

**Monitoring invertebrate features on Sites of
Special Scientific Interest: aquatic
invertebrates on the Gwent Levels: Redwick
and Llandevenny SSSI, St Brides SSSI**

DC Boyce

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Mae'r adroddiad hwn yn disgrifio rhaglen o waith samplu infertebrata dyfrol a gyflawnwyd ar gyfer Cyngor Cefn Gwlad Cymru mewn ffosydd corsydd pori ar Safleoedd o Ddiddordeb Gwyddonol Arbennig Redwick a Llandevenuey a St. Brides ar Wastadeddau Gwent yn 2011. Mae'n rhaid i'r Cyngor Cefn Gwlad ddatblygu strategaeth fonitro ar gyfer infertebrata dyfrol er mwyn cyflawni ei ymrwymadau 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 Infertebrata Dyfrol ar y ddau Safle o Ddiddordeb Gwyddonol Arbennig.

Dan y contract hwn roedd yn ofynnol samplu 24 o wahanol rannau o ffosydd yn unol â dulliau safonol a ddatblygwyd ar gyfer cynnal arolwg cenedlaethol o ecoleg systemau ffosydd gan Buglife (Palmer et al. 2009 a 2010). Cafodd y gwaith arolygu ei gyflawni rhwng 4 a 24 Mehefin, ac roedd yn canolbwyntio ar samplu chwilod, pryfed a malwod.

At ei gilydd cofnodwyd 101 o rywogaethau infertebrata dyfrol yn ystod y rhaglen samplu, ac roedd dwy ohonynt, sef y chwilen ddŵr arian fawr *Hydrophilus piceus* a'r pryf milwrol *Odontomyia ornata*, yn rhywogaethau Llyfr Data Coch. Nodwyd pum rhywogaeth arall a gofnodir yn anfynd yn genedlaethol ac 17 y credir eu bod yn driw iawn i gynefinoedd corsydd pori. Roedd y cyfoeth rhywogaethau yn y 24 sampl yn amrywio o 21 i 41 o rywogaethau. Roedd y Mynegrif Ansawdd Rhywogaethau yn cyfateb i oddeutu 1.18-1.68 ac roedd y Sgôr Ansawdd Cynefinoedd yn cyfateb i oddeutu 0-11.29.

Roedd y ffigurau hyn yn isel o'u cymharu â'r 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 wedi cyfrannu at yr amrywiaeth cymharol fach o infertebrata yn Redwick a Llandevenuey a St. Brides. Yn gyntaf, roedd llinad *Lemna* spp., gan gynnwys y cytrefwr diweddar o America *Lemna minuta*, yn tagu llawer o'r ffosydd. Credir bod presenoldeb llawer o linad yn arwydd o lefel uchel o ewtroffieiddio. Mae matiau dwys o linad hefyd yn atal twf gwelyau tanddwr o facroffytâu dyfrol sy'n gilfach bwysig iawn i infertebrata dyfrol.

Yn ail, caiff y rhan fwyaf o'r ffosydd eu clirio'n rheolaidd iawn, sydd hefyd yn atal y cynefinoedd ffosydd sy'n ymddangos yn hwyr mewn olyniaeth rhag datblygu, gyda'r llystyfiant dyfrol ac ifanc amrywiol sy'n cynnal yr amrywiaeth mwyaf o rywogaethau infertebrata.

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 Redwick & Llandevenuey and St. Brides SSSIs, Gwent Levels in 2011. 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 the two SSSIs.

This contract required 24 reed sections to be sampled according to standard methods developed for a national survey of the ecology of ditch systems by Buglife (Palmer et al. 2009 and 2010). Survey was carried out between 4 and 24 June and concentrated on sampling aquatic beetles, bugs and snails.

In all, 101 aquatic invertebrate species were recorded during the sampling programme, with two, the great silver water beetle *Hydrophilus piceus* and the soldierfly *Odontomyia ornata*, being Red Data Book species. A further five nationally scarce species and 17 that are thought to have a high fidelity to grazing marsh habitats were noted. Species richness in the 24 samples ranged from 21 to 41 species. The Species Quality Index and the Habitat Quality Score were in the range from 1.18-1.68 and 0-11.29 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 Redwick & Llandevenuey and St. Brides. 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, these 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 the 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 Redwick & Llandevenuey and St. Brides Sites of Special Scientific Interest (SSSI), Gwent Levels, Monmouth in 2011. Central grid references for the two sites approximate to ST 410855 and ST 290825 respectively. 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 former covers an area of 940 hectares (ha) of grazing marsh and the latter 1312 ha. They are two of seven SSSI, which collectively cover 5734 ha. of the Gwent Levels. This is the second in a series of aquatic invertebrate monitoring exercises, with the previous work in 2008 having covered the Whitson SSSI (Boyce, 2010). There have been a number of other earlier invertebrate surveys 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 the Redwick & Llandevenuey and St. Brides (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. (2009 and 2010).

2 METHODOLOGY

Redwick & Llandeveyney and St. Brides SSSI are two of seven component SSSIs of the Gwent Levels. They respectively contain 27 and 33 main reens (in addition to an extensive network of field ditches), amounting to approximately 35 and 41 kms. 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 'field blocks' within the SSSI, each of which is bounded by the intersecting main reens. The Redwick & Llandeveyney SSSI has 33 Field Block Units and 27 Main Reen Units. St. Brides SSSI has 45 Field Block Units and 33 Main Reen Units. This contract required 9 of the reen sections at the former site and 14 at the latter to be sampled according to standard methods developed for a national survey of the ecology of ditch systems by Buglife (Palmer et al., 2009 and 2010). 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. However, on the very long Hawse Reen (IDB28) two sample stations were established, giving a total of 23 ditch units and 24 sample stations for the 2011 monitoring programme. Each sample station has been given a coded number, with those sample stations prefixed with 'RL' being on the Redwick & Llandeveyney SSSI and those beginning with 'SB' being located on the St. Brides SSSI. Information about each of the sub-samples collected within these stations is presented in Tables 2.1 and 2.2, and their location is also shown in Figures 2.1 and 2.2.

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. 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.

Fieldwork was carried out on 04, 05, 06, 07, 08, 09, 10, 13, 14, 15, 23 and 24 June 2011. 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, no additions to the list of aquatic invertebrates recorded from the Gwent Levels were made this year.

Data from the three sub-samples was amalgamated into a table for each sample station (see Tables 3.1.1.1. to 3.1.24.1). 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. (2009). 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. Note that the earlier version 3 indices have been used in this document, as this allows direct comparison with the previous survey. However, the version 4 indices (Palmer et. al. 2010) have also been calculated for both this dataset and that collected in 2009. A summary of the results generated using the latter metrics can be found at Appendix 1. Further information on the calculation of these scores can be found in Palmer et al. (2009 and 2010.). 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 3.1.24.1) and also in the data summary at Table 3.1.

Table 2.1: Sample stations, Redwick & Llandeuenney SSSI aquatic invertebrate survey - 2011

Site code	Sub-sample	Grid ref.	Bank sampled from
RL01	EA20A	ST4211086480 (3m)	South
	EA20B	ST4188986401 (3m)	South
	EA20C	ST4165286316 (3m)	South
RL02	EA23A	ST4106283221 (3m)	South
	EA23B	ST4228483782 (4m)	South
	EA23C	ST4151983366 (3m)	South
RL03	IDB36A	ST4203084488 (3m)	South
	IDB36B	ST4093484043 (3m)	South
	IDB36C	ST4107584099 (3m)	North
RL04	IDB39A	ST4196184926 (3m)	East
	IDB39B	ST4172084782 (3m)	North
	IDB39C	ST4245885056 (3m)	North
RL05	IDB41A	ST4158485708 (3m)	South
	IDB41B	ST4170785796 (3m)	South
	IDB41C	ST4202386000 (3m)	North
RL06	IDB43A	ST4110185273 (3m)	West
	IDB43B	ST4136284749 (4m)	East
	IDB43C	ST4137184679 (3m)	East
RL07	IDB49A	ST4062686982 (3m)	West
	IDB49B	ST4087086677 (3m)	West
	IDB49C	ST4053887119 (4m)	East
RL08	IDB50A	ST4012287457 (3m)	East
	IDB50B	ST4016087232 (3m)	East
	IDB50C	ST4009987620 (4m)	East
RL09	IDB53A	ST3986784775 (3m)	North
	IDB53B	ST4004785381 (4m)	South
	IDB53C	ST3995785594 (3m)	West

Table 2.2: Sample stations, St. Brides SSSI aquatic invertebrate survey - 2011

Site code	Sub-sample	Grid ref.	Bank sampled from
SB01	EA 7A	ST2680282784 (3m)	North
	EA 7B	ST2703082988 (3m)	North
	EA 7C	ST2752583100 (3m)	South
SB02	EA 8A	ST2842480858 (3m)	South
	EA 8B	ST2869481006 (3m)	North
	EA 8C	ST2855580913 (3m)	North
SB03	EA 9A	ST3086682523 (3m)	South
	EA 9B	ST3067082307 (3m)	South
	EA 9C	ST3042382044 (3m)	South
SB04	EA 10A	ST3058584239 (3m)	West
	EA 10B	ST3049984366 (3m)	West
	EA 10C	ST3030484514 (3m)	West
SB05	IDB15A	ST2761882198 (4m)	West
	IDB15B	ST2734481793 (3m)	West
	IDB15C	ST2728581729 (4m)	South
SB06	IDB16A	ST2720381854 (4m)	North
	IDB16B	ST2762381520 (4m)	West
	IDB16C	ST2739581757 (3m)	West
SB07	IDB20A	ST2830083087 (5m)	West
	IDB20B	ST2638682964 (3m)	West
	IDB20C	ST2649882811 (3m)	East
SB08	IDB28(N)A	ST2787382835 (3m)	East
	IDB28(N)B	ST2762883049 (3m)	East
	IDB28(N)C	ST2808382658 (3m)	East
SB09	IDB28(S)A	ST2853181678 (3m)	East
	IDB28(S)B	ST2850981761 (3m)	East
	IDB28(S)C	ST2846881907 (3m)	East
SB10	IDB29A	ST2899383047 (3m)	South
	IDB29B	ST2876482913 (3m)	South
	IDB29C	ST2844682662 (3m)	South
SB11	IDB30A	ST3014882712 (3m)	North
	IDB30B	ST2959582291 (3m)	North
	IDB30C	ST2919781952 (3m)	North
SB12	IDB31A	ST3086683518 (3m)	North
	IDB31B	ST3090583019 (3m)	South
	IDB31C	ST3074282759 (3m)	South
SB13	IDB34A	ST2928083826 (3m)	East
	IDB34B	ST2922683898 (3m)	East
	IDB34C	ST2961583708 (3m)	West
SB14	IDB35A	ST2819683373 (3m)	South
	IDB35B	ST2858083597 (3m)	North
	IDB35C	ST2876283703 (3m)	South
SB15	IDB37A	ST2987584337 (3m)	East
	IDB37B	ST3011684281 (4m)	West
	IDB37C	ST3034384173 (3m)	West

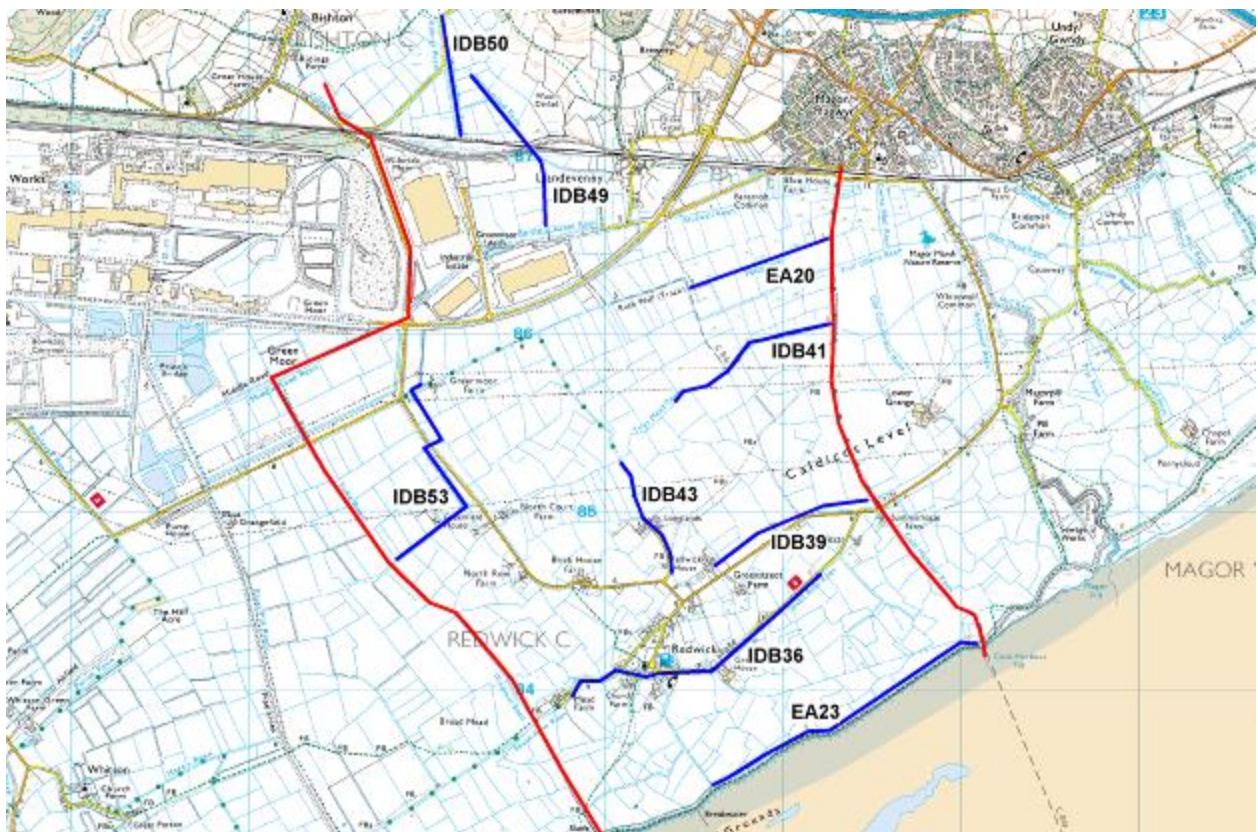


Figure 2.1: Sample stations, Redwick & Llandevenuey SSSI aquatic invertebrate survey - 2011

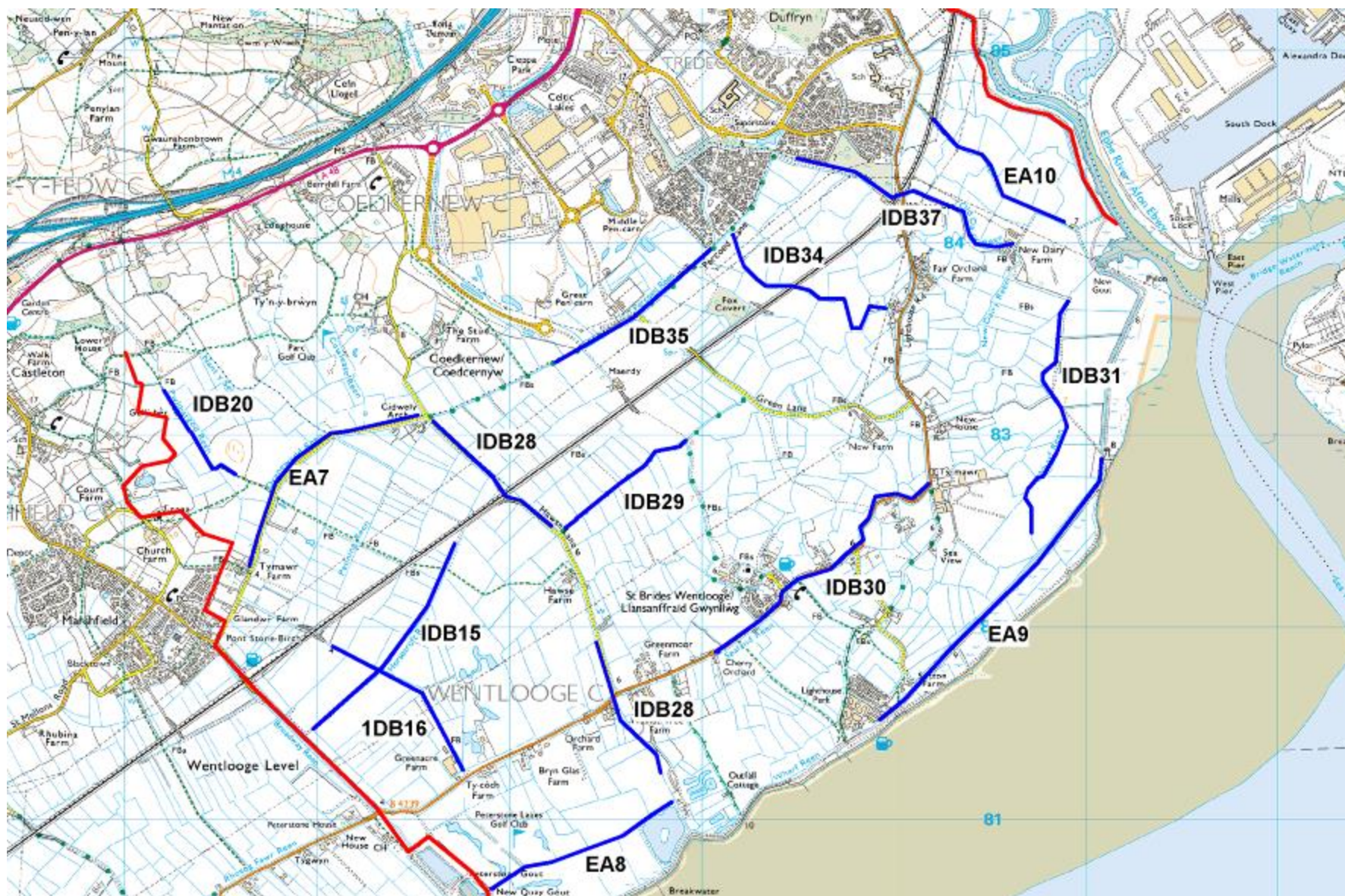


Figure 2.2. Sample stations, St. Brides SSSI aquatic invertebrate survey - 2011

3 RESULTS

Tables 3.1 and 3.2 provide a summary of the results of the 2011 monitoring exercise. Table 3.1 gives the Species Richness Score, Species Quality Score, Species Quality Index and Habitat Quality Score for the 24 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 2011 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. (2009).

Table 3.1. Summary of invertebrate monitoring, Redwick & Llandeveyney and St. Brides SSSIs

Sample station	SRS	SQS	SQI	HQS
RL01	40	66	1.65	8.75
RL02	41	60	1.46	8.54
RL03	21	25	1.19	0
RL04	31	39	1.26	3.23
RL05	37	52	1.40	6.76
RL06	22	28	1.27	0
RL07	33	47	1.42	4.55
RL08	32	45	1.41	3.12
RL09	30	42	1.40	5.00
SB01	37	53	1.43	10.81
SB02	31	37	1.19	3.23
SB03	33	39	1.18	6.06
SB04	33	47	1.42	7.58
SB05	34	43	1.26	5.88
SB06	36	60	1.67	8.33
SB07	21	26	1.24	2.38
SB08	31	52	1.68	11.29
SB09	23	29	1.26	2.17
SB10	21	29	1.38	7.14
SB11	23	29	1.26	6.52
SB12	26	31	1.19	5.77
SB13	39	65	1.67	9.00
SB14	34	44	1.29	5.88
SB15	40	51	1.27	3.75

The main part of this section of the report comprises a series of site reports that give the full data for all the sample stations, along with a short description of each. A photograph of all sub-sample sites is also included here.

Lastly, there follows a list of all nationally scarce or Red Data Book species as defined by Falk (1991) and Foster (2010) that were recorded during the 2011 survey. The species accounts include brief notes on ecology, UK and Welsh distribution.

Table 3.2. Checklist of aquatic invertebrates from Redwick & Llandevenuey and St. BridesSSSI, 2011

Species	Cons. status	Marsh fidelity	Status score	Sample station(s)
<i>Potamopyrgus antipodarum</i> (Gray)			1	SB01,07
<i>Bithynia tentaculata</i> (Linnaeus)			1	RL01,02,04,05,07,08,SB01,02,03,04,05,06,08,09,10,11,12,13,14,15
<i>Lymnaea palustris</i> (Muller)			1	RL07,08,09,SB01,02,04,07,13,15
<i>Lymnaea stagnalis</i> (Linnaeus)			1	RL01,04,07,SB01,02,03,04,05,06,08,09,11,12,13,14,15
<i>Lymnaea auricularia</i> (Linnaeus)			2	SB05
<i>Lymnaea peregra</i> (Muller)			1	RL01,02,03,04,05,07,08,09,SB01,02,03,04,05,06,07,08,10,13,14,15
<i>Physa/Physella</i> sp.			1	RL02,03,04,05,07,08,09,SB01,02,03,04,05,06,07,08,09,10,11,12,13,14,15
<i>Aplexa hypnorum</i> Fleming			2	RL03
<i>Planorbis planorbis</i> (Linnaeus)			1	RL01,02,03,04,05,06,07,08,09,SB01,02,03,04,05,08,09,11,12,13,14,15
<i>Anisus vortex</i> (Linnaeus)			1	RL01,03,04,05,06,07,08,09,SB01,02,03,04,05,06,07,08,09,10,11,12,13,14,15
<i>Bathyomphalus contortus</i> (Linnaeus)			2	RL01,05
<i>Hippeutis complanatus</i> (Linnaeus)			2	RL01,02,04,SB05,13
<i>Planorbarius corneus</i> (Linnaeus)			1	RL01,02,04,07,08,SB02,03,04,05,08,09,10,12,13,14,15
<i>Brachytrion pratense</i> Muller	Nb.	B	4	RL02,SB04,06,13,14
<i>Hydrometra stagnorum</i> (Linnaeus)			1	SB04,05,06,07,13,15
<i>Velia caprai</i> Tamanini			1	SB07
<i>Gerris lacustris</i> (Linnaeus)			1	RL02,03,07,SB02,04,12,13,15
<i>Gerris odontogaster</i> (Zetterstedt)			1	RL09,SB06
<i>Gerris thoracicus</i> Schummel			1	RL09,SB01,02,04,06,07,13,14,15
<i>Nepa cinerea</i> Linnaeus			1	RL01,02,SB02,04,05,06,07,08,10,13,15
<i>Ranatra linearis</i> (Linnaeus)				RL01
<i>Ilyocoris cimicoides</i> (Linnaeus)			1	RL01,02,04,05,07,08,09,SB01,02,03,04,05,06,11,12,13,14,15
<i>Notonecta glauca</i> Linnaeus			1	RL01,02,03,04,05,06,07,08,09,SB01,02,03,04,05,06,07,08,09,11,12,14,15
<i>Plea minutissima</i> Leach			1	RL02,07,08,SB03,12,15
<i>Corixa punctata</i> (Illiger)			1	RL04,05,06,07,SB01,03,05,11,12,15
<i>Hespercorixa linnaei</i> (Fieber)			1	RL01,02,05,06,07,09,SB05,06,13
<i>Hespercorixa sahlbergi</i> (Fieber)			1	RL02,03,04,05,06,07,09,SB01,02,03,08,11,12
<i>Callicorixa praeusta</i> (Fieber)			1	RL02
<i>Sigara dorsalis</i> (Leach)			1	RL02,04,05,07,08,09,SB02,03,05,06,11,12,14
<i>Sigara falleni</i> (Fieber)			1	SB01,07
<i>Sigara fossarum</i> (Leach)			1	RL05

<i>Sigara nigrolineata</i> (Fieber)			1	RL03,06
<i>Gyrinus substriatus</i> Stephens			1	RL09,SB01,02,04,07,09
<i>Peltodytes caesus</i> (Duftschmid)	NS.	A	4	RL05,08,SB08,10
<i>Haliphus lineatocollis</i> (Marsham)			1	RL02,04,SB01,04,05,06,08,09,10,14
<i>Haliphus heydeni</i> Wehncke			4	RL04,05,06,07,09,SB06,08,09,10,13
<i>Haliphus immaculatus</i> Gerhardt		B	2	RL05,SB01,02,SB03,05,06,11,12,14,15
<i>Haliphus ruficollis</i> (De Geer)			1	RL01,02,03,04,05,06,07,08,09,SB01,02,03,05,06,08,09,11,12,13,14,15
<i>Haliphus sibiricus</i> Motschulsky			2	RL02,03,04,05,06,08,SB01,04,05,06,07,08,14,15
<i>Haliphus flavicollis</i> Sturm			2	SB14
<i>Noterus clavicornis</i> (De Geer)			2	RL01,02,03,04,05,06,07,08,09,SB01,02,03,04,05,06,08,09,10,11,12,13,14,15
<i>Hygrobia hermanni</i> (Fabricius)			2	SB03,12
<i>Agabus sturmii</i> (Gyllenhal)			1	RL01,SB02,11
<i>Agabus bipustulatus</i> (Linnaeus)			1	RL01,03,SB04,13,14,15
<i>Agabus didymus</i> (Olivier)			2	SB07
<i>Ilybius ater</i> (De Geer)		B	1	RL01,SB12,13
<i>Ilybius fuliginosus</i> (Fabricius)			1	RL07,SB07
<i>Ilybius montanus</i> (Stephens)			1	RL01,05,09,SB13
<i>Ilybius quadriguttatus</i> (Lacordaire)		B	1	RL02,04,05,09,SB01,02,04,08,10,13,14
<i>Rhantus grapii</i> (Gyllenhal)		B	4	SB08,11
<i>Rhantus suturalis</i> (Macleay)		B	2	SB15
<i>Liopterus haemorrhoidalis</i> (Fabricius)			2	RL01,SB13,15
<i>Acilius sulcatus</i> (Linnaeus)			1	SB10
<i>Dytiscus marginalis</i> Linnaeus			1	RL01,02,05,07,08,09,SB02,04,05,06,15
<i>Hydaticus transversalis</i> (Pontoppidan)	NS.	A	8	RL01,SB13
<i>Graptodytes pictus</i> (Fabricius)		B	2	RL04,09,SB01,04,05,06,SB07,09,11,14,15
<i>Hydroporus angustatus</i> Sturm			1	RL01,04,06,08,09,SB10,11,13,14,15
<i>Hydroporus erythrocephalus</i> (Linnaeus)			1	RL01
<i>Hydroporus incognitus</i> Sharp			2	RL05,06,08,SB08
<i>Hydroporus memnonius</i> Nicolai			1	RL01
<i>Hydroporus palustris</i> (Linnaeus)			1	RL01,02,03,04,05,06,07,08,09,SB01,02,03,05,06,08,09,10,11,14,15
<i>Hydroporus planus</i> (Fabricius)			1	RL01,04,05,06,SB04,08,10,14,15
<i>Hydroporus pubescens</i> (Gyllenhal)			1	RL01,06,07,SB04,14
<i>Hydroporus striola</i> (Gyllenhal)				RL02,05,07,08,09,SB10
<i>Hydroporus tessellatus</i> (Drapiez)			1	SB01,03,15

<i>Porhydrus lineatus</i> (Fabricius)		2	RL01,02
<i>Stictotarsus duodecimpustulatus</i> (Fabricius)		2	SB07
<i>Suphrodytes dorsalis</i> (Fabricius)		2	RL03,04,08,09,SB08
<i>Hygrotus inaequalis</i> (Fabricius)		1	RL02,03,04,05,06,07,08,09,SB03,08,09,13,14
<i>Hyphyrus ovatus</i> (Linnaeus)		1	RL01,05,07,SB02,04,05,06,08,09,11,15
<i>Laccophilus hyalinus</i> (De Geer)		1	SB01,04,06,08,15
<i>Laccophilus minutus</i> (Linnaeus)	B	2	RL02,SB01,03,08,12,15
<i>Helophorus aequalis</i> Thomson		1	RL01,02,03,04,05,06,07,08,09,SB01,03,04,05,06,07,08,09,10,11,12,13,14,15
<i>Helophorus grandis</i> Illiger		1	RL05,SB06,09
<i>Helophorus brevipalpis</i> Bedel		1	RL01,02,03,04,05,06,07,08,09,SB01,02,03,04,05,06,07,08,09,10,11,12,13,14,15
<i>Helophorus griseus</i> Herbst		2	RL05,SB06,13,14
<i>Helophorus minutus</i> Fabricius		1	RL02,04,06,07,08,SB03,04,09,10,11,12
<i>Anacaena globulus</i> (Paykull)		1	RL02,03,08,SB01,05,06,08,10,13,14,15
<i>Anacaena limbata</i> (Fabricius)		1	RL01,02,03,04,05,06,08,SB01,02,03,06,13,14,15
<i>Anacaena lutescens</i> (Stephens)		1	RL01,05,SB01,13,15
<i>Cymbiodyta marginellus</i> (Stephens)		2	RL02,04
<i>Enochrus coarctatus</i> (Gredler)	B	2	RL01,02,SB02,05
<i>Enochrus melanocephalus</i> (Olivier)		4	SB06
<i>Enochrus ochropterus</i> (Marsham)		4	RL08,SB13
<i>Enochrus testaceus</i> (Fabricius)		2	RL01,02,05,08,09,SB01,02,05,09,12,13,15
<i>Helochares lividus</i> (Forster)	B	2	RL02,05,07,SB01,03,13
<i>Hydrobius fuscipes</i> (Linnaeus)		1	RL08,SB02,14
<i>Hydrophilus piceus</i> (Linnaeus)	NT.	A	8
<i>Laccobius bipunctatus</i> (Fabricius)		1	RL02,08,SB03,04,05,06,09,12,13,14,15
<i>Laccobius minutus</i> (Linnaeus)	B	2	SB01,05,14
<i>Cercyon marinus</i> (Sharp)		2	SB03
<i>Octhebius minimus</i> (Fabricius)		1	SB03,05
<i>Limnius volckmari</i> (Panzer)		1	SB07
<i>Sialis lutaria</i> (Linnaeus)		1	RL07
<i>Nemotelus notatus</i> Zetterstedt		2	SB02
<i>Odontomyia ornata</i> (Meigen)	RDB2.	A	8
<i>Odontomyia tigrina</i> (Fabricius)	N.	B	4
<i>Stratiomys singularior</i> (Harris)	N.	B	4
<i>Asellus aquaticus</i> (Linnaeus)		1	RL01,02,03,04,05,06,07,08,09,SB01,02,03,04,05,06,07,08,09,10,11,12,13,15

<i>Asellus meridianus</i> Racovitza	1	RL02,SB01,02,03,12
<i>Argyroneta aquatica</i> (Clerck)	2	RL01,SB03,08

3.1 Site reports

3.1.1. Sample station RL01 (EA20)

A high quality ditch, with much submerged growth of macrophytes (mostly fennel pondweed *Potamogeton pectinatus*, curled pondweed *P. crispus*, rigid hornwort *Ceratophyllum demersum* and ivy-leaved duckweed *Lemna trisulca*). There was generally high, but not completely dominant cover of floating duckweed *Lemna* spp., plus frequent floating leaves of frogbit *Hydrocharis morsus-ranae*. Much of this ditch was cattle grazed, with shallow, poached margins and a sparse fringe of marginal vegetation that included soft rush *Juncus effusus*, sedges *Carex* spp., common spike-rush *Eleocharis palustris*, lesser water-parsnip *Berula erecta*, branched bur-reed *Sparganium erectum*, lesser spearwort *Ranunculus flammula* and hemlock water-dropwort *Oenanthe crocata*. Fenced sections had a taller strip of emergent and fringing vegetation including many of the above species, plus reed sweet-grass *Glyceria maxima*, yellow flag *Iris pseudacorus* and great water dock *Rumex hydrolapathum*.

Table 3.1.1. Invertebrates from sample station RL01, Gwent Levels, Redwick & Llandevenuey SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		C,B,B	A,B,C		1
<i>Lymnaea stagnalis</i>		C,-,-	A,-,-		1
<i>Lymnaea peregra</i>		D,-,-	A,-,-		1
<i>Planorbis planorbis</i>		B,B,C	A,B,C		1
<i>Anisus vortex</i>		-,-,C	-,-,C		1
<i>Bathymphalus contortus</i>		-,-,C	-,-,C		2
<i>Hippeutis complanatus</i>		-,-,C	-,-,C		2
<i>Planorbarius corneus</i>		D,C,C	A,B,C		1
<i>Ilyocoris cimicoides</i>		C,-,-	A,-,-		1
<i>Nepa cinerea</i>		D,-,-	A,-,-		1
<i>Ranatra linearis</i>		D,-,-	A,-,-		2
<i>Notonecta glauca</i>		C,D,-	A,B,-		1
<i>Hespercorixa linnaei</i>		D,D,-	A,B,-		1
<i>Haliphus ruficollis</i>		C,C,C	A,B,C		1
<i>Noterus clavicornis</i>		C,C,C	A,B,C		2
<i>Agabus sturmii</i>		-,D,-	-,B,-		1
<i>Agabus bipustulatus</i>		D,D,-	A,B,-		1
<i>Ilybius ater</i>		D,-,-	A,-,-	B	1
<i>Ilybius montanus</i>		D,C,D	A,B,C		1
<i>Liopterus haemorrhoidalis</i>		D,-,D	A,-,C		2
<i>Dytiscus marginalis</i>		D,D,-	A,B,-		1
<i>Hydaticus transversalis</i>	NS.	-,D,-	-,B,-	A	8
<i>Hydroporus angustatus</i>		-,D,-	-,B,-		1
<i>Hydroporus erythrocephalus</i>		-,-,D	-,-,C		1
<i>Hydroporus memnonius</i>		-,D,-	-,B,-		1
<i>Hydroporus palustris</i>		-,-,D	-,-,C		1
<i>Hydroporus planus</i>		D,-,-	A,-,-		1
<i>Hydroporus pubescens</i>		C,-,-	A,-,-		1
<i>Porhydrus lineatus</i>		-,D,-	-,B,-		2
<i>Hyphydrus ovatus</i>		-,-,D	-,-,C		1
<i>Helophorus aequalis</i>		C,D,D	A,B,C		1
<i>Helophorus brevipalpis</i>		B,C,C	A,B,C		1
<i>Anacaena limbata</i>		D,-,D	A,-,C		1
<i>Anacaena lutescens</i>		C,C,D	A,B,C		1
<i>Enochrus coarctatus</i>		D,-,C	A,-,C	B	2

<i>Enochrus testaceus</i>		,-D,-	- ,B,-		2
<i>Hydrophilus piceus</i>	NT.	- ,D,-	- ,B,-	A	8
<i>Cyphon phragmiteticola</i>		- ,D,-	- ,B,-		-
<i>Scirtes hemisphaericus</i>		- ,D,-	- ,B,-		-
<i>Donacia marginata</i>		- ,D,-	- ,B,-		-
<i>Donacia semicuprea</i>		- ,-,D	- ,-,C		-
<i>Bagous alismatis</i>	Nb.	D,-,D	A,-,C		-
<i>Odontomyia tigrina</i>	N.	- ,D,-	- ,B,-	B	4
<i>Asellus aquaticus</i>		C,C,C	A,B,C		1
<i>Argyroneta aquatica</i>		- ,D,D	- ,B,C		2
				SRS	40
				SQS	66
				SQI	1.65
				HQS	8.75

3.1.2. Sample station RL02 (EA23)

This is a large ditch that runs parallel to the back of the seawall. It looked to be of high ecological quality, having a diverse wetland flora and low cover of floating duckweeds. Submerged growth of fennel pondweed was abundant locally and there were also many floating leaves of frogbit. The southern bank was cattle grazed, which had created good shallow water habitats, with open growth of a variety of emergent and fringing species, such as common water-plantain *Alisma plantago-aquatica*, lesser water-parsnip and floating sweet-grass, and there was also much sea club-rush *Scirpus maritimus*, suggesting some brackish influence. Where stock had not been able to reach, there were also emergent and fringing stands of tall monocotyledons such as common reed *Phragmites australis*, branched bur-reed and greater reedmace *Typha latifolia*.

Table 3.12. Invertebrates from sample station RL02, Gwent Levels, Redwick & Llandeveyney SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		C,-,D	A,-,C		1
<i>Lymnaea peregra</i>		-,D,-	-,B,-		1
<i>Physa</i> sp.		C,C,C	A,B,C		1
<i>Planorbis planorbis</i>		C,C,-	A,B,-		1
<i>Hippeutis complanatus</i>		C,-,-	A,-,-		2
<i>Planorbarius corneus</i>		D,-,-	A,-,-		1
<i>Brachytron pratense</i>	N.	D,-,-	A,-,-	B	4
<i>Gerris lacustris</i>		-,D,-	-,B,-		1
<i>Ilyocoris cimicoides</i>		C,-,-	A,-,-		1
<i>Nepa cinerea</i>		D,-,D	A,-,C		1
<i>Notonecta glauca</i>		D,D,-	A,B,-		1
<i>Plea minutissima</i>		C,-,D	A,-,C		1
<i>Callicorixa praeusta</i>		D,-,-	A,-,-		1
<i>Hespercorixa linnaei</i>		D,-,-	A,-,-		1
<i>Hespercorixa sahlbergi</i>		D,-,-	A,-,-		1
<i>Sigara dorsalis</i>		D,-,-	A,-,-		1
<i>Haliphus lineatocollis</i>		D,-,-	A,-,-		1
<i>Haliphus ruficollis</i>		C,D,-	A,B,-		1
<i>Haliphus sibiricus</i>		-,-,D	-,-,C		2
<i>Noterus clavicornis</i>		C,-,D	A,-,C		2
<i>Ilybius quadriguttatus</i>		-,-,D	-,-,C	B	1
<i>Dytiscus marginalis</i>		D,-,-	A,-,-		1
<i>Hydroporus palustris</i>		C,-,-	A,-,-		1
<i>Hydroporus striola</i>		D,-,D	A,-,C		2
<i>Porhydrus lineatus</i>		-,D,D	-,B,C		2
<i>Hygrotus inaequalis</i>		B,C,C	A,B,C		1
<i>Laccophilus minutus</i>		D,D,-	A,B,-	B	2
<i>Helophorus aequalis</i>		C,C,-	A,A,-		1
<i>Helophorus brevipalpis</i>		B,B,C	A,B,C		1
<i>Helophorus minutus</i>		D,D,-	A,B,-		1
<i>Anacaena globulus</i>		-,-,D	-,-,C		1
<i>Anacaena limbata</i>		D,D,-	A,B,-		1
<i>Cymbiodyta marginellus</i>		-,D,-	-,B,-		2
<i>Enochrus coarctatus</i>		-,-,D	-,-,C	B	2
<i>Enochrus testaceus</i>		D,-,-	A,-,-		2
<i>Helochares lividus</i>		-,-,D	-,-,C	B	2
<i>Laccobius bipunctatus</i>		D,D,D	A,B,C		1

<i>Odontomyia tigrina</i>	N.	D	A	B	4
<i>Stratiomys singularior</i>	N.	D,-,-	A,-,-	B	4
<i>Asellus aquaticus</i>		C,C,C	A,B,C		1
<i>Asellus meridianus</i>		D,-,-	A,-,-		1
				SRS	41
				SQS	60
				SQI	1.46
				HQS	8.54

3.1.3. Sample station RL03 (IDB36)

The majority of this ditch is in the ownership of Mr. Walters, who asked me to leave his land when I had only collected a single sub-sample (RL03A). This was unfortunate, as the eastern end of this ditch, which is in his ownership, looked likely to be much the most ecologically interesting. There were abundant submerged macrophytes here, with rigid hornwort and fennel pondweed appearing to be the most frequent species. The south side of the ditch had cattle trampled margins with common water-plantain, reed and floating sweet grasses being amongst the species present. The more westerly ditch sections, from which sub-samples RL03B and C were collected, had steep banks, no submerged vegetation and tall, ungrazed fen margins dominated by reed sweet-grass, hemlock water-dropwort, meadowsweet *Filipendula ulmaria* and great willowherb *Epilobium hirsutum*.

Table 3.13. Invertebrates from sample station RL03, Gwent Levels, Redwick & Llandevenuey SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Lymnaea peregra</i>	-	D,-	-	B,-	1
<i>Physa</i> sp.	-	B,C	-	B,C	1
<i>Aplexa hypnorum</i>	-	D,-	-	B,-	2
<i>Planorbis planorbis</i>	C,-	D	A,-	C	1
<i>Anisus vortex</i>	B,B,C		A,B,C		1
<i>Gerris lacustris</i>	-,-	D	-,-	C	1
<i>Notonecta glauca</i>	D,-	D	A,-	C	1
<i>Hespercorixa sahlbergi</i>	C,-	D	A,-	C	1
<i>Sigara nigrolineata</i>	D,-,-		A,-,-		1
<i>Haliphus ruficollis</i>	D,D,D		A,B,C		1
<i>Haliphus sibiricus</i>	D,-,-		A,-,-		2
<i>Noterus clavicornis</i>	D,D,-		A,B,-		2
<i>Agabus bipustulatus</i>	-,-	D	-,-	C	1
<i>Hydroporus palustris</i>	C,D,D		A,B,C		1
<i>Suphrodytes dorsalis</i>	D,-,-		A,-,-		2
<i>Hygrotus inaequalis</i>	C,D,-		A,B,-		1
<i>Helophorus aequalis</i>	D,C,D		A,B,C		1
<i>Helophorus brevipalpis</i>	C,B,C		A,B,C		1
<i>Anacaena globulus</i>	-	D,-	-	B,-	1
<i>Anacaena limbata</i>	-	D,-	-	B,-	1
<i>Asellus aquaticus</i>	D,C,C		A,B,C		1
				SRS	21
				SQS	25
				SQI	1.19
				HQS	0

3.1.4. Sample station RL04 (IDB39)

The main submerged aquatic species here was fennel pondweed, which was locally abundant. Floating vegetation was restricted to mats of duckweed, which covered the entire water surface in some areas, but were only at comparatively low cover along other stretches. Those parts of the ditch that had cattle grazed margins had a relatively low, emergent/fringing margin with species such as reed sweet-grass, common reed, sedges, rushes *Juncus* spp., hemlock water-dropwort and floating sweet-grass. In areas of the ditch backed by maize crops, there was tall fen emergent/fringing vegetation with the some of the same species as above plus some emergent water horsetail *Equisetum fluviatile*. Cattle grazed sections had poached margins with shallow water microhabitats.

Table 3.14. Invertebrates from sample station RL04, Gwent Levels, Redwick & Llandevenney SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>	-,-,D	-,-,C			1
<i>Lymnaea stagnalis</i>	-,-,D	-,-,C			1
<i>Lymnaea peregra</i>	-,-,D	-,-,C			1
<i>Physa</i> sp.	C,D,B	A,B,C			1
<i>Planorbis planorbis</i>	D,D,C	A,B,C			1
<i>Anisus vortex</i>	C,C,B	A,B,C			1
<i>Hippeutis complanatus</i>	-,D,-	-,B,-			2
<i>Planorbarius corneus</i>	D,-,-	A,-,-			1
<i>Ilyocoris cimicoides</i>	-,-,D	-,-,C			1
<i>Notonecta glauca</i>	-,-,D	-,-,C			1
<i>Corixa punctata</i>	D,-,-	A,-,-			1
<i>Hespercorixa sahlbergi</i>	D,-,C	A,-,C			1
<i>Sigara dorsalis</i>	-,-,D	-,-,C			1
<i>Haliphus lineatocollis</i>	-,-,D	-,-,C			1
<i>Haliphus heydeni</i>	-,-,C	-,-,C			4
<i>Haliphus ruficollis</i>	C,-,D	A,-,C			1
<i>Haliphus sibiricus</i>	D,-,-	A,-,-			2
<i>Noterus clavicornis</i>	C,-,D	A,-,C			2
<i>Ilybius quadriguttatus</i>	D,-,-	A,-,-		B	1
<i>Graptodytes pictus</i>	-,-,D	-,-,C		B	2
<i>Hydroporus angustatus</i>	C,D,	A,B,			1
<i>Hydroporus palustris</i>	C,D,	A,B,			1
<i>Hydroporus planus</i>	D,-,-	A,-,-			1
<i>Suphrodytes dorsalis</i>	D,-,-	A,-,-			2
<i>Hygrotus inaequalis</i>	D,-,C	A,-,C			1
<i>Helophorus aequalis</i>	D,D,-	A,B,-			1
<i>Helophorus brevipalpis</i>	B,C,B	A,B,C			1
<i>Helophorus minutus</i>	-,-,D	-,-,C			1
<i>Anacaena limbata</i>	C,D,-	A,B,-			1
<i>Cymbiodyta marginellus</i>	D,-,-	A,-,-			2
<i>Scirtes hemisphaericus</i>	-,C,-	-,B,-			-
<i>Donacia semicuprea</i>	-,D,-	-,A,-			-
<i>Asellus aquaticus</i>	C,C,-	A,B,-			1
				SRS	31
				SQS	39
				SQI	1.26
				HQS	3.23

3.1.5. Sample station RL05 (IDB41)

This was a botanically diverse ditch, with abundant submerged growth of pondweeds and a relatively sparse cover of duckweed. There was also a little floating amphibious bistort *Polygonum amphibium*. Parts of the banks were cattle grazed, with shallow shelving banks and a shallow emergent zone in which species such as common water-plantain, floating sweet-grass and water horsetail were present. Where stock had no access, there were tall fringing /emergent communities dominated by common reed, branched bur-reed, hemlock water-dropwort and sedges.

Table 3.15. Invertebrates from sample station RL05, Gwent Levels, Redwick & Llandevenuey SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		-,C,-	-,B,-		1
<i>Lymnaea peregra</i>		D,C,D	A,B,C		1
<i>Physa</i> sp.		D,C,C	A,B,C		1
<i>Planorbis planorbis</i>		B,B,B	A,B,C		1
<i>Anisus vortex</i>		C,C,B	A,B,C		1
<i>Bathymphalus contortus</i>		D,-,-	A,-,-		2
<i>Ilyocoris cimicoides</i>		D,D,C	A,B,C		1
<i>Notonecta glauca</i>		-,D,C	-,B,C		1
<i>Corixa punctata</i>		-,D,-	-,B,-		1
<i>Hespercorixa linnaei</i>		D,-,-	A,-,-		1
<i>Hespercorixa sahlbergi</i>		D,-,-	A,-,-		1
<i>Sigara dorsalis</i>		D,C,D	A,B,C		1
<i>Sigara fossarum</i>		-,D,	-,B,		1
<i>Peltodytes caesus</i>	NS.	-, -,D	-, -,C	A	4
<i>Haliphus heydeni</i>		C,C,-	A,B,-		4
<i>Haliphus immaculatus</i>		-,C,-	-,B,-	B	2
<i>Haliphus ruficollis</i>		D,-,C	A,-,C		1
<i>Haliphus sibiricus</i>		C,-,-	A,-,-		2
<i>Noterus clavicornis</i>		C,-,C	A,-,C		2
<i>Ilybius montanus</i>		-, -,D	-, -,C		1
<i>Ilybius quadriguttatus</i>		-, -,D	-, -,C	B	1
<i>Dytiscus marginalis</i>		D,-,D	A,-,C		1
<i>Hydroporus incognitus</i>		D,-,-	A,-,-		2
<i>Hydroporus palustris</i>		C,D,C	A,B,C		1
<i>Hydroporus planus</i>		-, -,D	-, -,C		1
<i>Hydroporus striola</i>		D,-,-	A,-,-		2
<i>Hygrotus inaequalis</i>		D,D,D	A,B,C		1
<i>Hyphydrus ovatus</i>		-, -,D	-, -,C		1
<i>Helophorus aequalis</i>		B,B,C	,A,B,C		1
<i>Helophorus grandis</i>		D,-,-	A,-,-		1
<i>Helophorus brevipalpis</i>		A,B,B	A,B,C		1
<i>Helophorus griseus</i>		-,C,C	-,B,C		2
<i>Anacaena limbata</i>		-,D,-	-,B,-		1
<i>Anacaena lutescens</i>		D,C,-	A,B,-		1
<i>Enochrus testaceus</i>		-, -,D	-, -,C		2
<i>Helochares lividus</i>		-, -,D	-, -,C	B	2
<i>Asellus aquaticus</i>		C,C,C	A,B,C		1
				SRS	37
		HQS	6.76	SQS	52
				SQI	1.40

3.1.6. Sample station RL06 (IDB43)

A rather small and unprepossessing ditch that had steep, recently excavated banks and that also appeared to be somewhat eutrophicated. Most of the ditch length was grazed by cattle on the eastern bank. Duckweed cover was variable, from approximately 10 to 100%, and there was a tall fringe of common reed, reed sweet-grass and hemlock water-dropwort on the ungrazed bank.

Table 3.16. Invertebrates in sample station RL06, Gwent Levels, Redwick & Llandevenuey SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Planorbis planorbis</i>		C,C,-	A,B,-		1
<i>Anisus vortex</i>		C,C,-	A,B,-		1
<i>Notonecta glauca</i>		D,-,-	A,-,-		1
<i>Corixa punctata</i>		D,-,-	A,-,-		1
<i>Hespercorixa linnaei</i>		-, -,D	-, -,C		1
<i>Hespercorixa sahlbergi</i>		D,-,-	A,-,-		1
<i>Sigara nigrolineata</i>		-,D,-	-,B,-		1
<i>Haliphus heydeni</i>		D,-,-	A,-,-		4
<i>Haliphus ruficollis</i>		D,-,D	A,-,D		1
<i>Haliphus sibiricus</i>		D,D,-	A,B,-		2
<i>Noterus clavicornis</i>		D,D,D	A,B,C		2
<i>Hydroporus angustatus</i>		-,D,D	-,B,C		1
<i>Hydroporus incognitus</i>		-, -,D	-, -,C		2
<i>Hydroporus palustris</i>		C,D,C	A,B,C		1
<i>Hydroporus planus</i>		-,D,D	-,B,C		1
<i>Hydroporus pubescens</i>		-, -,C	-, -,C		1
<i>Hygrotus inaequalis</i>		C,D,D	A,B,C		1
<i>Helophorus aequalis</i>		C,C,D	A,B,C		1
<i>Helophorus brevipalpis</i>		B,C,B	A,B,C		1
<i>Helophorus minutus</i>		D,-,-	A,-,-		1
<i>Anacaena limbata</i>		D,-,-	A,-,-		1
<i>Asellus aquaticus</i>		C,B,C	A,B,C		1
				SRS	22
				SQS	28
				SQI	1.27
				HQS	0

3.1.7. Sample station RL07 (IDB49)

A large ditch with submerged growth of fennel pondweed locally abundant. Duckweed cover is generally quite low and there are also some floating rafts of amphibious bistort. A high proportion of the banks are quite heavily grazed and trampled by either cattle (section to the north of the railway) or horses (south section). In these areas there is a sparse emergent/fringing strip in which common reed, reed sweet-grass, lesser water-parsnip and celery-leaved buttercup are prominent. A mixed tall fen community with some of these plus great willowherb, hemplock water-dropwort and rushes amongst others are prominent in areas where there is no stock access.

Table 3.17. Invertebrates in sample station RL07, Gwent Levels, Redwick & Llandevenue SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		D,-,-	A,-,-		1
<i>Lymnaea stagnalis</i>		D,-,-	A,-,-		1
<i>Lymnaea palustris</i>		-, -,D	-, -,C		2
<i>Lymnaea peregra</i>		C,-,D	A,-,C		1
<i>Physa</i> sp.		-, -,D	-, -,D		1
<i>Planorbis planorbis</i>		D,D,C	A,B,C		1
<i>Anisus vortex</i>		B,C,C	A,B,C		1
<i>Planorbarius corneus</i>		D,-,-	A,-,-		1
<i>Sialis lutaria</i>		-,D,-	-,B,-		1
<i>Gerris lacustris</i>		D,-,-	A,-,-		1
<i>Ilyocoris cimicoides</i>		C,C,C	A,B,C		1
<i>Notonecta glauca</i>		D,D,D	A,B,C		1
<i>Plea minutissima</i>		-, -,D	-, -,C		1
<i>Corixa punctata</i>		C,-,-	A,-,-		1
<i>Hespercorixa linnaei</i>		D,-,-	A,-,-		1
<i>Hespercorixa sahlbergi</i>		-, -,D	-, -,C		1
<i>Sigara dorsalis</i>		C,D,D	A,B,C		1
<i>Haliphus heydeni</i>		C,D,C	A,B,C		4
<i>Haliphus ruficollis</i>		C,C,C	A,B,C		1
<i>Noterus clavicornis</i>		D,D,C	A,B,C		2
<i>Ilybius fuliginosus</i>		-, -,D	-, -,C		1
<i>Dytiscus marginalis</i>		-,D,D	-,B,C		1
<i>Hydroporus palustris</i>		C,-,-	A,-,-		1
<i>Hydroporus pubescens</i>		D,-,D	A,-,C		1
<i>Hydroporus striola</i>		-,D,D	-,B,C		2
<i>Hygrotus inaequalis</i>		C,D,-	A,B,-		1
<i>Hyphydrus ovatus</i>		-, -,D	-, -,C		1
<i>Helophorus aequalis</i>		C,D,D	A,B,C		1
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1
<i>Helophorus minutus</i>		C,-,-	A,-,-		1
<i>Helochares lividus</i>		-,D,-	-,B,-	B	2
<i>Donacia semicuprea</i>		C,-,D	A,-,C		-
<i>Odontomyia ornata</i>	RDB2.	-,D,-	-,B,-	A	8
<i>Asellus aquaticus</i>		-,C,-	-,B,-		1
		SQI	1.42	SRS	33
		HQS	4.55	SQS	47

3.1.8. Sample station RL08 (IDB50)

A steep-sided ditch with a generally dominant cover of duckweeds. Underneath the duckweed mat there is some submerged macrophyte vegetation, primarily fennel pondweed and curled pondweed. The fringing and emergent vegetation is ungrazed and consists of mixed tall fen vegetation in which hemlock water-dropwort, branched bur-reed, great willowherb, meadowsweet and reed sweet-grass are the main constituents.

Table 3.1.8. Invertebrates in sample station RL08, Gwent Levels, Redwick & Llandevenuey SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		C,B,C	A,B,C		1
<i>Lymnaea palustris</i>		-,D,-	-,B,-		2
<i>Lymnaea peregra</i>		-,D,C	-,B,C		1
<i>Physa</i> sp.		C,C,B	A,B,C		1
<i>Planorbis planorbis</i>		C,B,C	A,B,C		1
<i>Anisus vortex</i>		C,C,C	A,B,C		1
<i>Planorbarius corneus</i>		C,C,D	A,B,C		1
<i>Ilyocoris cimicoides</i>		-,D,-	-,B,-		1
<i>Notonecta glauca</i>		-,D,-	-,B,-		1
<i>Plea minutissima</i>		-,D,-	-,B,-		1
<i>Sigara dorsalis</i>		-,D,-	-,B,-		1
<i>Peltodytes caesus</i>	NS.	-,D,-	-,B,-	A	4
<i>Halipus ruficollis</i>		C,C,D	A,B,C		1
<i>Halipus sibiricus</i>		D,D,-	A,B,-		2
<i>Noterus clavicornis</i>		C,D,-	A,B,-		2
<i>Dytiscus marginalis</i>		D,-,D	A,-,C		1
<i>Hydroporus angustatus</i>		D,D,D	A,B,C		1
<i>Hydroporus incognitus</i>		-, -,D	-, -,C		2
<i>Hydroporus palustris</i>		D,D,-	A,B,-		1
<i>Hydroporus striola</i>		-,D,D	-,B,C		2
<i>Suphrodytes dorsalis</i>		-,D,-	-,B,-		2
<i>Hygrotus inaequalis</i>		D,D,D	A,B,C		1
<i>Helophorus aequalis</i>		C,C,-	A,B,-		1
<i>Helophorus brevipalpis</i>		B,B,C	A,B,C		1
<i>Helophorus minutus</i>		C,-,-	A,-,-		1
<i>Anacaena globulus</i>		-, -,D	-, -,C		1
<i>Anacaena limbata</i>		C,-,D	A,-,C		1
<i>Enochrus ochropterus</i>		D,-,-	A,-,-		4
<i>Enochrus testaceus</i>		D,-,-	A,-,-		2
<i>Hydrobius fuscipes</i>		D,-,-	A,-,-		1
<i>Laccobius bipunctatus</i>		D,D,-,-	A,B,-,-		1
<i>Asellus aquaticus</i>		C,C,C	A,B,C		1
				SRS	32
				SQS	45
				SQI	1.41
				HQS	3.12

3.1.9. Sample station RL09 (IDB53)

This ditch appeared to be of generally high quality, having much growth of submerged fennel and curled pondweeds, plus low cover of duckweed. There was also a little floating amphibious bistort. Cattle trampling had produced shallow marginal areas with emergent water horsetail, floating sweet-grass and reed sweet-grass, and the latter species plus common reed, hemlock water-dropwort and yellow flag also occurred as tall fringing fen where stock did not have access.

Table 3.1.9. Invertebrates in sample station RL09, Gwent Levels, Redwick & Llandevenuey SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Lymnaea palustris</i>		-,D,-	-,B,-		2
<i>Lymnaea peregra</i>		-,D,C	-,B,C		1
<i>Physa</i> sp.		D,C,B	A,B,C		1
<i>Planorbis planorbis</i>		C,B,B	A,B,C		1
<i>Anisus vortex</i>		C,B,C	A,B,C		1
<i>Gerris odontogaster</i>		D,-,-	A,-,-		1
<i>Gerris thoracicus</i>		C,-,D	A,-,C		1
<i>Ilyocoris cimicoides</i>		-,D,-	-,B,-		1
<i>Notonecta glauca</i>		D,D,-	A,B,-		1
<i>Hespercorixa linnaei</i>		-,D,D	-,B,C		1
<i>Hespercorixa sahlbergi</i>		-,D,-	-,B,-		1
<i>Sigara dorsalis</i>		D,-,-	A,-,-		1
<i>Gyrinus substriatus</i>		-, -,D	-, -,C		1
<i>Haliphus heydeni</i>		-,D,-	-,B,-		4
<i>Haliphus ruficollis</i>		D,-,D	A,-,C		1
<i>Noterus clavicornis</i>		C,D,D	A,B,C		2
<i>Ilybius montanus</i>		-,D,D	-,B,C		1
<i>Ilybius quadriguttatus</i>		-, -,D	-, -,C	B	1
<i>Dytiscus marginalis</i>		-,D,-	-,B,-		1
<i>Graptodytes pictus</i>		D,-,-	A,-,-	B	2
<i>Hydroporus angustatus</i>		-,D,D	-,B,C		1
<i>Hydroporus palustris</i>		C,C,C	A,B,C		1
<i>Hydroporus striola</i>		C,-,-	A,-,-		2
<i>Suphrodytes dorsalis</i>		-,D,-	-,B,-		2
<i>Hygrotus inaequalis</i>		-,D,C	-,B,C		1
<i>Helophorus aequalis</i>		C,C,-	A,B,-		1
<i>Helophorus brevipalpis</i>		B,B,C	A,B,C		1
<i>Enochrus testaceus</i>		-,D,-	-,B,-		2
<i>Microcara testacea</i>		-, -,D	-, -,C		-
<i>Donacia semicuprea</i>		-,D,C	-,B,C		-
<i>Odontomyia tigrina</i>	N.	-,D,-	-,B,-	B	4
<i>Asellus aquaticus</i>		C,D,-	A,B,-		1
				SRS	30
				SQS	42
				SQI	1.40
				HQS	5.00

3.1.10. Sample station SB01 (EA7)

Avery large, open ditch in which submerged macrophytes appear to be largely absent. Duckweed only occurs at low cover and there are also occasional patches of frogbit. The banks of this ditch are not being grazed currently, and as a consequence there is a well-developed fringe of tall, marginal vegetation in which reed sweet-grass, common reed, branched bur-reed and reed canary-grass *Phalaris arundinacea* are the main constituents.

Table 3.1.10. Invertebrates in sample station SB01, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score	
<i>Potamopyrgus antipodarum</i>		C,C,-	A,B,-		1	
<i>Bithynia tentaculata</i>		D,D,D	A,B,C		1	
<i>Lymnaea stagnalis</i>		C,C,D	A,B,C		1	
<i>Lymnaea palustris</i>		D,-,-	A,-,-		2	
<i>Lymnaea peregra</i>		-,C,C	-,C,C		1	
<i>Physa</i> sp.		C,B,C	A,B,C		1	
<i>Planorbis planorbis</i>		D,D,-	A,B,-		1	
<i>Anisus vortex</i>		C,B,B	A,B,C		1	
<i>Gerris thoracicus</i>		-,D,-	-,B,-		1	
<i>Ilyocoris cimicoides</i>		D,C,-	A,B,-		1	
<i>Notonecta glauca</i>		D,C,C	A,B,C		1	
<i>Corixa punctata</i>		D,-,-	A,-,-		1	
<i>Hespercorixa sahlbergi</i>		D,-,D	A,-,C		1	
<i>Sigara falleni</i>		D,-,-	A,-,-		1	
<i>Gyrinus substriatus</i>		-, -,D	-, -,C		1	
<i>Haliphus lineatocollis</i>		D,-,-	A,-,-		1	
<i>Haliphus immaculatus</i>		-,C,-	-,B,-	B	2	
<i>Haliphus ruficollis</i>		C,-,-	A,-,-		1	
<i>Haliphus sibiricus</i>		D,C,D	A,B,C		2	
<i>Noterus clavicornis</i>		D,D,-	A,B,-		2	
<i>Ilybius quadriguttatus</i>		-, -,D	-, -,C	B	1	
<i>Graptodytes pictus</i>		D,D,-	A,B,-	B	2	
<i>Hydroporus palustris</i>		D,D,D	A,B,C		1	
<i>Hydroporus tessellatus</i>		-,D,-	-,B,-		1	
<i>Laccophilus hyalinus</i>		D,-,-	A,-,-		1	
<i>Laccophilus minutus</i>		D,-,-	A,-,-	B	2	
<i>Helophorus aequalis</i>		D,D,C	A,B,C		1	
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1	
<i>Anacaena globulus</i>		-, -,D	-, -,C		1	
<i>Anacaena limbata</i>		-,D,-	-,B,-		1	
<i>Anacaena lutescens</i>		D,-,-	A,-,-		1	
<i>Enochrus testaceus</i>		D,D,	A,B,		2	
<i>Helochares lividus</i>		D,-,-	A,-,-	B	2	
<i>Laccobius minutus</i>		-,D,-	-,B,-	B	2	
<i>Tanytarsus lemnae</i>		C,D,-	A,B,-		-	
<i>Odontomyia ornata</i>	RDB2.	D,-,-	A,-,-	A	8	
<i>Asellus aquaticus</i>		C,C,C	A,B,C		1	
<i>Asellus meridianus</i>		D,-,-	A,-,-		1	
SQS	53	1.43	HQS	10.81	SRS	37

3.1.11. Sample station SB02 (EA8)

This is a very large, deep and steep-sided ditch. There is occasional submerged growth of fennel and curled pondweeds, plus a little rigid hornwort and water-starwort *Callitriche* sp. The ditch appears to have been cleaned out quite recently, and as a consequence, emergent vegetation is not well developed, though there is a little reed sweet-grass and common reed. These two species are also frequent in the tall fen that fringes much of this ditch, with the other main constituents being hemlock water-dropwort and common nettle *Urtica dioica*. There are also some areas of willow *Salix* sp. and bramble *Rubus fruticosus* agg. scrub on the banks of the ditch.

Table 3.1.11. Invertebrates in sample station SB02, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>	-,-,D	-,-,C			1
<i>Lymnaea stagnalis</i>	-,D,D	-,B,C			1
<i>Lymnaea palustris</i>	D,D,D	A,B,C			2
<i>Lymnaea peregra</i>	D,-,-	A,-,-			1
<i>Physa</i> sp.	C,B,-	A,B,-			1
<i>Planorbis planorbis</i>	D,C,C	A,B,C			1
<i>Anisus vortex</i>	C,B,C	A,B,C			1
<i>Planorbarius corneus</i>	D,D,D	A,B,C			1
<i>Gerris lacustris</i>	-,-,D	-,-,C			1
<i>Gerris thoracicus</i>	-,D,-	-,B,-			1
<i>Ilyocoris cimicoides</i>	C,C,C	A,B,C			1
<i>Nepa cinerea</i>	D,-,-	A,-,-			1
<i>Notonecta glauca</i>	D,D,D	A,B,C			1
<i>Hespercorixa sahlbergi</i>	-,C,D	-,B,C			1
<i>Sigara dorsalis</i>	-,-,D	-,-,C			1
<i>Gyrinus substriatus</i>	C,D,-	A,B,-			1
<i>Haliphus immaculatus</i>	-,D,-	-,B,-		B	2
<i>Haliphus ruficollis</i>	D,-,-	A,-,-			1
<i>Noterus clavicornis</i>	-,D,D	-,B,C			2
<i>Agabus sturmii</i>	-,D,-	-,B,-			1
<i>Dytiscus marginalis</i>	D,-,-	A,-,-			1
<i>Hydroporus palustris</i>	D,-,-	A,-,-			1
<i>Hyphydrus ovatus</i>	D,D,D	A,B,C			1
<i>Helophorus brevipalpis</i>	C,C,C	A,B,C			1
<i>Helophorus minutus</i>	-,-,D	-,-,C			1
<i>Enochrus coarctatus</i>	-,-,D	-,-,C		B	2
<i>Enochrus testaceus</i>	D,D,D	A,B,C			2
<i>Hydrobius fuscipes</i>	-,D,-	-,B,-			1
<i>Nemotelus notatus</i>	D,-,-	A,-,-			2
<i>Asellus aquaticus</i>	C,C,C	A,B,C			1
<i>Asellus meridianus</i>	C,-,-	A,-,-			1
				SRS	31
				SQS	37
				SQI	1.19
				HQS	3.23

3.1.12. Sample station SB03 (EA9)

A very large, open ditch with much submerged algal growth and fennel pondweed locally frequent. Duckweed cover was generally quite low, and there was also some floating frogbit and amphibious bistort. The banks are grazed, with shallow, trampled margins that have a sparse emergent/fringing strip of reed sweet-grass, branched bur-reed, lesser water-parsnip, rushes and floating sweet-grass.

Table 3.1.12. Invertebrates in sample station SB03, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		B,C,D	A,B,C		1
<i>Lymnaea stagnalis</i>		-,D,-	-,B,-		1
<i>Lymnaea peregra</i>		C,C,-	A,B,-		1
<i>Physa</i> sp.		B,C,C	A,B,C		1
<i>Planorbis planorbis</i>		-,D,-	-,B,-		1
<i>Anisus vortex</i>		C,C,C	A,B,C		1
<i>Planorbarius corneus</i>		C,C,C	A,B,C		1
<i>Ilyocoris cimicoides</i>		D,-,-	A,-,-		1
<i>Notonecta glauca</i>		C,C,C	A,B,C		1
<i>Plea minutissima</i>		-,D,-	-,B,-		1
<i>Corixa punctata</i>		D,D,-	A,A,-		1
<i>Hesperocorixa sahlbergi</i>		-,D,-	-,B,-		1
<i>Sigara dorsalis</i>		D,D,C	A,B,C		1
<i>Haliphus immaculatus</i>		-,D,-	-,B,-	B	2
<i>Haliphus ruficollis</i>		D,D,D	A,B,C		1
<i>Noterus clavicornis</i>		C,C,C	A,B,C		2
<i>Hygrobia hermanni</i>		-,D,-	-,B,-		2
<i>Ilybius quadriguttatus</i>		-,D,-	-,B,-	B	1
<i>Hydroporus palustris</i>		D,D,C	A,B,C		1
<i>Hydroporus tessellatus</i>		-, -,D	-, -,C		1
<i>Hygrotus inaequalis</i>		D,-,-	A,-,-		1
<i>Laccophilus minutus</i>		D,D,C	A,B,C	B	2
<i>Helophorus aequalis</i>		D,C,C	A,B,C		1
<i>Helophorus brevipalpis</i>		C,C,B	A,B,C		1
<i>Helophorus minutus</i>		-,D,-	-,B,-		1
<i>Anacaena limbata</i>		-,D,D	-,B,C		1
<i>Helochaeres lividus</i>		-, -,D	-, -,C	B	2
<i>Laccobius bipunctatus</i>		-,D,D	-,B,C		1
<i>Cercyon marinus</i>		-,D,-	-,B,-		2
<i>Ochthebius minimus</i>		-,D,D	-,B,C		1
<i>Donacia marginata</i>		-,D,-	-,B,-		-
<i>Donacia semicuprea</i>		-,D,-	-,B,-		-
<i>Donacia simplex</i>		D,-,-	A,-,-		-
<i>Hypera pollux</i>		-, -,D	-, -,C		-
<i>Asellus aquaticus</i>	N.	-,C,D	-,B,C		1
<i>Asellus meridianus</i>		-,D,D	-,B,C		1
<i>Argyroneta aquatica</i>		C,D,C	A,B,C		2
		HQS	6.06	SRS	33
				SQS	39
				SQI	1.18

3.1.13. Sample station SB04 (EA10)

This is a botanically diverse ditch with a strong current. There is abundant submerged growth of Canadian pondweed *Elodea canadensis*, and abundant floating and emergent plants of arrowhead *Sagittaria sagittifolia*, frogbit, water horsetail, branched bur-reed, unbranched bur-reed *Sparganium emersum* and common reed. The ditch margins have tall fringes of mixed fen vegetation in which some of the above species occur along with sedges, reed canary-grass, meadowsweet and rushes amongst others.

Table 3.1.13. Invertebrates in sample station SB04, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		B,B,B	A,B,C		1
<i>Lymnaea stagnalis</i>		C,C,C	A,B,C		1
<i>Lymnaea palustris</i>		-,C,-	-,B,-		2
<i>Lymnaea peregra</i>		-,C,C	-,B,C		1
<i>Physa</i> sp.		C,-,D	A,-,C		1
<i>Planorbis planorbis</i>		C,C,C	A,B,C		1
<i>Anisus vortex</i>		B,B,C	A,B,C		1
<i>Planorbarius comeus</i>		-,D,-	-,B,-		1
<i>Brachytron pratense</i>	N.	-,D,-	-,B,-	B	4
<i>Hydrometra stagnorum</i>		D,D,D	A,B,C		1
<i>Gerris lacustris</i>		-, -,D	-, -,C		1
<i>Gerris thoracicus</i>		-,D,-	-,B,-		1
<i>Ilyocoris cimicoides</i>		D,D,D	A,B,C		1
<i>Nepa cinerea</i>		D,D,C	A,B,C		1
<i>Notonecta glauca</i>		C,C,C	A,B,C		1
<i>Gyrinus substriatus</i>		-,D,-	-,B,-		1
<i>Haliphus lineatocollis</i>		D,D,C	A,B,C		1
<i>Haliphus sibiricus</i>		-,C,D	-,B,C		2
<i>Noterus clavicornis</i>		-,D,D	-,B,C		2
<i>Agabus bipustulatus</i>		-, -,D	-, -,C		1
<i>Ilybius quadriguttatus</i>		D,-,-	A,-,-	B	1
<i>Dytiscus marginalis</i>		D,D,-	A,B,-		1
<i>Graptodytes pictus</i>		-,D,-	-,B,-	B	2
<i>Hydroporus planus</i>		-,D,-	-,B,-		1
<i>Hydroporus pubescens</i>		D,D,-	A,B,-		1
<i>Hyphydrus ovatus</i>		D,C,D	A,B,C		1
<i>Laccophilus hyalinus</i>		-,D,-	-,B,-		1
<i>Helophorus aequalis</i>		C,C,C	A,B,C		1
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1
<i>Helophorus minutus</i>		-, -,D	-, -,C		1
<i>Hydrophilus piceus</i>	NT.	-,D,-	-,B,-	A	8
<i>Laccobius bipunctatus</i>		-, -,D	-, -,C		1
<i>Donacia marginata</i>		D,-,-	A,-,-		-
<i>Donacia simplex</i>		D,-,-	A,-,-		-
<i>Asellus aquaticus</i>		C,C,C	A,B,C		1
				SRS	33
				SQS	47
				SQI	1.42
				HQS	7.58

3.1.14. Sample station SB05 (IDB15)

A botanically diverse ditch, with abundant submerged growth of rigid hornwort, fennel pondweed and water-starwort. Duckweed is only locally frequent, and there are also floating leaves of frogbit and broad-leaved pondweed *Potamogeton natans*. Significant stretches of this ditch are cattle grazed, which creates interesting areas of shallow water at the poached margins of the ditch. These areas have a low and patchy cover of branched bur-reed, floating sweet-grass, rushes. In areas where there is no stock access, mixed tall fen with some of these plants, plus hemlock water-dropwort is present.

Table 3.1.14. Invertebrates in sample station SB05, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		C,C,C	A,B,C		1
<i>Lymnaea stagnalis</i>		D,-,C	A,-,C		1
<i>Lymnaea auricularia</i>		-, -,D	-, -,C		2
<i>Lymnaea peregra</i>		C,B,-	A,B,-		1
<i>Physa</i> sp.		B,B,C	A,B,C		1
<i>Planorbis planorbis</i>		D,C,-	A,B,-		1
<i>Anisus vortex</i>		B,C,B	A,B,C		1
<i>Hippeutis complanatus</i>		C,-,-	A,-,-		2
<i>Planorbarius corneus</i>		D,-,-	A,-,-		1
<i>Hydrometra stagnorum</i>		-, -,D	-, -,C		1
<i>Ilyocoris cimicoides</i>		-, -,C	-, -,C		1
<i>Nepa cinerea</i>		-,D,-	-,B,-		1
<i>Notonecta glauca</i>		-, -,D	-, -,C		1
<i>Corixa punctata</i>		D,-,-	A,-,-		1
<i>Hespercorixa linnaei</i>		-, -,D	-, -,C		1
<i>Sigara dorsalis</i>		-, -,D	-, -,C		1
<i>Haliphus lineatocollis</i>		-,D,-	-,B,-		1
<i>Haliphus immaculatus</i>		C,-,-	A,-,-	B	2
<i>Haliphus ruficollis</i>		-, -,D	-, -,C		1
<i>Haliphus sibiricus</i>		C,D,-	A,B,-		2
<i>Noterus clavicornis</i>		D,-,C	A,-,C		2
<i>Dytiscus marginalis</i>		D,-,-	A,-,-		1
<i>Graptodytes pictus</i>		D,D,D	A,B,C	B	2
<i>Hydroporus palustris</i>		D,D,D	A,B,C		1
<i>Hyphydrus ovatus</i>		-, -,D	-, -,C		1
<i>Helophorus aequalis</i>		C,C,D	A,B,C		1
<i>Helophorus brevipalpis</i>		B,B,C	A,B,C		1
<i>Anacaena globulus</i>		-,D,-	-,B,-		1
<i>Enochrus coarctatus</i>		-, -,D	-, -,C	B	2
<i>Enochrus testaceus</i>		D,D,-	A,B,-		2
<i>Laccobius bipunctatus</i>		C,-,-	B,-,-		1
<i>Laccobius minutus</i>		D,-,-	A,-,-	B	2
<i>Ochthebius minimus</i>		-, -,D	-, -,C		1
<i>Plateumaris sericea</i>		D,-,-	A,-,-		-
<i>Donacia semicuprea</i>		-, -,D	-, -,C		-
<i>Tanysphyrus lemnae</i>		-,D,D	-,B,C		-
<i>Asellus aquaticus</i>		C,C,D	A,B,C		1

SRS	34
SQS	43
SQI	1.26
HQS	5.88

3.1.15. Sample station SB06 (IDB16)

A botanically diverse ditch, with abundant submerged growth of curled pondweed and rigid hornwort. Cattle graze the banks along parts of the ditch, and have created shallow margins with a dense to sparse emergent/fringing band of branched bur-reed, reed sweet-grass, greater reed-mace, floating sweet-grass, sedges, rushes and hemlock water-dropwort, plus a little common water-plantain. In some places there is abundant common reed, which is beginning to choke the channel. Duckweed is generally only present at low density, and there is much floating growth of frogbit.

Table 3.1.15. Invertebrates in sample station SB06, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		B,-,B	A,-,C		1
<i>Lymnaea stagnalis</i>		D,-,C	A,-,C		1
<i>Lymnaea peregra</i>		-,C,-	-,B,-		1
<i>Physa</i> sp.		B,B,-	A,B,-		1
<i>Anisus vortex</i>		C,C,-	A,B,-		1
<i>Brachytron pratense</i>	N.	-,D,-	-,B,-	B	4
<i>Hydrometra stagnorum</i>		-,D,-	-,B,-		1
<i>Gerris odontogaster</i>		D,-,-	A,-,-		1
<i>Gerris thoracicus</i>		-,D,-	-,B,-		1
<i>Ilyocoris cimicoides</i>		-, -,C	-, -,C		1
<i>Nepa cinerea</i>		D,D,-	A,B,-		1
<i>Notonecta glauca</i>		-,C,-	-,B,-		1
<i>Hespercorixa linnaei</i>		-,D,-	-,B,-		1
<i>Sigara dorsalis</i>		-,D,D	-,B,C		1
<i>Haliphus lineatocollis</i>		-, -,D	-, -,C		1
<i>Haliphus heydeni</i>		-, -,C	-, -,C		4
<i>Haliphus immaculatus</i>		-,C,-	-,B,-	B	2
<i>Haliphus ruficollis</i>		-,C,D	-,B,C		1
<i>Haliphus sibiricus</i>		B,D,-	A,B,-		2
<i>Noterus clavicornis</i>		C,-,D	A,-,C		2
<i>Dytiscus marginalis</i>		-,D,-	-,B,-		1
<i>Graptodytes pictus</i>		D,D,C,	A,B,C	B	2
<i>Hydroporus palustris</i>		D,D,-	A,B,-		1
<i>Hyphydrus ovatus</i>		D,D,D	A,B,C		1
<i>Laccophilus hyalinus</i>		-,D,-	-,B,-		1
<i>Odacantha melanura</i>	Nb.	D,-,-	A,-,-		-
<i>Helophorus aequalis</i>		A,D,D	A,B,C		1
<i>Helophorus grandis</i>		D,-,-	A,-,-		1
<i>Helophorus brevipalpis</i>		B,C,B	A,B,C		1
<i>Helophorus griseus</i>		D,-,-	A,-,-		2
<i>Anacaena globulus</i>		-,D,D,	-,B,C		1
<i>Anacaena limbata</i>		D,-,-	A,-,-		1
<i>Enochrus melanocephalus</i>		-, -,D,	-, -,C		4
<i>Hydrophilus piceus</i>	NT.	-, -,D	-, -,C	A	8
<i>Laccobius bipunctatus</i>		C,-,C,	A,-,C		1
<i>Cryptopleurum minutum</i>		D,-,-	A,-,-		-
<i>Coccidula scutellata</i>	Nb.	-, -,D	-, -,C		-
<i>Plateumaris sericea</i>		-, -,D,	-, -,C		-

<i>Donacia vulgaris</i>		-,D,	-,B,		-
<i>Tanysphyrus lemnae</i>		-, -,D	-, -,C		-
<i>Odontomyia tigrina</i>	N.	-, -,D	-, -,C	B	4
<i>Asellus aquaticus</i>		D,C,C,	A,B,C		1
				SRS	36
				SQS	60
				SQI	1.67
				HQS	8.33

3.1.16. Sample station SB07 (IDB20)

This is a botanically rather dull ditch, with no submerged macrophytes, and little floating or emergent vegetation other than a few floating rafts of floating sweet-grass. The banks are steep and ungrazed, with tall rather ruderal vegetation dominated by mixtures of hemlock water-dropwort, common nettle, goosegrass, hedge bindweed, bramble, reed canary-grass, common reed and meadowsweet.

Table 3.1.16. Invertebrates in sample station SB07, Gwent Levels, St. Brides SSSI

Species	Cons.		Sub-sample	Marsh fidelity	Status score
	Status	Abundance			
<i>Potamopyrgus antipodarum</i>		D,C,C	A,B,C		1
<i>Lymnaea palustris</i>		D,D,-	A,B,-		2
<i>Lymnaea peregra</i>		-,C,C	-,B,C		1
<i>Physa</i> sp.		-,C,B	-,B,C		1
<i>Anisus vortex</i>		-, -,D	-, -,C		1
<i>Hydrometra stagnorum</i>		-, -,D	-, -,C		1
<i>Velia caprai</i>		C,-,C	A,-,C		1
<i>Gerris thoracicus</i>		-,D,-	-,B,-		1
<i>Nepa cinerea</i>		-, -,D	-, -,C		1
<i>Notonecta glauca</i>		-,D,D	-,B,C		1
<i>Sigara falleni</i>		-, -,D	-, -,C		1
<i>Gyrinus substriatus</i>		D,-,-	A,-,-		1
<i>Haliphus sibiricus</i>		-,D,D	-,B,C		2
<i>Agabus didymus</i>		-, -,D	-, -,C		2
<i>Ilybius fuliginosus</i>		D,D,-	A,B,-		1
<i>Graptodytes pictus</i>		-,D,-	-,B,-	B	2
<i>Stictotarsus 12-pustulatus</i>		D,-,-	A,-,-		2
<i>Helophorus aequalis</i>		D,-,-	A,-,-		1
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1
<i>Limnius volckmari</i>		-, -,D	-, -,C		1
<i>Asellus aquaticus</i>		-, -,C	-, -,C		1
				SRS	21
				SQS	26
				SQI	1.24
				HQS	2.38

3.1.17. Sample station SB08 (IDB28/N)

This sample station encompasses the northern section of the Hawse Reen. It is a very large, open ditch with duckweed cover generally very high, though only occasional in some places. Despite this, there is still a very diverse aquatic macrophyte flora, in which fennel and curled pondweeds and rigid hornwort are abundant. Most of the ditch has a tall band of fringing-emergent mixed fen in which common reed, reed canary-grass, hemlock water-dropwort, reed sweet-grass, branched bur-reed and yellow flag are prominent. There is a very little floating frogbit, and also occasional mats of floating sweet-grass.

Table 3.1.17. Invertebrates in sample station SB08, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		D,C,-	A,B,-		1
<i>Lymnaea stagnalis</i>		D,C,-	A,B,-		1
<i>Lymnaea peregra</i>		D,D,-	A,B,-		1
<i>Physa</i> sp.		B,A,C	A,B,C		1
<i>Planorbis planorbis</i>		-, -,D	-, -,C		1
<i>Anisus vortex</i>		B,C,-	A,B,-		1
<i>Planorbarius corneus</i>		-,D,-	-,B,-		1
<i>Nepa cinerea</i>		-,D,-	-,B,-		1
<i>Notonecta glauca</i>		-,D,D	-,B,C		1
<i>Hespercorixa sahlbergi</i>		-,D,-	-,B,-		1
<i>Peltodytes caesus</i>	NS.	-,D,-	-,B,-	A	4
<i>Haliphus lineatocollis</i>		-,C,-	-,B,-		1
<i>Haliphus heydeni</i>		-, -,D	-, -,C		4
<i>Haliphus ruficollis</i>		-, -,C	-, -,C		1
<i>Haliphus sibiricus</i>		C,B,C	A,B,C		2
<i>Noterus clavicornis</i>		C,D,D	A,B,C		2
<i>Ilybius quadriguttatus</i>		-,D,-	-,B,-	B	1
<i>Rhantus grapii</i>		D,-,-	A,-,-	B	4
<i>Hydroporus incognitus</i>		-, -,D	-, -,C		2
<i>Hydroporus palustris</i>		D,-,C	A,-,C		1
<i>Hydroporus planus</i>		-, -,D	-, -,C		1
<i>Suphrodytes dorsalis</i>		-, -,D	-, -,C		2
<i>Hygrotus inaequalis</i>		D,D,-	A,B,-		1
<i>Hyphydrus ovatus</i>		-,D,D	-,B,C		1
<i>Laccophilus hyalinus</i>		-,D,-	-,B,-		1
<i>Laccophilus minutus</i>		-,D,-	-,B,-	B	2
<i>Helophorus aequalis</i>		D,D,C	A,A,C		1
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1
<i>Anacaena globulus</i>		-,D,D	-,B,C		1
<i>Donacia semicuprea</i>		-,D,-	-,B,-		-
<i>Odontomyia ornata</i>	RDB2.	D,-,-	A,-,-	A	8
<i>Asellus aquaticus</i>		C,C,C	A,B,C		1
				SRS	31
				SQS	52
				SQI	1.68
				HQS	11.29

3.1.18. Sample station SB09 (IDB28/S)

This sample was collected in the southern part of the Hawse Reen. The channel of this large, open ditch had an appreciable flow and supported good populations of submerged macrophytes, fennel and curled pondweeds and rigid hornwort being the main species noted. Duckweed cover was generally high, ranging from 50 to 100% cover in the three sub-samples. There was some emergent growth of branched bur-reed, reed and floating sweet-grasses, common water-plantain, arrowhead and water horsetail and the former two species plus hemlock water-dropwort, yellow flag and common reed also occurred as a strip of tall fen fringing the ditch margins.

Table 3.1.18. Invertebrates in sample station SB09, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		C,C,-	A,B,-		1
<i>Lymnaea stagnalis</i>		D,-,-	A,-,-		1
<i>Physa</i> sp.		B,B,B	A,B,C		1
<i>Planorbis planorbis</i>		C,B,B	A,B,C		1
<i>Anisus vortex</i>		C,C,C	A,B,C		1
<i>Planorbarius corneus</i>		D,D,-	A,B,-		1
<i>Notonecta glauca</i>		D,D,D	A,B,C		1
<i>Gyrinus substriatus</i>		D,-,-	A,-,-		1
<i>Haliphus lineatocollis</i>		C,-,-	A,-,-		1
<i>Haliphus heydeni</i>		C,-,-	A,-,-		4
<i>Haliphus ruficollis</i>		-, -,D	-, -,C		1
<i>Noterus clavicornis</i>		C,C,-	A,B,-		2
<i>Graptodytes pictus</i>		D,-,-	A,-,-	B	2
<i>Hydroporus palustris</i>		C,D,C	A,B,C		1
<i>Hygrotus inaequalis</i>		D,C,D	A,B,C		1
<i>Hyphydrus ovatus</i>		-,D,D	-,B,C		1
<i>Helophorus aequalis</i>		-,D,-	-,B,-		1
<i>Helophorus grandis</i>		-,D,-	-,B,-		1
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1
<i>Helophorus minutus</i>		D,-,-	A,-,-		1
<i>Enochrus testaceus</i>		D,-,-	A,-,-		2
<i>Laccobius bipunctatus</i>		D,-,-	A,-,-		1
<i>Asellus aquaticus</i>		C,C,C	A,B,C		1
				SRS	23
				SQS	29
				SQI	1.26
				HQS	2.17

3.1.19. Sample station SB10 (IDB29)

A rather dull-looking ditch, with steep banks, no submerged aquatic vegetation, a deep detritus substrate and a thick floating mat of duckweed. Otherwise, there is just a very small amount of frogbit, and some rafts of floating sweet-grass. The ditch margins have mixed tall fen in which common reed, reed sweet-grass, yellow flag and hemlock water-dropwort.

Table 3.1.19. Invertebrates in sample station SB10, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		-,D,-	-,B,-		1
<i>Lymnaea peregra</i>		D,C,C	A,B,C		1
<i>Physa</i> sp.		B,D,-	A,B,-		1
<i>Anisus vortex</i>		C,C,C	A,B,C		1
<i>Planorbium comeus</i>		D,D,-	A,B,-		1
<i>Nepa cinerea</i>		D,-,-	A,-,-		1
<i>Peltodytes caesus</i>	NS.	D,-,-	A,-,-	A	4
<i>Haliphus lineatocollis</i>		D,-,-	A,-,-		1
<i>Haliphus heydeni</i>		D,-,-	A,-,-		4
<i>Noterus clavicornis</i>		-,D,D	-,B,C		2
<i>Ilybius quadriguttatus</i>		-,D,D	-,B,C	B	1
<i>Acilius sulcatus</i>		-,-,D	-,-,C		1
<i>Hydroporus angustatus</i>		D,D,C	A,B,C		1
<i>Hydroporus palustris</i>		C,C,C	A,B,C		1
<i>Hydroporus planus</i>		D,-,-	A,-,-		1
<i>Hydroporus striola</i>		-,-,D	-,-,C		2
<i>Helophorus aequalis</i>		D,D,C	A,B,C		1
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1
<i>Helophorus minutus</i>		C,D,-	A,B,-		1
<i>Anacaena globulus</i>		D,D,-	A,B,-		1
<i>Asellus aquaticus</i>		B,C,B	A,B,C		1
				SRS	21
				SQS	29
				SQI	1.38
				HQS	7.14

3.1.20. Sample station SB11 (IDB30)

This was a quite floristically diverse ditch which, though having an almost continuous mat of floating duckweed on the water surface, still had frequent submerged beds of fine-leaved and curled pondweeds, plus a little rigid hornwort. Large sections of the banks were cattle grazed, with a relatively short, open emergent/fringing zone in which plants such as branched bur-reed, common reed, arrowhead, water horsetail, common water-plantain, lesser water-parsnip, hemlock water-dropwort and floating and reed sweet-grasses were among the most frequent constituents.

Table 3.1.20. Invertebrates in sample station SB11, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		C,D,D	A,B,C		1
<i>Lymnaea stagnalis</i>		D,D,D	A,B,C		1
<i>Physa</i> sp.		B,B,C	A,B,C		1
<i>Planorbis planorbis</i>		D,D,-	A,B,-		1
<i>Anisus vortex</i>		C,C,C	A,B,C		1
<i>Ilyocoris cimicoides</i>		D,-,-	A,-,-		1
<i>Notonecta glauca</i>		D,-,D	A,-,C		1
<i>Corixa punctata</i>		C,-,D	A,-,C		1
<i>Hesperocorixa sahlbergi</i>		-,D,-	-,B,-		1
<i>Sigara dorsalis</i>		D,-,-	A,-,-		1
<i>Haliplus immaculatus</i>		-,D,D	-,B,C	B	2
<i>Haliplus ruficollis</i>		D,-,-	A,-,-		1
<i>Noterus clavicornis</i>		D,-,-	A,-,-		2
<i>Agabus sturmii</i>		-, -,D	-, -,C		1
<i>Rhantus grapii</i>		-, -,D	-, -,C	B	4
<i>Graptodytes pictus</i>		D,D,D	A,B,C	B	2
<i>Hydroporus angustatus</i>		-, -,D	-, -,C		1
<i>Hydroporus palustris</i>		D,D,C	A,B,C		1
<i>Hyphydrus ovatus</i>		D,-,-	A,-,-		1
<i>Helophorus aequalis</i>		D,-,-	A,-,-		1
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1
<i>Helophorus minutus</i>		D,-,-	A,-,-		1
<i>Asellus aquaticus</i>		C,-,B	A,-,C		1
				SRS	23
				SQS	29
				SQI	1.26
				HQS	6.52

3.1.21. Sample station SB12 (IDB31)

A large, deep and open ditch with a well-developed aquatic macrophyte flora in which fennel and curled pondweeds predominate. There is also much growth of alga in the water column. At the surface, duckweed shows considerable variation in abundance, from 100% cover to 15% across the three sub-samples. Considerable areas of the ditch side are open to cattle and the banks show heavily poached shallow margins in which there is a patchy growth of emergents such as branched bur-reed, reed and floating sweet-grasses, arrowhead, yellow flag, reed canary-grass and common reed.

Table 3.1.21. Invertebrates in sample station SB12, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		-,C,C	-,B,B		1
<i>Lymnaea stagnalis</i>		D,D,D	A,B,C		1
<i>Physa</i> sp.		C,B,B	A,B,C		1
<i>Planorbis planorbis</i>		-,C,B	-,B,C		1
<i>Anisus vortex</i>		B,C,B	A,B,C		1
<i>Planorbarius corneus</i>		D,D,C	A,B,C		1
<i>Gerris lacustris</i>		-,D,-	-,B,-		1
<i>Ilyocoris cimicoides</i>		-,D,D	-,B,C		1
<i>Notonecta glauca</i>		D,C,C	A,B,C		1
<i>Plea minutissima</i>		-, -,D	-, -,C		1
<i>Corixa punctata</i>		D,D,D	A,B,C		1
<i>Hesperocorixa sahlbergi</i>		-, -,D	-, -,C		1
<i>Sigara dorsalis</i>		-,D,-	-,B,-		1
<i>Haliphus immaculatus</i>		-, -,D	-, -,C	B	2
<i>Haliphus ruficollis</i>		-,D,-	-,B,-		1
<i>Noterus clavicornis</i>		D,D,D	A,B,C		2
<i>Hygrobia hermanni</i>		C,D,D	A,B,C		2
<i>Ilybius ater</i>		D, -, -	A, -, -	B	1
<i>Laccophilus minutus</i>		-, -,D	-, -,C	B	2
<i>Helophorus aequalis</i>		D,D,D	A,B,C		1
<i>Helophorus brevipalpis</i>		B,C,C	A,B,C		1
<i>Helophorus minutus</i>		-,D,-	-,B,-		1
<i>Enochrus testaceus</i>		-, -,D	-, -,C		2
<i>Laccobius bipunctatus</i>		-, -,D	-, -,C		1
<i>Asellus aquaticus</i>		B, -, -	A, -, -		1
<i>Asellus meridianus</i>		D, -, -	A, -, -		1
				SRS	26
				SQS	31
				SQI	1.19
				HQS	5.77

3.1.22. Sample station SB13 (IDB34)

A very rich-looking ditch, despite cover of duckweed here being rather high (75-90% cover across the three sub-samples). There was much submerged growth of pondweeds and floating leaves of frogbit were also abundant. Cattle have created very wide, shallow ditch margins, which have a diverse emergent/fringing flora that includes much common water-plantain, lesser water-parsnip, branched bur-reed, common reed, sedges, reed sweet-grass and water horsetail.

Table 3.1.22. Invertebrates in sample station SB13, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		C,C,C	A,B,C		1
<i>Lymnaea stagnalis</i>		D,C,-	A,B,-		1
<i>Lymnaea palustris</i>		D,-,-	A,-,-		2
<i>Lymnaea peregra</i>		C,-,C	A,-,C		1
<i>Physa</i> sp.		-, -,C	-, -,C		1
<i>Planorbis planorbis</i>		-, -,D	-, -,C		1
<i>Anisus vortex</i>		C,C,C	A,B,C		1
<i>Hippeutis complanatus</i>		-, -,D	-, -,C		2
<i>Planorbarius comeus</i>		C,C,-	A,B,-		1
<i>Brachytron pratense</i>	N.	-, -,D	-, -,C	B	4
<i>Hydrometra stagnorum</i>		-,D,-	-,B,-		1
<i>Gerris lacustris</i>		-, -,D	-, -,C		1
<i>Gerris thoracicus</i>		-, -,D	-, -,C		1
<i>Ilyocoris cimicoides</i>		C,C,D	A,B,C		1
<i>Nepa cinerea</i>		D,-,D	A,-,C		1
<i>Hespercorixa linnaei</i>		-, -,D	-, -,C		1
<i>Haliplus heydeni</i>		-, -,D	-, -,C		4
<i>Haliplus ruficollis</i>		D,D,D	A,B,C		1
<i>Noterus clavicornis</i>		D,D,D	A,B,C		2
<i>Agabus bipustulatus</i>		-, -,D	-, -,C		1
<i>Ilybius ater</i>		D,D,-	A,B,-	B	1
<i>Ilybius montanus</i>		D,-,-	A,-,-		1
<i>Ilybius quadriguttatus</i>		D,D,D	A,B,C	B	1
<i>Liopteris haemorrhoidalis</i>		-, -,D	-, -,C		2
<i>Hydaticus transversalis</i>		D,-,-	A,-,-	A	8
<i>Hydroporus angustatus</i>		D,D,-	A,B,-		1
<i>Hygrotus inaequalis</i>		-, -,D	-, -,C		1
<i>Helophorus aequalis</i>		C,C,C	A,B,C		1
<i>Helophorus brevipalpis</i>		C,C,C	A,B,C		1
<i>Helophorus griseus</i>		-,D,-	-,B,-		2
<i>Anacaena globulus</i>		D,-,-	A,-,-		1
<i>Anacaena limbata</i>		-,D,-	-,B,-		1
<i>Anacaena lutescens</i>		D,-,C	A,-,C		1
<i>Enochrus ochropterus</i>		-,D,-	-,B,-		4
<i>Enochrus testaceus</i>		-, -,D	-, -,C		2
<i>Helochaeres lividus</i>		D,-,-	A,-,-	B	2
<i>Laccobius bipunctatus</i>		C,-,D	A,-,C		1
<i>Scirtes orbicularis</i>	Na,	-,D,-	-,B,-		-
<i>Silis ruficollis</i>	Nb.	D,-,-	A,-,-		-

<i>Plateumaris sericea</i>		D,-,-	A,-,-		-
<i>Donacia marginata</i>		D,-,D	A,-,C		-
<i>Donacia semicuprea</i>		D,-,-	A,-,-		-
<i>Odontomyia tigrina</i>	N.	D,-,-	A,-,-	B	4
<i>Asellus aquaticus</i>		C,C,D	A,B,C		1
				SRS	39
				SQS	65
				SQI	1.67
				HQS	9.00

3.1.23. Sample station SB14 (IDB35)

A large, deep and steep-sided ditch. The wetland flora here is very rich, with much submerged growth of fennel and curled pondweeds, plus some water-starwort. Duckweed is frequent, but not dominant, and there is also much frogbit and also some floating rafts of alga. There are frequent emergent plants of arrowhead and occasional common water-plantain, floating sweet-grass and branched bur-reed. The banks have a tall fringe of common reed, hemlock water-dropwort, meadowsweet, rushes and purple loosestrife *Lythrum salicaria*.

Table 3.1.23. Invertebrates in sample station SB14, Gwent Levels, St. Brides SSSI

Species	Cons. Status	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>		-, -, B	-, -, C		1
<i>Lymnaea stagnalis</i>		C, C, C	A, B, C		1
<i>Lymnaea peregra</i>		C, C, C	A, B, C		1
<i>Physa</i> sp.		C, C, C	A, B, C		1
<i>Planorbis planorbis</i>		C, C, C	A, B, C		1
<i>Anisus vortex</i>		C, C, C	A, B, C		1
<i>Planorbarius corneus</i>		-, -, C	-, -, C		1
<i>Brachytron pratense</i>	N.	-, D, D	-, B, C	B	4
<i>Gerris thoracicus</i>		D, D, D	A, B, C		1
<i>Ilyocoris cimicoides</i>		-, D, D	-, B, C		1
<i>Notonecta glauca</i>		-, -, D	-, -, C		1
<i>Sigara dorsalis</i>		-, -, D	-, -, C		1
<i>Haliphus lineatocollis</i>		D, C, D	A, B, C		1
<i>Haliphus immaculatus</i>		-, D, -	-, B, -	B	2
<i>Haliphus ruficollis</i>		-, C, C	-, B, C		1
<i>Haliphus sibiricus</i>		C, -, -	A, -, -		2
<i>Haliphus flavicollis</i>		-, D, -	-, B, -		2
<i>Noterus clavicornis</i>		-, D, C	-, B, C		2
<i>Agabus bipustulatus</i>		-, D, -	-, B, -		1
<i>Ilybius quadriguttatus</i>		-, -, D	-, -, C	B	1
<i>Graptodytes pictus</i>		D, C, C	A, B, C	B	2
<i>Hydroporus angustatus</i>		-, -, D	-, -, C		1
<i>Hydroporus palustris</i>		-, D, D	-, B, C		1
<i>Hydroporus planus</i>		-, D, -	-, B, -		1
<i>Hydroporus pubescens</i>		-, D, -	-, B, -		1
<i>Hygrotus inaequalis</i>		-, D, -	-, B, -		1
<i>Helophorus aequalis</i>		-, C, C	-, B, C		1
<i>Helophorus brevipalpis</i>		C, C, C	A, B, C		1
<i>Helophorus griseus</i>		-, D, -	-, B, -		2
<i>Anacaena globulus</i>		-, D, D	-, B, C		1
<i>Anacaena limbata</i>		-, -, D	-, -, C		1
<i>Hydrobius fuscipes</i>		-, D, -	-, C, -		1
<i>Laccobius bipunctatus</i>		-, D, D	-, B, C		1
<i>Laccobius minutus</i>		-, D, -	-, B, -	B	2
<i>Donacia simplex</i>		-, -, D	-, -, C		-
		HQS	5.88	SRS	34
				SQS	44
				SQI	1.29

3.1.24. Sample station SB15 (IDB37)

The first sub-sample of this ditch ran through woodland, and had steep, unmanaged banks, while the latter two ran through open, cattle-grazed grazing marsh. The channel had much submerged growth of Canadian pondweed, and floating leaves of frogbit and broad-leaved pondweed were also frequent. Duckweed was very scarce along most of this ditch. There was also much alga, both floating and submerged. Emergent and fringing vegetation was quite diverse, especially in the grazed sub-samples where cattle poaching had created shallow margins. Branched bur-reed, water horsetail, rushes, common water-plantain, lesser water-parsnip and floating sweet-grass were among the species recorded in this zone.

Table 3.1.24. Invertebrates in sample station SB15, Gwent Levels, St. Brides SSSI

Species	Abundance	Sub-sample	Marsh fidelity	Status score
<i>Bithynia tentaculata</i>	C,C,C	A,B,C		1
<i>Lymnaea stagnalis</i>	C,C,D	A,B,C		1
<i>Lymnaea palustris</i>	-,D,-	-,B,-		2
<i>Lymnaea peregra</i>	D,C,C	A,B,C		1
<i>Physa</i> sp.	B,B,C	A,B,C		1
<i>Planorbis planorbis</i>	B,C,C	A,B,C		1
<i>Anisus vortex</i>	C,B,B	A,B,C		1
<i>Planorbarius corneus</i>	D,D,C	A,B,C		1
<i>Hydrometra stagnorum</i>	D,-,-	A,-,-		1
<i>Gerris lacustris</i>	C,D,-	A,B,-		1
<i>Gerris thoracicus</i>	-, -,D	-, -,C		1
<i>Ilyocoris cimicoides</i>	D,D,D	A,B,C		1
<i>Nepa cinerea</i>	D,-,D	A,-,C		1
<i>Notonecta glauca</i>	C,C,C	A,B,C		1
<i>Plea minutissima</i>	-,D,-	-,B,-		1
<i>Corixa punctata</i>	-,D,C	-,B,C		1
<i>Haliphus immaculatus</i>	-,B,D	-,B,C	B	2
<i>Haliphus ruficollis</i>	D,C,C	A,B,C		1
<i>Haliphus sibiricus</i>	-,C,D	-,B,C		2
<i>Noterus clavicornis</i>	D,C,-	A,B,-		2
<i>Agabus bipustulatus</i>	D,-,-	B,-,-		1
<i>Rhantus suturalis</i>	-, -,D	-, -,C	B	2
<i>Liopterus haemorrhoidalis</i>	-, -,D	-, -,C		2
<i>Dytiscus marginalis</i>	D,-,D	A,-,C		1
<i>Graptodytes pictus</i>	D,-,D	A,-,C	B	2
<i>Hydroporus angustatus</i>	-, -,D	-, -,C		1
<i>Hydroporus palustris</i>	D,D,-	A,B,-		1
<i>Hydroporus planus</i>	D,D,D	A,B,C		1
<i>Hydroporus tessellatus</i>	-,D,-	-,B,-		1
<i>Hyphydrus ovatus</i>	D,D,-	A,B,-		1
<i>Laccophilus hyalinus</i>	D,D,-	A,B,-		1
<i>Laccophilus minutus</i>	-,C,-	-,B,-	B	2
<i>Helophorus aequalis</i>	D,D,C	A,B,C		1
<i>Helophorus brevipalpis</i>	C,B,B	A,B,C		1
<i>Anacaena globulus</i>	D,-,-	A,-,-		1
<i>Anacaena limbata</i>	D,D,-	A,B,-		1

<i>Anacaena lutescens</i>	-,D,-	-,B,-	1
<i>Enochrus testaceus</i>	D,-,D	A,-,C	2
<i>Laccobius bipunctatus</i>	D,D,-	A,B,-	1
<i>Donacia marginata</i>	-, -,D	-, -,C	-
<i>Hypera pollux</i>	-,D,-	-,B,-	
<i>Asellus aquaticus</i>	C,-,C	A,-,C	1
		SRS	40
		SQS	49
		SQI	1.22
		HQS	5.00

3.2 Important species recorded at Redwick-Llandevenuey and St. Brides SSSIs in 2011

This section lists the important aquatic species recorded during this survey in 2011. 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 (2010) respectively. The following sub-sections of the report also include a number of local water beetles that were downgraded from nationally scarce status in the recent water beetle review (Foster, 2010), but which are still of high ecological interest, and rated as nationally scarce species (four points) when calculating SQI by Palmer et. al. (2009).

3.2.1. Hairy dragonfly Brachytron pratense.

Nationally scarce B. A small hawk 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. In 2011, larvae were found in sample stations RL02, SB04, SB06, SB13 and SB14.

3.2.2. A water beetle Peltodytes caesus.

Nationally scarce. A small yellow-brown halipid 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 2011, this beetle was recorded from sample stations RL05, RL08, SB08 and SB10.

3.2.3. A water beetle Halplus heydeni.

Local. *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 *Halplus* 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. In 2011, adults were noted in sample stations RL04, RL05, RL06, RL07, RL09, SB06, SB08, SB09, SB10 and SB13.

3.2.4. A water beetle Rhantus grapii.

Local. 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. In 2011, adults were found in sample stations SB08 and SB11.

3.2.5. A water beetle Hydaticus transversalis.

Nationally scarce. The yellow transverse lines across the base of the wing cases make this medium-sized black diving beetle unmistakable. 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. Adults were netted in sample stations RL01 and SB13 in 2011.

3.2.6. A water beetle Enochrus melanocephalus.

Local. *E. melanocephalus* is a mid-sized yellow-brown water beetle with a predominantly black head and the last two palpal segments of similar length. It is a species of relatively eutrophic still waterbodies, such as ponds, fen pools and grazing marsh ditches and has frequently been found in sites where there is some brackish influence. It is also a characteristic species of early-successional habitats such as pools created by sand and gravel extraction. It is quite widely distributed in eastern England, becoming much scarcer in south-west England and Wales, where it is found primarily on the Somerset and Gwent Levels respectively. Adult were recorded in sample stations SB06 and SB13 this year.

3.2.7. 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. Adults were recorded in sample station RL08.

3.2.8. Great silver water beetle Hydrophilus piceus.

Red Data Book – Near Threatened. This unmistakable 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. Large larvae of this species were found in sample stations RL01, SB04 and SB06.

3.2.9. A soldierfly Odontomyia ornata.

Red Data Book 2. The adult of this soldierfly is a large, striking insect with variably-sized orange wedges on the abdomen. The larvae are large and very elongated, with a long last segment in which the anal slit is placed in the middle. This species shows a strong affinity with

grazing marsh ditches, though there are a very few colonies at inland fen sites. Its main British strongholds are on the Somerset and Gwent Levels, though it also has sizeable populations on coastal grazing marshes in East Sussex, and a scatter of other colonies in southern England and East Anglia. Larvae of *O. ornata* were collected in sample stations RL07, SB01 and SB08.

3.2.10. A soldierfly Odontomyia tigrina.

Nationally scarce. Adults of *O. tigrina* are predominantly black, mid-sized soldierflies, though closer inspection reveals the spines and halteres to be yellow. Larvae are brown with conspicuous dark longitudinal stripes. The last abdominal segment is short-haired and only moderately elongate with the anal slit being positioned baso-medially. This is a fly of late-successional eutrophic wetlands such as fens, lowland ponds and grazing marshes. The larvae are usually found in shallow water where there is a dense growth of emergent or floating vegetation. *O. tigrina* larvae were netted in sample stations RL01, RL02, RL09, SB06 and SB13 this year.

3.2.11. A soldierfly Stratiomys singularior.

Nationally Scarce. A large species of soldierfly, with dull yellow or cream markings on the abdomen. The larvae are large, brown and elongate, with the last abdominal segment being very long, and with the anal slit positioned well towards the base. In Britain, *S. singularior* is most frequently encountered in brackish coastal marshes, although it is also recorded inland, particularly where the water shows some brackish influence. Larvae develop in shallow water at the margins of ponds and ditches, amongst floating vegetation or in mud. *S. singularior* is primarily southern in its distribution, extending northwards to the Humber and South Wales. A larva of *S. singularior* was collected in station RL02.

4 DISCUSSION

In 2007, an assessment of the ditch invertebrate fauna was undertaken on sites in the Somerset and Gwent Levels (Drake, 2007). 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). Following this, a monitoring exercise was undertaken on the Whitson SSSI that produced figures for species richness and quality that were even lower than those from the 2007 Caldicott and Wentlooge data (Boyce, 2010). 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 those from 2009.

The sampling methodology allows for the inclusion of a wider range of aquatic invertebrate groups than has been used in the 2009 and 2011 monitoring programmes. It is therefore possible that the inclusion of additional taxa, such as the mayflies (Ephemeroptera), stoneflies (Plecoptera) and caddisflies (Trichoptera) The higher species richness figures of earlier studies by Drake and others in comparison to the CSM work since 2009 may therefore relate to nothing more than the inclusion of some of these extra groups. However, the presence of these groups within the samples is very unlikely to explain the decline in species and habitat quality. Indeed, their inclusion would be more likely to reduce species and habitat quality scores, as the vast majority are common species that show no marked affinity to grazing marsh habitats. The one exception to this was the leeches (Hirudinea), which include a relatively high proportion of rare or local species. The great majority of aquatic invertebrates with high conservation status, and/or high fidelity to grazing marsh habitats, are included within the taxa sampled in 2009 and 2011. Of these groups, the water beetles are easily the most important single group.

The 2011 survey gave median and mean faithful species figures of three for Redwick & Llandevenuey and four at St. Brides. On the former SSSI, all figures have been considerably lowered by sample stations RL06 and RL03, in which no faithful species were recorded. These were both ditches of low habitat quality that appear to be suffering from excessive eutrophication. Median and mean species richness figures on the two SSSIs were 32/32 and 33/31 respectively, which were very similar to those achieved at Whitson. Median and mean figures for the Species Quality Index were 1.40/1.38 at Redwick & Llandevenuey and 1.27/1.40 at St. Brides, which is somewhat higher than the Whitson data, though still lower than Drake's 2007 Wentlooge and Caldicott study.

The median and mean Habitat Quality Scores at Redwick & Llandevenuey SSSI were rather low, at 4.55 and 4.44, though without the two very poor ditches that scored '0', these figures would rise to 5.00 and 5.70. In comparison the Whitson SSSI figures from the 2009 monitoring exercise were 5.27 and 5.20. Median and mean HQS at St. Brides were 6.06 and 6.39.

Overall, it would appear that despite the earlier sampling dates in 2011, the richness and quality of the aquatic invertebrate fauna recorded from the Redwick & Llandevenuey and St. Brides SSSIs is broadly comparable with that of the Whitson SSSI monitored in 2009. Drake had previously commented that his 2007 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. Given that the figures achieved in 2009 and 2011 are still lower, it suggests that

the decline in invertebrate interest noted by Drake may be continuing. 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. The most significant negative impact *Lemna* is likely to have is in shading out growth of the submerged macrophyte vegetation that is so important for many of the scarcer grazing marsh invertebrates. On the Somerset Levels it is thought that increasing dominance of duckweeds, including *L. minuta*, relates to increased eutrophication caused by run-off from the intensively farmed catchment. This also appears to be the case on the Gwent Levels, with some of the ditches showing evidence of excessive eutrophication, such as the presence of dense growth of algae in and on the water column. The presence of abundant duckweed is also thought to be indicative of excessive levels of eutrophication, which in itself is deleterious to the survival of many of the more stenotopic invertebrate species. On the Whitson sites, dominant duckweed growth was very widely encountered in the ditches sampled. Dominant *Lemna* was also present on some of the Redwick & Llandevenuey and St. Brides SSSIs, though in general, duckweed abundance was much lower in the 2011 samples than it had been at Whitson. Though this may have in part related to the earlier sampling dates in 2011, the ditches looked at this year appeared to be of generally higher quality, with submerged macrophytes and species such as arrowhead and frogbit being much more frequent than they had been at Whitson.

The presence of a thick, choking mat of *Lemna* also makes it much more difficult to sample the invertebrate fauna effectively. Firstly, the duckweed fills the net very quickly, which means that a much smaller sample of the ditch can be netted than in a site where there is little or no duckweed. 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 may also be easily missed, as they are trapped inside the duckweed mats. Invertebrates 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. It is therefore quite possible that the generally poor quality of samples in duckweed dominated sample stations may relate to the significantly impaired sampling efficiency in such sites.

A second negative factor is the very regular ditch clearance work that takes place across much of the Gwent Levels, resulting in a dearth of the late-successional habitats with abundant submerged and emergent aquatic vegetation that are the richest ditch habitat for aquatic invertebrates. It also results in steep-sided banks, without the shallow water margins favoured by many invertebrate species. 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, and hence is likely to impact on the richness of the aquatic invertebrate fauna known to be associated with such habitats.

A number of the ditch edges at Llandevenuey-Redwick and St. Brides 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: INVERTEBRATE SCORES AND INDICES CALCULATED FOR GWENT LEVELS SSSIs USING THE VERSION 4 METRICS OF PALMER et. al. (2010)

Table A1.1 below presents the results of the invertebrate monitoring at Redwick & Llandevenuey and St. Brides SSSIs in 2011, plus the Whitson SSSI monitoring work undertaken in 2009 (Boyce, 2010). In order to make comparisons between the datasets easier, the version 3 metrics of Palmer et. al. (2009) have been used in the main body of the report, as these were used to carry out the Whitson analysis. Since that time, the scoring systems have been further refined in a fourth version of the grazing marsh assessment document (Palmer, et. al. 2010), and the results of these revised metrics for all three Gwent Levels SSSIs at which CSM programmes have been undertaken thus far are presented below. In future, the version 4 metrics will be used to carry out all monitoring work.

Table 3.1. Summary of invertebrate monitoring, Redwick & Llandevenuey, St. Brides and Whitson SSSIs using version 4 indices in Palmer et. al. (2010)

Sample station	SRS	SQS	SQI	HQS
RL01	40	55	1.38	1.18
RL02	41	53	1.29	1.17
RL03	21	23	1.10	1.00
RL04	31	37	1.19	1.06
RL05	37	45	1.22	1.14
RL06	22	23	1.05	1.00
RL07	33	39	1.18	1.12
RL08	32	37	1.16	1.06
RL09	30	37	1.23	1.10
SB01	36	45	1.25	1.19
SB02	31	34	1.10	1.06
SB03	33	38	1.15	1.12
SB04	33	40	1.21	1.15
SB05	34	38	1.12	1.12
SB06	36	47	1.31	1.17
SB07	20	23	1.15	1.05
SB08	31	42	1.35	1.23
SB09	23	26	1.13	1.04
SB10	21	25	1.19	1.14
SB11	23	25	1.09	1.13
SB12	26	28	1.08	1.12
SB13	39	52	1.33	1.18
SB14	34	38	1.12	1.15
SB15	40	45	1.13	1.10
WH1	35	41	1.17	1.09
WH2	27	32	1.19	1.11
WH3	38	50	1.32	1.16
WH4	20	24	1.20	1.05
WH5	34	42	1.24	1.18
WH6	34	42	1.24	1.12
WH7	43	53	1.23	1.07
WH8	30	35	1.17	1.03
WH9	27	33	1.22	1.07
WH10	38	46	1.21	1.08
WH11	18	21	1.17	1.06
WH12	27	34	1.26	1.22

Notes on Table A1.1:

Sample station = sample station codes, 'RL' and 'SB' codes are as for the main report, 'WH' codes refer to 12 sample stations established on the Whitson SSSI in 2009 (Boyce, 2010);

SRS = Species richness score, calculated by summing number of qualifying species in Table 2;

SQS = Species Quality Score, calculated by summing conservation status scores for all qualifying species in Table 2;

SQI = Species Quality Index, calculated by dividing SQS by SRS;

HQS = Habitat Quality Score, calculated by summing marsh fidelity scores for all qualifying species in Table 2, then dividing this number by SRS.

1 APPENDIX 2: PHOTOGRAPHS OF SUB-SAMPLE PLOTS



Figure A2.1. Sub-sample RL01A



Figure A2.2. Sub-sample RL01B



Figure A2.3. Sub-sample RL01C



Figure A2.4. Sub-sample RL02A



Figure A2.5. Sub-sample RL02B



Figure A2.6. Sub-sample RL02C



Figure A2.7. Sub-sample RL03C



Figure A2.8. Sub-sample RL04A



Figure A2.9. Sub-sample RL04B



Figure A2.10. Sub-sample RL04C



Figure A2.11. Sub-sample RL05A



Figure A2.12. Sub-sample RL05B



Figure A2.13. Sub-sample RL05C



Figure A2.14. Sub-sample RL06A



Figure A2.15. Sub-sample RL06B



Figure A2.16. Sub-sample RL06C



Figure A2.17. Sub-sample RL07A



Figure A2.18. Sub-sample RL07B



Figure A2.19. Sub-sample RL07C



Figure A2.20. Sub-sample RL08A



Figure A2.21. Sub-sample RL08B



Figure A2.22. Sub-sample RL08C



Figure A2.23. Sub-sample RL09A



Figure A2.24. Sub-sample RL09B



Figure A2.25. Sub-sample RL09C



Figure A2.26. Sub-sample SB01A



Figure A2.27. Sub-sample SB01B



Figure A2.28. Sub-sample SB01C



Figure A2.29. Sub-sample SB02A



Figure A2.30. Sub-sample SB02B



Figure A2.31. Sub-sample SB02C



Figure A2.32. Sub-sample SB03A



Figure A2.33. Sub-sample SB03B



Figure A2.34. Sub-sample SB03C



Figure A2.35. Sub-sample SB04A



Figure A2.36. Sub-sample SB04B



Figure A2.37. Sub-sample SB04C



Figure A2.38. Sub-sample SB05A



Figure A2.39. Sub-sample SB05B



Figure A2.40. Sub-sample SB05C



Figure A2.41. Sub-sample SB06A



Figure A2.42. Sub-sample SB06B



Figure A2.43. Sub-sample SB06C



Figure A2.44. Sub-sample SB07A



Figure A2.45. Sub-sample SB07B



Figure A2.46. Sub-sample SB07C



Figure A2.47. Sub-sample SB08A



Figure A2.48. Sub-sample SB08B



Figure A2.49. Sub-sample SB08C



Figure A2.50. Sub-sample SB09A



Figure A2.51. Sub-sample SB09B



Figure A2.52. Sub-sample SB09C



Figure A2.53. Sub-sample SB10A



Figure A2.54. Sub-sample SB10B



Figure A2.55. Sub-sample SB10C



Figure A2.56. Sub-sample SB11A



Figure A2.57. Sub-sample SB011B



Figure A2.58. Sub-sample SB011C



Figure A2.59. Sub-sample SB12A



Figure A2.60. Sub-sample SB012B



Figure A2.61. Sub-sample SB012C



Figure A2.62. Sub-sample SB013A



Figure A2.63. Sub-sample SB013B



Figure A2.64. Sub-sample SB013C



Figure A2.65. Sub-sample SB014A



Figure A2.66. Sub-sample SB014B



Figure A2.67. Sub-sample SB014C



Figure A2.69. Sub-sample SB015A



Figure A2.70. Sub-sample SB015B



Figure A2.71. Sub-sample SB015C