



Gravity

Smart Campus

Gravity LDO Environmental Statement
Volume 2 – Appendices
Appendix 12.9
Invertebrate Survey Report

Richard Wilson Ecology Limited



Terrestrial Invertebrate Survey, ROF Bridgwater,
Puriton, Somerset

Final Report

Prepared for Ecology Solutions Limited

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Notice

This document and its contents have been prepared for Ecology Solutions Limited and is intended solely for information and use in relation to the proposed mixed-use development located within the former Royal Ordnance Factory Bridgwater, Puriton in Somerset. This is the final report which should be used for the purposes of informing any ecological impact assessment, planning application or Development Consent Order.

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Executive Summary

- Ecology Solutions Ltd commissioned Richard Wilson Ecology Limited to undertake terrestrial invertebrate surveys for the purpose of informing an Ecological Impact Assessment for a proposed mixed-use campus ('Gravity') within the former Royal Ordnance Factory (ROF) Bridgwater and adjacent land parcels ('the study site').
- The study site is located approximately 6 km north-east of Bridgwater, equidistant between the villages of Puriton and Woolavington in Somerset. It covers approximately 250 ha, of which the former ROF comprises just under 170 ha. The study site's habitats include woodlands, mature scrub and hedgerows, a traditional orchard, tall grasslands, reed-fen, short perennial vegetation and short swards, open mosaic habitat on previously developed land, and disturbed vegetation communities on recently cleared ground. These have all been placed in context, considering invertebrate ecology, within the wider ecological landscape, based on the Somerset Levels and Moors Natural Character Area.
- Six land parcels within the study site (mostly contained within the former ROF) are designated within the local plan for their nature conservation interest as Local Wildlife Sites.
- For the purposes of description and evaluation, the study site has been divided into three compartments:
 - Undesignated land within the former ROF;
 - LWS Network (i.e. land parcels designated as LWS within the study site); and
 - External Fields (i.e. land parcels outwith the security fence of the former ROF but within the study site).
- Reference to recent historical survey work within and immediately adjacent to the study site has been undertaken to place the 2020 data in context and consider potential for ongoing presence in the case of two butterfly species (dingy skipper and small blue) where adult flight periods may have been missed due to an early spring and delayed start owing to the Coronavirus (Covid-19) pandemic.
- Nine survey visits took place between mid-May and mid-September 2020 in reasonable to optimal weather conditions using a variety of methods including aerial netting, sweeping vegetation, vacuum sampling and direct observation. Static traps (pitfall traps, a Malaise Trap and three flight interception traps attached to mature apple trees in the traditional orchard) were deployed for a period of a month in summer to supplement the active surveying.
- A total of 565 species were recorded throughout the study site, of which 20 (3.5 % of the assemblage) are Key Species – those with a nature conservation status. Species-richness in each compartment is:
 - Former ROF: 289 species (6 Key Species);
 - LWS Network: 241 species (11 Key Species); and
 - External Fields: 253 species (7 Key Species).
- Of the 20 Key Species, one is a Rare Key Species, the Nationally Rare horsefly, *Atylotus rusticus*, which is associated with grazing marshes in southern England, including the Somerset Levels. Several other species including the Nationally Scarce spider, *Argenna subnigra*, rove beetle, *Hypnogyra angularis*; and pot beetle *Cryptocephalus bipunctatus* are scarce or rare in the county.
- Within the ROF Factory, but outside the LWSs, 34 species are reliant on the vegetation communities present to complete their lifecycle, of which 25 species are intrinsically linked with the disturbed vegetation communities associated with the recently cleared ground and which have a distinctive appearance, similar to arable field margins. One Key Species, the weevil *Larinus planus* is associated with this community. A further two Key Species (*Atylotus rusticus* and the ground beetle *Acupalpus exiguus*) species are associated with the wetland habitats present; the former with reed-fen and the latter with the grasslands. The beetle's ecology and association with periodically inundated grasslands is interpreted as inferring that the tall swards are remnant floodplain grasslands.

- Within the LWS Network, 38 species are reliant on the vegetation communities present to complete their lifecycle, of which most (35 species) are intrinsically linked with the open mosaic habitats (OMH) present within the Puriton Ash Ground LWS, though a further nine taxa are co-dependent on the presence of dead wood for larval development. The OMH shares similar characteristics with the disturbed vegetation communities such as free draining substrate and a rich flower resource of benefit to pollinators. The Nationally Scarce weevil *Larinus planus* was recorded within the OMH and disturbed vegetation communities, suggesting there may be interchange of faunas between the two habitats. Twenty taxa have a fidelity to calcareous grasslands, a habitat that shares some physical characteristics with OMH and which is widely acknowledged as being one of the most species-rich grassland types in Britain. These twenty species are therefore further indication of the importance that the habitats within the LWS network have for invertebrates.
- The External Fields support a noteworthy assemblage of invertebrates associated with wood decay, many of which were recorded from a brief targeted survey of the faunas associated with the mature apple trees in the traditional orchard. The wood decay fauna is not restricted to the apple trees, there being additional resource within the mature hedgerows, including the orchard's field boundaries, along the Woolavington Track
- The invertebrate assemblages associated with habitats within undesignated land within the former ROF have been evaluated to be of **at least district nature conservation value**, based on the relative quality and extent of the habitat resource present for invertebrates within the wider region (based on the NCA), number of Key Species and the proportion of stenotopic taxa (species dependent on restricted habitat conditions) recorded in specific assemblages, indicating favourable conservation status. The LWS Network has collectively been evaluated to be of **county nature conservation value**, and the External Fields have been evaluated to be of **at least county nature conservation value**.
- Survey work during 2020 has been thorough, sufficient to evaluate the nature conservation value of invertebrate assemblages present within the study site, and identify habitats and features of importance for terrestrial invertebrate assemblages. An outcome of the survey work has been the identification of a wood decay fauna (saproxylic invertebrates) currently primarily associated with the orchard, but likely to include the mature hedgerows and scrub which, based on the wider resource in the NCA, has the potential to be of substantial county, or regional interest.
- No further invertebrate survey work is considered proportionate or necessary to inform the Local Development Order on the assumption that the LWS Network's ecological integrity is retained in the final submitted layout; **and** the traditional orchard and associated hedgerow network, mature scrub and wet woodland within the External Fields and ROF Bridgwater compartments. However, *if* layouts have the potential to compromise integrity, then further, targeted survey is recommended, to fully understand the nature conservation value of the wood decay resource. This would necessarily involve flight interception trapping.
- A narrative on relevant mitigation principles is provided, identifying development-led opportunities and means by which the existing LWS network can be integrated within the proposed development and ensuring their resilience post-construction.

1 Introduction

1.1 Background

Richard Wilson Ecology Limited was commissioned by Ecology Solutions Ltd in early May 2020 to undertake terrestrial invertebrate surveys within the former Royal Ordnance Factory (ROF) Bridgwater site and adjacent land parcels to inform the Ecological Impact Assessment (EclA) for the proposed mixed-use campus ('Gravity') development project.

An internal interim report was issued on the 3rd December 2020 to Ecology Solutions Limited for the purposes of providing a detailed summary of the results obtained from desk-based and field survey to demonstrate the work undertaken in 2020 had been completed to comply with certain funding requirements.

This final report updates and expands on the details conveyed in the interim report, including a detailed data analysis and evaluation, which can inform the ecological impact assessment supporting the Local Development Order.

1.1.1 Previous Invertebrate Surveys

The study site has had a history of ecology survey dating back to at least 2007 as far as the author is able to ascertain, involving two major planning applications (Sedgemoor District Council Planning Reference: 42/11/00017 for the remediation work; and subsequently, the granting of Outline Planning Permission (Planning Reference: 42/13/00010). Of relevance to this report, both applications placed reliance on aquatic invertebrate surveys of various ditches and waterbodies within and outwith the former factory site, dragonfly transects, and butterfly surveys, including brown hairstreak (*Thecla betulae*) egg-searches, which were undertaken between March and August 2009 (Ecology Solutions, 2011).

Aquatic and some terrestrial invertebrate survey work has also been undertaken more recently (during summer 2013) which included land adjacent to the current study site, i.e. outwith the ROF Bridgwater and fields surveyed in 2020 (see Section 1.2 for details). These focussed on the numerous ditches and rhynes to inform the consented Hinckley Point C Connection Project (The Ecological Partnership, 2014) and included three ditches (referred to as TEP341, TEP327 and TEP246), all located to the east of the ROF Bridgwater's boundary. These were surveyed, targeting the lesser silver water beetle (*Hydrochara caraboides*), a ¹legally protected species and which has a Near Threatened status based on the most recent nature conservation assessment (Foster, 2010).

The results of these historical surveys, and the relevance to the study site, are discussed in more detail in Section 4.1.

1.2 Study Site

The former ROF Bridgwater site (site centre: ST 333 423) occupies approximately 167 ha on low-lying flat ground, equidistant between the villages of Puriton and Woolavington in Somerset (vice-county 6: North Somerset), 6 km north-east of Bridgwater city centre (town hall). The study site also includes additional land parcels outwith the ROF's boundary fence, including a linear reedbed system to the north (linking to the Huntspill River); a disused railway corridor to the north-west that once connected the former factory to the mainline railway network; and surrounding fields, mostly to the south-east, south and south-west. These additional land parcels collectively add an additional 85 ha; thus the study site covers an extensive area of just over 250 ha.

ROF Bridgwater was constructed on the Puriton Levels at the beginning of WW2 and opened in 1941, remaining operational until decommission in 2008. Concurrently with its construction, the artificial Huntspill River was dug to supply freshwater to the factory. This is connected to the factory via a linear 865 m long compartmentalised reedbed.

The study site is located on the western end of the Somerset Levels and Moors, an extensive area of low-lying ground sandwiched between two east-west orientated escarpements to the north (Mendip Hills) and south (Polden Hills). This low-lying ground supports a mosaic of wetlands and moors, inter-connected by rivers, ditches and rhynes (a ditch specifically engineered to drain land for pasture) in an open landscape. Land drained

¹ It is protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

by rhynes has resulted in a patchwork of rectilinear fields that is evident within the study site outwith the ROF itself.

Six land parcels within the study site are designated as Local Wildlife Sites (LWS) and are listed below; those marked with an '*' are within the former ROF:

- *Puriton Rhynes and Ponds LWS (ST 339 428);
- *Puriton Cowslip Field LWS (ST 331 420);
- Woolavington Road and Fields North LWS (ST 331 417);
- *Puriton Ash Ground LWS (ST 326 422);
- *Puriton Meadows and Rail Spur LWS (ST 327 427); and
- North Mead Drove Fields LWS (ST 324 429).

All the LWSs have their origins in the landscape's post-inclosure history, and those within the curtilage of the ROF are of more recent genesis, directly associated with the factory's construction. Puriton Cowslip Field LWS has developed a calcicolous vegetation community, presumed to have arisen, either from importation of foreign base-rich material during the ROF's construction phase; or as an inert, non-hazardous (explosive) waste product from the manufacturing phase of the development. The substrate at Puriton Ash Ground LWS is assumed to be a mix of coal waste and material used for the foundations of the railway spur, which has resulted in the development of a short, perennial vegetation community with lichen-heath that has developed an open habitat, with scattered scrub.

Associated with the study site is a consented link road which was being constructed during 2020. This link road would connect the proposed development site direct to the M5 via the A39. The construction corridor passed through fields to the south-west of the ROF and north of Woolavington Road and occupies c. 2 ha.

1.2.1 Summary of Habitats and Vegetation Communities (2020)

Botanical surveys that have mapped vegetation communities within the study site have been completed on several occasions (2007 to 2009; and updated in 2011 (Ecology Solutions, 2011)). In combination with field notes and photographs taken by the surveyor, these have been used to provide the following description.

Within ROF Bridgwater itself, the central area, defined as land either side of the north-south orientated access road which bisects the Factory from the entrance gate has been, and was subject to ongoing remediation, resulting in areas of disturbed ground of varying topography and vegetation cover. This area is coincident with what was mapped as amenity and semi-improved grassland in 2011 (Ecology Solutions, 2011; Plan ECO3: Ecological Features). The vegetation community here is characteristic of recently disturbed soils, with a visual appearance similar to arable field margins or fallow ground. The community was characterised by an open structure with an abundant pollinator resource of varying species of which the Asteraceae (daisy family), and Apiaceae (carrot family, 'umbellifers') were a substantial component. These more recently disturbed habitat patches were interconnected with more stable vegetation communities, suggesting remediation had relaxed some years previously, allowing grasses to begin to form a taller, yet still open sward. Elsewhere, evidence of disturbance was less obvious, suggesting either any remediation had been of lower intensity, had occurred sufficiently historically (e.g. more than five years previously), or the community had developed from abandoned amenity grassland. Either way, the vegetation community in these habitat parcels had developed a continuous sward with bramble (*Rubus fruticosus* agg.) starting to encroach. This core area was therefore a highly heterogeneous mosaic of varying vegetation communities on a topographically varied landscape of spoil mounds and level ground, with a varied pollinator resource.

The ROF's margins supported more stable vegetation communities, the majority of which were associated with the four LWSs located within the curtilage of the factory. Outwith the non-statutory sites, these vegetation communities were predominantly tall, botanically species-poor grasslands with localised patches of tall herbs such as hogweed (*Heracleum sphondylium*). These fields, whilst botanically species-poor, exhibited some flora and structure suggestive of periodic inundation. Given the landscape within which the ROF was constructed, these fields, in addition to those within the LWS network, as being remnant floodplain grassland, a Habitat of Principal Importance (HoPI).

In the south-east quartile of the factory site, grasslands were bounded by mature hedgerows of hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*) and blackthorn (*Prunus spinosa*) with a fringe of bramble; or mature poplar (*Populus* sp.) and ash (*Fraxinus excelsior*) trees. These mature stands include a standing dead wood resource. The plantation woodland block in this corner supports immature specimens of oak (*Quercus* sp.), rowan (*Sorbus aucuparia*), ash, poplar and hawthorn with no lying or dead wood resource.

Within the non-statutory sites, the Puriton Rhynes and Ponds LWS comprises a series of grasslands, identified as floodplain grassland on the Multi-Agency Geographic Information for the Countryside (MAGIC) website, bounded by vegetated water-filled ditches and mature hedgerows and a narrow linear reedbed system divided into cells. The northern end of this reedbed is defined by a mature plantation woodland with an impenetrable bramble understorey. The Puriton Meadows and Rail Spur LWS consists of three rectilinear fields, identified as lowland meadow HoPI on MAGIC, which are divided by mature, wide hedgerows with a similar species mix as elsewhere but including willows (*Salix* spp.). Puriton Ash Ground LWS supports a mosaic of acid grassland, flower-rich short perennial vegetation with a locally frequent lichen community and scattered scrub, of which butterfly-bush (*Buddleia davidii*) is frequent. This habitat parcel supports a vegetation community that on first appraisal, is substantially different to that which is present elsewhere within the study site; but from an invertebrate ecology perspective, it shares similar features with vegetation communities on the recently disturbed ground. This includes exposures of bare ground, even if on a micro-scale; a varied topography, though not as extreme or obvious as the larger soil-dominated spoil heaps; and a vegetation community grading from short, open patchy cover through to relatively taller, more closed swards and scrub that form sheltered embayments.

Outwith the study site, the railway spur supports dense scrub which prevented access from within the ROF, or adjacent fields. The fields are a mix of cattle or sheep-grazed pasture in the north; or mostly managed for silage/ hay in the south. The exceptions to this are three orchards in the south-east quartile, associated with the village of Woolavington, and which are likely to have their origins in the late 1790s/ early 1800s when Sedgemoor was inclosed. The dominant fruit tree are apples (*Malus domestica*), which are all veteran specimens. Many of the trees have broken limbs or substantial trunk cavities and are sheltered by mature hedgerows. The orchard no longer appears to be managed and the grassland understorey was a mosaic of species-poor and more floristically diverse tall ruderal vegetation, with a couple of old waterbodies. To the west and north of these orchards are a series of fields bounded by mature hedgerows which fall within the footprint of the Hinckley Point C Connection Project. These fields are likely to have been grazed by cattle as there was an abundance of buttercups, which being unpalatable to bovids, are selectively avoided. This abundance can be an indication that the grasslands are of long-standing origin, which is likely to be the case in this instance. However, in early May 2020, the land was being subject to a great crested newt (*Triturus cristatus*) licenced mitigation project as temporary amphibian fencing was being erected to translocate the capturable population elsewhere.

In summary various habitats are present within the study site, ranging from recently disturbed ground through to long-standing grasslands, some of which are interpreted as remnant floodplain grassland, and others identified as being this HoPI, bounded by mature hedgerows and associated old orchards. The topographical variations, especially within areas recently remediated and in combination with the habitat mosaics and diversity have provided a complex resource for terrestrial invertebrates. The composition of the invertebrate assemblages present will be influenced by the study site's relationship with the wider ecological landscape and this is considered in more detail below, and when evaluating the results (see Section 5).

1.2.2 Context with Surrounding Landscape

The study site is located at the western end of an area of low-lying land situated between rising ground to the north (Mendip Hills), south (Polden Hills) and east (Mid-Somerset Hills and Yeovil Scarplands), within the ²Somerset Levels and Moors National Character Area (NCA). The NCA is a flat landscape of wetlands, rivers, ditches and rhynes, the latter having been engineered to drain the landscape for agriculture between the 1750s and 1850s, resulting in a patchwork mosaic of fields such as is evident within parts of the study site. This patchwork contributes to the largest area of lowland wet grassland and associated wetland habitats in Britain, and includes marginal areas which grade towards a more tree-associated biotope with scrub, hedgerows and riparian woodland (Natural England, 2013). It is in this context that the study site seems to fit, with the grasslands in the External Fields, with their associated hedgerows and in three instances an orchard, providing the gradation away from the more extensive wetlands evidenced within the Somerset Levels National Nature Reserve (NNR) and conjoining Sites of Special Scientific Interest (SSSI) and Ramsar site.

² Available on-line here: <http://publications.naturalengland.org.uk/publication/12320274?category=587130>; last accessed on the 28th January 2021.

Given that the ROF's footprint is located within the previously more extensive Puriton Levels, which itself was part of a connected network of heaths and moor such as Edington Moor and Catcott Heath that linked to the more extensive Shapwick Heath and Ham Wall NNRs, the habitats present within the study site are considered likely to have some functional connection to these high value habitats that are currently managed for nature conservation; either via the existing network of watercourses, including rhynes, or as a consequence of remnant habitat patches whose origins lie within the study site's historical relationship. As a consequence, the invertebrate assemblages, particularly more mobile groups such as the Diptera may have affinities with these biotopes that are present in the not too distant wider landscape, including the statutory site network 3 km to the east of the study site

1.2.3 Proposed Development Footprint

The proposed development is for a mixed-use campus within the study area. No draft layout has been provided as the intention is to use the baseline information to inform the final design.

1.3 Survey Limitations

1.3.1 Coronavirus Pandemic

In mid-March 2020, following the emergence of Coronavirus (Covid-19), the UK and devolved Governments announced a strict lockdown which extended through until late April 2020. This lockdown required all but essential workers to stay at home. As a consequence, and until the Chartered Institute of Ecology and Environmental Management (CIEEM) issued guidance following confirmation from Defra, it was uncertain whether ecology surveys (within the planning system) were included in the definition of 'essential worker'. This was resolved in early May 2020, and thus the first survey commenced shortly after. The implications of this delayed start are discussed below.

1.3.2 Weather Limitations

The spring of 2020 was remarkable for its prolonged dry and hot weather. Weather conditions leading up to the first main visit (late May 2020) were generally warmer and substantially drier than the long-term average (Meteorological Office ³ website). This was followed by a generally average, in terms of warmth (temperature), but a wetter and cloudier early to mid-summer (Meteorological Office ⁴ website). This combination of an exceptionally warm and dry spring followed by a cloudier and wetter summer is considered likely to have affected invertebrate species, especially their larval stages. Spring and early summer faunas are considered to have emerged early, in response to the clement weather, or died before emerging as adults due to desiccation. This, in combination with the delayed start as a consequence of Government restrictions arising from the Coronavirus Pandemic (see Section 1.3.1) resulted in this initial spring emergence possibly being at least partially missed.

The results of the surveys undertaken are likely to have been influenced by the conditions (weather and Pandemic) experienced in 2020 in that some species, if present, may have been missed. The significance of this is discussed in Section 4.1 (paragraphs after Table 1). In the context of continued presence of scarce butterflies previously recorded within the study site. Evaluating the data will have a greater focus on invertebrate assemblages and not just individual species of conservation interest. This, combined with a thorough survey effort and consideration of habitat features, including presence/ likely absence of foodplants (for example) will ensure a robust evaluation of the study site and individual land parcels such as the LWSs, enabling an informed conclusion.

³ See https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/summaries/uk_monthly_climate_summary_spring_2020_may.pdf; accessed on 22nd September 2020.

⁴ See https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/summaries/uk_monthly_climate_summary_summer_2020_3.pdf; accessed on 22nd September 2020.

2 Legislation

2.1 Legislation

Sixteen species of invertebrate present in the UK are protected through international law. These were originally included in Appendices to the the European Union's Habitats Directive and transposed into UK domestic legislation by the Conservation of Habitats and Species Regulations 2017 (as amended). Since January 2021, following the UK's departure and the end of the transition period, retained EU-derived legislation has been carried over via Sections 2 and 3 of the European Union (Withdrawal Agreement) Act 2018 (as amended). This Act ensures the retention of the 2017 Regulations on and after departure day (1st January 2021). Further, for the purposes of biodiversity, the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 have been made to address failures of retained EU law to operate effectively and other deficiencies, by amending the 2017 Regulations to ensure their validity.

Approximately 50 species of invertebrate are included in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

Section 40 of the Natural Environment and Rural Communities Act 2006 requires all local authorities to consider biodiversity when undertaking their public duty. In achieving this, the Government has published a list of Species of Principal Importance (SoPI) for nature conservation in England, which includes invertebrates. Somerset County Council has published a Pollinator Action Plan whose broad aims seek, amongst others, to protect, increase and enhance pollinator habitat (Somerset County Council, 2018).

A full list of all species covered by legislation and policy is available via the Buglife's ⁵website.

2.2 Policy

Paragraphs 170 to 177 inclusive of the National Planning Policy Framework (NPPF) conveys national policy on conserving and enhancing the natural environment including protecting habitats and biodiversity in the planning system (Ministry of Housing, Communities and Local Government, 2019). Guidance underpinning the NPPF is available ⁶on-line and provides a detailed narrative on considerations to protect and enhance biodiversity as part of the planning process. Relevant paragraphs are 009 to 035.

The National Pollinator Strategy is particularly relevant for invertebrate nature conservation and emphasises:

"The National Planning Policy Framework (2012) [subsequently updated] requires planning authorities to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations. It prescribes that local plans should have a clear strategy for enhancing the natural, built and historic environment and supporting wider biodiversity networks, including planning at a landscape scale across local authority boundaries and supporting Nature Improvement Areas." (Defra, 2014; Section 5).

⁵ See https://cdn.buglife.org.uk/2019/07/Policy-and-legislation-summary-final-2014_0.pdf; last accessed on the 21st January 2021.

⁶ See <https://www.gov.uk/guidance/natural-environment#biodiversity-geodiversity-and-ecosystems>; last accessed on 21st January 2021.

3 Methodology

3.1 Desk Study

The ecological desk study has been undertaken by Ecology Solutions and any relevant historical records of invertebrates received from the Somerset Environmental Records Centre will be forwarded on for the final report. Further information sources have been referred to as necessary, including from the author's library, in addition to referencing previous survey work (referred to in Section 1.1.1).

3.2 Field Survey

The purpose of the work was to undertake an appraisal of the study site's nature conservation value for terrestrial invertebrates and is therefore not intended to provide an exhaustive list of invertebrate taxa present. In achieving these aims, the surveys followed the methodologies described in Drake *et al.* (2007) using a variety of techniques, including sweeping of vegetation and aerial netting for flying invertebrates using a light-weight butterfly net as well as a more heavy duty sweep-net. This was complemented by vacuum sampling (using a commercially available modified garden blow-vac), sieving leaf-litter, searching under refugia and direct observation.

Specimens collected were either identified in the field or retained for subsequent microscopic identification. Surveys paid particular attention to those groups most likely to include species of nature conservation interest, focussing on aculeate Hymenoptera (solitary bees and wasps), Diptera (flies), Araneae (spiders), Coleoptera (beetles) and Hemiptera (bugs). However, a wide range of invertebrate orders were recorded including day-flying Lepidoptera (butterflies and moths).

3.3 Evaluation Methodologies

There is currently no standard frame of reference to evaluate the nature conservation value of invertebrate assemblages for the purposes of EclA, though increasingly, in addition to placing reliance on professional judgement of the surveyor and associates, the use of Pantheon (Webb *et al.*, 2018) is being applied.

3.3.1 Proportion of Key Species

An initial indication of a study site's nature conservation value is the proportion of species with a nature conservation status (NCS) recorded. NCS species are those that are assigned a formal status based on three systems applied to British invertebrates since the late 1980s. Details are provided in Appendix B but in summary, all NCS species are assigned a formal status which initially included Red Data Book (Shirt, 1987; Bratton, 1991), and Nationally Notable species (by various species status reviews administered by the Joint Nature Conservation Committee). Since 2001, consideration of a species threat to survival such as through habitat loss, based on the International Union for the Conservation of Nature's (IUCN) criteria (IUCN, 2012) has been adopted and this is gradually replacing the old Red Data Book categories. Running parallel with the IUCN criteria are two British rarity categories, which are based on the hectad system, which again are being defined by⁷ updating species status reviews.

Telfer (2017) provided a means of evaluating a study site's potential nature conservation value by considering the proportion of NCS species present within a study site, on the basis that the higher the percentage of NCS species, the more important the study site is. He refers to NCS species as 'Key Species' and splits this in to two groups: Rare Key Species, which are those taxa assigned Red Data, IUCN Threatened and Data Deficient, and Nationally Rare status; and Scarce Key Species, which are those assigned IUCN Near Threatened, Least Concern, and Nationally Scarce/ Notable status. As a rule of thumb, if close to 10 % of the species recorded are Key Species; and more than 1 % are Rare Key Species, it is suggestive that the study site is potentially of national significance for its invertebrate fauna.

⁷ Updated species status reviews are published on the JNCC website: <http://jncc.defra.gov.uk/page-3352>

3.3.2 Invertebrate Assemblages

In considering species assemblages, the taxa recorded within the study site have been entered into Pantheon, a database tool developed by Natural England and the Centre for Ecology & Hydrology to analyse invertebrate sample data (Webb *et al.*, 2018). Pantheon has incorporated the Invertebrate Species-habitat Information System (ISIS) developed by Derek Lott and referenced in Drake *et al.*, (2007) but takes the analysis further by attaching associated habitats and resources, habitat fidelity scores and other ecological information against each species. This is currently based on approximately 13,000 invertebrate species out of an estimated 37,000 species known from the UK. The taxa primarily used for this analysis are Coleoptera, Diptera, Hemiptera, Lepidoptera, aculeate Hymenoptera and Araneae; hence the focus on these groups for survey. As for the original ISIS, some caution must be applied as strictly speaking, survey effort would normally require standardisation such as timed sweeps.

For the purposes of EclA, the methods have allowed what ⁸Webb *et al.* (2018) describe as a semi-ISIS approach, stated to include some standardised methods such as timed vacuum sampling, static trapping such as pitfall or Malaise trapping; but extending to include more freeform sampling such as focussed searches for pollinators in a non-standardised way. Nevertheless, Pantheon can at least inform which invertebrate assemblages recorded are of particular importance within a site, such as those associated with wood decay, floristically rich habitats or both. A positive aspect of this approach is that attention is given to assemblages rather than solely relying on the national status of individual species, though the latter can also be indicative, especially as a proportion of the total species recorded.

Pantheon interrogates the composition of the terrestrial invertebrate assemblage in terms of biotopes, habitats, and the distribution of stenotopic species i.e. those terrestrial invertebrates with very specific and restricted habitat requirements and have an intrinsic nature conservation value; referred to as ⁹Specific Assemblage Types (SAT) (Webb *et al.*, 2018). In doing so, the limitations of Pantheon as a tool have been recognised based on the semi-ISIS compliant approach and confidence in the reported condition is therefore medium. To mitigate this confidence level, professional judgement has been applied where necessary to assist robust valuation.

Pantheon can only identify whether a site is in favourable or unfavourable condition expected for SSSIs, and condition is not strictly analogous with value. However, if favourable condition is concluded then this can, taking into account other factors, provide evidence that objectives for sites of national value (SSSIs) are being met and this seems a reasonable proxy in this instance for national value. However, use of unfavourable condition to argue against national value is more problematic and requires a degree of caution and application of professional judgement to determine the appropriate geographic scale of nature conservation value. In addition, as the survey did not strictly comply with methods described in Drake *et al.* (2007), such as timed sweeps, a degree of caution and professional judgement is likewise necessary to accommodate for any bias (detracting or enhancing) within the analysis that might introduce subjectivity into the evaluation.

In an attempt to inject some objectivity into the use of Pantheon SATs to inform evaluation of nature conservation value and to counteract some of the caveats given above, the threshold limits for each of the SATs has been noted with the intention of providing a reasonable judgement. This can be made in terms of the Proportion to Threshold (PtT) achieved for each SAT identified. The threshold referred to is the number of species within a SAT expected to be present if a site is considered to be in favourable condition (FC). Thus, if a SAT records or exceeds the expected threshold, the PtT will be 100 % or greater and this is taken as the basis for considering assigning national value. In the absence of other guidance, where the PtT is < 100 %, professional judgement is used to assist with the rationale for assessing a nature conservation value of the invertebrate assemblage in a sub-national context (i.e. regional, county, district, local). The further away from the threshold, the lower the nature conservation value the SAT. Other factors considered when determining the value include species-richness, proportion of Key Species in the assemblage, proportion of county rarities or significant records (where known), and site context within the landscape (i.e. availability and connectivity to similar semi-natural habitat, whether statutorily protected or not). Thus, whilst Pantheon remains a useful guide when assessing the nature conservation value for each of the land parcels for terrestrial invertebrates, professional judgement incorporating other evidence is necessary to come to a defensible evaluation.

⁸ See <http://www.brc.ac.uk/pantheon/lexicon/reported-condition>; last accessed on the 16th January 2019

⁹ SATs are characterised by species restricted to certain features within habitats (= stenotopic species) such as types of decaying wood (e.g. sapwood, or heartwood), fluctuating marsh or rich flower resource. Some SATs such as rich flower resource are cross-cutting, i.e. can be present in more than one habitat.

3.3.3 Designated Site Guidelines

3.3.3.1 Statutory Sites

The Joint Nature Conservation Committee (JNCC) has recently updated and ¹⁰published its guidance on invertebrates for the selection of biological SSSIs (Curson *et al.*, 2019). This document has been useful in considering the study site's nature conservation value based on the presence of, for example, Key Species, edge of range species or species assemblages, and placing this in context with the Area of Search, which for the purpose of this approach, is taken to be the relevant NCA. The relevant NCA profile to the study site is the Somerset Levels and Moors NCA (Natural England, 2013).

In summary, Curson *et al.* (2019) state that any species which are Critically Endangered, Endangered or Vulnerable (IUCN); or Nationally Rare (British rarity status) should be represented in SSSIs; and Near Threatened and Nationally Scarce taxa should also be considered if certain caveats apply. The presence of any such designated species at a site is not in itself sufficient for that site to be formally designated, but it would reach a threshold *for it to be considered*. Therefore, the presence of Critically Endangered, Endangered, Vulnerable (¹¹IUCN), or Nationally Rare species in a site can be considered as a proxy for considering national importance. The presence of Near Threatened or Nationally Scarce species in the absence of any of the previous four categories would need to consider additional factors such as their status in the vice-county/ region. A Near Threatened or Nationally Scarce species that is new, or rare in the vice-county would potentially merit consideration; whereas if it is frequent, it will likely fall short of the threshold for consideration.

3.3.3.2 Non-Statutory Sites

Somerset's guidelines which define how LWSs are selected (Biron, 2010) provides five bespoke criteria (6S9.1 to 6S9.5) for which a land parcel can be considered for designation as a non-statutory site based on invertebrates recorded. Three are relevant to this study (the other two relate to aquatic invertebrates) and are conveyed below:

- 6S9.1 Sites with a recently recorded RDB [Red Data Book] species;
- 6S9.3 Sites containing ≥ 2 Nationally Scarce, or ≥ 3 Somerset Notable species, or Somerset Priority species.
- 6S9.4 Sites with veteran trees with a saproxylic invertebrate ecological index of continuity > 15 .

There is an additional relevant criterion covering arable/ ruderal species communities (Biron, 2010; page 32) which makes specific reference to invertebrate assemblages:

- 6H12.3 Arable field margins supporting at least one species from a list of taxa on Buglife's ¹²webpage related to cereal field margins.

The presence of arable/ ruderal communities within the study site is discussed in Section 4.3.1.

3.4 Personnel

The invertebrate survey (field visits) was undertaken by Richard Wilson CEnv MCIEEM Mem.RES MSc; an experienced field entomologist. He is a ¹³recognised arachnid (spiders and harvestmen) specialist though he is familiar with a wider range of taxonomic groups. In addition to the arachnids, Richard identified some Diptera families such as the hoverflies (Syrphidae) and larger Brachycera (e.g. robberflies (Asilidae)) and aculeate Hymenoptera in addition to groups readily identifiable in the field such as the Lepidoptera (butterflies and moths) and Odonata (dragonflies and damselflies). Steven Falk FRES, who is a recognised specialist in pollinators identified other Diptera families (e.g. Muscidae) and verified some of the aculeate Hymenoptera (e.g. *Lasioglossum* spp.). Steve Lane identified most of the Coleoptera and Hemiptera collected.

¹⁰ Guidance is available via their website: <https://jncc.gov.uk/our-work/guidelines-for-selection-of-sssis/>; last accessed on 29th October 2020.

¹¹ International Union for the Conservation of Nature. See <https://www.iucnredlist.org/assessment/process> for more information.

¹² See <https://cdn.buglife.org.uk/2019/07/0420Notable20invertebrates20associated20with20cereal20field20margins-1.pdf>; last accessed on 21st January 2021.

¹³ Richard is the YNU's spider recorder, the Yorkshire, County Durham and Northumberland recorder for the national spider recording scheme; and sits on the conservation committee of the British Arachnological Society.

4 Results and Interpretation

4.1 Desk Study

Survey work supporting the Hinckley Point C Connection Project recorded the lesser silver water beetle in three watercourses, of which ditch TEP341, centred on ST 3427 4334, and approximately 325 metres north of the nearest ditch network within the study site is the nearest. It is therefore feasible that this aquatic water beetle is present within Puriton Rhynes and Ponds LWS's ditch network. The Project also recorded *Hydaticus transversalis* from ditch TEP341 referring to it as an IUCN Vulnerable species. However, Foster (2010) downgraded this species to Nationally Scarce. A second Nationally Scarce water beetle, *Peltodytes caesus* was recorded from ditch TEP327.

In spring and summer 2009, butterfly and dragonfly transects, an egg-search for brown hairstreak and aquatic invertebrate surveys were undertaken to inform the then proposed remediation of the study site. The surveys were completed both within and outwith the former ROF Bridgwater site; and based on the Phase 1 habitat map, the study site covered a similar footprint to 2020 surveys (Ecology Solutions, 2011). A total of 22 species of butterfly were recorded between April and July 2009, and 13 species of dragonfly and damselfly (between May and August 2009). The Key Species recorded were small blue (*Cupido minimus*), dingy skipper (*Erynnis tages*), brown hairstreak and variable damselfly (*Coenagrion pulchellum*). Aquatic invertebrate surveys were undertaken from 17 sampling points in May and a total of 102 species were recorded. Of the 137 species recorded as part of this earlier work, nine (see Table 1 below) have a nature conservation status. Note that since, or shortly before, the surveys were undertaken in 2009, water beetles (Foster, 2010), butterflies (Fox, Warren and Brereton, 2010) and Odonata (Daguet, French and Taylor, 2008) had their nature conservation status' reviewed against IUCN guidelines; hence the reduced number of taxa (particularly water beetles) compared to that listed in Ecology Solutions (2011).

Table 1: Key species recorded historically between April and August 2009 within study area.

Order	Family	Species	Conservation status
Coleoptera	Dytiscidae	<i>Hydaticus transversalis</i>	Nationally Scarce
Coleoptera	Hydraenidae	<i>Limnebius papposus</i>	Near Threatened; Nationally Scarce
Hygrophila	Lymnaeidae	<i>Stagnicola palustris</i> agg.	Data Deficient
Lepidoptera	Hesperiidae	Dingy skipper	Vulnerable; SoPI
Lepidoptera	Lycaenidae	Small blue	Near Threatened; SoPI
Lepidoptera	Lycaenidae	Brown hairstreak	Vulnerable; SoPI
Odonata	Coenagrionidae	Variable damselfly	Near Threatened
Odonata	Libellulidae	Scarce chaser (<i>Libellula fulva</i>)	Near Threatened
Unionoida	Unionidae	<i>Anodonta cygnea</i>	Near Threatened (European)

No information has been provided on the location(s) within the study site where the above taxa were recorded. Based on the author's knowledge of species' ecologies, it is possible that the small blue and dingy skipper were recorded within Puriton Cowslip Field LWS; and possibly Puriton Ash Ground LWS (within the ROF); whilst variable damselfly and scarce chaser could have been recorded within the Puriton Rhynes and Ponds LWS. Brown hairstreak lays its eggs on the young growth of blackthorn (*Prunus spinosa*) which is a widespread shrub within the tree-associated biotopes in the study site such as within the hedgerows of the Puriton Rhynes and Ponds LWS and Puriton Meadow and Spur LWS.

None of the taxa recorded in 2009 were observed during the 2020 field season. Both small blue and dingy skipper's flight periods are May through to early June and it is conceivable that the exceptionally warm and dry April hastened their emergence prior to the initial site visit. This said, their food plants (common bird's-foot trefoil (*Lotus corniculatus*) in the skipper's case, and kidney vetch (*Anthyllis vulneraria*) for small blue) were not observed. Further, whilst the spring may have brought flight seasons forward, it is likely that if dingy skipper remained present, any surviving adults would have been observed. Small blue can form discrete colonies and

require a small number of plants to survive, so whilst it is theoretically possible that a population persists within Puriton Cowslip Field LWS, assuming this is where the records pertain to, it seems unlikely. For the purposes of this report, it is assumed that neither small blue or dingy skipper remain within the study site.

No variable damselflies or scarce chasers were observed during 2020 though suitable habitat remains within the Puriton Rhynes and Ponds LWS. As no aquatic invertebrate survey methods were deployed, this explains the absence of records in 2020 for water beetles and other freshwater fauna.

4.2 Field Survey

4.2.1 Summary of Survey Results

Nine survey visits were completed during reasonable to optimal weather conditions for the time of year between mid-May and mid-September 2020. The details are conveyed in Table 2, including the various locations where surveys took place on each visit.

Table 2: Weather conditions for survey visits.

Date	Weather	Notes
12 th May 2020	Cloud: 3/8; Temperature: 14°C warming to 19°C; Wind Speed: Calm to 1. Cool start but then warming.	Scope site and survey fields, including orchard NW of Woolavington. Survey fields in SE corner of ROF Bridgwater
13 th May 2020	Cloud: 4/8 to 7/8; Temperature: 13°C; Wind Speed: 2 NNE. Cool and breezy day.	Scope & survey within ROF Bridgwater: <ul style="list-style-type: none"> Puriton Rhynes & Ponds LWS Puriton Cowslip Field LWS General area within ROF
8 th June 2020	Cloud: 3/8; Temperature: 20°C; Wind Speed: 1 (2) NW	<ul style="list-style-type: none"> Survey fields NE of Puriton.
9 th June 2020	Cloud: 3/8 (high cloud); Temperature: 17°C; Wind Speed: 1 (2) W	<ul style="list-style-type: none"> Puriton Rhynes & Ponds LWS Puriton Meadows & Rail Spur LWS, General areas within ROF Bridgwater. Set up Malaise trap and pitfall traps
10 th June 2020	Cloud: 8/8 (high cloud); Temperature: 14°C; Wind Speed: 1 W. Heavy rain and then drizzle.	<ul style="list-style-type: none"> Survey land NW of Woolavington Set up flight interception traps in orchard
7 th July 2020	Cloud: 8/8 clearing to 6/8; Temperature: 17°C warming to 20°C; Wind Speed: 1 (2) W. Warm and humid	<ul style="list-style-type: none"> Puriton Ash Ground LWS Puriton Rhynes & Ponds LWS General areas within ROF Bridgwater. Retrieve static traps
29 th July 2020	Cloud: 6/8; Temperature: 18°C; Wind Speed: Calm	<ul style="list-style-type: none"> Survey land NW of Woolavington General areas within ROF Bridgwater.
30 th July 2020	Cloud: 1/8; Temperature: 20°C; Wind Speed: 2 (3) SE	<ul style="list-style-type: none"> Puriton Rhynes & Ponds LWS
15 th September 2020	Cloud: 1/8; Temperature: 23°C; Wind Speed: 1	<ul style="list-style-type: none"> Puriton Meadows & Rail Spur LWS General areas within ROF Bridgwater.

A total of 565 species were recorded across all land parcels within the study corridor, of which 20 taxa (excluding Research Only) are Key Species (as defined by Telfer (2017) with definitions provided in Appendix B). Table 5 provides the breakdown of species-richness for each land parcel surveyed and Table 4 by taxonomic group. A complete list of species in taxonomic order is provided in Table 14 (Appendix C).

In describing and evaluating the results, the study site has been divided in to three compartments:

- ROF Bridgwater (land not designated as a LWS);
- the LWS Network (i.e. all LWSs, some of which straddle land either side of the ROF's boundary fence); and
- land outwith the former ROF Bridgwater security fence and not designated as a LWS (the 'External Fields').

Whilst survey work was not standardised across the various compartments; for example, pitfall trapping was only undertaken within the Puriton Ash Grounds LWS, the number of, and proportion of records collected for each compartment (Table 3) suggests that the data collected was broadly similar between each compartment studied, regardless of whether you include or exclude the data associated with static traps. Therefore, comparing the results for each compartment for the purposes of a broad overview of the results is a reasonable approach.

Table 3: Indication of survey effort based on number of records for each compartment.

Compartment	Records (with static traps)	Records (excluding static traps)
Study Site (all compartments)	1085	882
ROF Bridgwater (including LWSs)	766	621
ROF Bridgwater (excluding LWSs)	418 (38.5 %)	342 (38.8 %)
LWS Network	348 (32.1 %)	279 (31.6 %)
External Fields	319 (29.4 %)	261 (29.6 %)
<i>Percentages are number of invertebrate records collected from each compartment as a proportion of the total collected in the study site.</i>		

The location of static traps are provided in the table below.

Table 4: Location of static traps.

Trap	National Grid Reference	Compartment & habitat
Malaise trap)	ST 3370 4193	Edge of mature hedgerow, neutral grassland and mature poplars within non-designated area of ROF.
Pitfall traps	ST 3267 4208	OMH and scattered scrub within Puriton Ash Ground LWS
FITs	ST 3426 4180 ST 3421 4178	Three traps attached to mature apple trees within orchard located within External Fields.

The data presented in Table 5 provides an indication of species-richness and proportion of the invertebrate assemblage that are Key Species in the different compartments within the study site. The data suggests that the LWS Network, which is largely contained within ROF Bridgwater, supports approximately twice the number of Key Species as a proportion of species-richness compared to habitats outwith the LWS Network, but within the ROF. Further, the aggregated data for the LWSs suggest these land parcels in the context of the study site support a disproportionate invertebrate assemblage compared to those present outwith the designated network.

Table 5: Total species-richness distribution within study site and individual compartments.

Compartment	Species-Richness	Key Species	Proportion Key Species
Study site (all compartments)	565	20	3.5 %
ROF Bridgwater (including LWSs)	432	16	3.7 %
ROF Bridgwater (excluding LWSs)	289	6	2.1 %
LWS Network	241	11	4.5 %
External Fields	253	7	2.8 %

Table 6 provides a breakdown of taxonomic groups recorded in each of the compartments; the differences in this case are considered a reflection of survey methods. For example, the 119 species of Diptera recorded within

non-designated land inside ROF Bridgwater, when compared to the 60 species within the LWS Network is a consequence of the Malaise trap's location.

Table 6: Distribution of main taxonomic groups studied. Red numbers in parentheses equate to Key Species (excluding Research Only – see text for explanation).

Taxonomic Group	Study site	ROF Bridgwater (including LWS)	ROF Bridgwater (excluding LWS)	LWS Network	External Fields
Arachnida, Araneae & Opiliones (Spiders & harvestmen)	58 (2)	49 (2)	25 (0)	34 (2)	14 (0)
Coleoptera (Beetles)	147 (10)	106 (8)	45 (4)	84 (5)	60 (2)
Diptera (Flies)	194 (4)	143 (2)	119 (1)	60 (1)	103 (3)
Hemiptera (Bugs)	53 (0)	42 (0)	28 (0)	24 (0)	24 (0)
Hymenoptera (Bees, wasps & allies)	60 (3)	46 (3)	33 (1)	25 (2)	28 (2)
Lepidoptera (Butterflies & moths)	31 (1)	27 (1)	23 (0)	7 (1)	13 (0)
Others	22 (0)	19 (0)	16 (0)	7 (0)	11 (0)

4.2.2 Key Species

A total of 20 Key Species were recorded within the study site, of which two are Rare Key Species, including taxa that subject to a formal status review, will likely be downgraded. These 20 Key Species represent 3.5 % of the total number of species recorded within the study site; ranging between 2.1 % to 4.5 % depending on the compartment. Rare Key Species represent less than 1 % of the fauna. Details, including their ecology and occurrence at the study site is conveyed in Table 7.

Table 7: Selection of species recorded with an NCS within the study site.

Species	Status	Compartment(s) Recorded	Ecology
<i>Styloctetor compar</i> (= <i>Ceratinella scabrosa</i>) Araneae, Linyphiidae	Nationally Scarce	LWS Network	A small money-spider associated with dry (often calcareous) unimproved grasslands. Relatively widespread in south-east England but becoming scarce in the Midlands and in the south-west with few records in Somerset (Spider Recording Scheme, 2021).
<i>Argenna subnigra</i> Araneae, Dictynidae	Nationally Scarce	LWS Network	A ground-dwelling spider associated with sparsely vegetated open grasslands, including those characteristic of brownfield sites. It is rare in western England and represents the first records for Somerset.
<i>Acupalpus exiguus</i> Coleoptera, Carabidae	Nationally Scarce	ROF Bridgwater	A small pitchy-black ground beetle associated with wet grassland sites such as flood meadows, often on clay soils, though it has also been recorded in coastal localities on salt-marsh (Telfer, 2016).
<i>Tachyporus formosus</i> (Coleoptera, Staphylinidae)	Nationally Scarce	ROF Bridgwater	A small predatory orange and black rove beetle with a strong association with wetlands and marshy grassland (Lane, 2019).
<i>Stenus palustris</i> (Coleoptera, Staphylinidae)	Nationally Scarce (Nb)	LWS Network	A small predatory rove beetle strongly associated with fens, marshes and other wetland habitats, typically recorded within reed and sedge litter.
<i>Hypnogyra angularis</i> (Coleoptera, Staphylinidae)	Nationally Scarce (Na)	External Fields	This predatory rove beetle is a saproxylic species, associated with woodland, particularly pasture

Species	Status	Compartment(s) Recorded	Ecology
			woodland, parkland estates and orchards. Examples of its immediate habitat often involve wood mould, rot holes, and decayed tree trunks. There may be some association with bird nests in tree cavities.
<i>Longitarsus lycopi</i> (Coleoptera, Chrysomelidae)	Nationally Scarce	External Fields	A small yellowish flea beetle, most often associated with short sward grassland habitats where it is phytophagous on members of the Lamiaceae, commonly ground ivy (<i>Glechoma hederacea</i>) but also self-heal (<i>Prunella vulgaris</i>).
<i>Cryptocephalus bipunctatus</i> (Coleoptera, Chrysomelidae)	Nationally Scarce	LWS Network	A relatively large and convex pot beetle strikingly marked with black longitudinal patches on a gloss yellow elytral background. It is typically recorded in open woodland and scrub habitats (including on heathland), where adults feed on a variety of broad-leaved trees, perhaps with preference for hazel, willow and birch. The larvae are cased and free-living in the ground layer or on foliage and may be ant-associated.
<i>Diplapion stolidus</i> Coleoptera, Apionidae	Nationally Scarce (Nb)	LWS Network	A small phytophagous, grey-black weevil which is associated with ox-eye daisy (<i>Leucanthemum vulgare</i>) in field margins, road verges and other grassland habitats. The larvae probably develop in the rootstock or stems of the plant. In Britain, adults have been recorded mainly between May and September.
<i>Oxystoma cerdo</i> Coleoptera, Apionidae	[Nationally Scarce (Nb)]	ROF Bridgwater	This small grey-black weevil is distributed locally throughout Britain, commonly encountered in the Midlands and south-east England. It is typically recorded in grassland, sometimes in tall herb communities within other habitats. The adults and larvae feed on vetches, particularly tufted vetch (<i>Vicia cracca</i>), the larvae developing in the seed pods. Adults have been found between May and September. This species has increased in the last two decades and no longer deserves its status.
<i>Tanymecus palliatus</i> Coleoptera, Curculionidae	Nationally Scarce (Nb)	LWS Network	This is a moderately large weevil, which superficially resembles a very large Sitona in appearance. It is phytophagous, the adults being associated primarily with plants in the thistle family, although its foodplant associations may well be broader than this. The beetle is found in verge and other more-or-less open grassland habitats where it is usually found by sweeping vegetation.
<i>Larinus planus</i> Coleoptera, Curculionidae	[Nationally Scarce (Nb)]	LWS Network ROF Bridgwater	A moderately large, blackish, elongate weevil which is phytophagous on a variety of thistles in the genera <i>Carduus</i> and <i>Cirsium</i> in grassland. Adults are active in the field between April and September.
<i>Atylotus rusticus</i> (Diptera, Tabanidae)	Nationally Rare	ROF Bridgwater External Fields	A medium sized horsefly associated with grazing marsh and wetland vegetation. There are scattered records in southern England, mostly in and around Otmoor, near Oxford; and the Pevensey Levels (around Brighton). The species is known from the Somerset Levels (Stubbs and Drake, 2014).

Species	Status	Compartment(s) Recorded	Ecology
<i>Beris clavipes</i> (Diptera, Stratiomyidae)	Nationally Scarce	External Fields	A widespread though localised species associated with wetland habitats throughout England and lowland Wales, rare in Scotland (Stubbs and Drake, 2014).
<i>Fannia clara</i> (Diptera, Fanniidae)	pNationally Scarce	External Fields	A lesser housefly recorded from southern England but with a few records from southern Scotland. It is typically recorded in old broad-leaved woodland where the larvae develop in bird nests (Falk and Pont, 2017).
<i>Hydrotaea pilipes</i> (Diptera, Muscidae)	pNationally Scarce	LWS Network	A widespread but very local housefly reported from assorted habitats including woodland and saltmarsh edge. Larvae will be predators of other Diptera larvae in common with other members of the genus (Falk and Pont, 2017).
Small heath (<i>Coenonympha pamphilus</i>) (Lepidoptera, Nymphalidae)	Near Threatened; SoPI	LWS Network	Although a widespread species in the UK, this otherwise common species has experienced a substantial decline in both abundance and occurrence (Fox <i>et al.</i> , 2015), hence its classification as Near Threatened.

4.3 Baseline Invertebrate Assemblage Analysis

The following section describes the invertebrate assemblages recorded within the three compartments that make up the study site (ROF Bridgwater (outwith the LWS Network), LWS Network, and Outwith ROF Bridgwater). The species list for each of these has been analysed using Pantheon to identify the habitat associations and dependencies of the terrestrial invertebrate assemblage associated with each land parcel. The analysis first considers stenotopic species i.e. those terrestrial invertebrates with very specific and ¹⁴restricted habitat requirements. They are considered to have an intrinsic nature conservation value as stenotopic species are generally only recorded on sites that are of nature conservation value. The analysis then considers the habitat affinities of the wider assemblage.

4.3.1 ROF Bridgwater (outwith LWS Network)

The compartment analysed here comprises all habitats within the curtilage of the former ROF Bridgwater, but outwith those areas designated as LWSs (see Figure 1; Appendix A). A total of 289 species were recorded in this compartment of which 256 have been ¹⁵analysed by Pantheon.

A total of 34 stenotopic species were recorded, representing approximately 12 % of the invertebrate fauna identified from the compartment (see Table 15; Appendix C). Most (25 stenotopic species) are associated with the open habitat biotopes (SAT codes prefixed with an 'F' in Table 15), of which 17 species are interpreted as being associated with the habitat patches of disturbed ground that are scattered throughout this compartment where historical clearance work has taken place (see Photograph 1). These disturbed habitat patches, which occur on spoil mounds and level ground have a distinctive appearance similar to arable field margins. However, none of the species, stenotopic or more widespread, are included in Buglife's list (refer to Footnote 5) referenced in Biron (2010). One species of bee, *Lasioglossum fulvicorne*, though widespread in Britain, has a ¹⁶high fidelity to calcareous soils (Alexander, 2003; Else and Edwards, 2018; p. 651). The relevance of calcareous grassland fidelity is discussed in more detail in Section 4.3.2 in relation to the species listed in Table 9 but the presence of a species which has a high fidelity has the potential to amplify the value of a habitat present within a study site. The Nationally Scarce (though increasing) weevil *Larinus planus* (Coleoptera, Curculionidae) has been recorded in the open habitat SAT, short sward and bare ground (F112) on thistles (*Cirsium* spp.) with which it is associated.

Two additional Key Species, the Nationally Rare horsefly *Atylotus rusticus*, (Diptera, Tabanidae) and the National Scarce ground beetle *Acupalpus exiguus* (Coleoptera, Carabidae) are associated with wetland habitat SATs: reed-

¹⁴ Referred to as Specific Assemblage Types (SAT) in Pantheon (Webb *et al.* 2018).

¹⁵ Pantheon analyses species, attaching associated habitats and resources, assemblage types (adapted from the Invertebrate Species-habitat Information System), conservation status, habitat fidelity scores and other information against them.

¹⁶ Alexander (2003) defined high fidelity as a species routinely recorded from calcareous grasslands. They may also be recorded to a greater or lesser degree from other open habitats on freely draining soils, but it is likely that they are mainly dependent on calcareous grasslands to sustain viable populations.

Photograph 1: Nectar-rich resource in disturbed ground with bare ground just north of main offices (left) and spoil heap (right) within ROF Bridgwater.



fen and pools (W314) and undisturbed fluctuating marsh (W221) respectively. The horsefly was recorded throughout the study site in mid-summer but the ground beetle was recorded on one occasion within the fields at the southern end of the ROF Bridgwater, just east of the entrance gate. The Nationally Scarce ground beetle, *Acupalpus exiguus* suggest that these grasslands may be periodically inundated, and whilst they are not floristically species-rich, they are nevertheless a habitat of higher value for invertebrates than the botanical diversity may suggest. These grasslands are interpreted as being remnant examples of lowland floodplain grassland that would have been present prior to the factory's construction in the 1940s on the Puriton Levels and characteristic of the wider NCA. The presence of *A. rusticus* is supportive of this interpretation given its restricted distribution.

4.3.2 LWS Network

The LWS Network comprises all habitats within the curtilage of the former ROF Bridgwater that are designated as non-statutory sites (see Figure 1; Appendix Y). A total of 241 species were recorded in this compartment of which 224 have been analysed by Pantheon. Whilst the analysis has considered the four LWS studied as a single compartment, each of the individual LWSs are described with Table 8 providing a breakdown of species-richness (full species list for each individual LWS is provided in Table 17; Appendix C).

Table 8: Comparison of species data between individual LWSs within the study site.

	Puriton Ash Ground LWS	Puriton Cowslip Field LWS	Puriton Meadows & Rail Spur LWS	Puriton Rhynes & Ponds LWS
Species-richness	96	23	62	111
Key Species	5	2	3	2
Stenotopic Species	25	3	10	9

A total of 38 stenotopic species were recorded across all LWSs, representing approximately 16 % of the invertebrate fauna (see Table 16; Appendix C). Almost all (35 stenotopic species) are associated with the open habitat biotopes (SAT codes prefixed with an 'F' in Table 16), but several (five species) are reliant on the proximity of two SATs such as the dead wood resource (for the larval stages) and scrub edge (for the adult phase). However, the majority (25 species) within the LWS Network are dependent on either the presence of the rich flower resource, bare sand and chalk, or open short sward SATs; three-quarters (18 species) having been recorded within the Puriton Ash Ground LWS (see Photograph 2). Of the 25 stenotopic species, nine taxa (all bees) were also recorded within the wider ROF Bridgwater site, suggesting there is some interchange between the disturbed habitat on the spoil heaps.

Surveys in 2020 recorded 96 species in the Puriton Ground LWS, a small (c. 2.3 ha) land parcel within the ROF, of which five are Key Species; and 25 stenotopic species (see Table 17; Appendix C for a full list). The pot beetle, *Cryptocephalus bipunctatus* (Coleoptera, Chrysomelidae) is phytophagous on various broad-leaved trees, including birches (*Betula* spp.), poplars (*Populus* spp.) and hazel (*Corylus avellana*), though it can occur on dog rose (*Rosa canina*) (Cox, 2007) and whilst it may have wandered from adjacent hedgerows, it could equally be present within the LWS's scattered scrub. The Nationally Scarce weevil, *Larinus planus*, was recorded within the LWS, as well as elsewhere within ROF Bridgwater, thus further emphasising the similarity between the OMH and the disturbed vegetation communities associated with the spoil heaps.

Photograph 2: Puriton Ash Ground LWS (left) and recently landscaped spoil heap adjacent (right).



The Puriton Rhynes & Ponds LWS (c. 23 ha) is located in the north-east of the former ROF and includes the 865 m long reed-bed linking the study site to the Huntspill River NNR. Survey work focussed on the triangular fields (centred on ST 339 428) and the western edge of the reedbed (between ST 3344 4301 and ST 3364 4365). Of the 111 species recorded within this LWS, 78 species were recorded from the reedbed and 46 species from the grassland fields. Only one stenotopic species, the Nationally Scarce rove beetle *Stenus palustris* (Coleoptera, Staphylinidae) was recorded from this LWS, from the reedbed. A second Nationally Scarce beetle, a weevil *Tanymecus palliatus* was recorded from the grassland fields. This is a polyphagous species on various grassland Asteraceae including thistles in the genera *Cirsium* and *Carduus*.

The Puriton Meadows & Rail Spur LWS, which is located in the north-west of the former ROF Bridgwater site comprises three fields and wet woodland, plus linear dense scrub associated with the former railway line ('the rail spur'). Survey work resulted in 62 species being recorded, though this should be considered a snapshot of the fauna within this LWS. Of the three Key Species recorded, the provisionally Nationally Scarce housefly (Diptera, Muscidae) *Hydrotaea pilipes* is considered to be the most significant record from the LWS as there are limited number of records in Britain. The predatory larvae are soil-dwellers, hunting other dipteran larvae, and there may be an association with woodlands, though little is known about its ecology beyond this (Falk and Pont, 2017).

Limited recording was undertaken within the Puriton Cowslip Field LWS, but nevertheless, despite only 23 species being recorded, the Nationally Scarce mesh-webbed spider (Arachnida, Araneae, Dictynidae) *Argenna subnigra* occurs here. This is a ground-dwelling spider of open, sparsely vegetated grasslands where it resides under stones and the base of vegetation (Spider Recording Scheme, 2021b). This is a species which is rare in Somerset, having only been recorded the once, from Berrow Dunes, near Burnham-on-Sea (VC 6) in May 1990. The record is thus the first for thirty years and given the lack of records in the wider region, it is a regionally rare species. Further, the Nationally Scarce weevil *Diapion stolidum* is also present here, a species associated with ox-eye daisy.

A component of the invertebrate fauna recorded within the network of LWSs are the 20 species (see Table 9) which have a ¹⁷fidelity to calcareous grasslands (Alexander, 2003), which in this context, includes free draining soils that are typical on brownfield sites.

¹⁷ **Moderate:** species routinely recorded from calcareous grasslands, but also from semi-natural open habitats on freely-draining soils over all or part of their geographical area of distribution. **Low:** species frequently recorded in numbers from calcareous grasslands, but predominantly associated with other types of open habitats over all their British area of distribution.

Table 9: Invertebrates scoring moderate or low fidelity to calcareous grassland recorded on the three brownfield sites in 2020 (after Alexander, 2003).

Order	Family	Species	Conservation status	Habitat score
Araneae	Linyphiidae	<i>Micrargus subaequalis</i>		Moderate
Araneae	Linyphiidae	<i>Styloctetor compar</i>	Nationally Scarce	Moderate
Araneae	Lycosidae	<i>Pardosa monticola</i>		Moderate
Coleoptera	Apionidae	<i>Diplapion stolidum</i>	Nationally Scarce (Nb)	Moderate
Coleoptera	Chrysomelidae	<i>Cryptocephalus bipunctatus</i>	Nationally Scarce	Moderate
Coleoptera	Chrysomelidae	<i>Longitarsus dorsalis</i>		Moderate
Coleoptera	Elateridae	<i>Agrypnus murinus</i>		Moderate
Hemiptera	Cicadellidae	<i>Anaceratagallia ribauti</i>		Moderate
Hymenoptera	Halictidae	<i>Lasioglossum morio</i>		Moderate
Araneae	Gnaphosidae	<i>Zelotes latreillei</i>		Low
Araneae	Hahnidae	<i>Hahnia nava</i>		Low
Araneae	Linyphiidae	<i>Bathypantes parvulus</i>		Low
Araneae	Salticidae	<i>Heliophanus flavipes</i>		Low
Araneae	Salticidae	<i>Talavera aequipes</i>		Low
Coleoptera	Curculionidae	<i>Larinus planus</i>	[Nationally Scarce (Nb)]	Low
Coleoptera	Curculionidae	<i>Hypera zoilus</i>		Low
Coleoptera	Curculionidae	<i>Otiorhynchus ovatus</i>		Low
Coleoptera	Curculionidae	<i>Phyllobius roboretanus</i>		Low
Hymenoptera	Halictidae	<i>Lasioglossum pauxillum</i>		Low
Hymenoptera	Halictidae	<i>Sphecodes ephippius</i>		Low

Calcareous, or base-rich grasslands, are one of the most species-rich grassland types in Britain (Alexander, 2003; page 11) and so assemblages that support species with a moderate or high degree of fidelity to this habitat are potentially of nature conservation value. Eight out of the nine taxa identified as having moderate fidelity were recorded within the Puriton Ash Ground LWS (*Diplapion stolidum* being the exemption). Of these, four beetles (*Cryptocephalus bipunctatus*, *D. stolidum*, *Longitarsus dorsalis* and *Agrypnus murinus*); and a halictid bee (*Lasioglossum morio*) are also stenotopic (see Table 16, Appendix C), thus underlining the importance of these habitats within the context of the study site. Whilst species with a fidelity to calcareous grasslands are not restricted to the LWS network (e.g. *L. fulvicorne*), the majority of them are, emphasising the relative value of these designated sites. However, the presence of *L. fulvicorne*, a bee which was only recorded in two locations within the former ROF Bridgwater but outwith the LWS network reiterates the narrative that the disturbed vegetation communities are functionally similar to the OMH.

4.3.3 External Fields

The External Fields comprises all habitats outwith the security fence of the former ROF Bridgwater, which for the avoidance of doubt, includes the orchard immediately to the north of Woolavington and the fields to the north-east of Puriton (see Figure 1; Appendix Y). A total of 253 species were recorded in this compartment of which 229 have been analysed by Pantheon.

A total of 50 stenotopic species were recorded, representing approximately 20 % of the invertebrate fauna identified from the compartment (see Table 18; Appendix C). Just under half (23 stenotopic species) are associated with the decaying wood habitat (SAT codes prefixed with an 'A' in Table 18), and 25 species are associated with the open habitat biotopes SAT codes prefixed with an 'F' in Table 18).

A substantial proportion (c. 30 %) of the wood decay fauna (saproxylic invertebrates) was collected from three aerial flight interception traps (FITs) attached to the old apple trees within the orchard located outside the village of Woolavington. A total of 176 species were recorded by all methods within the orchard, of which 76 species

were directly collected from the trees and hedgerow shrubs by FITs (52 spp.) and beating the lower branches (29 spp.). Whilst only one Nationally Scarce species was recorded (the rove beetle *Hypnogyra angularis*, which is associated with wood mould in tree cavities), the 25 saproxylic species recorded throughout this compartment is noteworthy given the lack of ancient woodland within the NCA (Natural England, 2013; Section 4.2). This dead wood resource is not restricted to the orchard but is also present as boundary features (mature and over-mature hedgerows) within the ROF and elsewhere in the External Fields such as the track that skirts the orchard's eastern boundary from Woolavington, north towards Stoning Pound ('the Woolavington Track'). However, the plantation woodland, for example in the south-east corner of the ROF (centred on ST 3393 4195), lacked a dead wood resource. The analysis has also identified the importance of the juxtaposition of the open habitat biotope with the dead wood resource as ten species of solitary wasp including five species of *Ectemnius* (*E. cavifrons*, *E. cephalotes*, *E. continuus*, *E. lapidarius* and *E. lituratus*) co-depend on dead wood (for nesting) and open habitat (for foraging).

5 Nature Conservation Evaluation

As stated in Section 3.3, there is no standard frame of reference to evaluate a study site's invertebrate assemblages' nature conservation value. Instead, reliance is placed on various sources, including proportion of Key Species recorded, and analysis using Pantheon (Webb *et al.*, 2018). Added to this is recent guidance which considers how Key Species can best be represented in protected sites (SSSIs) (Curson *et al.*, 2019). Whilst the presence of Key Species in themselves is not a sole indication of national value, it is considered a useful guide as to where a particular site may sit in a geographical hierarchy. This underlying principle has been of value for the purposes of informing the evaluation within the study site's compartments.

Curson *et al.* (2019) suggests that sites can be valued based on:

- individual species that are considered to be threatened species (IUCN and British rarity, see this report's Appendix B for details), species of country conservation priority (i.e. SoPI), species with restricted or disjunct ranges, and edge of range species; and
- assemblages of specialised habitats and habitat-based assemblages such as OMH faunas, and habitat heterogeneity/ mosaics.

In addition to the above, it remains relevant to assess the invertebrate assemblage recorded against non-statutory site guidelines, if applicable. The administrative region's guidelines includes reference to terrestrial invertebrates (Biron, 2010) and the criteria are referred to in Section 5.1.3, Section 5.2.3 and Section 5.3.3.

This approach forms the basis for the following evaluation and in doing so, takes into consideration the criteria referred to above and more general points such as the relative value of how terrestrial invertebrate assemblages relate to both the importance and uniqueness of the habitats present, and the characteristics of the assemblage itself. The assessment first considers the presence of individual species recorded, also taking in to account the likelihood of continued presence of historically recorded taxa where relevant, followed by the assemblages recorded (i.e. not just the rarer taxa).

Following assessment of this, as explained in more detail below, ROF Bridgwater (excluding LWSs) is considered to support an assemblage of terrestrial invertebrates of **district nature conservation value**; the LWS Network is considered to support an assemblage of terrestrial invertebrates of **county nature conservation value**; and the External Fields is considered to support an assemblage of terrestrial invertebrates of **county nature conservation value**.

5.1 ROF Bridgwater (excluding LWS)

5.1.1 Individual Species

Out of a total species list of 289, six Key Species and one Rare Key Species (based on Telfer, 2017) were recorded, representing 2.1 % and 0.3 % of the assemblage respectively. Both these proportions are substantially below the proposed threshold for national importance (Key Species (10 %) and Rare Key Species (1 %)).

Applying Curson *et al.* (2019) one species, the Nationally Rare horsefly *Atylotus rusticus* (see Table 7 for details) has been recorded, and based on Harvey (2018), there is a single ¹⁸ record from East Huntspill, approximately 2.5 km to the north, from August 2017. Two of the SSSIs which are located to the east of ROF Bridgwater (Catcott Edington & Chilton Moor SSSI, and Shapwick Heath SSSI) are known to support important invertebrates, including the W314 reed-fen and pools SAT which *A. rusticus* is part of. Although there are no records of this horsefly from these land parcels, and no mention of the species from the ¹⁹citation relating to the Somerset Levels and Moors Ramsar Site, it is considered probable that the species is present in suitable habitat within the statutory sites and the wider landscape. Likewise, two additional Key Species (*Acupalpus exiguus* and *Tachyporus formosus*) have been recorded within the grassland habitats and their ecologies suggest that these

¹⁸ Record info available from the NBN Atlas: <https://records.nbnatlas.org/occurrences/3762b3ae-1aba-4a6f-ad46-205fb603e780>; available under CC-BY Licence; last accessed on 27th January 2021.

¹⁹ See <https://rsis.ramsar.org/RISapp/files/RISrep/GB914RIS.pdf>; last accessed on 27th January 2021.

habitats are similar to, and possibly represent remnant lowland wet grasslands of the once more extensive Puriton Levels, and that the grasslands retain a functional ecological connectivity with the wider Somerset Levels, albeit of diminished extent and quality as a consequence of the site's previous use.

5.1.2 Habitat Assemblages

The relative value of the terrestrial invertebrate assemblages relates to both the importance and uniqueness of the habitats present, and the characteristics of the assemblage itself.

5.1.2.1 Landscape context

Within the Somerset Levels and Moors NCA in south-west England, Natural England (2013) state that there are 43,393 ha of coastal and floodplain grazing marsh, a HoPI, and one of the dominant open habitat biotopes within the Somerset Levels. Based on the MAGIC website, within a 2 km buffer, there are ²⁰c. 1,465 ha of floodplain grassland, representing approximately 3.4 % of the NCA's resource, though all are outside the statutory sites. Based on the survey work, and reference to readily available aerial photography on-line, it is estimated that there are approximately 10 ha of similar grassland habitat inside this compartment, which represents an approximate additional 0.7 % of the immediate resource, and a mere additional c. 0.02 % of the total NCA resource. Therefore, whilst this additional 10 ha, supports Key Species, including a Nationally Rare horsefly, it represents a tiny contribution to the total resource, even within the immediate vicinity.

5.1.2.2 Stenotopic Species

The relative value of the notable habitats present for terrestrial invertebrate species can be interrogated in more detail regarding the stenotopic species recorded by the survey. As explained in Section 3.3, stenotopic species are dependent on quite specific and restricted habitat conditions that are rarely encountered in the wider landscape. Therefore, stenotopic species are considered to have an intrinsic nature conservation value and generally only occur in association with sites of relatively high nature conservation importance.

Pantheon has been used to investigate this further by interrogating the composition of the terrestrial invertebrate assemblage in terms of biotopes, habitats, and the distribution of stenotopic species recorded. In doing so, the limitations of Pantheon as a tool have been considered, and professional judgement has been applied where necessary to assist robust valuation.

Table 10: Invertebrate assemblage assessment for ROF Bridgwater (outwith LWS Network).

Broad biotope	Habitat	SAT	No. of species	FC Threshold	Proportion to Threshold	Species with conservation status
Open habitats	Cross-cutting	F002: Rich flower resource	16	15	107%	
Open habitats	Cross-cutting	F001: Scrub edge	7	11	64%	
Wetland	Marshland	W221: Undisturbed fluctuating marsh	2	4	50%	1
Tree-associated	Decaying wood	A212: Bark & sapwood decay	5	19	26%	
Wetland	Running water	W125: Slow-flowing rivers	1	4	25%	
Open habitats	Short sward & bare ground	F112: Open short sward	3	13	23%	1
Open habitats	Cross-cutting	F003: Scrub-heath & moorland	1	9	11%	
Wetland	Peatland	W314: Reed-fen & pools	1	11	9%	1
open habitats	Short sward & bare ground	F111: Bare sand & chalk	1	19	5%	

²⁰ This includes 10.7 ha present within fields outwith the former ROF Bridgwater site, but within the wider study site.

Following review of the number of stenotopic species recorded and the thresholds published in Drake *et al.* (2007), as conveyed in Table 10, the cross-cutting rich flower resource (F002) has exceeded the threshold considered to represent FC status, which is dominated by pollinators such as bees and flies. However, cross-cutting SATs have a poor discriminatory value in nature conservation terms (i.e. exceeding the threshold is not sufficient on its own to conclude national significance) (Webb *et al.*, 2018) and whilst it is considered to be partly influenced by the vegetation community developing on the disturbed soils such as on spoil heaps as illustrated on Photograph 1, the open short sward SAT (F112), which has a low PtT score of 23 % requires the rich flower resource (F002) PtT exceedance to be tempered. So whilst this transient habitat has intrinsic interest, the rich flower resource exceedance is not sufficient to conclude an assemblage of high nature conservation value given the lower PtT scores for associated relevant short sward and bare ground habitats.

The undisturbed fluctuating marsh (W221) PtT score of 50 %, which can be considered analogous to floodplain grassland, is a substantial distance away from the FC threshold, a possible reflection on the limited resource present within the context of the wider landscape, and is consistent with the narrative in Section 5.1.2.1.

It should be recalled that survey work missed the spring season (i.e. late April through to early May) and in combination with the very dry spring (see Section 1.3.2) was generally observed to have had a negative effect on insect activity, particularly pollinators, as the ground vegetation suffered from desiccation. This may have reduced activity and possibly resulted in increased species mortality at the pre-adult stage (larvae or pupae), or more rapid adult mortality, resulting in lower species-richness than otherwise may have been the case. Had surveys been undertaken, they may have resulted in additional stenotopic species being recorded within the undisturbed fluctuating marsh SAT, pushing it closer to FC status; though the current low PtT score for the open short sward is not thought likely to come substantially closer to the threshold. Nevertheless, professional judgement has been applied and it is considered that whilst the FC status threshold for both SATs are unlikely to have been met, it would likely have been closer and this has influenced the conclusion on the compartment's nature conservation value for invertebrates.

5.1.3 Taxonomic Assemblages

In addition to the guidelines for statutory site designation (refer back to Section 5.1.1), there are published guidelines for non-statutory site designation (Local Wildlife Sites) in Somerset (refer back to Section 3.3.3.2). The guidelines provide a coherent means by which the compartment can be assessed against. Applying the criteria, the compartment would meet the guidelines for LWS designation based on one criterion:

- Criterion 6S9.3: on the basis that there are three taxa (*Atylotus rusticus*, *Acupalpus exiguus* and *Tachyporus formosus*) that are genuinely Nationally Rare/ Nationally Scarce and likely to be scarce or rare in Somerset.

It is worth highlighting that no species were recorded within the disturbed vegetation communities that are included on Buglife's list of species association with arable field margins. So, whilst these vegetation communities support a pollinator assemblage, they fail to meet Criterion 6H12.3.

5.1.4 Conclusion

The invertebrate assemblage recorded within the compartment in 2020 includes six Key Species, of which one is a Rare Key Species. However, only three are considered to genuinely retain their nature conservation status, the Nationally Rare horsefly and two Nationally Scarce beetles, which are also rare in Somerset. The study site supports 34 stenotopic species, most being intrinsically linked to the open habitat biotopes, though the undisturbed fluctuating marsh, interpreted as being remnant examples of lowland floodplain grassland, are important for supporting the Key Species. However, the estimated 10 ha of this grassland that is present within this compartment represents a tiny proportion of the available resource within the NCA and immediate vicinity, and is not evaluated to be in favourable conservation status. Whilst the rich flower resource is identified to be in favourable condition as mentioned in Section 5.1.2.2, it has poor discriminatory value in conservation terms and in combination with the open short sward's low PtT score, and lack of Key Species, the dominant habitat within this compartment has a reduced nature conservation value than the data suggests on first appraisal.

Whilst the presence of three Key Species meets Criterion 6S9.3 (Biron, 2010), some professional judgement is necessary. The Key Species occur in a habitat that represents a tiny proportion of the adjacent landscape's resource. It is possible that they occur in suitable habitat within the statutory site network approximately 3 km to the east but within a 2 km buffer of the compartment, the habitats are not statutorily protected for nature conservation. On balance, the habitat within the compartment is not essential to maintain these taxa's favourable conservation status, within the NCA or county, but they do make a substantial contribution more

locally. For all the reasons summarised above, it is justifiable to conclude that the habitats within this compartment are of **at least district nature conservation value** for their invertebrate assemblages.

5.2 LWS Network

5.2.1 Individual Species

Out of a total species list of 241, 11 Key Species (one being Near Threatened) but no Rare Key Species (based on Telfer, 2017) were recorded, representing 4.6 % and 0 % of the assemblage respectively. Both these proportions are substantially below the proposed threshold for national importance (Key Species (10 %) and Rare Key Species (1 %)).

Of the eleven Key Species, the ground-dwelling mesh-web weaver *Argenna subnigra* (Araneae, Dictynidae) is a rare species in Somerset, there being only one other record; and the weevil *Tanymecus palliatus* (Coleoptera, Curculionidae) is similarly scarce. The provisionally Nationally Scarce housefly *Hydrotaea pillipes* (Diptera, Muscidae) may be new to the county, but there is no national recording scheme for this family, so confidence on the comprehensiveness of distributional data available from reliable sources such as the NBN Atlas is low. However, whilst it may be under-recorded, it is not likely to be anything more than occasional in the county, in suitable habitat. Curson *et al.* (2019) state that in the absence of threatened or Nationally Rare taxa, the presence of Nationally Scarce species should only be considered if they are rare or new to the county. *A. subnigra* can be stated with certainty, to be rare in Somerset (administrative county) and vice-county, as can *T. palliatus* as it is a notable Somerset species (Large, 2000). *H. pillipes* is likely to be a genuinely scarce species in the county.

5.2.2 Habitat Assemblages

5.2.2.1 Landscape context

Puriton Rhynes and Ponds LWS supports c. 14 ha of floodplain grassland, a HoPI, based on the MAGIC website database. This represents just under 1 % of the resource within the immediate vicinity (i.e. within a 2 km buffer). The weevil, *T. palliatus* was recorded from this LWS. As previously discussed (Section 5.1.2.1), within the context of the wider landscape, floodplain grassland is an abundant resource and the component within the this compartment represents a tiny fraction of the resource available.

Puriton Meadows and Rail Spur LWS supports a mosaic of wet woodland, scrub and approximately 1.6 ha of what MAGIC identifies as ‘good quality lowland semi-improved grassland’, but has a general appearance similar to most of the other grasslands within the study site. From an invertebrate ecology perspective, the three fields are similar to the floodplain grassland, but with a more enclosed aspect, sheltered by the mature hedgerows and scrub. Within the wider landscape, there are scattered pockets of similar habitat, for example around Tadham Moor in the Brue Valley to the north-west and in some of the fields north-west of Puriton, about 0.9 km to the south-east of this LWS. The rare muscid fly, *H. pillipes* was recorded from this location, which is consistent with its ecology of wet grassland and tree-associated biotopes in close proximity. It is this feature that is probably of greatest relevance when considering the compartment’s nature conservation value, and the LWS’s contribution rather than the grasslands *per se*.

Based on the MAGIC database, there are approximately 97.3 ha of OMH within the NCA, though none within a 2 km buffer of the compartment. The OMH land parcels are fragmentary and range between just over 34 ha to 0.32 ha (n = 26), though two land parcels account for two-thirds of the resource and the rest are below 5 ha (the median area is 1.1 ha including the two largest land parcels). Whilst the area of OMH within the compartment is approximately twice the NCA average (median), and represents an additional 2.4% of the resource, it is a scarce and fragmentary resource and the invertebrate fauna recorded here is likely to have closer associations with free-draining habitats elsewhere within the immediate vicinity. The example in the study site, which is probably most closely associated with this characteristic is the calcareous (base-rich) grassland within Puriton Cowslip Meadow LWS, in addition to the disturbed vegetation communities present within the wider ROF Bridgwater site described in Section 5.1. Seven Key Species, including two Nationally Scarce spiders: *A. subnigra* and *Styloctetor compar* (Araneae, Linyphiidae); and the pot beetle *C. bipunctatus* amplifies the value of these habitats, which in combination with the pollinator species-richness, enhances the interest of the OMH and calcareous grassland disproportionately to their contribution to the NCA’s resource.

5.2.2.2 Stenotopic Species

Following review of the number of stenotopic species recorded and the thresholds published in Drake *et al.* (2007), as conveyed in Table 11, the cross-cutting rich flower resource (F002) has exceeded the threshold

considered to represent FC status, which is dominated by pollinators such as bees and flies. However, as previously stated, cross-cutting SATs have a poor discriminatory value in nature conservation terms (Webb *et al.*, 2018) and therefore, it requires other SATs to score highly to retain an evaluation of high nature conservation value. The two other short sward and bare ground habitat SATs (bare sand and chalk (F111) and open short sward SAT (F112)) both have a low PtT score (37 % and 31 % respectively) so whilst the OMH and calcareous grasslands have intrinsic interest, the rich flower resource exceedance is not sufficient to conclude an assemblage of high nature conservation value given the other low PtT scores.

Again, survey work missed the spring season (i.e. late April through to early May) and in combination with the very dry spring (see Section 1.3.2) was generally observed to have had a negative effect on insect activity, particularly pollinators, for reasons previously explained. As for the other compartments, had surveys been undertaken, they may have resulted in additional stenotopic species being recorded but given the low PtT scores, it is not thought likely that they would have been substantially closer to the threshold, but may have been closer.

Table 11: Invertebrate assemblage assessment for LWS Network.

Broad biotope	Habitat	SAT	No. of species	FC Threshold	Proportion to Threshold	Species with Conservation Status
Open habitats	Cross-cutting	F002: Rich flower resource	17	15	113%	
Open habitats	Cross-cutting	F001: Scrub edge	7	11	64%	1
Open habitats	Short sward & bare ground	F111: Bare sand & chalk	7	19	37%	2
Open habitats	Short sward & bare ground	F112: Open short sward	4	13	31%	3
Wetland	Running water	W125: Slow-flowing rivers	1	4	25%	
Open habitats	Cross-cutting	F003: Scrub-heath & moorland	2	9	22%	
Wetland	Peatland	W313: Moss & tussock fen	1	6	17%	
Tree-associated	Decaying wood	FA212: Bark & sapwood decay	3	19	16%	
Tree-associated	Decaying wood	A213: Fungal fruiting bodies	1	7	14%	
Wetland	Peatland	W314: Reed-fen & pools	1	11	9%	

5.2.3 Taxonomic Assemblages

Eleven Key Species across all LWSs were recorded in 2020 with each individual designated site supporting between two and five taxa. Applying the guidelines' criteria (refer back to Section 3.3.3.2), collectively, and individually (see Table 17; Appendix C), the existing LWSs would meet the guidelines for LWS designation based on Criterion 6S9.3.

5.2.4 Conclusion

The invertebrate assemblage recorded within the compartment in 2020 includes eleven Key Species (one being Near Threatened and a SoPI), though none are a Rare Key Species. Of these, eight are considered to genuinely retain their nature conservation status and several are also rare in Somerset. The study site supports 38 stenotopic species, almost all linked to the open habitat biotopes. Twenty species are further evaluated to have an association with calcareous (or base-rich) grasslands, which in the context of the habitats within the compartment, include the Puriton Cowslip Field LWS and the OMH habitat within the Puriton Ash Ground LWS, which share similar edaphic conditions such as free draining substrates. Faunas associated with calcareous grasslands (or similar environments) are considered to potentially support assemblages of nature conservation value and this is the case here, as evidenced by the Nationally Scarce (and rare in Somerset) spider *Argenna subnigra*.

Consideration of OMH within the compartment, in the context of the NCA, suggests that whilst the habitat represents an additional 2.4 % of this resource, the extent present is about twice the median (i.e. 2.3 ha versus 1.1 ha). In combination with the calcareous grassland habitat, seven Key Species, including two Nationally Scarce spiders: *A. subnigra* and *Styloctetor compar*; and the pot beetle *C. bipunctatus* attests to the disproportionate value this habitat has, despite the relatively small proportion it represents within the NCA. This, in combination with the pollinator species-richness, enhances the interest of the OMH and calcareous grassland disproportionately to their contribution to the NCA's resource.

The presence of eleven Key Species meets Criterion 6S9.3 (Biron, 2010), which include Somerset rarities. Whilst they occur in habitats that represent a relatively small proportion of the adjacent landscape's resource, unlike the grasslands summed up in Section 5.1.4, several of these occur in OMH habitat (or similar) which is fragmentary and typically in substantially smaller land parcels within the NCA.

On balance, the habitats within the compartment are essential to maintain these taxa's favourable conservation status, within the NCA or county. For all the reasons summarised above, it is justifiable to conclude that the highlighted habitats within this compartment are of **county nature conservation value** for their invertebrate assemblages.

5.3 External Fields

5.3.1 Individual Species

Out of a total species list of 253, seven Key Species and one Rare Key Species (based on Telfer, 2017) were recorded, representing 2.8 % and 0.4 % of the assemblage respectively. Both these proportions are substantially below the proposed threshold for national importance (Key Species (10 %) and Rare Key Species (1 %)).

Of the seven Key Species, the Nationally Rare horsefly *Atylotus rusticus* was recorded (see Section 5.1.1 for details and some context). A further four taxa are genuinely Nationally Scarce, including a rove beetle associated with dead wood (*Hypnogyra angularis*) and a lesser housefly, *Fannia clara* (Diptera, Fanniidae), which is associated with bird's nests in woodland; neither of which are included in Large (2000) and would appear to be new county records based on the NBN Atlas.

5.3.2 Habitat Assemblages

5.3.2.1 Landscape context

As highlighted in Section 4.3.3, a substantial proportion of the invertebrate assemblage recorded within this compartment, was associated with wood decay, including the rove beetle *H. angularis*. Woodland within the NCA is a scarce resource, with approximately 1,181 ha present (all types), of which 141 ha is estimated to be ancient semi-natural woodland (Natural England, 2013), though there are no examples anywhere close to the compartment based on the MAGIC dataset. There is estimated, based on MAGIC, to be approximately 121 ha of traditional orchards within the NCA (including the 1.59 ha within the compartment), which are not described in detail in Natural England (2013), despite the recognition of the importance of this HoPI. Whilst ancient semi-natural woodland and traditional orchards are an indicator of wood decay resource, it is not exclusive to this habitat; mature hedgerows, scrub and within-field trees will also contain this habitat feature. However, for the purposes of landscape context, the presence of traditional orchards in the wider landscape is discussed below, taking in to consideration the presence of the mature hedgerows, scrub and additional features.

Within the immediate vicinity of the compartment (2 km buffer), there are approximately 15.53 ha of traditional orchard, including the 1.59 ha present within three fields in this compartment, and 121 ha within the NCA. The compartment's orchards therefore represent just over 10 % of the immediate, and 1.3 % of the NCA's resource. However, the average orchard within the NCA covers an area of 0.38 ha (within the buffer: 0.32 ha), thus the compartment's orchard is approximately four-times greater in area than the NCA and immediate vicinity. This is not a complete narrative on the wood decay resource availability as the mature hedgerows and scrub within the field network that is also present within the compartment (and within the ROF Bridgwater site) provides additional habitat. Nevertheless, it presents a contextual description of the potential availability and given the scarcity of tree-associated biotopes within the NCA and immediate vicinity, it amplifies the importance of this resource within the compartment.

5.3.2.2 Stenotopic Species

Following review of the number of stenotopic species recorded and the thresholds published in Drake *et al.* (2007), as conveyed in Table 12, the cross-cutting rich flower resource (F002) and scrub edge (F001) have exceeded the threshold considered to represent FC status. However, as they have a poor discriminatory value in nature conservation terms (Webb *et al.*, 2018), it requires other SATs to score highly to retain an evaluation of high nature conservation value. It is therefore notable that the bark and sapwood decay (A212) SAT has a PtT score of 95 %. There are three other decaying wood SATs (A211: heartwood decay (50 %); A215: epiphyte fauna (30 %) and A213: fungal fruiting bodies (7 %)), which whilst scoring moderately (A211) to poor, support a narrative that the wood decay resource within the compartment is noteworthy.

Table 12: Invertebrate assemblage assessment for External Fields.

Broad biotope	Habitat	SAT	No. of species	FC Threshold	Proportion to Threshold	Species with conservation status
Open habitats	Cross-cutting	F001: Scrub edge	16	11	145%	
Open habitats	Cross-cutting	F002: Rich flower resource	15	15	100%	
Tree-associated	Decaying wood	A212: Bark & sapwood decay	18	19	95%	
Tree-associated	Decaying wood	A211: Heartwood decay	3	6	50%	
Tree-associated	Decaying wood	A215: Epiphyte fauna	1	3	33%	
Wetland	Peatland	W314: Reed-fen & pools	2	11	18%	1
Open habitats	Short sward & bare ground	F112: Open short sward	2	13	15%	1
Tree-associated	Decaying wood	A213: Fungal fruiting bodies	1	7	14%	

A second means by which the nature conservation value of wood decay (saproxylic) invertebrate faunas are the two systems have been devised for the relative assessment of site quality for nature conservation using saproxylic beetles: the Index of Ecological Continuity (revised in Alexander, 2004) and the Saproxylic Quality Index (Fowles, Alexander and Key, 1999).

5.3.2.2.1 Index of Ecological Continuity

The Index of Ecological Continuity (IEC) has been used to identify Britain's most important sites for the saproxylic invertebrates of ancient trees and wood-pasture and parkland type habitats, and a hierarchical site table has been developed. The Index calculation is based on the presence or absence of a select list of beetle species (major revision by Alexander, 2004, plus subsequent adjustments). The species are graded according to their degree of association with Britain's remaining areas of old growth, mainly the ancient wood pastures and historic parklands; and these grades are used as the basis for a scoring system. The total of these scores provides the Index.

The species in the qualifying list include many which are difficult to find on demand and so the Index is best built up over a number of years. Records from earlier recording therefore contribute to the Index. A control on old records is however imposed, with only post-1950 records being used in the calculation. All records have arisen during 2020 and so this control is not relevant here. The cumulative nature of the IEC means that the figure at any one time is a minimum figure; the Index can only increase as previously overlooked species are revealed.

Experience has suggested that sites of national importance have an IEC in the range of 25 – 80, while IEC values of 15 – 24 are of regional importance (Alexander, 2004). Sites in excess of 80 are considered to be of European significance.

The IEC value of the compartment is three, which clearly indicates a score of low British significance.

5.3.2.2 Saproxylic Quality Index

The Saproxylic Quality Index (SaQI) (Fowles, Alexander and Key, 1999) is designed to take the whole saproxylic beetle fauna into account and to include some control of recording effort. The species are scored according to the level of their national status and on a geometric scale: from 1 point for common species through to 32 points for the rarest. The total of these scores is termed the Saproxylic Quality Score and the SaQI is calculated by dividing this score by the number of qualifying saproxylic species recorded and then multiplying the result by one hundred.

The SaQI calculation has certain provisos:

- A threshold of 40 qualifying species have been recorded from the site;
- the list should be complete, i.e. include all qualifying species recorded during surveys; and
- the same attention should have been applied to recording common species as rare ones.

Fowles, Alexander and Key (1999) suggest that a SaQI of 500 is probably an appropriate threshold for assessing national importance.

The Saproxylic Quality Index for the compartment is based on twelve scoring species (see Table 13), which is below the minimum threshold of 40 species; so caution has to be applied in considering the SaQI score (derived by the sum of the SQI score divided by species-richness multiplied by 100).

Table 13: Saproxylic beetles recorded within External Fields in 2020.

Family	Saproxylic Species	Conservation Status	SQI Score	IEC Score
Staphylinidae	²¹ <i>Hypnogyra angularis</i>	Nationally Scarce (Na)	16	2
Anobiidae	<i>Anobium punctatum</i>	Common	1	0
Anobiidae	<i>Ptilinus pectinicornis</i>	Common	1	0
Cryptophagidae	<i>Cryptophagus dentatus</i>	Unknown	1	0
Erotylidae	<i>Triplax russica</i>	Local	4	1
Salpingidae	<i>Salpingus planirostris</i>	Common	1	0
Cerambycidae	<i>Grammoptera ruficornis</i>	Common	1	0
Cerambycidae	<i>Pogonocherus hispidulus</i>	Local	2	0
Cerambycidae	<i>Pogonocherus hispidus</i>	Local	2	0
Cerambycidae	<i>Tetrops praeustus</i>	Local	2	0
Curculionidae	<i>Scolytus multistriatus</i>	Common	1	0
Curculionidae	<i>Scolytus rugulosus</i>	Local	2	0

Fowles, Alexander and Key (1999) suggest that a SaQI of 500 is probably an appropriate threshold for assessing national importance with 590 for international importance. The 2020 survey resulted in a SaQI of 283 which is substantially below the level for national significance. However, the SaQI was derived from only a dozen species and survey effort using FITs was restricted to a single period between the 9th June and 7th July 2020 so an element of caution should be applied.

5.3.3 Taxonomic Assemblages

Seven Key Species (one of which is a Rare Key Species) were recorded in 2020. Applying the non-statutory site guidelines' criteria (refer back to Section 3.3.3.2), the compartment would meet the guidelines for LWS designation based on Criterion 6S9.3.

Whilst the IEC score of three is below the threshold given in Criterion 6S9.4 of > 15 in Biron (2010), this likely down to survey effort, rather than a genuine reflection of the compartment's true value for saproxylic

²¹ As *Xantholinus angularis* in Fowles, Alexander and Key (1999).

invertebrates. FITs were only active for a short period in summer, when a prolonged survey between spring and autumn would have likely resulted in further saproxylic species with IEC scores being recorded. As the IEC score for a site is a cumulative score, it is anticipated that further appropriate survey effort would potentially come close to the threshold for LWS designation.

5.3.4 Conclusion

The invertebrate assemblage recorded within the compartment in 2020 includes seven Key Species (one a Rare Key Species). The study site supports 50 stenotopic species, of which around half are associated with the decaying wood habitat and 25 are associated with open habitat biotopes. A dozen species of saproxylic beetles were recorded, including the Nationally Scarce rove beetle *Hypnogyra angularis*, which is almost certainly an underestimate, influenced by the FIT survey effort targeting three apple trees in the orchard. The correct approach to assessment is therefore to recognise that species numbers would be higher. Habitats supporting high quality wood decay such as ancient semi-natural woodland and traditional orchards are rare (ancient woodland), or scattered and fragmentary (orchards) within the NCA, thus whilst the habitat represents 1.3 % of the NCA's total resource, the extent present (1.59 ha) is about four-times the average orchard area (0.38 ha). Furthermore, within a 2 km buffer, the resource within the compartment represents about 10 % available in the vicinity. This presence of wood decay habitat within the hedgerow network and scrub will add to the nature conservation value of this resource, which, if further survey is undertaken, is likely to result in additional saproxylic stenotopic and Key Species, possibly raising the nature conservation value above what the current data suggests.

The presence of seven Key Species meets Criterion 6S9.3 (Biron, 2010), which include Somerset rarities, and whilst Criterion 6S9.4 is not met, it is evaluated that if further survey effort is undertaken, the IEC score will increase from three to closer to 15.

On balance, the habitats within the compartment are essential to maintain these taxa's favourable conservation status, within the NCA or county. For all the reasons summarised above, it is justifiable to conclude that the orchard, including the mature hedgerows and adjacent fields support an invertebrate assemblage of **at least county nature conservation value**.

6 Recommendations and Mitigation Principles

6.1 Recommendations

Nine survey visits were completed between mid-May and mid-September 2020 and material collected by various methods was obtained from representative broad biotopes and habitats within the study site. For the purposes of evaluation, the study site has been divided into three compartments and the data analysed, concluding that they are of at least district (non-designated habitats within the former ROF) or at least county (LWS Network and External Fields) nature conservation value for their terrestrial invertebrate assemblages.

Consideration has been given to whether further survey effort is proportionate and justifiable to inform the Local Development Order (LDO) even having considered the constraints described in Section 1.3 and the limiting factors in to account; or whether as a consequence of the results, further, more specialist survey work such as deployment of FITs, would substantially alter the evaluation's conclusions: for example, raising the nature conservation value of a habitat or feature such that this could require additional or alternative mitigation, including avoidance.

Survey work applying general methods (aerial netting, sweeping the field layer, vacuum sampling ground vegetation and direct observation) has resulted in a total of 565 species (20 Key Species) which is a diverse assemblage. This has been supplemented by some limited targeted static trapping (pitfall traps within the Puriton Ash Ground LWS, a Malaise trap set on the edge of scrub within non-designated habitat of the former ROF, and three FITs attached to apple trees within the orchard). This effort has been sufficient for the purposes of evaluating the nature conservation value of the broad biotopes and habitats within the study site's compartments **and** on the understanding that key habitats including mature scrub, hedgerows and orchard will be maintained, including but not limited to no direct habitat loss, no further survey or assessment work is justified.

However, where habitats are to be directly affected, through habitat loss or alteration; or through meaningful indirect effects such as changes to nocturnal lux levels through inappropriate external lighting, then further survey work *may be* justified. On this point, the loss of the orchard's integrity, either in whole, or in part will result in a not insubstantial loss of an important and specific dead wood resource, that cannot be straightforwardly replaced. Log piles or other artificial dead wood provision will not necessarily recreate the specific conditions for the relevant fungi to develop; and it is this process, which breaks down the woody material, which provides the specialist habitat that saproxylic invertebrates, and particularly those with IEC scores, require.

Therefore, whilst survey effort has been sufficient to understand the nature conservation value for the purposes of the currently understood proposed development footprint, it is recommended that if this changes and has the potential to result in further losses to those habitats of heightened value, including, but not limited to the orchard, negatively affecting ecological integrity, the requirement for further survey and assessment should be reviewed.

6.2 Mitigation Principles

The following mitigation principles are provided for the purposes of informing the design and assumes no further survey work is required (see above).

The survey work has identified that the OMH within Puriton Ash Ground LWS and the disturbed vegetation communities elsewhere within the former ROF share similar features such as bare ground, rich flower resource, topographic and vegetation structural diversity. Whilst the LWS's integrity is currently understood to be protected, the disturbed vegetation communities will inevitably be lost to the development. These disturbed vegetation communities are temporary in nature and a 'do nothing' approach would result in their eventual loss to less diverse habitats such as tall, species-poor grasslands. Thus, there is a development-led opportunity to recreate and retain these habitats within the intended greenspace provision and advantageously, extend the existing Puriton Ash Ground LWS by doing so within land on the former ROF's south-western and western boundary; linking with the Gravity Link Road embankment/ verge. By recreating this habitat in the boundary space of the proposed development, it increases the LWS's resilience and provides a substantial biodiverse

corridor for pollinators that supports national (Defra, 2014) and Somerset pollinator policies (Somerset County Council, 2018), it has the potential to meet or possibly exceed Biodiversity Net Gain targets which will become a legal obligation through planning law, with the added potential benefit of reduced soft estate management. Details will be provided in a separate landscape and ecological management plan (or similar document) but it is sufficient to state here that there will be a requirement to reflect existing conditions with a varied topography, bare ground and a dominant rich flower resource. By reducing the grass cover, this will likely reduce mowing rates and volume of arisings (cut material) from being disposed.

The grassland communities in the non-designated habitats within the former ROF are interpreted as being remnant examples of floodplain grassland, which also occur in the External Fields. These grasslands support invertebrate faunas that are associated with periodic inundation and which then slowly dry out during the late spring and summer. A similar habitat could be created through careful design of Sustainable Urban Drainage Systems or swales which could accommodate excessive rainfall, with some areas over-deepened to provide more permanent wetlands. Appropriate locations within the ROF's eastern boundary would create linkages with similar habitat to the east (towards the orchard) and the Puriton Rhynes and Pond LWS.

Finally, the importance of the wood decay resource within the orchard and mature hedgerows has been discussed above. Consideration to extend the orchard by planting appropriate varieties of apple trees, including consideration of heritage varieties native to Somerset, to provide future resilience to the orchard habitat would enhance the pollinator resource and integrate the biological value with this aspect of Somerset's cultural heritage.

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A. Appendix A: Recording Effort in 2020.

Figure 1: Indicative sampling locations and transects walked (May to September 2020).

**B. Appendix B: Nature Conservation Status Categories
(Definitions)**

Introduction

The up to date status of species of conservation concern have been taken from Pantheon, the web-based analytical package maintained by the national biological records centre and developed by Webb *et al.* (2018) but reference to the various published Species Status Reviews; and the ²²Joint Nature Conservation Committee database of species designations has been undertaken where the author is aware there might be a discrepancy. However, no guarantee is given that this has been entirely comprehensive and reliance has largely been placed on Pantheon's accuracy.

Great Britain Rarity Status

Nationally Rare (NR) species are those that have been recently reassessed and are roughly equivalent to the old Red Data Book categories. These are defined as occurring in 15 or fewer hectads (10 km Ordnance Survey grid squares) and where there is reasonable confidence that intensive recording effort won't increase the number of hectads above 15.

Nationally Scarce (NS) species are those that are not NR and which have not been recorded in more than 100 hectads, and where there is reasonable confidence that intensive recording effort won't increase the number of hectads above 100.

Where taxa have yet to be reassessed under the Species Status Reviews, they formally retain their status based on historical reviews, which may date back to the late 1980s or early 1990s. These status' should be treated with caution as it is likely a significant proportion are no longer accurate, either due to a better understanding of their ecology, or have subsequently spread due to climate change or other amenable factors (e.g. they are more frequent and no longer deserve a nature conservation status); or they have declined; and may merit upgrading to a threat category.

Nationally Notable - species recorded, or likely to be restricted to 16 - 100 hectads in Britain. Historically, for some better recorded invertebrate taxa, they were further divided between Notable-A (Na) for species thought to occur in 30 or fewer hectads, and Notable-B (Nb) for those thought to occur between 31-100 hectads. These are referred to as Nationally Scarce (Na), or Nationally Scarce (Nb). Within Pantheon, some status' have been placed in square brackets, e.g. [Nationally Scarce (Nb)]. This denotes that in the professional judgement of the specialists (Webb *et al.*, 2018), this status is unreliable, but they have not been formally assessed against up to date criteria. The species are included in the relevant table in this report for the avoidance of doubt.

Red Data Book (RDB) species –species occurring in fewer than 16 10-km squares of the National Grid, divided as:

RDB 1: Endangered - for species known from a single population or in continuous recent decline and now known from five or fewer 10-km squares;

RDB 2: Vulnerable - likely to become endangered (RDB 1) if causal factors continue;

RDB 3: Rare: - species at risk but not qualifying as vulnerable; and

RDB K: Insufficiently Known - species likely to qualify at least as rare.

UK Biodiversity Action Planning

Species of Principal Importance as listed in Section 41 of the National Environment and Rural Communities Act, 2006. These are abbreviated as NERC-S41. Approximately 70 species of moth have been included in a list which proposes 'for Research only'; a frequently encountered example is the cinnabar (*Tyria jacobaeae*). These are widespread species which are believed to have experienced a decline and have been included to enable funding to be allocated for research. These species have not been included in Table 7.

²² Joint Nature Conservation Committee, <http://jncc.defra.gov.uk/page-3408>

UK Legal Protection

Approximately 50 species of invertebrate species in Britain receive legal protection through Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). About half receive limited protection; for example it is illegal to sell, or advertise for sale, a number of butterfly species. The remaining 28 species are more strictly protected, for example it is an offence to take or kill specimens without an appropriate licence. These species are generally extremely rare, restricted to a few, or a single site and none are likely to occur anywhere in the region.

IUCN Threat Categories

In recent years, invertebrate taxa in Great Britain have been assessed against the International Union for the Conservation of Nature's (IUCN) threat criteria that considers factors influencing a species survival. These include population decline or geographic contraction through habitat loss. These assessments are ongoing as part of the Species Status Reviews, overseen by the Joint Nature Conservation Committee and mostly published by Natural England. The criteria are defined by the IUCN, which places an assessed taxon in one of seven categories from Extinct down to Least Concern, based on one of the five main criteria. The following categories are defined as Threatened (Red List):

Critically Endangered (CR): A taxon is Critically Endangered when the best available evidence indicates that it is considered to be facing an extremely high risk of extinction in the wild.

Endangered (EN): A taxon is Endangered when the best available evidence indicates that it is considered to be facing a very high risk of extinction in the wild.

Vulnerable (VU): A taxon is Vulnerable when the best available evidence indicates that it is considered to be facing a high risk of extinction in the wild.

A further category, Near Threatened (NT), is applied to a taxon, which following assessment, came close to, but failed to qualify as a Threatened species. However, it is considered that if the factors influencing its assessment continue, it is likely to move in to one of the threat categories; and thus it acts as a watching brief.

C. **Appendix C: Species Lists**

Table 14: Species recorded within the study site’s compartments, ROF Bridgwater, Puriton during 2020.

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Arachnida	Araneae	Theridiidae	<i>Theridion pictum</i>				x	x	x
Arachnida	Araneae	Theridiidae	<i>Theridion varians</i>					x	
Arachnida	Araneae	Theridiidae	<i>Neottiura bimaculata</i>			x			x
Arachnida	Araneae	Theridiidae	<i>Paidiscura pallens</i>					x	
Arachnida	Araneae	Theridiidae	<i>Enoplognatha latimana</i>			x			x
Arachnida	Araneae	Theridiidae	<i>Enoplognatha thoracica</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Ceratinella brevipes</i>				x		x
Arachnida	Araneae	Linyphiidae	<i>Walckenaeria antica</i>				x		x
Arachnida	Araneae	Linyphiidae	<i>Dicymbium nigrum</i>				x		x
Arachnida	Araneae	Linyphiidae	<i>Pocadicnemis pumila sens. str.</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Pocadicnemis juncea</i>			x	x		x
Arachnida	Araneae	Linyphiidae	<i>Oedothorax retusus</i>			x	x		x
Arachnida	Araneae	Linyphiidae	<i>Cnephalocotes obscurus</i>			x	x		x
Arachnida	Araneae	Linyphiidae	<i>Styloctetor compar</i>		Nationally Scarce	x			x
Arachnida	Araneae	Linyphiidae	<i>Micrargus subaequalis</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Erigone dentipalpis</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Agyneta rurestris</i>				x		x
Arachnida	Araneae	Linyphiidae	<i>Agyneta saxatilis sens. str.</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Agyneta affinis</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Bathyphantes gracilis</i>			x	x	x	x
Arachnida	Araneae	Linyphiidae	<i>Bathyphantes parvulus</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Tenuiphantes mengei</i>				x		x
Arachnida	Araneae	Linyphiidae	<i>Microlinyphia pusilla</i>			x	x		x
Arachnida	Araneae	Tetragnathidae	<i>Tetragnatha extensa</i>					x	
Arachnida	Araneae	Tetragnathidae	<i>Pachygnatha degeeri</i>			x	x		x
Arachnida	Araneae	Araneidae	<i>Gibbaranea gibbosa</i>					x	
Arachnida	Araneae	Araneidae	<i>Araneus diadematus</i>	Garden Spider			x		x
Arachnida	Araneae	Araneidae	<i>Araneus quadratus</i>				x		x
Arachnida	Araneae	Araneidae	<i>Larinioides cornutus</i>				x	x	x
Arachnida	Araneae	Lycosidae	<i>Pardosa monticola</i>			x			x
Arachnida	Araneae	Lycosidae	<i>Pardosa palustris</i>			x			x
Arachnida	Araneae	Lycosidae	<i>Pardosa pullata</i>			x	x		x
Arachnida	Araneae	Lycosidae	<i>Pardosa prativaga</i>			x			x
Arachnida	Araneae	Lycosidae	<i>Pardosa tenuipes</i>			x		x	x
Arachnida	Araneae	Lycosidae	<i>Alopecosa pulverulenta</i>			x			x

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Arachnida	Araneae	Lycosidae	<i>Piratula latitans</i>				x		x
Arachnida	Araneae	Pisauridae	<i>Pisaura mirabilis</i>					x	
Arachnida	Araneae	Agelenidae	<i>Agelena labyrinthica</i>					x	
Arachnida	Araneae	Hahniidae	<i>Hahnia nava</i>			x			x
Arachnida	Araneae	Dictynidae	<i>Dictyna arundinacea</i>			x	x		x
Arachnida	Araneae	Dictynidae	<i>Dictyna uncinata</i>				x	x	x
Arachnida	Araneae	Dictynidae	<i>Lathys humilis</i>					x	
Arachnida	Araneae	Dictynidae	<i>Argenna subnigra</i>		Nationally Scarce	x			x
Arachnida	Araneae	Phrurolithidae	<i>Phrurolithus festivus</i>			x			x
Arachnida	Araneae	Clubionidae	<i>Clubiona reclusa</i>				x		x
Arachnida	Araneae	Clubionidae	<i>Clubiona neglecta sens. str.</i>			x	x		x
Arachnida	Araneae	Clubionidae	<i>Clubiona lutescens</i>				x		x
Arachnida	Araneae	Gnaphosidae	<i>Zelotes latreillei</i>			x			x
Arachnida	Araneae	Philodromidae	<i>Philodromus cespitum</i>				x		x
Arachnida	Araneae	Philodromidae	<i>Philodromus albidus</i>					x	
Arachnida	Araneae	Thomisidae	<i>Xysticus cristatus</i>			x	x		x
Arachnida	Araneae	Thomisidae	<i>Xysticus kochi</i>				x		x
Arachnida	Araneae	Thomisidae	<i>Ozyptila simplex</i>			x			x
Arachnida	Araneae	Salticidae	<i>Heliophanus flavipes</i>			x			x
Arachnida	Araneae	Salticidae	<i>Euophrys frontalis</i>			x			x
Arachnida	Araneae	Salticidae	<i>Talavera aequipes</i>			x			x
Arachnida	Opiliones	Leiobunidae	<i>Leiobunum rotundum</i>					x	
Insecta	Coleoptera	Carabidae	<i>Nebria brevicollis</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Bembidion guttula</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Pterostichus madidus</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Calathus fuscipes</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Oxypselaphus obscurus</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Amara aenea</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Amara communis</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Amara convexior</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Amara lunicollis</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Amara ovata</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Amara similata</i>					x	
Insecta	Coleoptera	Carabidae	<i>Amara tibialis</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Curtonotus aulicus</i>				x		x
Insecta	Coleoptera	Carabidae	<i>Harpalus affinis</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Harpalus rufipes</i>			x			x

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Coleoptera	Carabidae	<i>Acupalpus dubius</i>				x		x
Insecta	Coleoptera	Carabidae	<i>Acupalpus exiguus</i>		Nationally Scarce		x		x
Insecta	Coleoptera	Carabidae	<i>Badister bullatus</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Demetrias atricapillus</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Paradromius linearis</i>			x	x		x
Insecta	Coleoptera	Carabidae	<i>Calodromius spilotus</i>					x	
Insecta	Coleoptera	Carabidae	<i>Philorhizus melanocephalus</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Syntomus foveatus</i>			x			x
Insecta	Coleoptera	Carabidae	<i>Syntomus obscuroguttatus</i>			x	x		x
Insecta	Coleoptera	Carabidae	<i>Microlestes minutulus</i>			x			x
Insecta	Coleoptera	Helophoridae	<i>Helophorus grandis</i>				x		x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus dispar</i>			x	x		x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus formosus</i>		Nationally Scarce		x		x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus hypnorum</i>			x	x	x	x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus nitidulus</i>			x		x	x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus solutus</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Tachinus rufipes</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Haploglossa villosula</i>					x	
Insecta	Coleoptera	Staphylinidae	<i>Aloconota gregaria</i>					x	
Insecta	Coleoptera	Staphylinidae	<i>Amischa analis</i>				x		x
Insecta	Coleoptera	Staphylinidae	<i>Mocyta fungi</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Aleochara bipustulata</i>			x	x		x
Insecta	Coleoptera	Staphylinidae	<i>Drusilla canaliculata</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Cypha longicornis</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Platystethus nitens</i>				x		x
Insecta	Coleoptera	Staphylinidae	<i>Anotylus tetracarinatus</i>					x	
Insecta	Coleoptera	Staphylinidae	<i>Stenus fulvicornis</i>			x	x		x
Insecta	Coleoptera	Staphylinidae	<i>Stenus latifrons</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Stenus similis</i>			x	x		x
Insecta	Coleoptera	Staphylinidae	<i>Stenus picipes</i>				x		x
Insecta	Coleoptera	Staphylinidae	<i>Stenus aceris</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Stenus ossium</i>			x	x		x
Insecta	Coleoptera	Staphylinidae	<i>Stenus palustris</i>		Nationally Scarce (Nb)	x			x
Insecta	Coleoptera	Staphylinidae	<i>Paederus littoralis</i>			x	x		x
Insecta	Coleoptera	Staphylinidae	<i>Paederus riparius</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Astenus lyonessius</i>				x		x
Insecta	Coleoptera	Staphylinidae	<i>Philonthus cognatus</i>				x		x

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Coleoptera	Staphylinidae	<i>Ocypus aeneocephalus</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Tasgius globulifer</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Quedius cruentus</i>					x	
Insecta	Coleoptera	Staphylinidae	<i>Quedius schatzmayri</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Hypnogyra angularis</i>		Nationally Scarce (Na)			x	
Insecta	Coleoptera	Staphylinidae	<i>Xantholinus linearis</i>			x			x
Insecta	Coleoptera	Scarabaeidae	<i>Onthophagus joannae</i>			x			x
Insecta	Coleoptera	Scirtidae	<i>Microcara testacea</i>			x			x
Insecta	Coleoptera	Scirtidae	<i>Cyphon coarctatus</i>			x	x	x	x
Insecta	Coleoptera	Elateridae	<i>Agrypnus murinus</i>			x		x	x
Insecta	Coleoptera	Elateridae	<i>Athous bicolor</i>			x			x
Insecta	Coleoptera	Elateridae	<i>Agriotes sputator</i>			x		x	x
Insecta	Coleoptera	Cantharidae	<i>Cantharis lateralis</i>			x	x	x	x
Insecta	Coleoptera	Cantharidae	<i>Cantharis flavilabris</i>			x	x	x	x
Insecta	Coleoptera	Cantharidae	<i>Cantharis rufa</i>			x	x	x	x
Insecta	Coleoptera	Cantharidae	<i>Cantharis rustica</i>					x	
Insecta	Coleoptera	Cantharidae	<i>Rhagonycha fulva</i>			x	x	x	x
Insecta	Coleoptera	Anobiidae	<i>Anobium punctatum</i>	Woodworm				x	
Insecta	Coleoptera	Anobiidae	<i>Ptilinus pectinicornis</i>	Fan-bearing Wood-borer				x	
Insecta	Coleoptera	Malachiidae	<i>Cordylepherus viridis</i>				x		x
Insecta	Coleoptera	Kateretidae	<i>Brachypterus glaber</i>			x		x	x
Insecta	Coleoptera	Kateretidae	<i>Brachypterus urticae</i>	Nettle Pollen Beetle		x			x
Insecta	Coleoptera	Nitidulidae	<i>Epuraea aestiva</i>					x	
Insecta	Coleoptera	Nitidulidae	<i>Meligethes flavimanus</i>					x	
Insecta	Coleoptera	Nitidulidae	<i>Meligethes nigrescens</i>					x	
Insecta	Coleoptera	Silvanidae	<i>Psammoecus bipunctatus</i>			x			x
Insecta	Coleoptera	Phalacridae	<i>Phalacrus caricis</i>				x		x
Insecta	Coleoptera	Phalacridae	<i>Olibrus aeneus</i>					x	
Insecta	Coleoptera	Cryptophagidae	<i>Cryptophagus dentatus</i>					x	
Insecta	Coleoptera	Cryptophagidae	<i>Atomaria gutta</i>			x			x
Insecta	Coleoptera	Cryptophagidae	<i>Atomaria rubella</i>			x			x
Insecta	Coleoptera	Erotylidae	<i>Triplax russica</i>					x	
Insecta	Coleoptera	Coccinellidae	<i>Rhyzobius litura</i>			x	x		x
Insecta	Coleoptera	Coccinellidae	<i>Psyllobora vigintiduopunctata</i>	22-spot Ladybird			x		x
Insecta	Coleoptera	Coccinellidae	<i>Propylea quattuordecimpunctata</i>	14-spot Ladybird			x	x	x
Insecta	Coleoptera	Coccinellidae	<i>Adalia bipunctata</i>	2-spot Ladybird				x	
Insecta	Coleoptera	Coccinellidae	<i>Coccinella septempunctata</i>	7-spot Ladybird		x	x	x	x

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Coleoptera	Coccinellidae	<i>Tytthaspis sedecimpunctata</i>	16-spot Ladybird		x	x	x	x
Insecta	Coleoptera	Coccinellidae	<i>Subcoccinella vigintiquattuorpunctata</i>	24-spot Ladybird		x			x
Insecta	Coleoptera	Latridiidae	<i>Enicmus transversus</i>			x			x
Insecta	Coleoptera	Latridiidae	<i>Corticaria impressa</i>			x			x
Insecta	Coleoptera	Latridiidae	<i>Melanophthalma suturalis</i>			x			x
Insecta	Coleoptera	Latridiidae	<i>Corticaria gibbosa</i>					x	
Insecta	Coleoptera	Oedemeridae	<i>Oedemera nobilis</i>	Swollen-thighed Beetle		x	x	x	x
Insecta	Coleoptera	Oedemeridae	<i>Oedemera lurida</i>			x			x
Insecta	Coleoptera	Salpingidae	<i>Salpingus planirostris</i>					x	
Insecta	Coleoptera	Scraptiidae	<i>Anaspis garneysi</i>					x	
Insecta	Coleoptera	Scraptiidae	<i>Anaspis maculata</i>					x	
Insecta	Coleoptera	Cerambycidae	<i>Grammoptera ruficornis</i>					x	
Insecta	Coleoptera	Cerambycidae	<i>Pogonocherus hispidulus</i>					x	
Insecta	Coleoptera	Cerambycidae	<i>Pogonocherus hispidus</i>					x	
Insecta	Coleoptera	Cerambycidae	<i>Leiopus linnei</i>					x	
Insecta	Coleoptera	Cerambycidae	<i>Tetrops praeustus</i>					x	
Insecta	Coleoptera	Chrysomelidae	<i>Bruchus loti</i>					x	
Insecta	Coleoptera	Chrysomelidae	<i>Bruchus rufimanus</i>	Bean Beetle				x	
Insecta	Coleoptera	Chrysomelidae	<i>Phyllotreta undulata</i>				x		x
Insecta	Coleoptera	Chrysomelidae	<i>Longitarsus dorsalis</i>			x			x
Insecta	Coleoptera	Chrysomelidae	<i>Longitarsus luridus</i>					x	
Insecta	Coleoptera	Chrysomelidae	<i>Longitarsus lycopi</i>		Nationally Scarce (Nb)			x	
Insecta	Coleoptera	Chrysomelidae	<i>Longitarsus parvulus</i>				x		x
Insecta	Coleoptera	Chrysomelidae	<i>Neocrepidodera ferruginea</i>			x			x
Insecta	Coleoptera	Chrysomelidae	<i>Neocrepidodera transversa</i>			x	x		x
Insecta	Coleoptera	Chrysomelidae	<i>Crepidodera plutus</i>				x	x	x
Insecta	Coleoptera	Chrysomelidae	<i>Chaetocnema arida</i>			x			x
Insecta	Coleoptera	Chrysomelidae	<i>Chaetocnema hortensis</i>			x	x	x	x
Insecta	Coleoptera	Chrysomelidae	<i>Sphaeroderma testaceum</i>				x		x
Insecta	Coleoptera	Chrysomelidae	<i>Cryptocephalus bipunctatus</i>		Nationally Scarce	x			x
Insecta	Coleoptera	Rhynchitidae	<i>Involvulus caeruleus</i>	Apple Twig Cutter				x	
Insecta	Coleoptera	Rhynchitidae	<i>Neocoenorrhinus aequatus</i>	Apple Fruit Rhynchites				x	
Insecta	Coleoptera	Apionidae	<i>Ceratapion gibbirostre</i>				x	x	x
Insecta	Coleoptera	Apionidae	<i>Diplapion stolidum</i>		Nationally Scarce (Nb)	x			x
Insecta	Coleoptera	Apionidae	<i>Protapion assimile</i>			x			x
Insecta	Coleoptera	Apionidae	<i>Protapion fulvipes</i>	White Clover Seed Weevil			x		x
Insecta	Coleoptera	Apionidae	<i>Protapion trifolii</i>					x	

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Coleoptera	Apionidae	<i>Apion frumentarium</i>				x		x
Insecta	Coleoptera	Apionidae	<i>Ischnopterapion loti</i>			x			x
Insecta	Coleoptera	Apionidae	<i>Oxystoma cerdo</i>		[Nationally Scarce (Nb)]		x		x
Insecta	Coleoptera	Apionidae	<i>Oxystoma pomonae</i>			x	x	x	x
Insecta	Coleoptera	Curculionidae	<i>Otiorhynchus ovatus</i>			x			x
Insecta	Coleoptera	Curculionidae	<i>Phyllobius roboretanus</i>	Small Green Nettle Weevil		x			x
Insecta	Coleoptera	Curculionidae	<i>Barypeithes pellucidus</i>			x			x
Insecta	Coleoptera	Curculionidae	<i>Sciaphilus asperatus</i>	Strawberry Root Weevil		x			x
Insecta	Coleoptera	Curculionidae	<i>Tanymecus palliatus</i>		Nationally Scarce (Nb)	x			x
Insecta	Coleoptera	Curculionidae	<i>Sitona lineatus</i>			x	x		x
Insecta	Coleoptera	Curculionidae	<i>Sitona suturalis</i>					x	
Insecta	Coleoptera	Curculionidae	<i>Larinus planus</i>		[Nationally Scarce (Nb)]	x	x		x
Insecta	Coleoptera	Curculionidae	<i>Hypera postica</i>	Clover Leaf Weevil				x	
Insecta	Coleoptera	Curculionidae	<i>Hypera zoilus</i>			x			x
Insecta	Coleoptera	Curculionidae	<i>Hypera rumicis</i>					x	
Insecta	Coleoptera	Curculionidae	<i>Euophryum confine</i>					x	
Insecta	Coleoptera	Curculionidae	<i>Microplontus rugulosus</i>					x	
Insecta	Coleoptera	Curculionidae	<i>Ceutorhynchus typhae</i>					x	
Insecta	Coleoptera	Curculionidae	<i>Anthonomus rubi</i>	Strawberry Blossom Weevil		x		x	x
Insecta	Coleoptera	Curculionidae	<i>Scolytus multistriatus</i>	Small Elm Bark Beetle				x	
Insecta	Coleoptera	Curculionidae	<i>Scolytus rugulosus</i>	Fruit Bark Beetle				x	
Insecta	Diptera	Tipulidae	<i>Nephrotoma quadrifaria</i>				x	x	x
Insecta	Diptera	Tipulidae	<i>Tipula fascipennis</i>				x	x	x
Insecta	Diptera	Tipulidae	<i>Tipula vernalis</i>					x	
Insecta	Diptera	Limoniidae	<i>Phylidorea ferruginea</i>			x	x		x
Insecta	Diptera	Bibionidae	<i>Dilophus febrilis</i>				x		x
Insecta	Diptera	Anisopodidae	<i>Sylvicola punctatus</i>			x	x	x	x
Insecta	Diptera	Ptychopteridae	<i>Ptychoptera contaminata</i>			x			x
Insecta	Diptera	Rhagionidae	<i>Chrysopilus cristatus</i>			x		x	x
Insecta	Diptera	Rhagionidae	<i>Rhagio scolopaceus</i>				x	x	x
Insecta	Diptera	Tabanidae	<i>Haematopota crassicornis</i>			x			x
Insecta	Diptera	Tabanidae	<i>Haematopota pluvialis</i>			x	x		x
Insecta	Diptera	Tabanidae	<i>Atylotus rusticus</i>		Nationally Rare		x	x	x
Insecta	Diptera	Xylomyidae	<i>Solva marginata</i>				x		x
Insecta	Diptera	Stratiomyidae	<i>Beris clavipes</i>		Nationally Scarce			x	
Insecta	Diptera	Stratiomyidae	<i>Nemotelus notatus</i>			x	x	x	x
Insecta	Diptera	Stratiomyidae	<i>Nemotelus pantherinus</i>				x	x	x

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Diptera	Stratiomyidae	<i>Nemotelus uliginosus</i>			x			x
Insecta	Diptera	Stratiomyidae	<i>Pachygaster leachii</i>					x	
Insecta	Diptera	Stratiomyidae	<i>Chloromyia formosa</i>			x		x	x
Insecta	Diptera	Stratiomyidae	<i>Microchrysa flavicornis</i>					x	
Insecta	Diptera	Stratiomyidae	<i>Oplodontha viridula</i>					x	
Insecta	Diptera	Asilidae	<i>Leptogaster cylindrica</i>			x	x	x	x
Insecta	Diptera	Hybotidae	<i>Bicellaria vana</i>				x		x
Insecta	Diptera	Empididae	<i>Empis tessellata</i>					x	
Insecta	Diptera	Empididae	<i>Empis livida</i>			x	x		x
Insecta	Diptera	Empididae	<i>Empis opaca</i>					x	
Insecta	Diptera	Empididae	<i>Empis lutea</i>				x		x
Insecta	Diptera	Empididae	<i>Empis scutellata</i>					x	
Insecta	Diptera	Empididae	<i>Hilara anglodanica</i>					x	
Insecta	Diptera	Empididae	<i>Rhamphomyia crassirostris</i>					x	
Insecta	Diptera	Dolichopodidae	<i>Chrysotus gramineus</i>				x		x
Insecta	Diptera	Dolichopodidae	<i>Dolichopus festivus</i>			x	x	x	x
Insecta	Diptera	Dolichopodidae	<i>Dolichopus griseipennis</i>			x	x	x	x
Insecta	Diptera	Dolichopodidae	<i>Dolichopus trivialis</i>			x	x	x	x
Insecta	Diptera	Dolichopodidae	<i>Poecilobothrus nobilitatus</i>			x	x	x	x
Insecta	Diptera	Dolichopodidae	<i>Scellus notatus</i>					x	
Insecta	Diptera	Dolichopodidae	<i>Sciapus platypterus</i>				x		x
Insecta	Diptera	Syrphidae	<i>Melanostoma mellinum</i>	a hoverfly		x	x	x	x
Insecta	Diptera	Syrphidae	<i>Melanostoma scalare</i>	a hoverfly		x	x	x	x
Insecta	Diptera	Syrphidae	<i>Platycheirus albimanus</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Platycheirus angustatus</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Platycheirus clypeatus</i>	a hoverfly		x		x	x
Insecta	Diptera	Syrphidae	<i>Platycheirus fulviventris</i>	a hoverfly		x			x
Insecta	Diptera	Syrphidae	<i>Platycheirus occultus</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Platycheirus scutatus sens. lat.</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Paragus haemorrhous</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Chrysotoxum bicinctum</i>	a hoverfly		x		x	x
Insecta	Diptera	Syrphidae	<i>Episyrphus balteatus</i>	a hoverfly		x	x	x	x
Insecta	Diptera	Syrphidae	<i>Eupeodes corollae</i>	a hoverfly		x	x		x
Insecta	Diptera	Syrphidae	<i>Leucozona lucorum</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Scaeva pyrastris</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Sphaerophoria scripta</i>	a hoverfly			x	x	x
Insecta	Diptera	Syrphidae	<i>Sphaerophoria taeniata</i>	a hoverfly				x	

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Diptera	Syrphidae	<i>Syrphus vitripennis</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Xanthogramma pedissequum</i>	a hoverfly			x	x	x
Insecta	Diptera	Syrphidae	<i>Cheilosia albitarsis sens. lat.</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Cheilosia illustrata</i>	a hoverfly		x			x
Insecta	Diptera	Syrphidae	<i>Cheilosia pagana</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Cheilosia proxima</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Cheilosia vernalis</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Ferdinandea cuprea</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Rhingia campestris</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Chrysogaster solstitialis</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Neoascia tenur</i>	a hoverfly		x			x
Insecta	Diptera	Syrphidae	<i>Eristalinus sepulchralis</i>	a hoverfly		x		x	x
Insecta	Diptera	Syrphidae	<i>Eristalis arbustorum</i>	a hoverfly		x	x	x	x
Insecta	Diptera	Syrphidae	<i>Eristalis horticola</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Eristalis nemorum</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Eristalis pertinax</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Eristalis tenax</i>	a hoverfly			x	x	x
Insecta	Diptera	Syrphidae	<i>Helophilus pendulus</i>	a hoverfly		x	x	x	x
Insecta	Diptera	Syrphidae	<i>Helophilus trivittatus</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Myathropa florea</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Parhelophilus frutetorum</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Pipiza noctiluca</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Pipizella viduata</i>	a hoverfly			x	x	x
Insecta	Diptera	Syrphidae	<i>Volucella bombylans</i>	a hoverfly		x			x
Insecta	Diptera	Syrphidae	<i>Volucella inanis</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Volucella pellucens</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Volucella zonaria</i>	a hoverfly				x	
Insecta	Diptera	Syrphidae	<i>Syritta pipiens</i>	a hoverfly		x	x	x	x
Insecta	Diptera	Syrphidae	<i>Tropidia scita</i>	a hoverfly			x		x
Insecta	Diptera	Syrphidae	<i>Xylota segnis</i>	a hoverfly			x		x
Insecta	Diptera	Pipunculidae	<i>Pipunculus campestris</i>				x		x
Insecta	Diptera	Conopidae	<i>Physocephala rufipes</i>				x		x
Insecta	Diptera	Conopidae	<i>Thecophora atra</i>				x		x
Insecta	Diptera	Ulidiidae	<i>Herina lugubris</i>	a picture-winged fly			x		x
Insecta	Diptera	Ulidiidae	<i>Physiphora alceae</i>	a picture-winged fly				x	
Insecta	Diptera	Tephritidae	<i>Tephritis neesii</i>				x		x
Insecta	Diptera	Tephritidae	<i>Xyphosia miliaria</i>					x	

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Insecta	Diptera	Lauxaniidae	<i>Calliopum aeneum</i>				x		x
Insecta	Diptera	Lauxaniidae	<i>Sapromyza quadripunctata</i>			x		x	x
Insecta	Diptera	Sciomyzidae	<i>Pherbellia cinerella</i>			x	x		x
Insecta	Diptera	Sciomyzidae	<i>Coremacera marginata</i>					x	
Insecta	Diptera	Sciomyzidae	<i>Dichetophora obliterata</i>				x		x
Insecta	Diptera	Sciomyzidae	<i>Limnia unguicornis</i>					x	
Insecta	Diptera	Sciomyzidae	<i>Tetanocera elata</i>				x		x
Insecta	Diptera	Sepsidae	<i>Sepsis cynipsea</i>				x	x	x
Insecta	Diptera	Sepsidae	<i>Sepsis fulgens</i>			x		x	x
Insecta	Diptera	Sepsidae	<i>Sepsis punctum</i>			x			x
Insecta	Diptera	Sepsidae	<i>Sepsis violacea</i>				x		x
Insecta	Diptera	Opomyzidae	<i>Opomyza germinationis</i>				x	x	x
Insecta	Diptera	Opomyzidae	<i>Opomyza petrei</i>			x			x
Insecta	Diptera	Chloropidae	<i>Chlorops pumilionis</i>				x		x
Insecta	Diptera	Chloropidae	<i>Thaumatomyia glabra</i>				x		x
Insecta	Diptera	Heleomyzidae	<i>Suillia variegata</i>				x		x
Insecta	Diptera	Hippoboscidae	<i>Lipoptena cervi</i>				x		x
Insecta	Diptera	Scathophagidae	<i>Cordilura ciliata</i>				x		x
Insecta	Diptera	Scathophagidae	<i>Cordilura impudica</i>				x		x
Insecta	Diptera	Scathophagidae	<i>Cordilura albipes</i>				x		x
Insecta	Diptera	Scathophagidae	<i>Norellisoma spinimanum</i>				x		x
Insecta	Diptera	Scathophagidae	<i>Scathophaga stercoraria</i>			x	x	x	x
Insecta	Diptera	Anthomyiidae	<i>Anthomyia confusanea</i>			x	x		x
Insecta	Diptera	Anthomyiidae	<i>Anthomyia pluvialis</i>				x		x
Insecta	Diptera	Anthomyiidae	<i>Anthomyia procellaris</i>					x	
Insecta	Diptera	Anthomyiidae	<i>Botanophila fugax</i>					x	
Insecta	Diptera	Anthomyiidae	<i>Hylemya nigrimana</i>				x		x
Insecta	Diptera	Anthomyiidae	<i>Hylemya vagans</i>				x	x	x
Insecta	Diptera	Anthomyiidae	<i>Hylemya variata</i>				x	x	x
Insecta	Diptera	Anthomyiidae	<i>Hylemyza partita</i>				x	x	x
Insecta	Diptera	Anthomyiidae	<i>Adia cinerella</i>			x	x		x
Insecta	Diptera	Anthomyiidae	<i>Delia florilega</i>				x		x
Insecta	Diptera	Anthomyiidae	<i>Delia platura</i>			x	x		x
Insecta	Diptera	Anthomyiidae	<i>Eustalomyia festiva</i>					x	
Insecta	Diptera	Anthomyiidae	<i>Hydrophoria ruralis</i>					x	
Insecta	Diptera	Anthomyiidae	<i>Pegoplata aestiva</i>			x	x		x
Insecta	Diptera	Anthomyiidae	<i>Pegoplata infirma</i>			x	x	x	x

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Insecta	Diptera	Anthomyiidae	<i>Mycophaga testacea</i>					x	
Insecta	Diptera	Anthomyiidae	<i>Paradelia intersecta</i>				x		x
Insecta	Diptera	Fanniidae	<i>Fannia armata</i>					x	
Insecta	Diptera	Fanniidae	<i>Fannia canicularis</i>					x	
Insecta	Diptera	Fanniidae	<i>Fannia clara</i>		pNationally Scarce			x	
Insecta	Diptera	Fanniidae	<i>Fannia pallitibia</i>				x		x
Insecta	Diptera	Fanniidae	<i>Fannia serena</i>			x	x	x	x
Insecta	Diptera	Muscidae	<i>Coenosia pumila</i>			x			x
Insecta	Diptera	Muscidae	<i>Schoenomyza litorella</i>				x		x
Insecta	Diptera	Muscidae	<i>Azelia nebulosa</i>					x	
Insecta	Diptera	Muscidae	<i>Hydrotaea cyrtoneurina</i>				x		x
Insecta	Diptera	Muscidae	<i>Hydrotaea floccosa</i>					x	
Insecta	Diptera	Muscidae	<i>Hydrotaea pilipes</i>		pNationally Scarce				x
Insecta	Diptera	Muscidae	<i>Mesembrina meridiana</i>				x		x
Insecta	Diptera	Muscidae	<i>Morellia aenescens</i>			x		x	x
Insecta	Diptera	Muscidae	<i>Musca autumnalis</i>			x	x	x	x
Insecta	Diptera	Muscidae	<i>Neomyia cornicina</i>			x	x		x
Insecta	Diptera	Muscidae	<i>Polietes lardarius</i>			x			x
Insecta	Diptera	Muscidae	<i>Polietes meridionalis</i>				x	x	x
Insecta	Diptera	Muscidae	<i>Muscina levida</i>					x	
Insecta	Diptera	Muscidae	<i>Stomoxys calcitrans</i>			x	x		x
Insecta	Diptera	Muscidae	<i>Graphomya maculata</i>			x	x	x	x
Insecta	Diptera	Muscidae	<i>Hebecnema umbratica</i>			x			x
Insecta	Diptera	Muscidae	<i>Hebecnema vespertina</i>					x	
Insecta	Diptera	Muscidae	<i>Mydaea ancilla</i>				x		x
Insecta	Diptera	Muscidae	<i>Helina depuncta</i>					x	
Insecta	Diptera	Muscidae	<i>Helina evecta</i>			x	x		x
Insecta	Diptera	Muscidae	<i>Helina impuncta</i>				x	x	x
Insecta	Diptera	Muscidae	<i>Helina lasiophthalma</i>					x	
Insecta	Diptera	Muscidae	<i>Helina pertusa</i>					x	
Insecta	Diptera	Muscidae	<i>Helina pubiseta</i>				x		x
Insecta	Diptera	Muscidae	<i>Helina reversio</i>			x	x		x
Insecta	Diptera	Muscidae	<i>Phaonia errans</i>				x	x	x
Insecta	Diptera	Muscidae	<i>Phaonia perdita</i>					x	
Insecta	Diptera	Muscidae	<i>Phaonia subventa</i>				x		x
Insecta	Diptera	Muscidae	<i>Phaonia trimaculata</i>				x		x
Insecta	Diptera	Muscidae	<i>Phaonia tuguriorum</i>			x	x	x	x

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Insecta	Diptera	Muscidae	<i>Phaonia valida</i>					x	
Insecta	Diptera	Calliphoridae	<i>Calliphora vicina</i>				x	x	x
Insecta	Diptera	Calliphoridae	<i>Lucilia ampullacea</i>					x	
Insecta	Diptera	Calliphoridae	<i>Lucilia caesar</i>			x	x	x	x
Insecta	Diptera	Calliphoridae	<i>Lucilia sericata</i>				x		x
Insecta	Diptera	Polleniidae	<i>Pollenia angustigena</i>					x	
Insecta	Diptera	Polleniidae	<i>Pollenia pediculata</i>				x		x
Insecta	Diptera	Polleniidae	<i>Pollenia rudis</i>				x	x	x
Insecta	Diptera	Polleniidae	<i>Pollenia viatica</i>				x	x	x
Insecta	Diptera	Rhinophoridae	<i>Phyto discrepans</i>			x			x
Insecta	Diptera	Rhinophoridae	<i>Rhinophora lepida</i>				x		x
Insecta	Diptera	Rhinophoridae	<i>Tricogena rubricosa</i>			x		x	x
Insecta	Diptera	Sarcophagidae	<i>Brachicoma devia</i>				x		x
Insecta	Diptera	Sarcophagidae	<i>Ravinia pernix</i>				x		x
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga pumila</i>				x		x
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga crassimargo</i>				x		x
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga rosellei</i>				x		x
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga dissimilis</i>				x	x	x
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga haemorrhhoa</i>				x		x
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga vagans</i>				x	x	x
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga nigriventris</i>			x	x		x
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga variegata</i>			x			x
Insecta	Diptera	Tachinidae	<i>Eriothrix rufomaculata</i>			x	x	x	x
Insecta	Diptera	Tachinidae	<i>Voria ruralis</i>				x		x
Insecta	Diptera	Tachinidae	<i>Phryxe vulgaris</i>					x	
Insecta	Diptera	Tachinidae	<i>Exorista rustica</i>				x		x
Insecta	Diptera	Tachinidae	<i>Phania funesta</i>				x		x
Insecta	Diptera	Tachinidae	<i>Phasia pusilla</i>				x		x
Insecta	Diptera	Tachinidae	<i>Phasia obesa</i>				x		x
Insecta	Diptera	Tephritidae	<i>Tephritis divisa</i>			x	x		x
Insecta	Hemiptera, Auchenorrhyncha	Aphrophoridae	<i>Aphrophora alni</i>				x		x
Insecta	Hemiptera, Auchenorrhyncha	Aphrophoridae	<i>Philaenus spumarius</i>			x	x	x	x
Insecta	Hemiptera, Auchenorrhyncha	Aphrophoridae	<i>Neophilaenus lineatus</i>			x	x	x	x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Cicadella viridis</i>				x		x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Idiocerus stigmatalis</i>					x	
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Anaceratagallia ribauti</i>			x			x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Anoscopus albifrons</i>			x			x

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Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Arthaldeus pascuellus</i>			x	x		x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Allygus mixtus</i>				x	x	x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Conosanus obsoletus</i>					x	
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Euscelis incisus</i>			x	x	x	x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Streptanus sordidus</i>			x	x		x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Zyginidia scutellaris</i>			x		x	x
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Conomelus anceps</i>			x	x		x
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Criomorphus albomarginatus</i>			x			x
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Hyledelphax elegantulus</i>			x			x
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Javesella dubia</i>			x			x
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Javesella pellucida</i>	Tortoise Shieldbug		x			x
Insecta	Hemiptera, Heteroptera	Scutelleridae	<i>Eurygaster testudinaria</i>	Bishop's Mitre Shieldbug			x		x
Insecta	Hemiptera, Heteroptera	Pentatomidae	<i>Aelia acuminata</i>	Common Green Shieldbug			x	x	x
Insecta	Hemiptera, Heteroptera	Pentatomidae	<i>Palomena prasina</i>	Dock Bug			x		x
Insecta	Hemiptera, Heteroptera	Coreidae	<i>Coreus marginatus</i>	Box Bug				x	
Insecta	Hemiptera, Heteroptera	Coreidae	<i>Gonocerus acuteangulatus</i>					x	
Insecta	Hemiptera, Heteroptera	Rhopalidae	<i>Rhopalus subrufus</i>				x	x	x
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Cymus melanocephalus</i>				x		x
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Drymus sylvaticus</i>			x			x
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Scolopostethus decoratus</i>			x			x
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Scolopostethus thomsoni</i>			x	x	x	x
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Stygnocoris sabulosus</i>					x	
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Trapezonotus desertus</i>			x			x
Insecta	Hemiptera, Heteroptera	Tingidae	<i>Tingis ampliata</i>					x	
Insecta	Hemiptera, Heteroptera	Tingidae	<i>Tingis cardui</i>					x	
Insecta	Hemiptera, Heteroptera	Nabidae	<i>Nabis ferus</i>				x		x
Insecta	Hemiptera, Heteroptera	Nabidae	<i>Nabis flavomarginatus</i>				x		x
Insecta	Hemiptera, Heteroptera	Nabidae	<i>Nabis rugosus</i>				x		x
Insecta	Hemiptera, Heteroptera	Anthocoridae	<i>Cardiastethus fasciiventris</i>					x	
Insecta	Hemiptera, Heteroptera	Anthocoridae	<i>Orius niger</i>			x	x		x
Insecta	Hemiptera, Heteroptera	Anthocoridae	<i>Temnostethus gracilis</i>					x	
Insecta	Hemiptera, Heteroptera	Miridae	<i>Capsus ater</i>			x		x	x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Closterotomus norwegicus</i>					x	
Insecta	Hemiptera, Heteroptera	Miridae	<i>Deraeocoris lutescens</i>					x	
Insecta	Hemiptera, Heteroptera	Miridae	<i>Heterotoma planicornis</i>				x	x	x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Leptopterna dolabrata</i>			x		x	x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Lygus rugulipennis</i>				x		x

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Hemiptera, Heteroptera	Miridae	<i>Miridius quadrivirgatus</i>			x	x		x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Notostira elongata</i>			x	x	x	x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Orthops campestris</i>			x			x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Orthops kalmii</i>				x		x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Phytocoris varipes</i>				x		x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Plagiognathus arbustorum</i>				x		x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Stenodema calcarata</i>			x			x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Stenodema laevigata</i>				x	x	x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Stenotus binotatus</i>				x		x
Insecta	Hymenoptera	Cephidae	<i>Cephus spinipes</i>	a sawfly		x			x
Insecta	Hymenoptera	Tenthredinidae	<i>Athalia circularis</i>	a sawfly			x		x
Insecta	Hymenoptera	Tenthredinidae	<i>Athalia cordata</i>	a sawfly			x		x
Insecta	Hymenoptera	Tenthredinidae	<i>Athalia rosae</i>	a sawfly			x		x
Insecta	Hymenoptera	Tenthredinidae	<i>Cladius pectinicornis</i>	a sawfly		x	x	x	x
Insecta	Hymenoptera	Tenthredinidae	<i>Dolerus aericeps</i>	a sawfly			x		x
Insecta	Hymenoptera	Ichneumonidae	<i>Amblyteles armatorius</i>	an ichneumon			x		x
Insecta	Hymenoptera	Crabronidae	<i>Crossocerus megacephalus</i>	a digger wasp		x			x
Insecta	Hymenoptera	Crabronidae	<i>Crossocerus podagricus</i>	a digger wasp				x	
Insecta	Hymenoptera	Crabronidae	<i>Ectemnius cavifrons</i>	a digger wasp				x	
Insecta	Hymenoptera	Crabronidae	<i>Ectemnius cephalotes</i>	a digger wasp				x	
Insecta	Hymenoptera	Crabronidae	<i>Ectemnius continuus</i>	a digger wasp			x	x	x
Insecta	Hymenoptera	Crabronidae	<i>Ectemnius lapidarius</i>	a digger wasp				x	
Insecta	Hymenoptera	Crabronidae	<i>Ectemnius lituratus</i>	a digger wasp				x	
Insecta	Hymenoptera	Crabronidae	<i>Pemphredon lethifer agg.</i>	a digger wasp		x			x
Insecta	Hymenoptera	Crabronidae	<i>Pemphredon lugubris</i>	Mournful Wasp			x	x	x
Insecta	Hymenoptera	Crabronidae	<i>Psenulus pallipes sens. str.</i>	Pale Footed Black Wasp			x		x
Insecta	Hymenoptera	Crabronidae	<i>Psenulus concolor</i>					x	
Insecta	Hymenoptera	Crabronidae	<i>Stigmus solskyi</i>	a digger wasp			x		x
Insecta	Hymenoptera	Andrenidae	<i>Andrena bicolor</i>	Gwynne's Mining Bee		x			x
Insecta	Hymenoptera	Andrenidae	<i>Andrena chrysosceles</i>	a mining bee				x	
Insecta	Hymenoptera	Andrenidae	<i>Andrena dorsata</i>	a mining bee		x	x	x	x
Insecta	Hymenoptera	Andrenidae	<i>Andrena flavipes</i>	Yellow Legged Mining Bee			x	x	x
Insecta	Hymenoptera	Andrenidae	<i>Andrena haemorrhoa</i>	Early Mining Bee				x	
Insecta	Hymenoptera	Andrenidae	<i>Andrena labialis</i>	a mining bee				x	
Insecta	Hymenoptera	Andrenidae	<i>Andrena minutula</i>	a mining bee		x	x		x
Insecta	Hymenoptera	Andrenidae	<i>Andrena semilaevis</i>	a mining bee				x	
Insecta	Hymenoptera	Andrenidae	<i>Andrena synadelpha</i>	a mining bee				x	

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Hymenoptera	Apidae	<i>Bombus hypnorum</i>	a bumblebee				x	
Insecta	Hymenoptera	Apidae	<i>Bombus lapidarius</i>	Large Red Tailed Bumble Bee		x	x	x	x
Insecta	Hymenoptera	Apidae	<i>Bombus pascuorum</i>	Common Carder Bee		x	x		x
Insecta	Hymenoptera	Apidae	<i>Bombus terrestris</i>	Buff-tailed Bumble Bee		x	x		x
Insecta	Hymenoptera	Apidae	<i>Nomada flava</i>	a cuckoo bee				x	
Insecta	Hymenoptera	Apidae	<i>Nomada flavoguttata</i>	a cuckoo bee			x		x
Insecta	Hymenoptera	Colletidae	<i>Colletes hederæ</i>	a mining bee			x		x
Insecta	Hymenoptera	Colletidae	<i>Colletes similis</i>	a mining bee				x	
Insecta	Hymenoptera	Colletidae	<i>Hylaeus brevicornis</i>	Short Horned Yellow-face Bee		x			x
Insecta	Hymenoptera	Colletidae	<i>Hylaeus communis</i>	Common Yellow Face Bee		x	x	x	x
Insecta	Hymenoptera	Colletidae	<i>Hylaeus dilatatus</i>	a mining bee		x			x
Insecta	Hymenoptera	Halictidae	<i>Halictus tumulorum</i>	a mining bee			x		x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum calceatum</i>	Slender Mining Bee		x	x		x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum fulvicorne</i>	a mining bee			x		x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum lativentre</i>	a mining bee		x			x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum leucozonium</i>	a mining bee		x			x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum malachurum</i>	a mining bee	[Nationally Scarce (Nb)]	x		x	x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum morio</i>	Brassy Mining Bee		x	x		x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum pauxillum</i>	a mining bee	[Nationally Scarce (Na)]	x		x	x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum smeathmanellum</i>	a mining bee		x			x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum villosulum</i>	Shaggy Mining Bee		x	x	x	x
Insecta	Hymenoptera	Halictidae	<i>Sphecodes ephippius</i>	a cuckoo bee		x		x	x
Insecta	Hymenoptera	Halictidae	<i>Sphecodes puncticeps</i>	a cuckoo bee			x		x
Insecta	Hymenoptera	Megachilidae	<i>Osmia spinulosa</i>	a solitary bee		x	x		x
Insecta	Hymenoptera	Megachilidae	<i>Osmia bicornis</i>	Red Mason Bee			x		x
Insecta	Hymenoptera	Chrysididae	<i>Chrysis angustula</i>				x	x	x
Insecta	Hymenoptera	Tiphiidae	<i>Tiphia minuta</i>	The Small Tiphia	[Nationally Scarce (Nb)]		x		x
Insecta	Hymenoptera	Vespidae	<i>Ancistrocerus trifasciatus</i>	a mason wasp			x		x
Insecta	Hymenoptera	Vespidae	<i>Symmorphus gracilis</i>	a mason wasp		x			x
Insecta	Hymenoptera	Vespidae	<i>Vespa crabro</i>	The Hornet			x		x
Insecta	Hymenoptera	Vespidae	<i>Vespula germanica</i>	German Wasp		x	x	x	x
Insecta	Hymenoptera	Vespidae	<i>Vespula vulgaris</i>	Common Wasp			x	x	x
Insecta	Lepidoptera	Choreutidae	<i>Anthophila fabriciana</i>	a moth				x	
Insecta	Lepidoptera	Sesiidae	<i>Synanthedon myopaeformis</i>	Red-belted Clearwing				x	
Insecta	Lepidoptera	Zygaenidae	<i>Zygaena lonicerae</i>	Narrow-bordered Five-spot Burnet		x			x
Insecta	Lepidoptera	Hesperiidae	<i>Thymelicus lineola</i>	Essex Skipper			x		x
Insecta	Lepidoptera	Hesperiidae	<i>Thymelicus sylvestris</i>	Small Skipper				x	

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Lepidoptera	Hesperiidae	<i>Ochlodes sylvanus</i>	Large Skipper		x			x
Insecta	Lepidoptera	Pieridae	<i>Pieris brassicae</i>	Large White			x		x
Insecta	Lepidoptera	Pieridae	<i>Pieris rapae</i>	Small White		x	x	x	x
Insecta	Lepidoptera	Pieridae	<i>Pieris napi</i>	Green-veined White			x	x	x
Insecta	Lepidoptera	Nymphalidae	<i>Pararge aegeria</i>	Speckled Wood			x	x	x
Insecta	Lepidoptera	Nymphalidae	<i>Coenonympha pamphilus</i>	Small Heath	NT, SoPI	x			x
Insecta	Lepidoptera	Nymphalidae	<i>Aphantopus hyperantus</i>	Ringlet			x		x
Insecta	Lepidoptera	Nymphalidae	<i>Maniola jurtina</i>	Meadow Brown		x	x	x	x
Insecta	Lepidoptera	Nymphalidae	<i>Pyronia tithonus</i>	Gatekeeper			x	x	x
Insecta	Lepidoptera	Nymphalidae	<i>Melanargia galathea</i>	Marbled White			x		x
Insecta	Lepidoptera	Nymphalidae	<i>Vanessa atalanta</i>	Red Admiral		x	x	x	x
Insecta	Lepidoptera	Nymphalidae	<i>Aglais io</i>	Peacock			x		x
Insecta	Lepidoptera	Nymphalidae	<i>Aglais urticae</i>	Small Tortoiseshell		x		x	x
Insecta	Lepidoptera	Nymphalidae	<i>Polygonia c-album</i>	Comma			x	x	x
Insecta	Lepidoptera	Lycaenidae	<i>Lycaena phlaeas</i>	Small Copper			x		x
Insecta	Lepidoptera	Lycaenidae	<i>Celastrina argiolus</i>	Holly Blue			x		x
Insecta	Lepidoptera	Lycaenidae	<i>Aricia agestis</i>	Brown Argus			x		x
Insecta	Lepidoptera	Lycaenidae	<i>Polyommatus icarus</i>	Common Blue			x		x
Insecta	Lepidoptera	Crambidae	<i>Chrysoteuchia culmella</i>	Garden Grass-veneer			x		x
Insecta	Lepidoptera	Geometridae	<i>Camptogramma bilineata</i>	Yellow Shell				x	
Insecta	Lepidoptera	Geometridae	<i>Aplocera plagiata</i>	Treble-bar			x		x
Insecta	Lepidoptera	Erebidae	<i>Rivula sericealis</i>	Straw Dot			x		x
Insecta	Lepidoptera	Erebidae	<i>Callimorpha dominula</i>	Scarlet Tiger			x		x
Insecta	Lepidoptera	Erebidae	<i>Tyria jacobaeae</i>	Cinnabar	SoPI - Research		x	x	x
Insecta	Lepidoptera	Noctuidae	<i>Autographa gamma</i>	Silver Y			x		x
Insecta	Lepidoptera	Noctuidae	<i>Noctua pronuba</i>	Large Yellow Underwing			x		x
Insecta	Mecoptera	Panorpidae	<i>Panorpa communis</i>				x		x
Insecta	Odonata	Lestidae	<i>Lestes sponsa</i>	Emerald Damselfly			x		x
Insecta	Odonata	Platycnemididae	<i>Platycnemis pennipes</i>	White-legged Damselfly		x	x		x
Insecta	Odonata	Coenagriidae	<i>Coenagrion puella</i>	Azure Damselfly		x	x		x
Insecta	Odonata	Aeshnidae	<i>Aeshna cyanea</i>	Southern Hawker			x		x
Insecta	Odonata	Aeshnidae	<i>Aeshna mixta</i>	Migrant Hawker			x		x
Insecta	Odonata	Aeshnidae	<i>Anax imperator</i>	Emperor Dragonfly			x	x	x
Insecta	Odonata	Libellulidae	<i>Libellula quadrimaculata</i>	Four-spotted Chaser			x	x	x
Insecta	Odonata	Libellulidae	<i>Orthetrum cancellatum</i>	Black-tailed Skimmer				x	
Insecta	Odonata	Libellulidae	<i>Sympetrum striolatum</i>	Common Darter			x		x
Insecta	Orthoptera	Tettigoniidae	<i>Pholidoptera griseoptera</i>	Dark Bush Cricket				x	

Class	Order	Family	Species	Vernacular	National Status	LWS Network	ROF Bridgwater (Outwith LWS)	External Fields	ROF Bridgwater
Insecta	Orthoptera	Tettigoniidae	<i>Metrioptera roeselii</i>	Roesel's Bush Cricket			x	x	x
Insecta	Orthoptera	Conocephalidae	<i>Conocephalus discolor</i>	Long-winged Conehead			x	x	x
Insecta	Orthoptera	Conocephalidae	<i>Conocephalus dorsalis</i>	Short-winged Conehead			x	x	x
Insecta	Orthoptera	Phaneropteridae	<i>Leptophyes punctatissima</i>	Speckled Bush Cricket				x	
Insecta	Orthoptera	Acrididae	<i>Omocestus viridulus</i>	Common Green Grasshopper		x		x	x
Insecta	Orthoptera	Acrididae	<i>Chorthippus brunneus</i>	Common Field Grasshopper			x	x	x
Insecta	Orthoptera	Acrididae	<i>Chorthippus parallelus</i>	Meadow Grasshopper		x	x	x	x
Insecta	Orthoptera	Acrididae	<i>Myrmeleotettix maculatus</i>	Mottled Grasshopper		x			x
Malacostraca	Isopoda	Philosciidae	<i>Philoscia muscorum</i>	Common Striped Woodlouse		x	x		x
Malacostraca	Isopoda	Oniscidae	<i>Oniscus asellus</i>	Common Shiny Woodlouse			x		x
Malacostraca	Isopoda	Armadillidiidae	<i>Armadillidium vulgare</i>	Common Pill Woodlouse		x			x
			565		20	241	289	253	432

Table 15: Stenotopic species recorded within the ROF Bridgwater (outwith LWS) compartment during 2020.

Order	Family	Species	Conservation status	Broad biotope	Habitat	SAT Code	SAT Name	Habitat score
Hymenoptera	Crabronidae	<i>Pemphredon lugubris</i>		tree-associated	decaying wood	A212	Bark & Sapwood decay	
Hymenoptera	Crabronidae	<i>Psenulus pallipes</i>		tree-associated	decaying wood	A212	Bark & Sapwood decay	
Diptera	Xylomyidae	<i>Solva marginata</i>		tree-associated	decaying wood	A212	Bark & Sapwood decay	
Hymenoptera	Crabronidae	<i>Ectemnius continuus</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & Sapwood decay; Scrub edge	
Hymenoptera	Crabronidae	<i>Stigmus solskyi</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & Sapwood decay; Scrub edge	
Hemiptera	Cicadellidae	<i>Allygus mixtus</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Hymenoptera	Vespidae	<i>Ancistrocerus trifasciatus</i>		open habitats; tree-associated	decaying wood	F001	Scrub edge	
Lepidoptera	Nymphalidae	<i>Pararge aegeria</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Lepidoptera	Nymphalidae	<i>Pyronia tithonus</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Hemiptera	Rhopalidae	<i>Rhopalus (Rhopalus) subrufus</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Hymenoptera	Andrenidae	<i>Andrena dorsata</i>		open habitats	short sward & bare ground	F002	Rich flower resource	soft rock cliff: 3
Hymenoptera	Andrenidae	<i>Andrena flavipes</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Andrenidae	<i>Andrena minutula</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Bombus lapidarius</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Bombus pascuorum</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Bombus terrestris</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Colletidae	<i>Colletes hederiae</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Halictus tumulorum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Colletidae	<i>Hylaeus communis</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Lasioglossum calceatum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Lasioglossum fulvicorne</i>		open habitats	short sward & bare ground	F002	Rich flower resource	calcareous grassland: High
Hymenoptera	Halictidae	<i>Lasioglossum morio</i>		open habitats	short sward & bare ground	F002	Rich flower resource	calcareous grassland: Moderate
Hymenoptera	Halictidae	<i>Lasioglossum villosulum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Nomada flavoguttata</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Megachilidae	<i>Osmia bicornis</i>		open habitats; tree-associated	shaded woodland floor; tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Megachilidae	<i>Osmia spinulosa</i>		open habitats	short sward & bare ground	F002, F111	Rich flower resource; Open short sward	
Coleoptera	Carabidae	<i>Curtonotus aulicus</i>		open habitats	tall sward & scrub	F003	Scrub-heath & moorland	
Lepidoptera	Lycaenidae	<i>Aricia agestis</i>		open habitats	short sward & bare ground	F112	Short sward & bare ground	
Coleoptera	Malachiidae	<i>Cordylepherus viridis</i>		open habitats	short sward & bare ground	F112	Short sward & bare ground	
Coleoptera	Curculionidae	<i>Larinus planus</i>	[Nb]	open habitats	short sward & bare ground	F112	Short sward & bare ground	calcareous grassland: Low
Odonata	Platycnemididae	<i>Platycnemis pennipes</i>		wetland	running water	W125	Slow-flowing rivers	
Coleoptera	Carabidae	<i>Acupalpus exiguus</i>	NS	wetland	marshland	W221	Undisturbed fluctuating marsh	
Coleoptera	Staphylinidae	<i>Platystethus nitens</i>		tree-associated; wetland	marshland; shaded woodland floor; wet woodland	W221	Undisturbed fluctuating marsh	
Diptera	Tabanidae	<i>Atylotus rusticus</i>	NR	wetland	peatland	W314	Reed-fen & pools	

Table 16: Stenotopic species recorded within the LWS Network compartment during 2020.

Order	Family	Species	Conservation status	Broad biotope	Habitat	SAT	SAT Name	Habitat score
Hymenoptera	Crabronidae	<i>Crossocerus megacephalus</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & sapwood decay; Scrub-edge	
Hymenoptera	Crabronidae	<i>Pemphredon lethifer</i>		open habitats; tree-associated	decaying wood; tall sward & scrub	A212, F001	Bark & sapwood decay; Scrub-edge	
Hymenoptera	Vespidae	<i>Symmorphus gracilis</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & sapwood decay; Scrub-edge	
Coleoptera	Latridiidae	<i>Melanophthalma suturalis</i>		tree-associated	decaying wood	A213	Fungal fruiting bodies	
Coleoptera	Curculionidae	<i>Anthonomus rubi</i>		open habitats	tall sward & scrub	F001	Scrub-edge	
Araneae	Salticidae	<i>Heliophanus flavipes</i>		open habitats	tall sward & scrub	F001	Scrub-edge	calcareous grassland: Low
Hymenoptera	Colletidae	<i>Hylaeus brevicornis</i>		open habitats	tall sward & scrub	F001, F002	Scrub-edge; Rich flower resource	
Coleoptera	Chrysomelidae	<i>Cryptocephalus bipunctatus</i>	NS	open habitats; tree-associated	arboreal; short sward & bare ground	F001, F112	Scrub-edge; Open short sward	calcareous grassland: Moderate
Hymenoptera	Andrenidae	<i>Andrena bicolor</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Andrenidae	<i>Andrena dorsata</i>		open habitats	short sward & bare ground	F002	Rich flower resource	soft rock cliff: 3
Hymenoptera	Andrenidae	<i>Andrena minutula</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Bombus lapidarius</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Bombus terrestris</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Colletidae	<i>Hylaeus communis</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Colletidae	<i>Hylaeus dilatatus [Genus inferred]</i>		open habitats	short sward & bare ground; tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Lasioglossum calceatum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Lasioglossum lativentre</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Lasioglossum leucozonium</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Lasioglossum malachurum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	soft rock cliff: 3
Hymenoptera	Halictidae	<i>Lasioglossum morio</i>		open habitats	short sward & bare ground	F002	Rich flower resource	calcareous grassland: Moderate
Hymenoptera	Halictidae	<i>Lasioglossum pauxillum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	calcareous grassland: Low
Hymenoptera	Halictidae	<i>Lasioglossum smeathmanellum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Lasioglossum villosulum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Megachilidae	<i>Osmia spinulosa</i>		open habitats	short sward & bare ground	F002, F111	Rich flower resource; Bare sand & chalk	
Coleoptera	Carabidae	<i>Harpalus rufipes</i>		open habitats	tall sward & scrub	F003	Scrub-heath & moor	
Hemiptera	Lygaeidae	<i>Scolopostethus decoratus</i>		open habitats		F003	Scrub-heath & moor	
Araneae	Dictynidae	<i>Argenna subnigra</i>	NS	open habitats	short sward & bare ground	F111	Bare sand & chalk	
Coleoptera	Apionidae	<i>Diplapion stolidum</i>	Nb	open habitats	short sward & bare ground	F111	Bare sand & chalk	calcareous grassland: Moderate
Coleoptera	Chrysomelidae	<i>Longitarsus dorsalis</i>		open habitats	short sward & bare ground	F111	Bare sand & chalk	calcareous grassland: Moderate
Araneae	Thomisidae	<i>Ozyptila simplex</i>		open habitats	short sward & bare ground	F111	Bare sand & chalk	
Araneae	Lycosidae	<i>Pardosa palustris</i>		open habitats	short sward & bare ground	F111	Bare sand & chalk	
Araneae	Salticidae	<i>Talavera aequipes</i>		open habitats	short sward & bare ground	F111	Bare sand & chalk	calcareous grassland: Low
Coleoptera	Elateridae	<i>Agrypnus murinus</i>		open habitats	short sward & bare ground	F112	Open short sward	calcareous grassland: Moderate
Lepidoptera	Nymphalidae	<i>Coenonympha pamphilus</i>	NT; SoPI	open habitats	short sward & bare ground	F112	Open short sward	
Coleoptera	Curculionidae	<i>Larinus planus</i>	[Nb]	open habitats	short sward & bare ground	F112	Open short sward	calcareous grassland: Low
Odonata	Platycnemididae	<i>Platycnemis pennipes</i>		wetland	running water	W125	Slow-flowing rivers	
Coleoptera	Staphylinidae	<i>Stenus palustris</i>		wetland	peatland	W313	Moss & tussock fen	

Order	Family	Species	Conservation status	Broad biotope	Habitat	SAT	SAT Name	Habitat score
Coleoptera	Staphylinidae	<i>Paederus riparius</i>		wetland	peatland	W314	Reed-fen & pools	

Table 17: Species recorded in individual LWSs during 2020.

Class	Order	Family	Species	Status	Stenotopic Assemblage	Puriton Ash Ground LWS	Puriton Cowslip Field LWS	Puriton Meadows & Rail Spur LWS	Puriton Rhynes & Ponds LWS
Arachnida	Araneae	Theridiidae	<i>Neottiura bimaculata</i>			x			x
Arachnida	Araneae	Theridiidae	<i>Enoplognatha latimana</i>						x
Arachnida	Araneae	Theridiidae	<i>Enoplognatha thoracica</i>			x			
Arachnida	Araneae	Linyphiidae	<i>Pocadicnemis pumila sens. str.</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Pocadicnemis juncea</i>			x	x		x
Arachnida	Araneae	Linyphiidae	<i>Oedothorax retusus</i>						x
Arachnida	Araneae	Linyphiidae	<i>Cnephalocotes obscurus</i>			x	x		x
Arachnida	Araneae	Linyphiidae	<i>Styloctetor compar</i>	Nationally Scarce		x			
Arachnida	Araneae	Linyphiidae	<i>Micrargus subaequalis</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Erigone dentipalpis</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Agyneta saxatilis sens. str.</i>			x			
Arachnida	Araneae	Linyphiidae	<i>Agyneta affinis</i>			x			x
Arachnida	Araneae	Linyphiidae	<i>Bathypantes gracilis</i>						x
Arachnida	Araneae	Linyphiidae	<i>Bathypantes parvulus</i>						x
Arachnida	Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>						x
Arachnida	Araneae	Linyphiidae	<i>Microlinyphia pusilla</i>				x		x
Arachnida	Araneae	Tetragnathidae	<i>Pachygnatha degeeri</i>			x	x		x
Arachnida	Araneae	Lycosidae	<i>Pardosa monticola</i>			x			
Arachnida	Araneae	Lycosidae	<i>Pardosa palustris</i>		F111	x			x
Arachnida	Araneae	Lycosidae	<i>Pardosa pullata</i>			x	x		x
Arachnida	Araneae	Lycosidae	<i>Pardosa prativaga</i>						x
Arachnida	Araneae	Lycosidae	<i>Pardosa tenuipes</i>						x
Arachnida	Araneae	Lycosidae	<i>Alopecosa pulverulenta</i>			x			
Arachnida	Araneae	Hahniidae	<i>Hahnia nava</i>			x	x		
Arachnida	Araneae	Dictynidae	<i>Dictyna arundinacea</i>						x
Arachnida	Araneae	Dictynidae	<i>Argenna subnigra</i>	Nationally Scarce	F111		x		
Arachnida	Araneae	Phrurolithidae	<i>Phrurolithus festivus</i>			x	x		
Arachnida	Araneae	Clubionidae	<i>Clubiona neglecta sens. str.</i>			x			
Arachnida	Araneae	Gnaphosidae	<i>Zelotes latreillei</i>			x			
Arachnida	Araneae	Thomisidae	<i>Xysticus cristatus</i>				x		
Arachnida	Araneae	Thomisidae	<i>Ozyptila simplex</i>		F111	x			
Arachnida	Araneae	Salticidae	<i>Heliophanus flavipes</i>		F001	x			x
Arachnida	Araneae	Salticidae	<i>Euophrys frontalis</i>			x	x		
Arachnida	Araneae	Salticidae	<i>Talavera aequipes</i>		F111	x			
Insecta	Coleoptera	Carabidae	<i>Nebria brevicollis</i>			x			
Insecta	Coleoptera	Carabidae	<i>Bembidion guttula</i>						x

Class	Order	Family	Species	Status	Stenotopic Assemblage	Puriton Ash Ground LWS	Puriton Cowslip Field LWS	Puriton Meadows & Rail Spur LWS	Puriton Rhynes & Ponds LWS
Insecta	Coleoptera	Carabidae	<i>Pterostichus madidus</i>			x			
Insecta	Coleoptera	Carabidae	<i>Calathus fuscipes</i>			x			
Insecta	Coleoptera	Carabidae	<i>Oxypselaphus obscurus</i>						x
Insecta	Coleoptera	Carabidae	<i>Amara aenea</i>			x			
Insecta	Coleoptera	Carabidae	<i>Amara communis</i>			x			
Insecta	Coleoptera	Carabidae	<i>Amara convexior</i>			x			
Insecta	Coleoptera	Carabidae	<i>Amara lunicollis</i>			x			
Insecta	Coleoptera	Carabidae	<i>Amara ovata</i>			x			
Insecta	Coleoptera	Carabidae	<i>Amara tibialis</i>			x			
Insecta	Coleoptera	Carabidae	<i>Harpalus affinis</i>			x			
Insecta	Coleoptera	Carabidae	<i>Harpalus rufipes</i>		F003	x			
Insecta	Coleoptera	Carabidae	<i>Badister bullatus</i>			x			
Insecta	Coleoptera	Carabidae	<i>Demetrias atricapillus</i>						x
Insecta	Coleoptera	Carabidae	<i>Paradromius linearis</i>						x
Insecta	Coleoptera	Carabidae	<i>Philorhizus melanocephalus</i>						x
Insecta	Coleoptera	Carabidae	<i>Syntomus foveatus</i>			x			
Insecta	Coleoptera	Carabidae	<i>Syntomus obscuroides</i>						x
Insecta	Coleoptera	Carabidae	<i>Microlestes minutulus</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus dispar</i>				x		x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus hypnorum</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus nitidulus</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Tachyporus solutus</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Tachinus rufipes</i>			x			
Insecta	Coleoptera	Staphylinidae	<i>Mocyta fungi</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Aleochara bipustulata</i>			x			
Insecta	Coleoptera	Staphylinidae	<i>Drusilla canaliculata</i>			x			x
Insecta	Coleoptera	Staphylinidae	<i>Cypha longicornis</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Stenus fulvicornis</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Stenus latifrons</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Stenus similis</i>						x
Insecta	Coleoptera	Staphylinidae	<i>Stenus aceris</i>				x		x
Insecta	Coleoptera	Staphylinidae	<i>Stenus ossium</i>			x			
Insecta	Coleoptera	Staphylinidae	<i>Stenus palustris</i>	Nationally Scarce (Nb)	W313				x
Insecta	Coleoptera	Staphylinidae	<i>Paederus littoralis</i>			x	x		
Insecta	Coleoptera	Staphylinidae	<i>Paederus riparius</i>		W314				x
Insecta	Coleoptera	Staphylinidae	<i>Ocypus aeneocephalus</i>			x			
Insecta	Coleoptera	Staphylinidae	<i>Tasgius globulifer</i>			x			

Class	Order	Family	Species	Status	Stenotopic Assemblage	Puriton Ash Ground LWS	Puriton Cowslip Field LWS	Puriton Meadows & Rail Spur LWS	Puriton Rhynes & Ponds LWS
Insecta	Coleoptera	Staphylinidae	<i>Quedius schatzmayri</i>				x		
Insecta	Coleoptera	Staphylinidae	<i>Xantholinus linearis</i>			x			
Insecta	Coleoptera	Scarabaeidae	<i>Onthophagus joannae</i>			x		x	
Insecta	Coleoptera	Scirtidae	<i>Microcara testacea</i>						x
Insecta	Coleoptera	Scirtidae	<i>Cyphon coarctatus</i>						x
Insecta	Coleoptera	Elateridae	<i>Agrypnus murinus</i>		F112	x			
Insecta	Coleoptera	Elateridae	<i>Athous bicolor</i>						x
Insecta	Coleoptera	Elateridae	<i>Agriotes sputator</i>				x		x
Insecta	Coleoptera	Cantharidae	<i>Cantharis nigra</i>						x
Insecta	Coleoptera	Cantharidae	<i>Cantharis lateralis</i>						x
Insecta	Coleoptera	Cantharidae	<i>Cantharis rufa</i>						x
Insecta	Coleoptera	Cantharidae	<i>Rhagonycha fulva</i>						x
Insecta	Coleoptera	Kateretidae	<i>Brachypterus glaber</i>						x
Insecta	Coleoptera	Kateretidae	<i>Brachypterus urticae</i>						x
Insecta	Coleoptera	Silvanidae	<i>Psammoecus bipunctatus</i>						x
Insecta	Coleoptera	Cryptophagidae	<i>Atomaria gutta</i>						x
Insecta	Coleoptera	Cryptophagidae	<i>Atomaria rubella</i>						x
Insecta	Coleoptera	Coccinellidae	<i>Rhyzobius litura</i>						x
Insecta	Coleoptera	Coccinellidae	<i>Coccinella septempunctata</i>					x	
Insecta	Coleoptera	Coccinellidae	<i>Tytthaspis sedecimpunctata</i>						x
Insecta	Coleoptera	Coccinellidae	<i>Subcoccinella vigintiquattuorpunctata</i>						x
Insecta	Coleoptera	Latridiidae	<i>Enicmus transversus</i>						x
Insecta	Coleoptera	Latridiidae	<i>Corticaria impressa</i>						x
Insecta	Coleoptera	Latridiidae	<i>Melanophthalma suturalis</i>		A213				x
Insecta	Coleoptera	Oedemeridae	<i>Oedemera nobilis</i>			x		x	x
Insecta	Coleoptera	Oedemeridae	<i>Oedemera lurida</i>				x		
Insecta	Coleoptera	Chrysomelidae	<i>Longitarsus dorsalis</i>		F111	x			
Insecta	Coleoptera	Chrysomelidae	<i>Neocrepidodera ferruginea</i>						x
Insecta	Coleoptera	Chrysomelidae	<i>Neocrepidodera transversa</i>						x
Insecta	Coleoptera	Chrysomelidae	<i>Chaetocnema arida</i>						x
Insecta	Coleoptera	Chrysomelidae	<i>Chaetocnema hortensis</i>			x			
Insecta	Coleoptera	Chrysomelidae	<i>Cryptocephalus bipunctatus</i>	Nationally Scarce	F001, F112	x			
Insecta	Coleoptera	Apionidae	<i>Diplapion stolidum</i>	Nationally Scarce (Nb)	F111		x		
Insecta	Coleoptera	Apionidae	<i>Protapion assimile</i>				x		
Insecta	Coleoptera	Apionidae	<i>Ischnopterapion loti</i>				x		
Insecta	Coleoptera	Apionidae	<i>Oxystoma pomonae</i>						x
Insecta	Coleoptera	Curculionidae	<i>Otiorhynchus ovatus</i>			x			

Class	Order	Family	Species	Status	Stenotopic Assemblage	Puriton Ash Ground LWS	Puriton Cowslip Field LWS	Puriton Meadows & Rail Spur LWS	Puriton Rhynes & Ponds LWS
Insecta	Coleoptera	Curculionidae	<i>Phyllobius roboretanus</i>						x
Insecta	Coleoptera	Curculionidae	<i>Barypeithes pellucidus</i>			x	x		
Insecta	Coleoptera	Curculionidae	<i>Sciaphilus asperatus</i>			x			
Insecta	Coleoptera	Curculionidae	<i>Tanymecus palliatus</i>	Nationally Scarce (Nb)					x
Insecta	Coleoptera	Curculionidae	<i>Sitona lineatus</i>			x			x
Insecta	Coleoptera	Curculionidae	<i>Larinus planus</i>	[Nationally Scarce (Nb)]	F112	x			
Insecta	Coleoptera	Curculionidae	<i>Hypera zoilus</i>			x			
Insecta	Coleoptera	Curculionidae	<i>Anthonomus rubi</i>		F001	x	x		x
Insecta	Diptera	Limoniidae	<i>Phylidorea ferruginea</i>						x
Insecta	Diptera	Anisopodidae	<i>Sylvicola punctatus</i>					x	
Insecta	Diptera	Ptychopteridae	<i>Ptychoptera contaminata</i>						x
Insecta	Diptera	Rhagionidae	<i>Chrysopilus cristatus</i>						x
Insecta	Diptera	Tabanidae	<i>Haematopota crassicornis</i>					x	
Insecta	Diptera	Tabanidae	<i>Haematopota pluvialis</i>			x			
Insecta	Diptera	Stratiomyidae	<i>Nemotelus notatus</i>					x	x
Insecta	Diptera	Stratiomyidae	<i>Nemotelus uliginosus</i>			x			
Insecta	Diptera	Stratiomyidae	<i>Chloromyia formosa</i>					x	x
Insecta	Diptera	Asilidae	<i>Leptogaster cylindrica</i>					x	x
Insecta	Diptera	Empididae	<i>Empis livida</i>			x			
Insecta	Diptera	Dolichopodidae	<i>Dolichopus festivus</i>			x			
Insecta	Diptera	Dolichopodidae	<i>Dolichopus griseipennis</i>					x	
Insecta	Diptera	Dolichopodidae	<i>Dolichopus trivialis</i>						x
Insecta	Diptera	Dolichopodidae	<i>Poecilobothrus nobilitatus</i>					x	
Insecta	Diptera	Syrphidae	<i>Melanostoma mellinum</i>					x	x
Insecta	Diptera	Syrphidae	<i>Melanostoma scalare</i>			x			
Insecta	Diptera	Syrphidae	<i>Platycheirus clypeatus</i>						x
Insecta	Diptera	Syrphidae	<i>Platycheirus fulviventris</i>					x	
Insecta	Diptera	Syrphidae	<i>Chrysotoxum bicinctum</i>			x			
Insecta	Diptera	Syrphidae	<i>Episyrphus balteatus</i>					x	
Insecta	Diptera	Syrphidae	<i>Eupeodes corollae</i>			x			
Insecta	Diptera	Syrphidae	<i>Cheilosia illustrata</i>					x	
Insecta	Diptera	Syrphidae	<i>Neoascia tenur</i>						x
Insecta	Diptera	Syrphidae	<i>Eristalinus sepulchralis</i>					x	x
Insecta	Diptera	Syrphidae	<i>Eristalis arbustorum</i>					x	
Insecta	Diptera	Syrphidae	<i>Helophilus pendulus</i>					x	
Insecta	Diptera	Syrphidae	<i>Volucella bombylans</i>					x	
Insecta	Diptera	Syrphidae	<i>Syritta pipiens</i>					x	

Class	Order	Family	Species	Status	Stenotopic Assemblage	Puriton Ash Ground LWS	Puriton Cowslip Field LWS	Puriton Meadows & Rail Spur LWS	Puriton Rhynes & Ponds LWS
Insecta	Diptera	Lauxaniidae	<i>Sapromyza quadripunctata</i>					x	
Insecta	Diptera	Sciomyzidae	<i>Pherbellia cinerella</i>			x			
Insecta	Diptera	Sepsidae	<i>Sepsis fulgens</i>					x	
Insecta	Diptera	Sepsidae	<i>Sepsis punctum</i>					x	
Insecta	Diptera	Opomyzidae	<i>Opomyza petrei</i>					x	
Insecta	Diptera	Scathophagidae	<i>Scathophaga stercoraria</i>					x	
Insecta	Diptera	Anthomyiidae	<i>Anthomyia confusanea</i>					x	
Insecta	Diptera	Anthomyiidae	<i>Adia cinerella</i>					x	
Insecta	Diptera	Anthomyiidae	<i>Delia platura</i>			x		x	
Insecta	Diptera	Anthomyiidae	<i>Pegoplatea aestiva</i>					x	x
Insecta	Diptera	Anthomyiidae	<i>Pegoplatea infirma</i>					x	
Insecta	Diptera	Fanniidae	<i>Fannia serena</i>					x	
Insecta	Diptera	Muscidae	<i>Coenosia pumila</i>						x
Insecta	Diptera	Muscidae	<i>Hydrotaea pilipes</i>	pNationally Scarce				x	
Insecta	Diptera	Muscidae	<i>Morellia aenescens</i>					x	x
Insecta	Diptera	Muscidae	<i>Musca autumnalis</i>					x	x
Insecta	Diptera	Muscidae	<i>Neomyia cornicina</i>					x	x
Insecta	Diptera	Muscidae	<i>Polietes lardarius</i>					x	
Insecta	Diptera	Muscidae	<i>Stomoxys calcitrans</i>					x	
Insecta	Diptera	Muscidae	<i>Graphomya maculata</i>						x
Insecta	Diptera	Muscidae	<i>Hebecnema umbratica</i>					x	
Insecta	Diptera	Muscidae	<i>Helina evecta</i>					x	
Insecta	Diptera	Muscidae	<i>Helina reversio</i>			x		x	
Insecta	Diptera	Muscidae	<i>Phaonia tuguriorum</i>			x			
Insecta	Diptera	Calliphoridae	<i>Lucilia caesar</i>			x			
Insecta	Diptera	Rhinophoridae	<i>Phyto discrepans</i>			x			
Insecta	Diptera	Rhinophoridae	<i>Tricogena rubricosa</i>			x			
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga nigriventris</i>			x			
Insecta	Diptera	Sarcophagidae	<i>Sarcophaga variegata</i>			x			
Insecta	Diptera	Tachinidae	<i>Eriothrix rufomaculata</i>			x			x
Insecta	Diptera	Tephritidae	<i>Tephritis divisa</i>					x	
Insecta	Hemiptera, Auchenorrhyncha	Aphrophoridae	<i>Philaenus spumarius</i>						x
Insecta	Hemiptera, Auchenorrhyncha	Aphrophoridae	<i>Neophilaenus lineatus</i>						x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Anaceratagallia ribauti</i>			x			
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Anoscopus albifrons</i>						x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Arthaldeus pascuellus</i>						x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Euscelis incisus</i>						x

Class	Order	Family	Species	Status	Stenotopic Assemblage	Puriton Ash Ground LWS	Puriton Cowslip Field LWS	Puriton Meadows & Rail Spur LWS	Puriton Rhynes & Ponds LWS
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Streptanus sordidus</i>						x
Insecta	Hemiptera, Auchenorrhyncha	Cicadellidae	<i>Zyginidia scutellaris</i>						x
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Conomelus anceps</i>						x
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Criomorphus albomarginatus</i>						x
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Hyledelphax elegantulus</i>				x		
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Javesella dubia</i>				x		
Insecta	Hemiptera, Auchenorrhyncha	Delphacidae	<i>Javesella pellucida</i>						x
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Drymus sylvaticus</i>						x
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Scolopostethus decoratus</i>		F003	x			
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Scolopostethus thomsoni</i>						x
Insecta	Hemiptera, Heteroptera	Lygaeidae	<i>Trapezonotus desertus</i>			x			
Insecta	Hemiptera, Heteroptera	Anthcoridae	<i>Orius niger</i>			x			
Insecta	Hemiptera, Heteroptera	Miridae	<i>Capsus ater</i>					x	x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Leptopterna dolabrata</i>					x	
Insecta	Hemiptera, Heteroptera	Miridae	<i>Miridius quadrivirgatus</i>						x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Notostira elongata</i>						x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Orthops campestris</i>						x
Insecta	Hemiptera, Heteroptera	Miridae	<i>Stenodema calcarata</i>						x
Insecta	Hymenoptera	Cephidae	<i>Cephus spinipes</i>						x
Insecta	Hymenoptera	Tenthredinidae	<i>Cladius pectinicornis</i>					x	
Insecta	Hymenoptera	Crabronidae	<i>Crossocerus megacephalus</i>		A212, F001	x			
Insecta	Hymenoptera	Crabronidae	<i>Pemphredon lethifer agg.</i>		A212, F001				x
Insecta	Hymenoptera	Andrenidae	<i>Andrena bicolor</i>		F002	x			
Insecta	Hymenoptera	Andrenidae	<i>Andrena dorsata</i>		F002	x			
Insecta	Hymenoptera	Andrenidae	<i>Andrena minutula</i>		F002	x			
Insecta	Hymenoptera	Apidae	<i>Bombus lapidarius</i>		F002			x	
Insecta	Hymenoptera	Apidae	<i>Bombus pascuorum</i>					x	
Insecta	Hymenoptera	Apidae	<i>Bombus terrestris</i>		F002	x			
Insecta	Hymenoptera	Colletidae	<i>Hylaeus brevicornis</i>		F001, F002	x			
Insecta	Hymenoptera	Colletidae	<i>Hylaeus communis</i>		F002	x		x	
Insecta	Hymenoptera	Colletidae	<i>Hylaeus dilatatus</i>		F002			x	x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum calceatum</i>		F002			x	
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum lativentre</i>		F002				x
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum leucozonium</i>		F002	x			
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum malachurum</i>	[Nationally Scarce (Nb)]	F002	x			
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum morio</i>		F002	x		x	
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum pauxillum</i>	[Nationally Scarce (Na)]	F002	x		x	

Class	Order	Family	Species	Status	Stenotopic Assemblage	Puriton Ash Ground LWS	Puriton Cowslip Field LWS	Puriton Meadows & Rail Spur LWS	Puriton Rhynes & Ponds LWS
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum smeathmanellum</i>		F002	x			
Insecta	Hymenoptera	Halictidae	<i>Lasioglossum villosulum</i>		F002	x		x	
Insecta	Hymenoptera	Halictidae	<i>Sphecodes ephippius</i>			x			
Insecta	Hymenoptera	Megachilidae	<i>Osmia spinulosa</i>		F002, F111			x	
Insecta	Hymenoptera	Vespidae	<i>Symmorphus gracilis</i>		A212, F001	x			
Insecta	Hymenoptera	Vespidae	<i>Vespula germanica</i>			x			
Insecta	Lepidoptera	Zygaenidae	<i>Zygaena lonicerae</i>					x	
Insecta	Lepidoptera	Hesperiidae	<i>Ochlodes sylvanus</i>					x	
Insecta	Lepidoptera	Pieridae	<i>Pieris rapae</i>					x	x
Insecta	Lepidoptera	Nymphalidae	<i>Coenonympha pamphilus</i>	NT, SoPI	F112			x	
Insecta	Lepidoptera	Nymphalidae	<i>Maniola jurtina</i>					x	x
Insecta	Lepidoptera	Nymphalidae	<i>Vanessa atalanta</i>					x	
Insecta	Lepidoptera	Nymphalidae	<i>Aglais urticae</i>					x	
Insecta	Odonata	Platycnemididae	<i>Platycnemis pennipes</i>		W125			x	
Insecta	Odonata	Coenagriidae	<i>Coenagrion puella</i>					x	
Insecta	Orthoptera	Acrididae	<i>Omocestus viridulus</i>					x	
Insecta	Orthoptera	Acrididae	<i>Chorthippus parallelus</i>						x
Insecta	Orthoptera	Acrididae	<i>Myrmeleotettix maculatus</i>			x			
Malacostraca	Isopoda	Philosciidae	<i>Philoscia muscorum</i>						x
Malacostraca	Isopoda	Armadillidiidae	<i>Armadillidium vulgare</i>			x			
241				11	38	96	23	62	111

Table 18: Stenotopic species recorded on External Fields during 2020.

Order	Family	Species	Conservation status	Broad biotope	Habitat	SAT	SAT Name	Habitat score
Coleoptera	Staphylinidae	<i>Hypnogyra angularis</i>	Nationally Scarce (Na)	tree-associated	decaying wood	A211	Heartwood decay	IEC (older version): 1, IEC: 2
Diptera	Syrphidae	<i>Myathropa florea</i>		tree-associated	decaying wood	A211	Heartwood decay	
Coleoptera	Anobiidae	<i>Ptilinus pectinicornis</i>		tree-associated	decaying wood	A211	Heartwood decay	
Coleoptera	Scraptiidae	<i>Anaspis garneysi</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Coleoptera	Scraptiidae	<i>Anaspis maculata</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Coleoptera	Anobiidae	<i>Anobium punctatum</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Coleoptera	Cerambycidae	<i>Grammoptera ruficornis</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Hymenoptera	Crabronidae	<i>Pemphredon lugubris</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Coleoptera	Cerambycidae	<i>Pogonocherus hispidulus</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Coleoptera	Cerambycidae	<i>Pogonocherus hispidus</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Hymenoptera	Crabronidae	<i>Psenulus concolor</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Coleoptera	Curculionidae	<i>Scolytus multistriatus</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Coleoptera	Curculionidae	<i>Scolytus rugulosus</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Lepidoptera	Sesiidae	<i>Synanthedon myopaeformis</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Coleoptera	Cerambycidae	<i>Tetrops praeustus</i>		tree-associated	decaying wood	A212	Bark & sapwood decay	
Hymenoptera	Crabronidae	<i>Crossocerus podagricus</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & sapwood decay; Scrub edge	
Hymenoptera	Crabronidae	<i>Ectemnius cavifrons</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & sapwood decay; Scrub edge	
Hymenoptera	Crabronidae	<i>Ectemnius cephalotes</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & sapwood decay; Scrub edge	
Hymenoptera	Crabronidae	<i>Ectemnius continuus</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & sapwood decay; Scrub edge	
Hymenoptera	Crabronidae	<i>Ectemnius lapidarius</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & sapwood decay; Scrub edge	
Hymenoptera	Crabronidae	<i>Ectemnius lituratus</i>		open habitats; tree-associated	decaying wood	A212, F001	Bark & sapwood decay; Scrub edge	
Coleoptera	Erotylidae	<i>Triplax russica</i>		tree-associated	decaying wood	A213	Fungal fruitig bodies	IEC (older version): 1, IEC: 1
Hemiptera	Anthocoridae	<i>Cardiastethus fasciiventris</i>		tree-associated	arboreal; decaying wood	A215	Epiphyte fauna	
Araneae	Agelenidae	<i>Agelena labyrinthica</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Hemiptera	Cicadellidae	<i>Allygus mixtus</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Coleoptera	Curculionidae	<i>Anthonomus rubi</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Orthoptera	Phaneropteridae	<i>Leptophyes punctatissima</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Lepidoptera	Nymphalidae	<i>Pararge aegeria</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Orthoptera	Tettigoniidae	<i>Pholidoptera griseoptera</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Lepidoptera	Nymphalidae	<i>Pyronia tithonus</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Hemiptera	Rhopalidae	<i>Rhopalus (Rhopalus) subrufus</i>		open habitats	tall sward & scrub	F001	Scrub edge	
Hymenoptera	Andrenidae	<i>Andrena chrysosceles</i>		open habitats	short sward & bare ground	F001, F002	Scrub edge, Rich flower resource	
Hymenoptera	Andrenidae	<i>Andrena synadelpha</i>		open habitats	short sward & bare ground	F001, F002	Scrub edge, Rich flower resource	
Hymenoptera	Andrenidae	<i>Andrena dorsata</i>		open habitats	short sward & bare ground	F002	Rich flower resource	soft rock cliff: 3
Hymenoptera	Andrenidae	<i>Andrena flavipes</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Andrenidae	<i>Andrena haemorrhhoa</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Andrenidae	<i>Andrena labialis</i>		open habitats	short sward & bare ground	F002	Rich flower resource	

Order	Family	Species	Conservation status	Broad biotope	Habitat	SAT	SAT Name	Habitat score
Hymenoptera	Andrenidae	<i>Andrena semilaevis</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Bombus hypnorum</i>		open habitats; tree-associated	shaded woodland floor; tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Bombus lapidarius</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Colletidae	<i>Colletes similis</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Colletidae	<i>Hylaeus communis</i>		open habitats	tall sward & scrub	F002	Rich flower resource	
Hymenoptera	Halictidae	<i>Lasioglossum malachurum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	soft rock cliff: 3
Hymenoptera	Halictidae	<i>Lasioglossum pauxillum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	calcareous grassland: Low
Hymenoptera	Halictidae	<i>Lasioglossum villosulum</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Hymenoptera	Apidae	<i>Nomada flava</i>		open habitats	short sward & bare ground	F002	Rich flower resource	
Coleoptera	Elateridae	<i>Agrypnus murinus</i>		open habitats	short sward & bare ground	F112	Open short sward	calcareous grassland: Moderate
Coleoptera	Chrysomelidae	<i>Longitarsus lycopi</i>	Nationally Scarce	open habitats	short sward & bare ground	F112	Open short sward	calcareous grassland: Moderate
Diptera	Tabanidae	<i>Atylotus rusticus</i>	Nationally Rare	wetland	peatland	W314	Reed-fen & pools	
Diptera	Stratiomyidae	<i>Oplodontha viridula</i>		wetland	marshland; peatland	W314	Reed-fen & pools	grazing marsh - salinity: 0, grazing marsh - status: 2, seepage (calcareous): B

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