very localised distribution across the whole of the British Isles, including Wales where it has population centres in the coastal fens of Glamorgan and Anglesey and on the Gwent Levels. At Whitson, adults were recorded in sample stations 8, 9 and 10.

3.2.9. *Great silver water beetle Hydrophilus piceus.* RDB3.

Red Data Book 3. This unmistakeable insect is the largest British beetle. It is a rare species in Britain, which occurs on coastal grazing marshes in Kent, Sussex, Somerset and Gwent, and also in the Norfolk Broads. It was formerly more widely distributed in the Midlands, the London marshes and the Cambridgeshire fens, but appears to have disappeared from these areas. Larvae of *H. piceus* feed on water snails, and leave characteristic holes in the shells of their victims. They tend to be restricted to ditches with very dense mats of macrophytes, where their prey is most abundant, though adults disperse by flight and can be found in a wide range of still water habitats. A single well-grown larva of this species was noted in sample station 5 at Whitson.

3.2.10. *A water beetle Laccobius sinuatus.*

Nationally scarce. A small, rounded brown water beetle, which is most easily distinguished from its congeners by examination of the male genitalia. It is most often found at the shallow, muddy margins of base-rich stagnant waterbodies. *L. sinuatus* is primarily a species of the eastern side of England, with much more scattered records to the west. In Wales, it is extremely local, with the main concentration of records being from the Anglesey fens. A single adult male was recorded at Whitson in sample station 1. This appears to be the first record of *L. sinuatus* from the Gwent Levels.

4 DISCUSSION

In 2007, an assessment of the ditch invertebrate fauna was undertaken on sites in the Somerset and Gwent Levels (Drake, in press). In the latter area this study collected samples from the Wentlooge and Caldicott SSSIs, using the same methodology employed during this study. The Gwent samples collected by Drake (ibid.) were disappointing, with the quality of the aquatic invertebrate fauna appearing to have declined since the detailed invertebrate survey of the Gwent Levels undertaken by the Nature Conservancy Council in the early 1980s (Drake, Foster & Palmer, 1984). The current study produced figures for the Whitson SSSI that were even lower than those from the 2007 Caldicott and Wentlooge data. For example, where the median faithful species recorded by Drake (op. cit.) at the latter sites was six, a median value of only three was achieved at Whitson in 2009. By the same token median and mean species richness figures of 40 and 42.5 were achieved in 2007, with these figures being respectively 33.5 and 31.5 in 2009. Lastly, the median and mean Species Quality Index for the 2007 Gwent samples were approximately 1.40 and 1.46 respectively, as opposed to 1.36 and 1.34 respectively for the 2009 samples.

Care must be taken in interpreting the above figures, as a number of changes have been made to the list of marsh fidelity and conservation status scores between the two reports. Also, it would be expected that the Species Richness of the 2009 samples would be lower than those collected in 2007, as the latter study included taxa, such as freshwater Crustacea that were not collected at Whitson. The 2007 samples were also collected in the spring and early summer, whereas the 2009 data was collected in late July. Palmer et. al. (2009) state that the end of April through to early June is the ideal period for sampling the aquatic invertebrate fauna of grazing marsh ditches, though they say that useful results can be achieved all the way through to mid-October. This is because aquatic Coleoptera, which are much the most significant group for assessing the ditch invertebrate fauna, show a strong peak in diversity and abundance in the spring and early summer, when many species reproduce. This contract was not let until late-June, and it was not therefore possible to assess the invertebrate fauna within the most favourable sampling window. It is thought probable that an earlier survey date would have significantly enhanced the quality of the 2009 samples.

Taking these caveats into account, it seems likely that the Whitson ditches are of comparable interest to those sampled elsewhere on the Gwent Levels in 2007. Drake (op. cit.) comments that his samples from Caldicott and Wentlooge were very disappointing and that he believed that the invertebrate interest of these sites had declined since the early 1980s. He cited the excessive abundance of least duckweed *Lemna minuta*, a recent colonist that is native to north and central America, as the most important negative factor. I would certainly support this conclusion, with most of the smaller ditches sampled in 2009 being completely choked with this and other duckweed species. On the Somerset Levels it is thought that the increasing dominance of duckweeds not only relates to the arrival of *L. minuta*, but also to increased eutrophication caused by run-off from the intensively farmed catchment. This may also be the case on the Gwent Levels. The presence of a thick, choking mat of *Lemna* also makes it much more difficult to sample the invertebrate fauna effectively. This is particularly the case with small and/or delicate invertebrate species, which may be unable to escape from the piles of duckweed when the net

contents are spread over a plastic sheet. They are also difficult to see in the sample that is put into a tray of shallow water, because of the continuous layer of floating duckweed that covers the water surface. The abundance of duckweeds increases as it grows rapidly over the summer months. This is perhaps another reason why it would be preferable that future sampling should be carried out earlier in the spring.

A second negative factor is the very regular ditch clearance work that seems to be taking place at some of the Whitson sample stations. The very regular clearance of ditches results in a dearth of the late-successional habitats with abundant submerged and emergent aquatic vegetation that are the richest ditch habitat for aquatic invertebrates. Note that the presence of excessive *Lemna* also arrests the development of diverse late-successional habitats, as the continuous thick mat of duckweed prevents establishment of beds of submerged macrophytes. Very regular mechanical clearance is especially evident in the larger ditches, these ironically being those where wind action and current means there is much less of a problem with excessive duckweed growth.

On a more positive note, a good proportion of ditch edges at Whitson are still open to grazing by cattle. The poaching action of the animals at the water's edge creates shallow water and bare mud microhabitats that significantly increase the overall diversity of niches available to the invertebrate fauna. Grazing of shoots of common reed and other tall monocotyledons by the cattle also prevents these species from achieving excessive dominance.

5 REFERENCES

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APPENDIX 1: PHOTOGRAPHS OF SUB-SAMPLE PLOTS

Figure A1. Sub-sample 1A

Figure A2. Sub-sample 1B

Figure A3. Sub-sample 1C

Figure A4. Sub-sample 2A

Figure A5. Sub-sample 2B

Figure A6. Sub-sample 2C

Figure A7. Sub-sample 3A

Figure A8. Sub-sample 3B

Figure A9. Sub-sample 3C

Figure A10. Sub-sample 4A

Figure A11. Sub-sample 4B

Figure A12. Sub-sample 4C

Figure A13. Sub-sample 5A

Figure A14. Sub-sample 5B

Figure A15. Sub-sample 5C

Figure A16. Sub-sample 6A

Figure A17. Sub-sample 6B

Figure A18. Sub-sample 7A

Figure A19. Sub-sample 7B

Figure A20. Sub-sample 7C

Figure A21. Sub-sample 8A

Figure A22. Sub-sample 8B

Figure A23. Sub-sample 9A

Figure A24. Sub-sample 9B

Figure A25. Sub-sample 9C

Figure A26. Sub-sample 10A

Figure A27. Sub-sample 10B

Figure A28. Sub-sample 10C

Figure A29. Sub-sample 11A

Figure A30. Sub-sample 11B

Figure A31. Sub-sample 11C

Figure A32. Sub-sample 12A

Figure A33. Sub-sample 12B

Figure A34.Sub-sample 12C