

Greencore Group Plc

Fitzalan Link, North Littlehampton

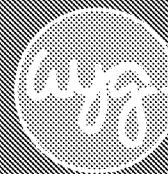
Invertebrate Survey

10th October 2011

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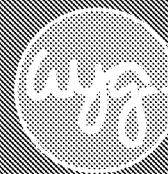
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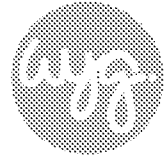
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Appendix A – Report Condition

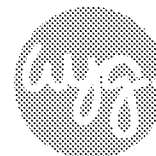
Appendix B - Insect species recorded from site of proposed Fitzalan Link, Littlehampton. 2011.

Appendix C– Site Plan

Contents	Summary
Site location	An area of land on the outskirts of Littlehampton, West Sussex, favoured for the proposed "Fitzalan Link" road development scheme, centred on ordnance survey grid reference TQ 031 029 was surveyed for its entomological interest during the summer of 2011.
Previous reports/surveys	An Extended Phase One Habitat survey was undertaken by WYG in October 2009 which recommended that a suite of invertebrate survey of the Fitzalan Link site were completed prior to development.
WYG Survey	The site was visited on the following dates: 23rd June, 14th and 25th July and 16th August 2011 to sample the invertebrate diversity present on the site. Survey methods were confined to visual searching, then the use of a hand net or pooter to capture individual species, sweeping vegetation, beating foliage and grubbing. The weather during these surveys was good, with considerable amounts of sun, although it did deteriorate around mid afternoon on the final visit.
Results	The survey site for the proposed Fitzalan Link contains small populations of relatively few scarce insect species and generally is considered to be of only local importance. The surveys yielded records of six Nationally Scarce and one Red Data Book species of insect. Most of the scarcer species recorded have significantly larger populations elsewhere within the County. However, the picture – winged flies <i>Acanthiophilus helianthi</i> and <i>Merzomyia westermanni</i> appear to be scarce within West Sussex (although this may be partially due to a current lack of recording effort for this group of flies in West Sussex) and every effort should be made to retain the populations of these insects on site.
Recommendations	In order to retain the existing entomological interests of the site, the following actions are likely to be beneficial: ✧ Within this buffer area, efforts should be made to retain or re-establish the



	existing grassland element, ensuring that key host and forage plants, including Ragwort and other yellow composites, Black Knapweed, Clovers, Creeping Thistle and Spear Thistle. ❖ Some Bramble, which provides an excellent pollen and nectar source as well as shelter, should also be retained and managed to ensure that the site does not scrub over. Provision of small areas of bare ground would provide nesting opportunities for ground – nesting Hymenoptera. ❖ Any future cutting or harvesting of the remaining grassland on site should be undertaken at a more sympathetic time, preferably after plants have set seed and invertebrates have had chance to reproduce. Kirby (2001) suggests cutting as late as possible within the year and that only part of the site should be cut each year thus maintaining the widest diversity of invertebrates within the site. ❖ Maintenance of the scrub and bramble along the edges of the site is important as they provide both shelter and foraging resources for invertebrates. Management should ensure that the scrub and bramble does not encroach into the grasslands.
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1.0 INTRODUCTION

1.1 BACKGROUND

WYG Environment (WYG) was commissioned by Greencore Group Plc to carry out an invertebrate survey on land at the proposed Fitzalan Link site, Littlehampton. The purpose of the survey was to provide baseline data and identify any protected, rare or notable invertebrate species within the site's development perimeter (see plan 1). The results of this survey will then be used to make recommendations regarding any further surveys along with any potential invertebrate mitigation and / or compensation required.

1.2 SITE DESCRIPTION

An area of land on the outskirts of Littlehampton, West Sussex, favoured for the proposed "Fitzalan Link" road development scheme, was surveyed for its entomological interest during the summer of 2011.

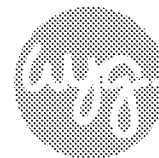
1.3 HABITATS WITHIN THE SITE

At the time of the first visit on 23rd June, the majority of the site consisted of rank grassland with a variety of flowering plants which provide foraging sources for invertebrates. These included Creeping Thistle, *Cirsium arvense*, Ragwort *Senecio jacobaea*, White Clover *Trifolium repens*, Red Clover *Trifolium pratense*, Buttercups *Ranunculus* sp. and Yarrow *Achillea millefolium*. Small amounts of Spear Thistle *Cirsium vulgare*, Teasel *Dipsacus fullonum*, Black Knapweed *Centaurea nigra* Prickly Sow – thistle *Sonchus asper* and "Hawkish" yellow composites were also present. The western site boundary contained scrubby Bramble *Rubus fruticosus* agg. patches for much of its length. The eastern side of the site was delimited by a row of widely spaced mature trees at the northern end, dominated by Poplar *Populus* sp. and Ash *Fraxinus excelsior*, but also containing some exotic conifers. The tree line gave way in the South – eastern section to scrub which was dominated by Bramble.

By the time of the second visit on 14th July, the majority of the site had been recently cut as a hay crop, leaving little vegetation over most of the site. The main interest of the site was thence confined to the boundary areas, particularly along the western side, where a narrow buffer zone of uncut grassland had been left.

A number of invertebrate species are protected by European and UK legislation, such as those listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and in the Conservation of Species and Habitats Regulations 2010. As a result, some species are protected from some or all of the following (amongst others): (i) killing, injuring or taking; (ii) possession or control; (iii) damage to, destruction of or obstruction of access to any places used for shelter or protection; and (iv) disturbance while using such a structure. Following a review in 2007 of species listed on the UK Biodiversity Action Plan (BAP), there has been a significant increase in the number of invertebrates included. The current UK BAP now lists 411 invertebrate species.

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2.0 FIELD SURVEY

2.1 METHODOLOGY

The site was visited on the following dates: 23rd June, 14th and 25th July and 16th August 2011 to sample the invertebrate diversity present on the site. This was achieved by conducting a walk-over survey of the site and sampling the invertebrates using several different techniques (Eyre, 1996; Hill *et al.*, 2005, Sutherland, 2004):

Sweep netting: netting invertebrates in low vegetation using a stout-handled net which is moved vigorously through the vegetation to dislodge resting invertebrates. This method can be considered to be quantitative, when carried out for a specified amount of time.

Beating tray: beating trees and bushes with a stick using a sharp tap to dislodge the invertebrates which then fall onto the beating tray held beneath. This technique is effective in obtaining arboreal invertebrate species.

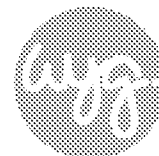
Grubbing: looking for invertebrates in suitable habitats or microhabitats e.g. under stones, logs, under bark, in crevices within walls and rocks, leaf litter, around the base of plants, dead and decaying fungi, dung and carrion.

Direct searching: looking for invertebrates in the suitable habitats or microhabitats for species known or considered likely to occur within the site.

Having caught invertebrates within a net a pooter was used to capture individual species.

The weather during these surveys was generally good, with considerable amounts of sun, although it did deteriorate around mid afternoon on the final visit.

This survey effort is considered to be sufficient to determine the site's importance for invertebrates and is in line with the recommendations given by Natural England in their invertebrate standing advice (2011).



3.0 RESULTS

The terrestrial invertebrate surveys were undertaken by Adam Wright an independent ecologist specialising in terrestrial invertebrate surveying and assessment.

3.1 SURVEY RESULTS

A full list of all insect species recorded during the course of surveys is appended as **Appendix B**. A number of the species encountered are considered to be Nationally Scarce or Red Data Book species. These are marked as such within **Appendix B** and are discussed in more detail below. The status category definitions and criteria for individual species are those devised by the JNCC and are as follows:

STATUS CATEGORY DEFINITIONS AND CRITERIA.

RDB 1 - Endangered.

Taxa in danger of extinction and whose survival is unlikely if causal factors continue operating.

Species which are known or believed to occur as only a single population within one 10km square of the National Grid.

Species which only occur in habitats known to be particularly vulnerable.

Species which have shown a rapid or continuous decline over the last twenty years and are now estimated to exist in five or fewer 10km squares.

Species which are possibly extinct but have been recorded in the 20th century and if rediscovered would need protection.

RDB 2 - Vulnerable.

Taxa believed likely to move into the endangered category in the near future if the causal factors continue operating.

Species declining throughout their range.

Species in vulnerable habitats.

RDB 3 - Rare.

Taxa with small populations that are not at present Endangered or Vulnerable, but are at risk

Species which are estimated to exist in only fifteen or fewer post 1970 10km squares. This criterion may be relaxed where populations are likely to exist in over fifteen 10km squares but occupy small areas of especially vulnerable habitat.

Nationally Scarce (Na).

Taxa which do not fall within the RDB categories but which are none - the - less uncommon in Great Britain and thought to occur in 30 or fewer 10km squares of the National Grid.

Nationally Scarce (Nb).

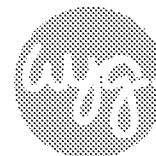
Nationally Scarce (N).

DIPTERA

A picture – winged fly *Campiglossa malaris* **Endangered RDB 1**

A picture – winged fly *Merzomyia westermanni* **Nationally Scarce N**

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far unrecorded from Wales. Locally, although recorded with some frequency in the past, Clemons (2008) shows no other post 2000 records for *M. westermanni* in West Sussex, although the author has also recorded this species at Slindon in 2011.

HYMENOPTERA

A mining bee *Andrena trimmerana* **Nationally Scarce Nb**

This species was recorded from Bramble scrub towards the southern end of the site at TQ 03130284 on 23rd June. *A. trimmerana* is a predominantly southern species, particularly associated with warm coastal grassland, although other habitats including woodland edge are also utilised. *A. trimmerana* is a double – brooded species utilising a variety of plant species for pollen collection, although Bramble is often favoured by the second brood. Falk (1991) notes a considerable decline at inland sites. Locally, *A. trimmerana* has been recorded with some regularity.

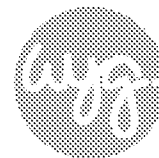
A mining bee *Lasioglossum malachurum* **Nationally Scarce Nb**

A single specimen of this bee was encountered on 14th July at TQ 03090311 on the western side of the site. It is a eusocial species, and workers occur that are considerably smaller than the gynes. *L. malachurum* is polylectic, collecting pollen from a wide variety of plants. It has been recorded from a range of habitats where there is warm disturbed ground. Typical breeding sites are in bare clayey soil on coastal cliffs and landslips, but it also occurs inland, in quarries, chalk grassland and heaths. Nationally, this species is restricted to southern England. Previously a very local and scarce species, *L. malachurum* has become far more frequent and is currently extending its British range (Edwards. & Broad, 2005). If this expansion continues, it is likely that the status of *L. malachurum* will require review. Locally, this would appear to be a fairly common species.

A mining bee *Lasioglossum pauxillum* **Nationally Scarce Na**

This species was recorded on 14th July, again as a single specimen. *L. pauxillum* nests in sparsely vegetated light soils in warm, sunny conditions. It may be found in a variety of habitats including calcareous grassland, soft rock coastal cliffs and heathland. Previously, *L. pauxillum* was a scarce species restricted to South – East England, but in the last decade it has increased in frequency and expanded its range northwards and westwards (Edwards & Broad, 2005). Its current Nationally Scarce (Na) status requires downgrading. Currently, *L. pauxillum* appears to be locally common in West Sussex.

This bee proved to be locally frequent on site, with several specimens recorded on every visit, often visiting Ragwort flowers. *N. fucata* is a cleptoparasite of the mining bee *Andrena flavipes*, which was also regularly recorded during the survey. The host is associated with bare or sparsely vegetated soils in a variety of habitats, where it collects pollen from a wide range of plant species. *A. flavipes* is widespread in southern England and south Wales, and appears to have expanded its range in recent decades (Edwards & Telfer, 2002). *N. fucata* is now similarly widespread in southern England and south Wales. It is currently a frequently encountered species, although in the 1970s, it endured a period of great scarcity and has in the past been subject to considerable fluctuations in population size and distribution. If *N. fucata* continues to prosper at present levels nationally, its status will require review (Edwards & Telfer, 2002).



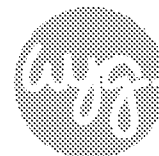
4.0 SUMMARY OF INVERTEBRATE INTEREST

The surveys yielded records of six **Nationally Scarce** and one **Red Data Book** species of insect.

Picture – winged flies (Tephritidae) formed one of the most important groups of insect recorded during the surveys, with a total of 12 species recorded. Most of these overwinter in their respective host plants and therefore have strong ties to their hosts for their entire life cycle, which may take up to eleven months. Changes in management practices such as timing of cutting regimes can easily have a deleterious effect on such insects, particularly if cutting occurs before the host plants have seeded. Similarly complete removal of the cut seedheads is likely to prove harmful. The presence of good numbers of such species on a site tends to indicate some form of long term stability or management continuity on the site.

During the current surveys, two Nationally Scarce species of Picture – winged fly were recorded as well as *Campiglossa malaris*. The latter is currently accorded Endangered (RDB 1) status, although it is clear from it's recent dramatic expansion in both range and frequency that it's status requires considerable downgrading. The two Nationally Scarce species found, *Acanthiophilus helianthi* and *Merzomyia westermanni* both appear to be genuinely scarce within West Sussex. All three of these species have obligate associations with particular host plants, and develop in their seed heads. In the case of *C. malaris* and *M. westermanni*, the host plants are Ragworts, whilst *A. helianthi* develops in the seed heads of Black Knapweed. Whilst Ragwort was present in some quantity within the uncut areas of the site throughout the surveys, all the Black Knapweed on site was cut at a time when it had not reached fully open flowering stage, and certainly long before seed heads had formed. Hence the adult *A. helianthi* recorded on 16th August were deprived of any opportunity to lay eggs in the seed heads of their host plant, and the timing of the cut may have had a highly deleterious effect on the population of this fly on the site. Additionally, the removal of the vast majority of the hay may exacerbate the situation further by removing all seed from the site, preventing the growth of new plants.

The remainder of the Nationally Scarce insects recorded during survey were bees, three of which were mining bees. All three of these species were recorded as single individuals, suggesting that their populations were at low levels on site. Indeed, across the whole site very little evidence of ground nesting Hymenoptera nest holes was recorded. These were largely confined to a few holes in the bare ground caused by walkers on the footpaths, and bare areas formed by scuffing of the soil surface during hay cutting. Of the species recorded, both *Lasioglossum malachurum* and *Lasioglossum pauxillum* are both



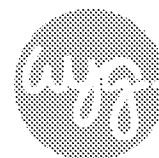
Fitzalan Link: Invertebrate report

currently increasing in numbers and range nationally, and are not now as scarce as they were a few decades ago.

The remaining Nationally Scarce species recorded, *Nomada fucata*, is a cleptoparasite of the mining bee *Andrena flavipes*. Both the host and parasite were found with some frequency during the survey, at several locations within the site. A few nest holes believed to be those of *Andrena flavipes* were noted in bare ground at scattered locations on the site, but there was no large nesting aggregation.

The survey site for the proposed Fitzalan Link contains small populations of relatively few scarce insect species and generally is considered to be of local importance. Most of the scarcer species recorded have significantly larger populations elsewhere within the County. However, the picture – winged flies *Acanthiophilus helianthi* and *Merzomyia westermanni* appear to be scarce within West Sussex (although this may be partially due to a current lack of recording effort for this group of flies in West Sussex) and every effort should be made to retain the populations of these insects on site.

- ✧ Within this buffer area, efforts should be made to retain or re-establish the existing grassland element, ensuring that key host and forage plants, including Ragwort and other yellow composites, Black Knapweed, Clovers, Creeping Thistle and Spear Thistle.
- ✧ Some Bramble, which provides an excellent pollen and nectar source as well as shelter, should also be retained and managed to ensure that the site does not scrub over. Provision of small areas of bare ground would provide nesting opportunities for ground – nesting Hymenoptera.
- ✧ Any future cutting or harvesting of the remaining grassland on site should be undertaken at a more sympathetic time, preferably after plants have set seed and invertebrates have had chance to reproduce. Kirby (2001) suggests cutting as late as possible within the year and that only part of the site should be cut each year thus maintaining the widest diversity of invertebrates within the site.
- ✧ Maintenance of the scrub and bramble along the edges of the site is important as they provide both shelter and foraging resources for invertebrates. Management should ensure that the scrub and bramble does not encroach into the grasslands.



6.0 REFERENCES

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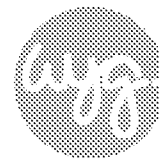
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Greencore Group Plc
A044029-4

Appendix A – Report Condition



Fitzalan Link: Invertebrate report

Report Conditions Fitzalan Link, Littlehampton - Invertebrate survey

This report is produced solely for the benefit of Greencore Group Plc, and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYG Environment. In time improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of WYG using due skill and care in the preparation of the report.

This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

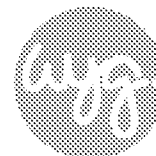
This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented as the best obtained within the scope for this report.

Reliance has been placed on the documents and information supplied to WYG Environment by others but no independent verification of these has been made and no warranty is given on them. No liability is accepted or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

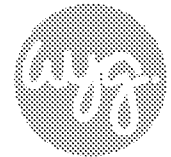
Whilst skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather related conditions.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions.

The potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties. The performance of environmental protection measures, e.g. of buildings and other structures in relation to acoustics, vibration, noise mitigation, and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.

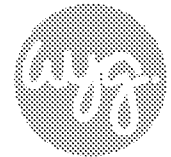


ORDER	FAMILY	SCIENTIFIC NAME	ENGLISH NAME	STATUS
ORTHOPTERA			Grasshoppers & Crickets	
		Leptophyes punctatissima	Speckled Bush Cricket	Common, Widespread
DERMAPTERA			Earwigs	
		Forficula auricularia	Common Earwig	Common, Widespread
HEMIPTERA			True bugs	
	Coreidae		Squash Bugs	
		Coreus marginatus	Squash Bug	Common, Widespread
	Pentatomidae		Shield Bugs	
		Dolycoris baccarum	Sloe Bug	Common, Widespread
		Palomena prasina	Green Shield Bug	Common, Widespread
ODONATA			Dragonflies & Damselflies	
	Coenagriidae		Damselflies	
		Ischnura elegans	Blue-tailed Damselfly	Common, Widespread
	Libellulidae		Skimmers, Chasers & Darters	
		Sympetrum striolatum	Common Darter	Common, Widespread
LEPIDOPTERA			Butterflies & moths	
		Celastrina argiolus	Holly Blue	Common, Widespread
		Gonepteryx rhamni	Brimstone	Common, Widespread
		Inachis io	Peacock	Common, Widespread
		Lycaena phlaeas	Small Copper	Common, Widespread
		Maniola jurtina	Meadow Brown	Common, Widespread
		Ochlodes venata	Large Skipper	Common, Widespread
		Pararge aegeria	Speckled Wood	Common, Widespread
		Pieris brassicae	Large White	Common, Widespread
		Pieris rapae	Small White	Common, Widespread



	Polyommatus	icarus	Common Blue	Common, Widespread
	Pyronia	tithonus	Gatekeeper	Common, Widespread
	Thymelicus	sylvestris	Small Skipper	Common, Widespread
	Vanessa	atalanta	Red Admiral	Common, Widespread
	Vanessa	cardui	Painted Lady	Common, Widespread
DIPTERA			True Flies	
	Stratiomyidae		Soldier Flies	
	Chloromyia	formosa		Common, Widespread
	Chorisops	tibialis		Common, Widespread
	Pachygaster	atra		Common, Widespread
	Pachygaster	leachii		Common, Widespread
	Nemotelus	notatus		Local, coastal
	Rhagionidae		Snipe Flies	
	Rhagio	tringarius		Common, Widespread
	Asilidae		Robber Flies	
	Machimus	atricapillus		Common, Widespread
	Dolichopodidae		Long-headed Flies	
	Dolichopus	ungulatus		Common, Widespread
	Syrphidae		Hoverflies	
	Cheilosia	illustrata		Common, Widespread
	Chrysotoxum	bicinctum		Common, Widespread
	Episyrphus	balteatus		Common, Widespread
	Eristalis	arbustorum		Common, Widespread
	Eristalis	interruptus		Common, Widespread
	Eristalis	pertinax		Common, Widespread
	Eristalis	tenax		Common, Widespread
	Eumerus	funeralis		Common, Widespread

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Eupeodes	corollae	Common, Widespread
Eupeodes	luniger	Common, Widespread
Helophilus	pendulus	Common, Widespread
Helophilus	trivittatus	Common, Widespread
Melanostoma	mellinum	Common, Widespread
Melanostoma	scalare	Common, Widespread
Merodon	equestris	Common, Widespread
Myathropa	florea	Common, Widespread
Pipizella	viduata	Common, Widespread
Platycheirus	albimanus	Common, Widespread
Platycheirus	clypeatus	Common, Widespread
Platycheirus	tarsalis	Common, Widespread
Scaeva	pyrastris	Common, Widespread
Sphaerophoria	scripta	Common, Widespread
Syrirta	pipiens	Common, Widespread
Syrphus	ribesii	Common, Widespread
Syrphus	vitripennis	Common, Widespread
Volucella	bombylans	Common, Widespread
Xanthogramma	pedisequum	Common, Widespread

Conopidae

Thick-headed Flies

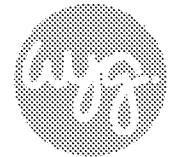
Sicus	ferrugineus	Common, Widespread
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Tephritidae

Picture-winged Flies

Acanthiophilus	helianthi	N
Campiglossa	malaris	RDB 1
Chaetostomella	cylindrica	Common, Widespread
Merzomyia	westermanni	N
Sphenella	marginata	Common, Widespread

[illegible]



Andrenidae

Mining Bees

Andrena	bicolor	Common, Widespread
Andrena	dorsata	Common, Widespread
Andrena	flavipes	Common, Widespread
Andrena	minutula	Common, Widespread
Andrena	nigroaenea	Common, Widespread
Andrena	ovatula	Common, Widespread
Andrena	trimmerana	Nb

Halictidae

Mining & Cuckoo Bees

Halictus	tumulorum	Common, Widespread
Lasioglossum	calceatum	Common, Widespread
Lasioglossum	fulvicorne	Common, Widespread
Lasioglossum	leucopus	
Lasioglossum	leucozonium	
Lasioglossum	malachurum	Nb
Lasioglossum	morio	Common, Widespread
Lasioglossum	pauxillum	Na
Sphecodes	ephippius	Common, Widespread
Sphecodes	monilicornis	Common, Widespread

Megachilidae

Solitary Bees

Megachile	centuncularis	Common, Widespread
Osmia	leaiana	Common, Widespread

Anthophoridae

Flower & Nomad Bees

Nomada	fabriciana	Common, Widespread
Nomada	fucata	Na
Nomada	marshamella	Common, Widespread

Apidae

Social & Cuckoo Bees

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Fitzalan Link: Invertebrate report

