The condition of the aquatic element of the reen invertebrate assemblages on Nash & Goldcliff SSSI and Newport Wetlands SSSI on the Gwent Levels in 2022

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Cymedr sgoriau'r Mynegai Ansawdd Rhywogaethau (SQI) ar gyfer 2022 yn Nhrefonnen ac Allteuryn a Gwlyptiroedd Casnewydd oedd 1.22 ac 1.34 yn y drefn honno, yn debyg iawn i'r gwerthoedd a gyflawnwyd yn 2012 (1.21 ac 1.32). Mae hyn yn awgrymu mai ychydig iawn o newid a fu yn y casgliad o infertebratau dyfrol ar y naill SoDdGA neu'r llall dros y cyfnod o 10 mlynedd. Mae'r sgorau SQI hyn yn gymharol isel o'u cymharu â'r rhai a gyflawnwyd ar systemau ffosydd corsydd pori eraill yn y DU ac mae'n amlwg bod nifer o ffactorau negyddol yn parhau i fod yn weithredol ar Wastadeddau Gwent. Yn bennaf ymhlith y rhain mae ewtroffigedd a/neu lygredd yn y ffosydd draenio, rheolaeth anghydnaws megis ffensio ffosydd draenio, gan arwain at fwy o gysgod gan lystyfiant tal a phrysgwydd, a phroffiliau serth y glannau sy'n cael eu creu pan fydd y ffosydd draenio'n cael eu clirio. O'u cyfuno â diffyg pori gan dda byw, mae prinder o ran yr ystod o gilfachau dŵr bas, gydag ardaloedd moel wedi'u sathru a chlystyrau gwasgaredig o lystyfiant sy'n codi o'r dŵr, sydd mor bwysig i lawer o infertebratau dyfrol.

Mae'r materion hyn yn llai o ffactor ar Wlyptiroedd Casnewydd, sy'n cael eu rheoli'n dda ar y cyfan. Mae ymylon y ffosydd yn agored ac yn cael eu pori gan wartheg, ac mae gan y glannau broffiliau bas. Fodd bynnag, mae rhai o'r ffosydd draenio yma, yn enwedig ffosydd y caeau sydd wedi'u lledu, bellach yn cael eu tagu gan lystyfiant trwchus sy'n codi o'r dŵr a phrysgwydd. Mae hyn wedi caniatáu iddynt gael eu cytrefu gan arbenigwyr hwyr-olynol pwysig fel y chwilen *Dytiscus dimidiatus* a *Hydaticus transversalis* ond mae angen dechrau rhaglen o glirio cylchdro i'w hatal rhag cael eu tagu'n llwyr gan lystyfiant a mynd yn sych tra'n cadw cyfran o'r ffosydd draenio hwyr-olynol.

Yn Nhrefonnen ac Allteuryn ac ar Wlyptiroedd Casnewydd, dylid ystyried tynnu ffensys i ganiatáu mynediad i dda byw ac ailbroffilio glannau serth i hyrwyddo ymylon ffosydd agored gyda phroffiliau bas i'r glannau.

Executive summary

An assessment of the aquatic invertebrate faunas of the reens on Nash & Goldcliff SSSI and Newport Wetlands SSSI was undertaken in late September 2022. The sampling stations on main reens and field ditches were the same as used in the previous assessment in 2012, with 12 main reens at Nash & Goldcliff and two main reens and five field ditches at Newport Wetlands to enable a comparison over a ten-year period. All sampling was carried out using standard methods developed for surveying ditch systems by Buglife.

Totals of 97 and 69 aquatic species were recorded on Nash & Goldcliff and Newport Wetlands respectively. This included four species which are SSSI individually qualifying features, with Great Silver Water Beetle *Hydrophilus piceus* and Ornate Brigadier soldierfly *Odontomyia ornata* on both SSSIs and King Diving Beetle *Dytiscus dimidiatus* and the diving beetle *Hydaticus transversalis* at Newport Wetlands. A total of 29 of the 66 key component species comprising the aquatic element of the reen invertebrate assemblage, as identified by Natural Resources Wales, was recorded on Nash & Goldcliff and 21 of 57 species on Newport Wetlands. These equate to 44% and 37% respectively and suggest that the sampling protocol and its timing provides an accurate representation of the aquatic fauna.

The means of the Species Quality Index (SQI) scores for 2022 on Nash & Goldcliff and Newport Wetlands were 1.22 and 1.34 respectively, very similar to the values achieved in 2012 (1.21 and 1.32). This suggests that there has been very little change in the aquatic invertebrate assemblage on either SSSI over the 10-year period. These SQI scores are relatively low when compared to those achieved on other UK grazing marsh ditch systems and there are clearly a number of negative factors that continue to operate on the Gwent Levels. Chief amongst these are eutrophication and/or pollution of the reens, unsympathetic management such as the fencing off of reens, resulting in increased shading by tall emergent vegetation and scrub, and steep bank profiles created when the reens are cast. When combined with a lack of livestock grazing, there is a dearth of the range of shallow water niches, with bare poached areas and scattered clumps of emergent vegetation, so important for many aquatic invertebrates.

These issues are less of a factor on Newport Wetlands, which is generally well managed, with open, cattle grazed ditch margins that have shallow bank profiles. However, some of the reens here, particularly the widened field ditches, are now becoming very choked with dense emergent vegetation and scrub. This has allowed them to be colonized by important late-successional specialists such as King Diving Beetle and *Hydaticus transversalis* but it is necessary to begin a programme of rotational clearance to prevent them from becoming completely choked with vegetation and drying out whilst retaining a proportion of late-successional reens.

On both Nash & Goldcliff and Newport Wetlands, consideration should be given to fence removal to allow stock access and the reprofiling of steep banks to promote open ditch margins with shallow bank profiles.

1. Introduction

The Gwent Levels comprise over 5500ha of claimed land with over 150km of main ditches or 'reens' as well as extensive networks of field ditches (Table 1). The majority of the Levels is included within eight SSSIs - Magor & Undy, Nash & Goldcliff, Newport Wetlands, Redwick & Llandevenny, Rumney & Peterstone, St. Brides, Whitson and Magor Marsh (see Figure 1). All eight SSSIs support reen invertebrate assemblages of national importance, as well as 13 individually qualifying species (Table 2). Although aquatic invertebrate surveys are undertaken for industrial, infrastructure and domestic developments on the Gwent Levels (e.g. Boyce, 2016, 2019; EMEC Ecology, 2019; Rachel Hacking Ecology, 2016), the last strategic assessments of the invertebrate faunas were undertaken in 2009, 2011 and 2012 (Boyce, 2010, 2012, 2013) but no attempt was made to determine condition at that time.

Table 1. Key statistics for the Gwent Levels SSSIs. Invertebrate sampling point data from Boyce (2010, 2012 & 2013).

Site	Size (ha)	Main reens	Length (km)	Standing water (ha)	Field block units	Invertebrate main reen sampling points
Magor Marsh	21.9	-	-	0.5	-	-
Magor & Undy	586.6	32	38	36	27	14
Nash & Goldcliff	760.7	18	30	49.5	33	12
Newport Wetlands	374.2	2	2	13.1	5	2 + 5 field ditches
Redwick & Llandevenny	940	27	35	52	33	9
Rumney & Peterstone	969.3	24	40	57	52	16
St. Brides	1312	33	41	74	45	14
Whitson	891.3	18	25	41	20	12

Figure 1. Gwent Levels SSSIs. R & P = Rumney & Peterstone; St. B = St. Brides; N W = Newport Wetlands; N & G = Nash & Goldcliff; W = Whitson; R & LI = Redwick & Llandevenny; M & U = Magor & Undy; M M = Magor Marsh.

Table 2. SSSI individually qualifying invertebrate species on the Gwent Levels.

Species	English name	SSSI
Agabus uliginosus	a diving beetle	Magor Marsh
Bagous subcarinatus	a weevil	Rumney & Peterstone
Bagous tubulus	a weevil	Rumney & Peterstone
Bombus sylvarum	Shrill Carder Bee	Magor Marsh; Magor & Undy; Nash & Goldcliff; Newport Wetlands; Redwick & Llandevenny; Rumney & Peterstone; St. Brides; Whitson
Celypha woodiana	Mistletoe Marble	Magor Marsh
Coenagrion pulchellum	Variable Damselfly	Rumney & Peterstone; St. Brides; Whitson
Dytiscus dimidiatus	King Diving Beetle	Magor Marsh; Newport Wetlands; Rumney & Peterstone; St. Brides; Whitson
Hydaticus transversalis	a diving beetle	Nash & Goldcliff; Newport Wetlands; Redwick & Llandevenny; Rumney & Peterstone; St. Brides; Whitson
Hydrophilus piceus	Great Silver Water Beetle	Magor Marsh; Magor & Undy; Nash & Goldcliff; Newport Wetlands; Redwick & Llandevenny; St. Brides; Whitson
Laccornis oblongus	a diving beetle	Magor Marsh
Limnoxenus niger	a water scavenger beetle	Redwick & Llandevenny; Whitson
Odontomyia ornata	Ornate Brigadier	Magor Marsh; Magor & Undy; Nash & Goldcliff; Newport Wetlands; Redwick & Llandevenny; Rumney & Peterstone; St. Brides; Whitson
Plateumaris bracata	a reed beetle	Rumney & Peterstone; St. Brides

Recent analyses by Natural Resources Wales have identified 594 invertebrate species of conservation concern on the Gwent Levels of which 151 are key species to be used to determine assemblage condition, including 58 water beetles (Table 3). A previous attempt in 2004 had identified 51 key species including 33 water beetles but this had focussed on aquatic species only. The majority of the 151 species (32%) are associated with Submerged Vegetation, with significant numbers also associated with Bare Clay, Brackish conditions, Tall Fen and Emergent Vegetation (Table 4). The Gwent Levels also supports 166 water beetles, making it the most important 'site' in Wales.

Table 3. Number of key invertebrate species recorded on each of the Gwent Levels SSSIs.

Site	Wasps	Beetles	Bugs	Dragonflies	Flies	Leeches	Mayflies	Moths	Snails/ mussels	Spiders	Species
Magor Marsh	1	40	9	3	24	0	1	4	7	1	90
Magor & Undy	1	55	12	3	24	1	1	6	8	1	112
Nash & Goldcliff	0	50	12	2	14	1	1	5	6	2	93
Newport Wetlands	1	44	9	2	15	0	1	5	5	1	83
Redwick & Llandevenny	2	50	14	3	27	2	1	5	8	1	113
Rumney & Peterstone	1	52	14	2	19	1	1	1	6	1	98
St. Brides	0	47	11	3	12	1	1	5	4	1	85
Whitson	0	49	11	3	15	1	1	3	6	0	89
Total	**3**	**77**	**18**	**3**	**29**	**2**	**1**	**7**	**9**	**2**	**151**

Table 4. Habitat preference of key invertebrate species recorded on each of the Gwent Levels SSSIs. See Appendix 2 for key species for Nash & Goldcliff and Newport Wetlands.

Site	Bare clay	Brackish	Emergent vegetation	Leaf Litter	Lemna mat	Mollusc parasitoid	Scrub & trees arboreal	Scrub & Trees Saproxylic	Submerged vegetation	Tall fen	Vernal pool	Total
Magor Marsh	9	4	8	5	5	9	4	4	28	13	1	90
Magor & Undy	14	11	8	6	5	9	4	6	36	13	0	112
Nash & Goldcliff	14	7	3	7	6	3	3	5	33	12	0	93
Newport Wetlands	13	8	4	4	5	4	2	5	29	9	0	83
Redwick & Llandevenny	12	13	6	6	6	9	4	5	39	13	0	113
Rumney & Peterstone	15	10	6	5	6	6	2	2	34	12	0	98
St. Brides	11	9	4	5	6	3	2	3	31	11	0	85
Whitson	12	9	5	6	6	3	3	4	35	6	0	89
Total	**19**	**19**	**11**	**8**	**6**	**9**	**6**	**8**	**48**	**16**	**1**	**151**

Previous surveys were undertaken in late July to early August 2009, June 2011 and June & July 2012 (Boyce, 2010, 2012 & 2013) with sampling and recording methodology following that detailed by Buglife (Palmer *et al*., 2013). Whilst the latter advocates that surveys are undertaken from late April to early July, the Countryside Council for Wales has stated that "aquatic invertebrate sampling is not strongly affected by the season and can be conducted between mid-March and the end of October, so long as freezing weather conditions are avoided" (Anon., 2007).

Whilst previous surveys did not provide an assessment against conservation objectives, measures of species richness and species and habitat quality were calculated (Boyce, 2013; Table 5). It was concluded that, with the exception of Magor & Undy, the richness and quality of the aquatic invertebrate faunas from all SSSIs between 2009 and 2012 were broadly comparable but were of lower quality than the aquatic invertebrate assemblage recorded from Caldicott and Wentlooge in 2007 (Drake, 2007). The more impoverished fauna on Magor & Undy was thought to be due to deeply-cut and fenced reens and a lack of grazing which precluded the development of a range of shallow water niches, with bare poached areas and scattered clumps of emergent vegetation, so important for many aquatic invertebrates (Boyce, 2013). By contrast, the higher quality scores on Newport Wetlands may have been the result of cattle trampling – primarily used to encourage bird populations - which promoted mixed-height emergent vegetation and shallow muddy margins.

Drake (2007) concluded that species richness and quality on the Gwent Levels had declined since surveys in the early 1980s (Drake, 1986), with surveys from 2009 to 2012 suggesting that declines were continuing (Boyce, 2013). Such declines were thought to be the consequence of eutrophication and changes to water chemistry, the increased

abundance of duckweeds *Lemna* spp. and algae as a result of eutrophication which shade out the growth of submerged macrophytes, regular ditch clearance suppressing late-successional habitats with abundant submerged and emergent vegetation, and a dearth of shallow margins as a consequence of deeply-cut ditches and a lack of grazing.

Table 5. Measures of species richness and species and habitat quality on the Gwent Levels. From: Boyce (2013). FS = median faithful species of sample stations; SRS = median/ mean species richness of sample stations; SQS = median/mean species quality score of sample stations; SQI = median/mean species quality index of sample stations; HQS = median/mean habitat quality score of sample stations.

Site	Year	FS	SRS	SQS	SQI	HQS
Magor & Undy SSSI	2012	1	26.5/25.29	32/30.29	1.8/1.2	2.62/3.11
Nash & Goldcliff SSSI	2012	2.5	31/31.5	36.5/38.17	1.2/1.2	4.84/5.29
Newport Wetlands SSSI	2012	5	31.5/32.25	41/42.75	1.33/1.32	10.46/10.33
Redwick & Llandevenny SSSI	2011	4	32/32	37/38.78	1.4/1.38	4.55/4.66
Rumney & Peterstone SSSI	2012	3	30/30.19	36.5/36.06	1.17/1.19	5.52/6.03
St. Brides SSSI	2011	4	33/31	38/36.4	1.27/1.4	6.52/6.46
Whitson SSSI	2009	3	33.5/31.5	38/27.75	1.36/1.34	5.27/5.2
Caldicott/Wentlooge	2007	6	40/42.5	-	1.4/1.6	-

The aim of the survey work in 2022 was to assess the current condition of the aquatic invertebrate fauna associated with reens on Nash & Goldcliff SSSI and Newport Wetlands SSSI by repeating the sampling exercise undertaken in 2012 (Boyce, 2013). Nash & Goldcliff and Newport Wetlands have 18 (30 km in length) and two (2 km) main reens respectively (Table 1), as well as extensive networks of field ditches. The largest reens, and referred to hereafter with the prefix 'EA', are cleared of detritus and vegetation on a one to three year cycle. The smaller main reens (identified in this report with the prefix 'IDB') are generally cleared on around a seven-year cycle. All are managed by Natural Resources Wales (NRW). Nash & Goldcliff is predominantly privately-owned pastoral and arable farmland, while Newport Wetlands is pasture land under the ownership of NRW where the primary goal is management for wildlife.

2. Methods

This contract required the same 12 main reens at Nash & Goldcliff and the two at Newport Wetlands that were sampled in 2012 to be re-surveyed. The sampling of the five field ditches included in the baseline survey from the latter site was also repeated. The locations of the main reen sample stations at Nash & Goldcliff and Newport Wetlands are shown in Figures 2 and 3 and the positions of the field ditch samples are also included on the latter figure. All sampling was carried out using the standard methods developed for surveying ditch systems by Buglife (Palmer *et al.*, 2013). At each of the reens sampled, the contractor collected three sub-samples from the same points used in 2012 (eg. EA26A-C). The three sub-sections at each main reen site are collectively considered to constitute a single sample station. The only exception was IDB85, where the severe drought over the preceding months had resulted in the second two sub-sample sites being completely dried out at the time of the survey, and IDB85A only having very shallow water with a limited aquatic fauna. To compensate for this, two additional samples were collected on NRW's

Swaplands reserve, which includes the eastern end of IDB86. These two samples are identified here as SWAP01 and 02. Because they were not sampled in 2012, they are not included in the analysis of the ditch invertebrate fauna.

The five field ditch sites on the Newport Wetlands (identified as 'NWFD' sample stations elsewhere in this report) were all short in length, and here only a single sample was collected from each in 2012. In this case, the three eastern field ditches (NWFD01-03) and the two further west (NWFD04-05) have been considered to constitute sample stations previously. However, it was not possible to collect a sample from NWFD04 in 2022, as it had dried out completely and two samples were therefore collected from NWFD05 to compensate for this.

Ten-figure GPS-derived grid references for all the sub-samples are given in Tables 6 and 7 and the locations of all the sample stations described above are shown in Figures 2 and 3.

Before beginning to collect invertebrates, a ten-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 on to three minutes and the net was usually about a quarter to a third full of plant material (about 2 to 3 litres by volume). The sample was then spread out onto a white polythene sheet and invertebrates were recorded/collected for eight minutes as the material was teased apart. Part of the debris was then put into a white tray with approximately 2 cm 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 one 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. 1 cm 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*. (2013). 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 across the six days from 23rd to 28th September 2022 inclusive. 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.

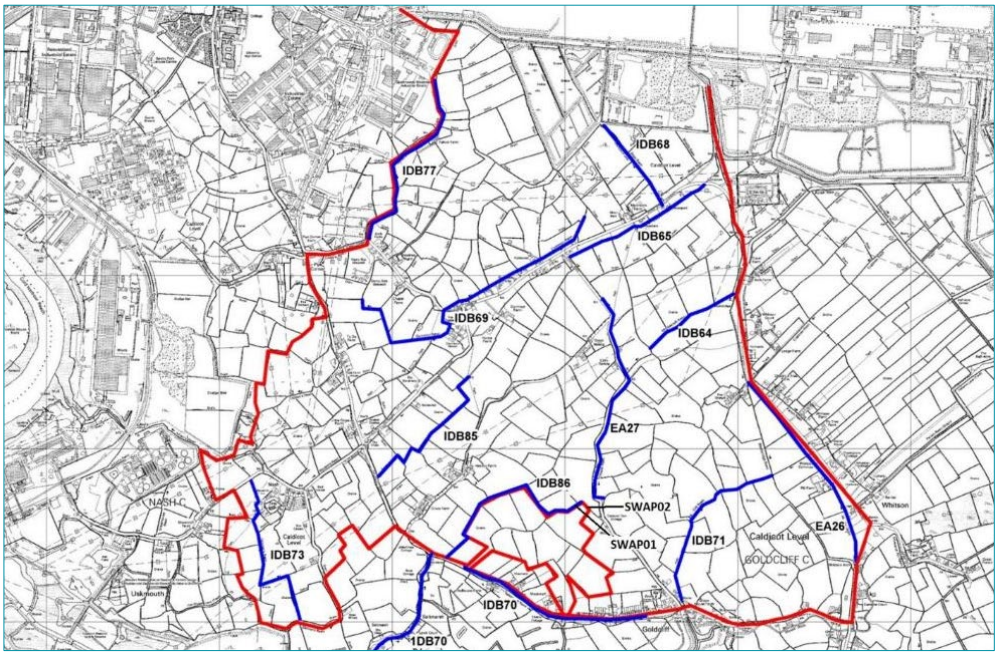

Figure 2. Nash & Goldcliff SSSI 2022 sample stations.

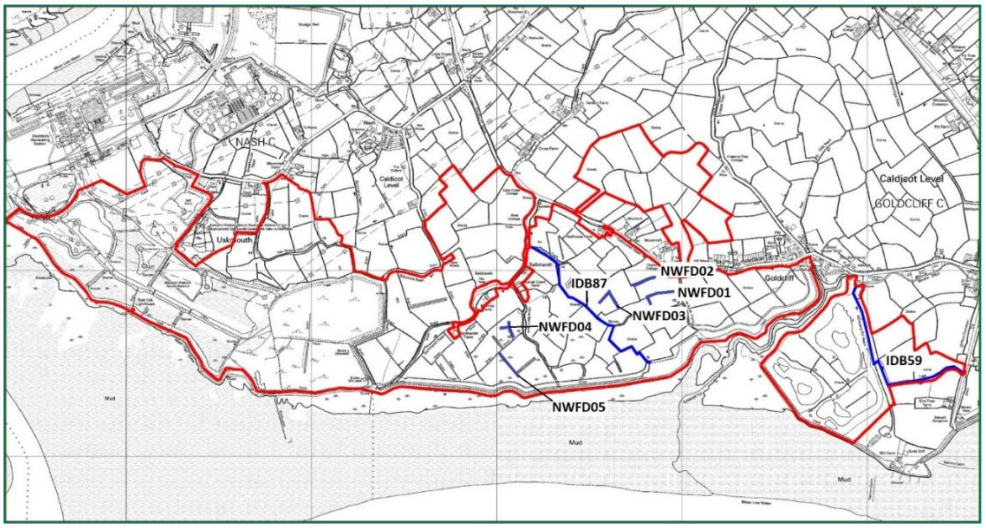

Figure 3. Newport Wetlands SSSI 2022 sample stations.

Table 6. Nash & Goldcliff SSSI 2022 sample stations.

Sample station	Sub-sample	Grid reference	Sample station	Sub-sample	Grid reference
EA26	EA26A	ST3767283405	**IDB70**	IDB70B	ST3544783300
-	EA26B	ST3734784039	-	IDB70C	ST3698982991
-	EA26C	ST3716384265	**IDB71**	IDB71A	ST3690983770
EA27	EA27A	ST3636684376	-	IDB71B	ST3672783546
-	EA27B	ST3620684050	-	IDB71C	ST3668283426
-	EA27C	ST3628084769	**IDB73**	IDB73A	ST3420283604
IDB64	IDB64A	ST3655784647	-	IDB73B	ST3421383759
-	IDB64B	ST3658384662	-	IDB73C	ST3434883254
-	IDB64C	ST3682384826	**IDB77**	IDB77A	ST3527286054

Sample station	Sub-sample	Grid reference	Sample station	Sub-sample	Grid reference
IDB65	IDB65A	ST3668885452	**-**	IDB77B	ST3526485966
-	IDB65B	ST3639585291	**-**	IDB77C	ST3502185439
-	IDB65C	ST3624285220	**IDB85**	IDB85A	ST3502083944
IDB68	IDB68A	ST3638085702	**-**	IDB85B	ST3530484160
-	IDB68B	ST3645185615	**-**	IDB85C	ST3541184316
-	IDB68C	ST3652685110	**IDB86**	IDB86A	ST3599883633
IDB69	IDB69A	ST3501484619	**-**	IDB86B	ST3586283655
-	IDB69B	ST3522984653	**-**	IDB86C	ST3540283450
-	IDB69C	ST3608285254	**-**	SWAP01	ST3604383652
IDB70	IDB70A	ST3583883059	**-**	SWAP02	ST3611883674

Table 7. Newport Wetlands SSSI 2022 sample stations.

Sample station	Sub-sample	Grid reference	Sample station	Sub-sample	Grid reference
IDB59	IDB59A	ST3738582433	**NWFD01-03**	NWFD01	ST3579982845
-	IDB59B	ST3699882651	**-**	NWFD02	ST3577582927
-	IDB59C	ST3695082818	**-**	NWFD03	ST3561382851
IDB87	IDB87A	ST3579182527	**NWFD04-05**	NWFD04	ST3500982703
-	IDB87B	ST3558382726	**-**	NWFD05	ST3506882519
-	IDB87C	ST3546082819	**-**	-	-

The site quality metric developed by Palmer *et al.* (2013) has been calculated. This allocates a score to each aquatic invertebrate species based on its rarity in the UK, then calculates the average (the Species Quality Index or SQI) for the pooled sub-samples from each of the sample stations shown in Tables 6 and 7. Note that IDB85, where the drying out of the reen prevented collection of adequate data, and the two Swaplands samples (SWAP01 and 02) that were collected in their stead, have been excluded from this analysis.

The SQI metric gives a Conservation Status score of 1 to 5, which is assigned as follows:

Conservation Status Score 5: - Habitats Directive Annex II and/or IV; WCA Schedule 5; Red List CR, EN, VU (revised assessments); Red Data Book (RDB) 1 – EN (Endangered) or RDB2 – VU (Vulnerable) (unrevised lists).

Conservation Status Score 4: - Red List NT - NearThreatened and DD - Data Deficient (revised assessments); RDB3 – Rare, RDBI – Indeterminate and RDBK – Unknown (unrevised lists).

Conservation Status Score 3: - Nationally Scarce (N, NS, Nationally Notable Na and Nb).

Conservation Status Score 2: - Local.

Conservation Status Score 1: - None of the above (common).

Where multiple categories apply to a species, the highest score is used, not the sum of the scores. The Invertebrate Conservation Status Score (CSS) for a sample or a wetland is

obtained by adding together all the individual species scores. This is then divided by the number of native species recorded in the sample (Species Richness Score; SRS) to give the SQI. Non-native taxa (the snail *Potamopyrgus antipodarum* and the freshwater shrimp *Crangonyx pseudogracilis*) are not used when calculating any of these metrics. Also, if a sample contains fewer than ten invertebrate taxa the SQI should not be calculated.

The invertebrate Habitat Quality Score (HQS), which was the mean of Marsh Fidelity Scores (MFS) for all the species present, was also calculated for the 2012 dataset. However, this has been dropped from later versions of the Buglife methodology, as it gave little additional information to the SQS and it has therefore not been employed here. This is because almost all the 'faithful' species are also uncommon, so the two metrics are not independent. Nevertheless, for interest the Marsh Fidelity Scores for all species recorded here in 2022 are given in the checklist (Table 8), as it provides an additional indicator of high quality aquatic habitat.

3. Results

Tables 8 and 9 provide a summary of the results of the 2022 monitoring exercise. Table 8 lists all of the invertebrate species recorded during the 2022 survey, 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*. (2013). Following on from this, Table 9 gives the Species Richness Score (SRS), Conservation Status Score (CSS) and Species Quality Index (SQI) for all of the sample stations. Note that all the scores for the main reens are arrived at by pooling the results from the three sub-samples collected at each station. The field ditch figures are the result of pooling three and two samples and so the latter is not strictly comparable with the data collected from the main reens.

Totals of 97 and 69 species were recorded on Nash & Goldcliff and Newport Wetlands respectively, including four species – *Dytiscus dimidiatus*, *Hydaticus transversalis*, *Hydrophilus piceus* and *Odontomyia ornata* – which are SSSI individually qualifying species (Tables 8, 10 & 11).

Table 8. Checklist of aquatic and wetland invertebrates recorded on Nash & Goldcliff SSSI and Newport Wetlands SSSI in 2022. NT = Near Threatened; NS = Nationally Scarce

Species	English name	MFS/CSS	Status	Sample stations
Bithynia tentaculata	Common Bithynia	1/1	-	EA26,27; IDB59,64,65,69,70,71,73,86; NWFD04-05
Potamopyrgus antipodarum	Jenkin's Spire Snail	Alien	-	IDB70
Lymnaea stagnalis	Great Pond Snail	1/1	-	EA26,27; IDB59,64,65,70,73,86,87; NWFD01-03, 04-05
Lymnaea palustris agg	Marsh Pond Snail	1/1	-	EA26
Radix balthica	Wandering Pond Snail	1/1	-	EA26,27; IDB59,64,65,68,69,70,71,73,77,86, 87; NWFD01-03, 04-05
Physa fontinalis	Common Bladder Snail	1/1	-	EA26,27; IDB64,65,68,69,70,71,73,86,87; NWFD01-03, 04-05
Anisus vortex	Whirlpool Ram's-horn Snail	1/1	-	EA26,27; IDB59,64,65,68,69,70,71,73,77,86, 87; NWFD01-03, 04-05

Species	English name	MFS/CSS	Status	Sample stations
Hippeutis complanatus	Flat Ram's-horn Snail	1/2	-	IDB59
Planorbarius corneus	Great Ram's-horn Snail	1/1	-	EA26,27; IDB59,64,65,68,69,70,71,73,86
Planorbis planorbis	Margined Ram's-horn Snail	1/1	-	EA27; IDB59,64,65,68,69,70,71,73,77,86, 87; NWFD01-03, 04-05
Sphaerium corneum	Horny Orb Mussel	1/1	-	EA26,27; IDB65,69,77,87
Sphaerium lacustre	Lake Orb Mussel	1/1	-	IDB68,69,70,86
Dugesia lugubris	a flatworm	n/a	-	EA26
Theromyzon tessulatum	Duck Leech	1/1	-	EA27; IDB59,64,65,68,69,70,71,86,87; NWFD01-03
Hemiclepsis marginata	a leech	1/2	-	EA26
Glossiphonia complanata	a leech	1/1	-	IDB59,68
Glossiphonia paludosa	a leech	1/2	-	IDB65
Erpobdella testacea	a leech	1/2	-	EA26; IDB59,64,65,68,69,70,73,77,86; NWFD01-03
Erpobdella octoculata	a leech	1/1	-	EA26,27; IDB68,69,71,77
Brachytron pratense	Hairy Dragonfly	2/2	-	IDB65,86; NWFD04-05
Aeshna cyanea	Southern Hawker	1/1	-	EA26
Aeshna mixta	Migrant Hawker	1/2	-	EA26; IDB59,64,68,86; NWFD01-03, 04-05
Sympetrum striolatum	Common Darter	1/1	-	EA26,27; IDB64,68,86; NWFD01-03, 04-05
Mesovelia furcata	a mesoveliid water bug	1/2	-	IDB69; NWFD01-03
Hydrometra stagnorum	Common Water Measurer	1/1	-	EA26; IDB59,73
Microvelia reticulata	a veliid water bug	1/1	-	IDB65,86,87; NWFD01-03, 04-05
Gerris lacustris	a pond skater	1/1	-	EA26; IDB64,65,69; NWFD01-03
Gerris odontogaster	a pond skater	1/1	-	IDB86; NWFD01-03
Nepa cinerea	Water Scorpion	1/1	-	IDB64,65
Ilyocoris cimicoides	Saucer Bug	1/1	-	EA26,27; IDB59,64,65,68,69,70,71,73,86,87; NWFD01-03, 04-05
Notonecta glauca	Common Backswimmer	1/1	-	EA27; IDB59,64,65,69,70,71,73,87; NWFD01-03, 04-05
Notonecta marmorea viridis	a backswimmer	1/1	-	IDB73,87; NWFD01-03
Plea minutissima	a pleid water boatman	1/1	-	EA27; IDB59,64,65,68,69,70,73,86; NWFD01-03, 04-05
Corixa punctata	a water boatman	1/1	-	EA27; IDB86,87; NWFD01-03
Corixa affinis	a water boatman	1/2	**NS**	IDB59,87; NWFD01-03
Hespercorixa linnaei	a lesser water boatman	1/1	-	EA27; IDB64,68,69,70,73,86,87; NWFD01-03
Hespercorixa sahlbergi	a lesser water boatman	1/1	-	IDB64,70,73,87
Sigara dorsalis	a lesser water boatman	1/1	-	IDB87; NWFD01-03
Sigara falleni	a lesser water boatman	1/1	-	NWFD01-03
Peltodytes caesus	a haliplid water beetle	3/3	**NS**	EA27; IDB65,87; NWFD01-03
Haliplus heydeni	a haliplid water beetle	1/2	-	IDB69
Haliplus ruficollis	a haliplid water beetle	1/1	-	EA26,27; IDB59,68,69,70,71,73,86,87; NWFD01-03, 04-05
Haliplus sibiricus	a haliplid water beetle	1/1	-	EA26; IDB59,64,71
Haliplus flavicollis	a haliplid water beetle	1/2	-	EA27; IDB86

Species	English name	MFS/CSS	Status	Sample stations
Haliplus lineatocollis	a haliplid water beetle	1/1	-	EA26,27; IDB59,64,65,70,71
Noterus clavicornis	a diving beetle	1/1	-	EA27; IDB59,64,65,69,70,71,86,87; NWFD01-03, 04-05
Hygrobia hermanni	Screech Beetle	1/2	-	NWFD01-03
Agabus sturmii	a diving beetle	1/1	-	IDB68
Agabus bipustulatus	a diving beetle	1/1	-	IDB65,71,73,77,86,87
Agabus nebulosus	a diving beetle	1/1	-	IDB65,71; NWFD01-03
Ilybius montanus	a diving beetle	1/1	-	IDB68
Ilybius quadriguttatus	a diving beetle	2/2	-	IDB73,86
Colymbetes fuscus	a diving beetle	1/1	-	IDB65,73,86,87; NWFD01-03, 04-05
Nartus grapii	a diving beetle	2/2	-	IDB59,86
Rhantus suturalis	a diving beetle	2/2	-	EA27; IDB59,69,73
Liopterus haemorrhoidalis	a diving beetle	1/2	-	EA27; IDB65
Laccophilus hyalinus	a diving beetle	1/2	-	EA26
Laccophilus minutus	a diving beetle	2/1	-	IDB59,86,87
Dytiscus dimidiatus	King Diving Beetle	1/4	**NT/NS**	IDB87
Dytiscus marginalis	a great diving beetle	1/1	-	IDB65
Dytiscus semisulcatus	a great diving beetle	1/2	-	IDB73
Hydaticus transversalis	a diving beetle	3/3	**NS**	IDB87; NWFD04-05
Hydroporus angustatus	a diving beetle	1/1	-	EA27; IDB68,69,70,71,86,87
Hydroporus incognitus	a diving beetle	1/1	-	EA27; IDB64,65,69
Hydroporus palustris	a diving beetle	1/1	-	EA27; IDB59,65,69,70,71,73,77,86; NWFD04-05
Hydroporus planus	a diving beetle	1/1	-	IDB59,68
Hydroporus pubescens	a diving beetle	1/1	-	IDB59,70,73,87
Hydroporus tessellatus	a diving beetle	1/1	-	IDB70,71,73
Graptodytes pictus	a diving beetle	2/2	-	EA26,27; IDB59,65,73,86
Porhydrus lineatus	a diving beetle	1/2	-	IDB73,87; NWFD04-05
Hygrotus inaequalis	a diving beetle	1/1	-	IDB59,65,68,69,70,73,87; NWFD01-03
Hyphydrus ovatus	a diving beetle	1/1	-	IDB69,70,71,73,87; NWFD04-05
Hydroglyphus geminus	a diving beetle	1/2	-	IDB59,68
Helophorus brevipalpis	a helophorid water beetle	1/1	-	EA27
Helophorus minutus	a helophorid water beetle	1/1	-	EA27; IDB70
Berosus affinis	a hydrophilid water beetle	3/2	-	IDB59,64,70,87; NWFD01-3, 04-05
Laccobius bipunctatus	a hydrophilid water beetle	1/1	-	EA26,27; IDB59,64,65,69,71,77
Hydrophilus piceus	Great Silver Water Beetle	3/4	**NT/NS**	IDB65,86; NWFD01-03
Hydrobius fuscipes ss	a hydrophilid water beetle	1/1	-	IDB87
Anacaena globulus	a hydrophilid water beetle	1/1	-	EA26; IDB68,69,70,86
Anacaena limbata	a hydrophilid water beetle	1/1	-	EA27; IDB59,64,65,69,70,71,86,87
Anacaena lutescens	a hydrophilid water beetle	1/1	-	EA27
Cymbiodyta marginella	a hydrophilid water beetle	1/2	-	IDB59,70,77; NWFD04-05
Enochrus ochropterus	a hydrophilid water beetle	1/2	-	IDB68,77
Enochrus testaceus	a hydrophilid water beetle	1/2	-	IDB71,77

Species	English name	MFS/CSS	Status	Sample stations
Enochrus coarctatus	a hydrophilid water beetle	2/2	-	IDB86
Helochares lividus	a hydrophilid water beetle	2/2	-	IDB59,65,71,77,87; NWFD01-03
Hydraena riparia	a hydraenid water beetle	1/2	-	EA26; IDB59,70
Ochthebius minimus	a hydraenid water beetle	1/1	-	EA26,27; IDB59,64,65,71,87; NWFD01-03
Deinopsis erosa	a rove beetle	n/a	-	IDB70
Thinonoma atra	a rove beetle	n/a	-	IDB86
Anotylus clypeonitens	a rove beetle	n/a	**NT/NS**	IDB73
Stenus latifrons	a rove beetle	n/a	-	EA27
Stenus butrintensis	a rove beetle	n/a	**NS**	EA27
Paederus riparius	a rove beetle	n/a	-	IDB64
Scirtes orbicularis	a marsh beetle	n/a	**NS**	IDB77
Dryops luridus	a long-toed water beetle	n/a	-	EA26; IDB70,87; NWFD01-03, 04-05
Anthocomus rufus	a melyrid beetle	n/a	-	NWFD01-03
Phalacrus caricis	a phalacrid beetle	n/a	-	IDB87
Coccidula rufa	a ladybird	n/a	-	EA26,27
Tanysphyrus lemnae	an errirhinid weevil	n/a	-	EA26,27; IDB64,65
Odontomyia ornata	Ornate Brigadier soldierfly	3/5	**NS**	EA27; IDB59,65,69; NWFD01-03, 04-05
Stratiomys singularior	Flecked General soldierfly	2/3	-	IDB86
Elachiptera brevipennis	a chloropid fly	n/a	-	EA27
Crangonyx pseudogracilis	a freshwater shrimp	Alien	-	EA26,27; IDB59,64,65,68,69,70,71,73,77,85, 86,87; NWFD01-03, 04-05
Asellus aquaticus	a water louse	1/1	-	EA26,27; IDB64,68,69,70,71,77,87; NWFD04-05
Asellus meridianus	a water louse	1/1	-	EA26,27; IDB77; NWFD01-03

Table 9. Species Richness Score (SRS), Conservation Status Score (CSS) and Species Quality Index (SQI) metrics for aquatic invertebrates on Nash & Goldcliff SSSI and Newport Wetlands SSSI in both 2012 and 2022.

Nash & Goldcliff SSSI

Sample station	SRS 2012	SRS 2022	CSS 2012	CSS 2022	SQI 2012	SQI 2022
EA26	25	30	27	36	1.08	**1.2**
EA27	41	35	57	46	1.39	**1.31**
IDB64	28	26	34	29	1.21	**1.11**
IDB65	32	39	40	54	1.25	**1.38**
IDB68	30	25	37	29	1.23	**1.16**
IDB69	36	32	46	39	1.28	**1.22**
IDB70	30	32	36	36	1.2	**1.12**
IDB71	34	26	38	28	1.12	**1.08**
IDB73	42	28	54	34	1.28	**1.21**
IDB77	24	15	28	19	1.17	**1.27**
IDB85	n/a	n/a	n/a	n/a	n/a	n/a
IDB86	32	38	34	51	1.06	**1.34**

Newport Wetlands SSSI

Sample station	SRS 2012	SRS 2022	CSS 2012	CSS 2022	SQI 2012	SQI 2022
IDB59	33	38	40	53	1.21	**1.32**
IDB87	30	36	42	47	1.4	**1.31**
NWFD01-03	39	37	53	50	1.34	**1.35**
NWFD04-05	27	24	36	33	1.33	**1.37**

Of the 93 key species included in the Nash & Goldcliff assemblage, 29 were recorded in 2022 (Tables 10 & 11). However, if only aquatic species are considered and those taxa not targeted by the survey excluded (e.g. mayflies, moths and snail-killing flies), 29 of 66 species (44%) were recorded. The equivalent for Newport Wetlands was 21 of 57 species (37%). These were associated with six main habitats.

Table 10. Key assemblage species recorded on Nash & Goldcliff and Newport Wetlands in 2022 and their habitat association.

Area	Nash & Goldcliff	Newport Wetlands
All Species	97	69
SSSI Qualifying Species	2	4
Key SSSI Assemblage Species	29	21
Habitats	-	-
Bare Clay	4	4
Brackish	1	1
Leaf Litter	1	0
Lemna Mat	3	2
Submerged Vegetation	19	14
Tall Fen	1	0
Total	29	21

Table 11. Checklist of key assemblage species recorded on Nash & Goldcliff and Newport Wetlands in 2022. x = presence.

Species	Nash & Goldcliff	Newport Wetlands	SSSI Q feature	Habitat
Berosus affinis	x	x	-	Bare Clay
Brachytron pratense	x	x	-	Submerged Vegetation
Corixa affinis	-	x	-	Brackish
Cymbiodyta marginella	x	x	-	Submerged Vegetation
Dytiscus dimidiatus	-	x	x	Submerged Vegetation
Dytiscus marginalis	x	-	-	Submerged Vegetation
Enochrus coarctatus	x	-	-	Submerged Vegetation
Enochrus testaceus	x	-	-	Leaf Litter
Glossiphonia paludosa	x	-	-	Submerged Vegetation
Graptodytes pictus	x	x	-	Submerged Vegetation
Haliplus flavicollis	x	-	-	Submerged Vegetation
Haliplus heydeni	x	-	-	Submerged Vegetation
Helochares lividus	x	x	-	Bare Clay
Hemiclepsis marginata	x	-	-	Submerged Vegetation
Hippeutis complanatus	-	x	-	Submerged Vegetation
Hydaticus transversalis	-	x	x	Submerged Vegetation

Species	Nash & Goldcliff	Newport Wetlands	SSSI Q feature	Habitat
Hydroglyphus geminus	x	x	-	Bare Clay
Hydrophilus piceus	x	x	x	Bare Clay
Ilybius quadriguttatus	x	-	-	Submerged Vegetation
Ilyocoris cimicoides	x	x	-	Submerged Vegetation
Laccophilus minutus	x	x	-	Submerged Vegetation
Liopterus haemorrhoidalis	x	-	-	Submerged Vegetation
Mesovelia furcata	x	x	-	Lemna Mat
Nartus grapii	x	x	-	Submerged Vegetation
Odontomyia ornata	x	x	x	Lemna Mat
Peltodytes caesus	x	x	-	Submerged Vegetation
Planorbarius corneus	x	x	-	Submerged Vegetation
Planorbis planorbis	x	x	-	Submerged Vegetation
Porhydrus lineatus	x	x	-	Submerged Vegetation
Rhantus suturalis	x	x	-	Submerged Vegetation
Scirtes orbicularis	x	-	-	Tall Fen
Stratiomys singularior	x	-	-	Brackish
Tanysphyrus lemnae	x	-	-	Lemna Mat
Total	**29**	**21**	-	-

3.1. Species profiles

Eight invertebrate species with a formal conservation status were recorded at Nash & Goldcliff SSSI and Newport Wetlands SSSI in 2022. The relevant status categories are defined as follows:

NT (GB) – GB Red List, Near Threatened. A taxon is Near Threatened when its GB populations have been evaluated against the IUCN criteria and it does not currently qualify for Critically Endangered, Endangered or Vulnerable status, but is close to qualifying, or is likely to do so soon.

N – Nationally Scarce. Taxa which are estimated to occur within the range of 16 to 100 10km squares, but where division into Na or Nb status has not been attempted due to limited availability of information on British distribution. Second status review not yet completed and status therefore taken from first review.

NS – Nationally Scarce. In more recent second status reviews, the Na and Nb sub-divisions have been subsumed into a single category covering species occurring in 16 to 100 10km squares of the National Grid. Unlike the previous 'N' category, which covered the same range, the amalgamation does not necessarily result from inadequate information on the British distribution.

3.1.1 A water boatman *Corixa affinis* Leach, 1817. NS.

There are five British species of *Corixa*. At 8 to 9 mm, *C. affinis* is the smallest British member of the genus and the light lines on the hemielytra are usually broader than the dark lines. Confirmation of its identity is provided by microscopic examination of the male palae and parameres. It is very locally distributed in both fresh and brackish pools and ditches around the coast of Britain as far north as Anglesey and south Yorkshire, though the majority of sites are in south-eastern England and East Anglia. Most sites are in coastal grazing marsh ditches and pools but there are also a few inland localities in southern England. In Wales, it is known from a few sites on the Gwent Levels (including

Newport Wetlands, where it was recorded in the previous 2012 survey). It was again recorded on Newport Wetlands in 2022, in ditches IDB59 and IDB87 and also in field ditch NWFD01.

3.1.2 A water beetle *Peltodytes caesus* (Duftschmid, 1805). NS.

P. caesus is a small, yellow-brown haliplid water beetle with diagnostic pointed tips to the coxal processes and a very heavily punctured upper surface. It is a very characteristic species of coastal grazing marshes, where it favours well-vegetated ditches with a soft muddy bottom. It can also be found less frequently in nutrient-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 southern species that has not been found north of Lancashire. Most recent records are from grazing marsh ditches in south-east England and East Anglia, with strong outlying populations on the Gwent and Somerset Levels. The Gwent Levels still has good populations of *P. caesus* in open ditches with abundant submerged macrophytes. It was recorded quite widely on both Nash & Goldcliff and Newport Wetlands in 2012 and in 2022, there were records from EA27, IDB65, IDB87 and NWFD03.

3.1.3 King Diving Beetle *Dytiscus dimidiatus* Bergsträsser, 1777. NT/NS.

This is the largest of the six British great diving beetles in the genus *Dytiscus*. It can be distinguished from the other members of the genus by a combination of its large size, the presence of yellow margins on only the lateral margins of the pronotum, the reddish-brown colouration of its underside and the blunt, rounded processes on its hind coxae. *D. dimidiatus* is a rare species, largely confined to the Somerset and Gwent Levels, the Sussex and Kent grazing marshes and the Fens and Broads of East Anglia. There may be a preference for waterbodies that are at least partially shaded. Both larvae and adults are predators that feed on a wide range of aquatic invertebrates. Most records come from high quality grazing marsh and fen habitats. It is a qualifying feature on five of the eight SSSIs - Magor Marsh, Newport Wetlands, Rumney & Peterstone, St. Brides and Whitson. In 2022, a single male was found in a late-successional ditch (IDB87C) on Newport Wetlands. It was not recorded during the 2012 survey of these two SSSIs.

3.1.4 A diving beetle *Hydaticus transversalis* (Pontoppidan, 1763). NS.

The yellow sides and transverse lines across the base of the wing cases and the black basal crescent on the otherwise orange-yellow thorax make this medium-sized black diving beetle unmistakeable. It favours open, late-successional pools and ditches with abundant aquatic vegetation 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 now just a few isolated colonies and it has certainly become extinct in some former breeding areas. It is a qualifying feature on six of the eight SSSIs - Nash & Goldcliff, Newport Wetlands, Redwick & Llandevenny, Rumney & Peterstone, St. Brides and Whitson. Adults were collected in late-successional ditches on Newport Wetlands SSSI (IDB87; NWFD05) in 2022. It was not recorded at either of these SSSIs during the 2012 survey.

3.1.5 Great Silver Water Beetle *Hydrophilus piceus* (Linnaeus, 1758). NT/NS.

H. piceus is an unmistakeable insect, as both an adult and well-grown larva, on account of its very large size. Adults may reach nearly 50 cm, which makes them the largest British beetle. It is a rare species, 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, leaving 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 much wider range of still water habitats. It is a qualifying feature on seven of the eight SSSIs - Magor Marsh, Magor & Undy, Nash & Goldcliff, Newport Wetlands, Redwick & Llandevenny, St. Brides and Whitson. It was found in 2022 in ditches IDB65, IDB86 on Nash & Goldcliff and in field ditches NWFD01 and NWFD03 on Newport Wetlands.

3.1.6 A rove beetle *Stenus butrintensis* Smetana, 1959. N.

The sub-genus *Metatesnus* includes a number of mid-sized black rove beetles, with grey-white hairs covering much of the body and short, strongly lobed tarsi. Like the very similar, and much commoner *S. pallitarsis*, *S. butrintensis* has yellow tarsi, and it is most readily distinguished by the form of the male genitalia and the female infundibulum. It has a very scattered distribution across southern England, with most sites being in the south-east. It is usually found in tall fen habitat, particularly in stands of greater reedmace *Typha latifolia*, where it is often to be found inside the leaf sheaths. A female was collected in the aquatic sample from Nash & Goldcliff in ditch EA27.

3.1.7 A marsh beetle *Scirtes orbicularis* (Panzer, 1793). NS.

There are two British species of *Scirtes*, both of which have a broad, rounded body form, long spurs on the hind tibiae and strongly swollen hind femora that enable them to hop. *S. orbicularis* can be distinguished from the commoner *S. hemisphaericus* by having rugose,

confluent elytral puncturation and a more yellow-brown ground colour. Larvae are aquatic, occurring in fenland pools and grazing marsh ditches. It is a very scarce species which is confined to a few areas of lowland fen and grazing marsh in southern England. In Wales, it has only ever been found on the Gwent Levels. Its British strongholds are here, on the Somerset Levels, Norfolk Broads and on the coastal grazing marshes of east Sussex and west Kent. It was formerly known from the marshes around the Thames estuary but has not been recorded from these sites recently. In 2022, it was recorded from Nash & Goldcliff, in ditch IDB77 (where it was also recorded in 2012).

3.1.8 Ornate Brigadier soldierfly *Odontomyia ornata* (Meigen, 1822). RDB2.

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. It shows a strong affinity with grazing marsh ditches, though there are a very few colonies at inland fen sites. The main British strongholds of the Ornate Brigadier 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. It is a qualifying feature on all eight Gwent Levels SSSIs. Larvae were recorded quite widely in 2022, from ditches EA27, IDB65 and IDB69 on Nash & Goldcliff and from ditch IDB59 and field ditches NWFD03 and NWFD05 on Newport Wetlands.

4. Discussion

The results presented in Table 9 suggest there has been very little change in the aquatic invertebrate assemblage present in ditches on both Nash & Goldcliff SSSI and Newport Wetlands SSSI over the 10-year period from 2012 to 2022. The mean of the SQI scores for 2022 on Nash & Goldcliff and Newport Wetlands are 1.22 and 1.34 respectively, which are very similar to the values of 1.21 and 1.32 achieved in 2012.

The two SSSIs continue to support populations of important aquatic invertebrates such as the haliplid water beetle *Peltodytes caesus*, the Great Silver Water Beetle and the Ornate Brigadier soldierfly.

Table 12 provides a comparison between the SQI scores achieved at Malltraeth with those from recent surveys by the author of other grazing marsh ditch systems in Britain. It clearly shows that the SQI scores on Nash & Goldcliff and Newport Wetlands are lower than those from other grazing marsh ditch systems in Britain and there are clearly a number of negative factors that continue to operate on these sites, as elsewhere on the Gwent Levels. Chief amongst these are eutrophication and/or pollution of the reens and unsympathetic management such as the fencing off of the reens, resulting in increased shading by tall emergent vegetation and scrub and the steep bank profiles created when

the reens are cast. These issues are less of a factor on Newport Wetlands SSSI, which is generally well managed, with open, cattle grazed ditch margins that have shallow bank profiles. However, some of the reens here, particularly the widened field ditches (NWFD01-05), are now becoming very choked with dense emergent vegetation and scrub. This has allowed them to be colonized by important late-successional specialists such as the King Diving Beetle and the diving beetle *Hydaticus transversalis* but it is necessary to begin a programme of rotational clearance to prevent them from becoming completely choked with vegetation and drying out, as was the case with NWFD04 when it was visited in 2022.

Table 12. Mean Species Quality Index (SQI) metrics for aquatic invertebrates on selected grazing marsh levels in Britain.

Site	SQI	Source
Pevensey Levels SSSI, East Sussex	1.66	Boyce, 2018
Malltraeth Marsh SSSI, Anglesey	1.44	Boyce & Fowles, 2017
Newport Wetlands SSSI 2012/2022	1.32/1.34	Boyce, 2022
Gordano Valley SSSI, Somerset	1.31	Boyce, 2021b
Wet Moor SSSI, Somerset	1.27	Boyce, 2021b
Bridgwater Bay NNR, 2021	1.27	Boyce, 2021a
Nash & Goldcliff SSSI 2012/2022	1.21/1.22	Boyce, 2022

Given that sampling was undertaken at a small number of sampling stations over a six day period in late September, the number of aquatic species included in the reen invertebrate assemblages was high, 29 of 66 (44%) on Nash & Goldcliff and 21 of 57 (37%) on Newport Wetlands. This suggests that this sampling protocol provides an accurate representation of the aquatic fauna, and that these percentages may provide a measure of assemblage condition.

5. Recommendations

Continue sympathetic management practices on Newport Wetlands such as allowing access for grazing stock to promote open ditch margins with shallow bank profiles (see image for Sub-sample NWFD02 in Appendix 1). Similar management should be adopted on Nash & Goldcliff SSSI and other Gwent Levels SSSI to provide early-successional conditions.

A programme of rotational clearance to prevent reens from becoming completely choked with vegetation and drying out should be undertaken on both Nash & Goldcliff and Newport Wetlands, whilst maintaining a proportion of late-successional reens for species such as King Diving Beetle and *Hydaticus transversalis*.

Consideration should be given to fence removal to allow livestock access, reprofiling steep banks to promote shallow margins and to excessive scrub removal whilst retaining old willows for species such as the Musk Beetle *Aromia moschata*.

In the longer term, eutrophication and pollution issues need to be addressed.

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Appendix 1. Sample station descriptions

Nash & Goldcliff EA26

Sample station EA26 was visited on 23rd September 2022. This is a large ditch with an appreciable flow and an open water column. There is no submerged vegetation but floating duckweeds and rafts of Floating Sweet-grass are frequent and there is a little emergent Reed Sweet-grass and Reed Canary-grass. The ditch is mostly open, with just a little shade cast from a Crack Willow in EA26C. Bank profiles vary from steep to moderate with the first two samples being open to stock grazing, which is resulting in light poaching of the ditch margins.

Sub-sample EA26A

Sub-sample EA26B

Sub-sample EA26C

Nash & Goldcliff EA27

Sample station EA27 was visited on 23rd September 2022. This is a large, open ditch that has a shallow, stock grazed and poached eastern bank and a steeper, unmanaged western bank with tall vegetation where it lies adjacent to Chapel Road. There is dense floating duckweeds, as well as abundant Frogbit and some rafts of Floating Sweet-grass. Submerged vegetation comprises beds of locally abundant Rigid Hornwort. The grazed eastern bank has a moderately to heavily poached marginal zone with a diverse emergent community dominated by Lesser Water-parsnip, Reed Sweet-grass and Branched Bur-reed.

Sub-sample EA27A

Sub-sample EA27B

Sub-sample EA27C

Nash & Goldcliff IDB64

Sample station IDB64 was surveyed on 23rd September 2022. This is a small reen with abundant submerged beds of Canadian Pondweed and occasional Rigid Hornwort. There is a dense floating mat of duckweed plus some Frogbit and a shallow-profiled, grazed and quite heavily poached, emergent fringe of Great and Floating Sweet-grass, Common Reed and Lesser Water-parsnip.

Sub-sample IDB64A

Sub-sample IDB64B

Sub-sample IDB64C

Nash & Goldcliff IDB65

Sample station IDB65 was surveyed on 24th September 2022. This is the Chapel Reen; a mid-sized macrophyte-rich ditch with abundant submerged beds of Canadian Pondweed and Rigid Hornwort. Duckweed becomes increasingly abundant towards the west, and there is a atall emergent Common Reed fringing the two more easterly sub-samples, while the last is open to grazing on both banks with a short, poached sward and shallow bank profiles.

Sub-sample IDB65A

Sub-sample IDB65B

Sub-sample IDB65C

Nash & Goldcliff IDB68

Sample station IDB68 was surveyed on 24th September 2022. This is the Elen Reen; a mid-sized rather dull ditch dominated by a thick floating mat of duckweed with just a little submerged Rigid Hornwort. Bank profiles are steep and the western bank is shaded by dense scrub and taller trees.

Sub-sample IDB68A

Sub-sample IDB68B

Sub-sample IDB68C

Nash & Goldcliff IDB69

Sample station IDB69 was surveyed on 27th September 2022. Vegetation cover is dominated by a thick mat of floating duckweed, though there were also some beds of Rigid Hornwort in the western part of this ditch. Banks were mostly open to grazing by stock, resulting in shallow, poached bank profiles with sparse fringing Floating Sweet-grass and emergent vegetation. The two more easterly sub-samples had some cover of Bramble, Hawthorn and other scrub along the banks of the reen.

Sub-sample IDB69A

Sub-sample IDB69B

Sub-sample IDB69C

Nash & Goldcliff IDB70

Sample station IDB70 was surveyed on 25th September 2022. It is an open, but deeply sunken ditch with steep, ungrazed bank profiles. There is frequent submerged growth of fine-leaved pondweeds, Canadian Pondweed and Rigid Hornwort. The water surface is dominated by a mat of duckweeds, with occasional to locally abundant leaves of Frogbit and there is a tall fringe of Common Reed, Sea Club-rush and Yellow Flag.

Sub-sample IDB70A

Sub-sample IDB70B

Sub-sample IDB70C

Nash & Goldcliff IDB71

Sample station IDB71 was surveyed on 23rd September 2022. This is the Clift Reen. Duckweed dominates the water surface but there are also locally abundant rafts of Frogbit. Submerged beds of Rigid Hornwort are abundant. Both banks have grazed, poached margins with shallow bank profiles and a low, open emergent fringe of Lesser Water-parsnip, Floating and Reed Sweet-grass, Reed Canary-grass and Common Reed. The banks are mostly open but there are some patchy stands of Hawthorn scrub.

Sub-sample IDB71A

Sub-sample IDB71B

Sub-sample IDB71C

Nash & Goldcliff IDB73

Sample station IDB73 was surveyed on 28th September 2022. This is a shallow, steep-profiled ditch with no significant stands of submerged or floating vegetation. Most of its length has been quite recently cleared out but there are some stands of tall emergent Branched Bur-reed and Greater Reedmace.

Sub-sample IDB73A

Sub-sample IDB73B

Sub-sample IDB73C

Nash & Goldcliff IDB77

Sample station IDB77 was surveyed on 24th September 2022. This is a small, recently cast ditch with little aquatic vegetation other than a dense floating mat of duckweed and a little marginal Floating Sweet-grass where there are shallower, cattle poached margins. Mostly open, but with some sections partially shaded by Hawthorn and other scrub.

Sub-sample IDB77A

Sub-sample IDB77B

Sub-sample IDB77C

Nash & Goldcliff IDB86

Sample station IDB86 was surveyed on 25th September 2022. A small, rather deeply cut ditch that nonetheless still had locally abundant beds of submerged Rigid Hornwort and Ivy-leaved Duckweed, plus patchy cover of floating duckweeds (mostly Great Duckweed). It has been quite recently cast and there were only patchy stands of tall emergent vegetation in which Greater Reedmace and Branched Bur-reed were the main constituents. This ditch was open to grazing on both banks.

Sub-sample IDB86A

Sub-sample IDB86B

Sub-sample IDB86C

Newport Wetlands IDB59

IDB59 lies within NRW's Newport Wetlands Reserve and was sampled on 26th September 2022. It has been quite recently cleared and has only patchy beds of submerged vegetation, a little floating duckweed and sparse emergent Branched Bur-reed.

Sub-sample IDB59A

Sub-sample IDB59B

Sub-sample IDB59C

Newport Wetlands IDB87

IDB87 lies within NRW's Newport Wetlands Reserve and was sampled on 26th September 2022. It is a late-successional ditch that is grazed and open on both banks. It has diverse submerged and floating vegetation that includes Rigid Hornwort, Ivy-leaved Duckweed and Frogbit with only sparse floating duckweeds. There is abundant tall emergent vegetation dominated by Common Reed.

Sub-sample IDB87A

Sub-sample IDB87B

Sub-sample IDB87C

Newport Wetlands NWFD01-03

The three easterly field ditches sampled in NRW's Newport Wetlands Reserve on 26th September 2022. Late-successional vegetation with abundant submerged and floating pondweeds, stonewort and Frogbit. The shallower bank is intensely grazed and poached but in deeper water there is dense growth of tall emergent Common Reed and Greater Reedmace.

Sub-sample NWFD01

Sub-sample NWFD02

Sub-sample NWFD03

Newport Wetlands NWFD04-05

The two westerly field ditches sampled in NRW's Newport Wetlands Reserve on 26th September 2022. NWFD04 had completely dried out, so both samples were taken from NWFD05, which had late-successional vegetation with abundant submerged beds of stonewort. The shallower bank is intensely grazed and poached but in deeper water there is dense growth of tall emergent Common Reed and Greater Reedmace.

Sub-sample NWFD04

Sub-sample NWFD05

Appendix 2. Key component species of the reen invertebrate assemblages on Nash & Goldcliff SSSI and Newport Wetlands SSSI. Species in red are individually qualifying species. NT = Near Threatened; NR = Nationally Rare; NS = Nationally Scarce; x = present.

Species	Order	Family	Status	NRW habitat	Aquatic/terrestrial	Nash & Goldcliff	Newport Wetlands
Agabus conspersus	Coleoptera	Dytiscidae	-	Brackish	Fully Aquatic	x	x
Anacaena bipustulata	Coleoptera	Hydrophilidae	-	Leaf Litter	Fully Aquatic	x	x
Anodonta cygnea	Unionoida	Unionidae	-	Bare Clay	Fully Aquatic	x	-
Aphrophora salicina	Hemiptera	Aphrophoridae	-	Scrub & Trees/Arboreal	Terrestrial	-	x
Argyroneta aquatica	Araneae	Cybaeidae		Submerged Vegetation	Fully Aquatic	x	-
Aromia moschata	Coleoptera	Cerambycidae	NS	Scrub & Trees/Saproxylic	Terrestrial	-	x
Bathyomphalus contortus	Hygrophila	Planorbidae	-	Submerged Vegetation	Fully Aquatic	x	x
Berosus affinis	Coleoptera	Hydrophilidae	-	Bare Clay	Fully Aquatic	x	x
Brachytron pratense	Odonata	Aeshnidae	-	Submerged Vegetation	Aquatic Larva	x	x
Caenis robusta	Ephemeroptera	Caenidae	-	Submerged Vegetation	Aquatic Larva	x	x
Cataclysta lemnata	Lepidoptera	Crambidae	-	Lemna Mat	Aquatic Larva	x	x
Cercyon convexiusculus	Coleoptera	Hydrophilidae	-	Leaf Litter	Fully Aquatic	x	x
Cercyon sternalis	Coleoptera	Hydrophilidae	-	Leaf Litter	Fully Aquatic	x	-
Cercyon ustulatus	Coleoptera	Hydrophilidae	-	Leaf Litter	Fully Aquatic	x	-
Chloriona unicolor	Hemiptera	Delphacidae	-	Tall Fen	Terrestrial	x	-
Colobaea punctata	Diptera	Sciomyzidae	NS	Mollusc Parasitoid	Aquatic Larva	-	x
Corixa affinis	Hemiptera	Corixidae	NS	Brackish	Fully Aquatic	-	x
Corixa panzeri	Hemiptera	Corixidae	-	Bare Clay	Fully Aquatic	x	x
Cymatia coleoptrata	Hemiptera	Corixidae	-	Submerged Vegetation	Fully Aquatic	x	x
Cymbiodyta marginellus	Coleoptera	Hydrophilidae	-	Submerged Vegetation	Fully Aquatic	x	x
Delphax pulchellus	Hemiptera	Delphacidae	-	Tall Fen	Terrestrial	x	-
Dictenidia bimaculata	Diptera	Tipulidae	-	Scrub & Trees/Saproxylic	Terrestrial	x	x
Donacia marginata	Coleoptera	Chrysomelidae	-	Emergent Vegetation	Terrestrial	x	x
Donacia semicuprea	Coleoptera	Chrysomelidae	-	Emergent Vegetation	Terrestrial	x	x
Dytiscus dimidiatus	Coleoptera	Dytiscidae	NT; NS	Submerged Vegetation	Fully Aquatic	x	x
Dytiscus marginalis	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x

Species	Order	Family	Status	NRW habitat	Aquatic/terrestrial	Nash & Goldcliff	Newport Wetlands
Elgiva solicita	Diptera	Sciomyzidae	-	Mollusc Parasitoid	Aquatic Larva	x	x
Enochrus coarctatus	Coleoptera	Hydrophilidae	-	Submerged Vegetation	Fully Aquatic	x	x
Enochrus melanocephalus	Coleoptera	Hydrophilidae	-	Leaf Litter	Fully Aquatic	x	x
Enochrus testaceus	Coleoptera	Hydrophilidae	-	Leaf Litter	Fully Aquatic	x	x
Eriogaster lanestris	Lepidoptera	Lasiocampidae	NR	Scrub & Trees/Arboreal	Terrestrial	x	x
Eupterycyba jucunda	Hemiptera	Cicadellidae	-	Scrub & Trees/Arboreal	Terrestrial	x	-
Fredegunda diluta	Hymenoptera	Ichneumonidae	-	Tall Fen	Terrestrial	-	x
Galerucella grisescens	Coleoptera	Chrysomelidae	-	Emergent Vegetation	Amphibious	-	x
Gerris lateralis	Hemiptera	Gerridae	-	Submerged Vegetation	Fully Aquatic	x	x
Gracilia minuta	Coleoptera	Cerambycidae	NR	Scrub & Trees/Saproxylic	Terrestrial	x	x
Graptodytes pictus	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x
Gymnetron villosulum	Coleoptera	Curculionidae	NS	Emergent Vegetation	Terrestrial	-	x
Gyraulus laevis	Hygrophila	Planorbidae	NS	Bare Clay	Fully Aquatic	x	x
Gyrinus caspius	Coleoptera	Gyrinidae	-	Brackish	Fully Aquatic	-	x
Haliplus apicalis	Coleoptera	Haliplidae	-	Brackish	Fully Aquatic	x	-
Haliplus flavicollis	Coleoptera	Haliplidae	-	Submerged Vegetation	Fully Aquatic	x	-
Haliplus heydeni	Coleoptera	Haliplidae	-	Submerged Vegetation	Fully Aquatic	x	x
Haliplus immaculatus	Coleoptera	Haliplidae	-	Brackish	Fully Aquatic	x	x
Helochares lividus	Coleoptera	Hydrophilidae	-	Bare Clay	Fully Aquatic	x	x
Helophorus granularis	Coleoptera	Helophoridae	-	Submerged Vegetation	Fully Aquatic	x	-
Helophorus griseus	Coleoptera	Helophoridae	-	Bare Clay	Fully Aquatic	x	x
Hemiclepsis marginata	Rhynchobdellida	Glossiphoniidae	-	Submerged Vegetation	Fully Aquatic	x	-
Hippeutis complanatus	Hygrophila	Planorbidae	-	Submerged Vegetation	Fully Aquatic	x	x
Hydaticus transversalis	Coleoptera	Dytiscidae	NS	Submerged Vegetation	Fully Aquatic	x	x
Hydrellia albilabris	Diptera	Ephydridae	-	Lemna Mat	Amphibious Larva	x	x
Hydrochus angustatus	Coleoptera	Hydrophilidae	NS	Submerged Vegetation	Fully Aquatic	x	x
Hydroglyphus geminus	Coleoptera	Dytiscidae	-	Bare Clay	Fully Aquatic	x	x
Hydrophilus piceus	Coleoptera	Hydrophilidae	NT; NS	Bare Clay	Fully Aquatic	x	x
Hydroporus figuratus	Coleoptera	Dytiscidae	-	Leaf Litter	Fully Aquatic	x	-
Hygrotus impressopunctatus	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x
Hypomma fulvum	Araneae	Linyphiidae	NS	Tall Fen	Terrestrial	x	x
Idiocerus lituratus	Hemiptera	Cicadellidae	-	Scrub & Trees/Arboreal	Terrestrial	x	-
Ilybius quadriguttatus	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x
Ilyocoris cimicoides	Hemiptera	Naucoridae	-	Submerged Vegetation	Fully Aquatic	x	x

Species	Order	Family	Status	NRW habitat	Aquatic/terrestrial	Nash & Goldcliff	Newport Wetlands
Laccobius colon	Coleoptera	Hydrophilidae	-	Bare Clay	Fully Aquatic	x	x
Laccobius minutus	Coleoptera	Hydrophilidae	-	Submerged Vegetation	Fully Aquatic	x	x
Laccophilus minutus	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x
Lenisa geminipuncta	Lepidoptera	Noctuidae	-	Tall Fen	Terrestrial	x	x
Leucania obsoleta	Lepidoptera	Noctuidae	-	Tall Fen	Terrestrial	x	x
Limnebius nitidus	Coleoptera	Hydraenidae	-	Bare Clay	Fully Aquatic	x	x
Limnoxenus niger	Coleoptera	Hydrophilidae	NT; NS	Submerged Vegetation	Fully Aquatic	x	-
Liopterus haemorrhoidalis	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x
Mesovelia furcata	Hemiptera	Mesoveliidae	-	Lemna Mat	Fully Aquatic	x	-
Nemotelus uliginosus	Diptera	Stratiomyidae	-	Brackish	Aquatic Larva	x	x
Nigrotipula nigra	Diptera	Tipulidae	-	Bare Clay	Aquatic Larva	x	x
Ochthebius dilatatus	Coleoptera	Hydraenidae	-	Bare Clay	Fully Aquatic	x	x
Ochthebius marinus	Coleoptera	Hydraenidae	-	Brackish	Fully Aquatic	x	x
Ochthebius pusillus	Coleoptera	Hydraenidae	-	Bare Clay	Fully Aquatic	-	x
Odacantha melanura	Coleoptera	Carabidae	NS	Tall Fen	Terrestrial	x	x
Odontomyia ornata	Diptera	Stratiomyidae	NS	Lemna Mat	Aquatic Larva	x	x
Odontomyia tigrina	Diptera	Stratiomyidae	-	Lemna Mat	Aquatic Larva	x	x
Oulimnius troglodytes	Coleoptera	Elmidae	NS	Bare Clay	Fully Aquatic	x	-
Paracorixa concinna	Hemiptera	Corixidae	-	Bare Clay	Fully Aquatic	x	x
Parydroptera discomyzina	Diptera	Ephydridae	NS	Brackish	Amphibious Larva	-	x
Peltodytes caesus	Coleoptera	Haliplidae	NS	Submerged Vegetation	Fully Aquatic	x	x
Phalacrocera replicata	Diptera	Cylindrotomidae	NS	Submerged Vegetation	Aquatic Larva	-	x
Pherbellia brunnipes	Diptera	Sciomyzidae	NS	Mollusc Parasitoid	Aquatic Larva	x	-
Pherbellia dorsata	Diptera	Sciomyzidae	NS	Mollusc Parasitoid	Aquatic Larva	-	x
Planorbarius corneus	Hygrophila	Planorbidae	-	Submerged Vegetation	Fully Aquatic	x	x
Planorbis planorbis	Hygrophila	Planorbidae	-	Submerged Vegetation	Fully Aquatic	x	x
Plateumaris bracata	Coleoptera	Chrysomelidae	NS	Tall Fen	Terrestrial	x	-
Platypalpus pallidicornis	Diptera	Hybotidae	-	Tall Fen	Terrestrial	x	x
Porhydrus lineatus	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x
Prionychus ater	Coleoptera	Tenebrionidae	-	Scrub & Trees/Saproxylic	Terrestrial	x	x
Pseudocistela ceramboides	Coleoptera	Tenebrionidae	NS	Scrub & Trees/Saproxylic	Terrestrial	x	-
Ranatra linearis	Hemiptera	Nepidae	-	Submerged Vegetation	Fully Aquatic	x	x
Rhantus grapii	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x
Rhantus suturalis	Coleoptera	Dytiscidae	-	Submerged Vegetation	Fully Aquatic	x	x

Species	Order	Family	Status	NRW habitat	Aquatic/terrestrial	Nash & Goldcliff	Newport Wetlands
Rhinoncus inconspectus	Coleoptera	Curculionidae	-	Emergent Vegetation	Amphibious	x	-
Scirtes orbicularis	Coleoptera	Scirtidae	NS	Tall Fen	Fully Aquatic	x	x
Sesia bembeciformis	Lepidoptera	Sesiidae	-	Scrub & Trees/Saproxylic	Terrestrial	-	x
Sigara stagnalis	Hemiptera	Corixidae	-	Brackish	Fully Aquatic	x	x
Stratiomys singularior	Diptera	Stratiomyidae	-	Brackish	Aquatic Larva	x	-
Sympetrum sanguineum	Odonata	Libellulidae	-	Tall Fen	Aquatic Larva	x	x
Synanthedon myopaeformis	Lepidoptera	Sesiidae	-	Scrub & Trees/Saproxylic	Terrestrial	x	-
Tanysphyrus lemnae	Coleoptera	Erirhinidae	-	Lemna Mat	Fully Aquatic	x	x
Tetanocera punctifrons	Diptera	Sciomyzidae	NS	Mollusc Parasitoid	Aquatic Larva	x	x
Trigonometopus frontalis	Diptera	Lauxaniidae	-	Tall Fen	Terrestrial	x	-
Tropidia scita	Diptera	Syrphidae	-	Tall Fen	Amphibious Larva	x	x
Vanoyia tenuicornis	Diptera	Stratiomyidae	-	Submerged Vegetation	Aquatic Larva	x	x
-	-	-	-	-	-	**93**	**83**

Data Archive Appendix

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

~~[B] A full set of maps produced in JPEG format~~.

~~[C] A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers~~.

~~[D] A set of raster files in ESRI and ASCII grid formats~~.

~~[E] A database named [name] in Microsoft Access 2000 format with metadata described in a Microsoft Word document [name.doc]~~.

~~[F] A full set of images produced in [jpg/tiff] format~~.

[G] Species records held in Welsh Invertebrate Database (WID).

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue https://libcat.naturalresources.wales (English Version) and https://catllyfr.cyfoethnaturiol.cymru (Welsh Version) by searching 'Dataset Titles'. The metadata is held as record no. 125740.