INVERTEBRATE SURVEY OF USKMOUTH POWER STATION, NEWPORT

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Cover photograph: *Argogorytes fargei*.

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1 Summary

- The three days of terrestrial sampling produced a diversity of 444 species.
- All sampling done in good or at least acceptable conditions, all compartments at least partially covered each visit.
- Of the 444 species, 38 (8.6%) are considered here as Species of conservation significance, 11 of them (2.5%) of Red Data Book (RDB) or equivalent status.
- This is a very high diversity for just three days, especially as the great majority of the species were recorded in open areas, with only relatively limited wetland and woodland edge sampled.
- The proportion of species of conservation significance high, indicative of regional importance.
- The discovery of species little known in or new for Wales further emphasises the quality of the site.
- The open, sparsely vegetated but flower-rich areas are most important, especially with scattered scrub and varied topography producing a complex habitat mosaic.
- The reens and shallow wetland areas also added extra diversity and quality.
- Exposed substrate, especially in the form of south-facing slopes and banks, are very important for nesting aculeate Hymenoptera.
- It is recommended that if the site is developed, particularly the red-hatched areas in Figure 2, then a mitigation plan will be needed and funding available to manage mitigation areas to maintain the most important invertebrate assemblages.
- The brown-hatched areas on Figure 2 can probably be altered without appreciable loss of local or regional biodiversity.
- Land that can be maintained undisrupted will eventually need to be managed to prevent loss through scrub encroachment. The use of such land as off-site mitigation sites for developments elsewhere in Newport should be investigated.

2 Introduction

This very large area of land surrounding the Uskmouth Power Station complex is largely open grassland, tall herbs, ruderal with much exposed substrate and some areas almost devoid of vegetation. There are several waterbodies but most of these are steep sided or inaccessible due to dense vegetation and no aquatic samples were taken. Some ditches are accessible and riparian vegetation could be sampled, and there is a wetter area in compartment E with marshland vegetation. Much scrub of bramble and sallow is encroaching and planted trees fringe some compartments. The area was divided into six sample compartments of about the same size, with approximately equal time given to each. As far as is known, there has not been any systematic survey of the invertebrates of the site before, although extensive surveys of ABP land just across the river covered habitat of similar type.

3 Survey Methodology

3.1 Sampling Techniques

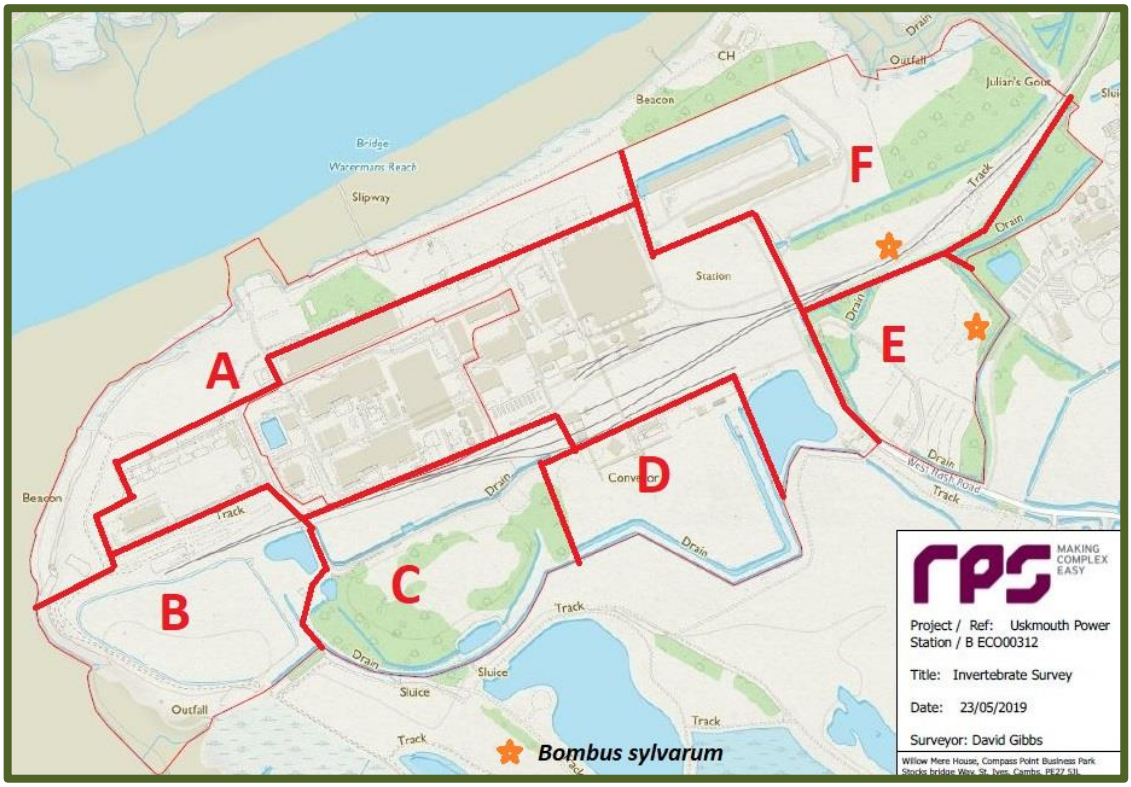
The survey area is very large, in a single day of survey it was not possible to cover every part of all compartments thoroughly. To take a sample from each compartment on each visit a transect was walked around the power station through the more interesting habitat, approximately following the same route on each of the three days. The site was divided into six compartments approximately in line with the nature of the dominant habitat types of that area, but most of these large compartments where very varied. Any one of the six compartments could easily have absorbed the same amount of survey time as was available for the whole survey.

All sampling was done with a 40 cm diameter white-bag sweep-net combined with spot searching of particular features and some limited ground searching. The net was swept

steadily from side to side as one paces steadily through the grass, herbage or scrub foliage, or in scrubby areas specimens were knocked from the foliage. Specimens were extracted from the net with a pooter or, in the case of larger specimens, individually potted in 30ml soda glass tubes. When sampling was completed or the pooter became too full the contents were killed with ethyl acetate then transferred to 30ml soda glass tubes together with a data label.

The sample compartments are marked on the map, Figure 1.

Figure 1: Map showing sample compartments.



3.2 TIMING OF VISITS

The three visits to the site were timed as far as possible to cover the peak of insect diversity through the summer, particularly for invertebrates of open areas especially grassland, although first visit was a little later than ideal. The first visit on 23 May 2019 was as soon as possible after survey was commissioned and should have been early enough to record all but the early spring species. The second visit on 1 July 2019 covered the high summer fauna, and the last visit on 27 August 2019 covers species emerging later in the summer.

3.3 CONSTRAINTS

Every attempt was made to visit in sunny, dry conditions, and the ability to visit at short notice meant that this was largely achieved despite very unsettled weather in the early part of the summer. On 23 May it was warm and sunny, dry with a slight breeze so ideal conditions. On 1 July it was relatively cool, 17°C, overcast with a NW wind, but dry, so less than ideal conditions but still perfectly acceptable. The final visit on 27 August was overcast, with vegetation rather damp in the morning after overnight rain, but very little wind and ambient temperature of 18°C. Some light rain in late morning slightly compromised sampling, but not enough to make any significant difference.

3.4 SPECIES IDENTIFICATION

Where practical, invertebrates were identified in the field but wherever the slightest doubt existed, one or more specimens were collected for more detailed scrutiny. To achieve

rigorously accurate identifications, specimens were identified using the author's own library and entomological collection. Where these proved insufficient, specimens were submitted to relevant experts. Selected specimens have been retained in the author's personal collection as vouchers.

3.5 TAXONOMIC COVERAGE

It is desirable that as wide a taxonomic range as possible is identified, in order to sample numerous ecological types, i.e. invertebrates with widely differing natural histories. As there was only a limited amount of time available for identification, it was important to name the more readily identified groups which do not require very time consuming techniques or are out with the experience of the worker.

The following orders and families of invertebrates were sampled and named to species.

Opiliones – Harvestmen

Araneae – Spiders

Odonata - Dragonflies and Damselflies

Orthoptera – Grasshoppers and crickets

Dermaptera: - earwigs

Hemiptera, Auchenorrhyncha - Froghoppers, Leafhoppers and Planthoppers (excluding females of difficult genera)

Hemiptera, **Heteroptera - True Bugs** (excluding smaller Miridae)

Lepidoptera – Butterflies and Moths

Trichoptera – caddisflies

Coleoptera – **Beetles** (all except small Aleocharine rove beetles and other very small obscure families)

Diptera - True Flies (except, Cecidomyiidae, Chironomidae, Ceratopogonidae, Simulidae, Phoridae, Sphaeroceridae, and females of some groups which are not identifiable).

Hymenoptera, Symphyta – sawflies

Hymenoptera, Parasitica – parasitoid wasps

Hymenoptera, Aculeata - Ants, wasps and bees

3.6 ASSESSMENT OF RESULTS

The quality of the site for invertebrates has been assessed with reference to the species found which are considered to be nationally scarce or rare by the various Natural England (NE) Commissioned Reports published by the Joint Nature Conservation Committee (JNCC) (e.g. Falk 1991a; Falk 1991b; Hyman, 1992) and subsequently Natural England. These reviews place all nationally scarce species into categories according to their degree of rarity and their vulnerability to extinction and are accepted as the "official" JNCC/NE designations (see Appendix 1). The more recent ones also assess taxa with reference to IUCN (International Union for Conservation of Nature) threat categories.

Since the first reviews were published in the 1990's selected families have been updated and this process is ongoing. But this still leaves many groups (e.g. Tipulidae and Sciomyzidae) where statuses have remained unchanged for nearly 30 years while other families (e.g. Larger Brachycera Drake 2017) have been updated very recently. For this reason, in order to facilitate the greatest consistency with earlier surveys, species that were included in earlier reviews, but have lost their status recently, are included in the analysis. These species, no longer considered of conservation concern, are indicated as such in the species accounts. In addition, a number of species that still have official national status but are clearly much more

frequent than formerly, and will probably have their status removed when their family is updated, are indicated as such.

Additionally, an attempt has been made to gauge the value of the site within a local and regional context. Many of the Nationally Scarce species are also very uncommon in a local or regional context. Also, many species which do not merit inclusion in "The reviews of scarce insects" are none-the-less scarce within the region. Biodiversity Action Plan (BAP) and Amber List species are important here, although the BAP species are heavily skewed towards the Lepidoptera.

As a simple and readily comparable indication of quality, the proportion of Nationally Scarce and RDB species of the total diversity is calculated. The same is done just for the rarest taxa with RDB status. Depending on the habitat type, a proportion of scarce/RDB between 3-5% needs to be exceeded before it can be safely concluded that the site has some conservation significance. Very high quality sites of national importance will have a proportion close to or exceeding 10% Nationally Scarce/RDB species.

4 Results

4.1 Overall Results

The survey identified 444 species of invertebrates (Appendix 2), a very good diversity for just three days of terrestrial survey of open habitat with only limited sampling along the margins of water bodies and fringing trees and shrubs.

A broad range of invertebrate groups was covered to a greater or lesser extent and the species list includes representatives of the following groups: harvestmen, spiders, dragonflies & damselflies, grasshoppers & crickets, earwigs, true bugs, froghoppers, planthoppers & leafhoppers, moths, butterflies, caddisflies, beetles, true flies, sawflies, ants, wasps and bees. The main technique of sweep-netting was most efficient at sampling flying insects with Diptera found in the greatest number (161 species, 36%). The second largest group found was Hymenoptera (127 species, 29%), an exceptionally high proportion for this group reflecting the warm weather on most visits, the inclusion of a good number of Ichneumonidae and an excellent diversity of bees. The Coleoptera are third in diversity (56 species, 13%), poorer than expected, these will mostly be phytophagous and flower-visiting species. Both Lepidoptera and Hemiptera were similar in diversity (41 and 34 species respectively, 9 and 7.7%), the Lepidoptera largely made up of butterflies, day flying moths and micromoths. The proportion of Hemiptera is quite high relative to comparable surveys reflecting the good range of plant species present.

Of the 444 species identified by this survey, 38 (8.6%) are considered here as Key Species (defined in section 3.6). This is a very good proportion of Key Species, and certainly indicative of an area of significant conservation value. If the 31 species of Ichneumonidae are excluded (these have not been assessed for their conservation status so tend to reduce the overall proportion of conservation significant species) then we get a proportion of 9.2% species of conservation significance. Eleven of these species have RDB status or equivalent (2.5%), an exceptionally high proportion very much pointing to the quality of the site for invertebrates of conservation concern. This diversity and quality is not atypical of large ex-industrial sites; compared to all the sites I have surveyed over the last 15+ years, this site comes approximately in the upper quartile for quality based of proportion of Key Species.

A closer analysis of the Key Species found reveals that several are no longer of great conservation concern. In **Table 1** below eleven species have been highlighted in grey as of lower national conservation concern despite still having national status officially. However, of these at least one, *Acanthiophilus helianthi* is little recorded in Wales so still regionally significant. Nine species highlighted in yellow in the species column really do merit attention as they are judged still to be of national conservation significance. Of the unhighlighted species, i.e. those that have not obviously changed their status, but are difficult

to access, two of them are clearly very little known in Wales so of greater conservation status here than in the UK as a whole.

Table 1 Summary of key species.

Species	National Status	current national status	Welsh status
Conocephalus discolor	**Nationally Scarce a**	Much increased in range and abundance.	Increasingly frequent
Forficula lesnei	**Nationally Scarce b**	Increasingly recorded and likely to be overlooked	Still relatively uncommon in Wales
Pentastiridius leporinus	**Nationally Scarce b**	Around coast of South UK	Very local in S Wales
Bembecia ichneumoniformis	**Nationally Scarce b**	Widespread in UK and much overlooked.	Reasonably frequent in suitable habitat in Wales.
Hippodamia variegata	**Nationally Scarce b**	Increasingly frequent on open, warm sites	Now frequent in S Wales
Mordellistena pseudopumila	**RDBK**	Very little known and under-recorded.	Rare but probably overlooked, one other recent record in Wales.
Temnocerus longiceps	**Nationally Scarce b**	Widespread but very local	Well distributed but local in Wales
Oxystoma cerdo	**Nationally Scarce b**	Mainly northern but becoming more frequent in South	Still very local with a few south coast records
Polydrusus formosus	**Nationally Scarce a**	Rapidly increasing range	Mainly S Wales but increasingly frequent
Tanymecus palliatus	**Nationally Scarce b**	Widespread but very local	Very rare in Wales, mainly on the Gower.
Rhinocyllus conicus	**Nationally Scarce a**	Increasingly frequent and spreading north	Still very uncommon in Wales and confined to SE
Vanoyia tenuicornis	**(Nationally Scarce) None**	Widespread but local in south UK	Well distributed in S Wales but local
Platypalpus luteolus	**(RDB3) Nationally Scarce**	Widespread in south UK but either rare or very elusive.	Very few Welsh records.
Neoascia obliqua	**Nationally Scarce**	Widely scattered in UK, mainly northern	Scattered across South Wales with a few records from the north
Micropeza lateralis	**pNationally Scarce**	Widespread but local	Seems to be very rare in Wales with only one other record found.
Acanthiophilus helianthi	**Nationally Scarce**	Local but seems to be getting commoner very recently.	Still very few records
Campiglossa malaris	**RDB1 (RDBK)**	Much commoner than formerly and spreading rapidly	A recent arrival in Wales but spreading along south coast rapidly.
Dioxyna bidentis	**Nationally Scarce**	Widespread but local and not common	Well distributed in Wales but local and mainly coastal
Tephritis divisa	**None (RDBK)**	A recent arrival in Britain, rapidly spreading north and west.	In Wales a very recent arrival, first recorded in Newport in 2018.
Homoneura notata	**pNationally Scarce**	Widespread in southern UK where local	Confined to South Wales, especially near the coast
Cnemacantha muscaria	**(RDB3) pNationally Scarce**	Local but increasingly frequent on dry habitats	Coastal, but probably much under-recorded
Ditaeniella grisescens	**Nationally Scarce**	Widespread in UK but very local	Mainly South Wales, especially on the Gower
Tetanocera punctifrons	**Nationally Scarce**	Widely distributed but local	well distributed including in Carmarthenshire
Meroplius fukuharai	**(RDBK) not assessed**	a recent discovery in GB, still very rare but probably spreading	First Welsh record
Tiphia minuta	**Nationally Scarce b**	Widespread but local in Britain	Widespread in Wales but mainly along south coast.
Argogorytes fargei	**Nationally Scarce a**	Much declined, most recent records Isle of Wight and E coast of England	Only very old records from Wales
Gorytes laticinctus	**RDB3**	Until recently rare and confined to SE Britain. Rapid increase in range in last few years.	Recorded in Wales for first time this year, at least 3 localities all in S Wales.

Nysson trimaculatus	**Nationally Scarce b**	Local in England north to Yorkshire, possibly becoming commoner	This would appear to be the first record for Wales
Philanthus triangulum	**RDB2**	Much increased, now common across much of country	Well established along south Wales coast
Andrena nigriceps	**Nationally Scarce b**	Widespread but always scarce and very local	Distributed around coast especially on large dune systems.
Andrena trimmerana	**Nationally Scarce b**	Infrequent in South Wales and southern England	Widespread in Wales with the great majority of records along the south coast
Bombus sylvarum	**Nationally Scarce b, BAP**	Very local but common in places	very important colony locally
Colletes marginatus	**Nationally Scarce a**	Local around UK coast and on Breckland	On large dune areas in Wales
Hylaeus signatus	**Nationally Scarce b**	Widespread in S England but local	Confined to S Wales where locally frequent.
Sphecodes crassus	**Nationally Scarce b**	Widespread, possibly overlooked and becoming commoner	Well distributed around the coast of Wales
Sphecodes niger	**RDB3**	Very infrequent in S England N to Norfolk, probably increasing its range	Mainly on the Gower and in far SE Wales
Sphecodes scabricollis	**RDB3**	Rare and local	S Wales important for this species at a national level.
Stelis ornatula	**RDB3**	Very uncommon across southern England N to Oxfordshire. Possibly increasing recently.	Scattered around the Welsh coast, especially on the Gower.

4.2 ASSESSMENT OF COMPARTMENTS

4.2.1 Compartment A

This is a long, narrow compartment covering much of the northern part of the site. It is relatively unvaried, being largely flat with the limited slopes and banks confined to the far western end. A large part is relatively floristically poor grassland that was cut before the second visit so relatively unproductive. Very large parts are densely scrubbed over with bramble and buddleia so not easy to sample with a sweep-net. The most productive areas where sparsely vegetated parts with ruderal plants. This compartment was sampled on each of the three visits. The limited habitat is reflected in the diversity of invertebrates found with 122 species identified, the least speciose of the six compartments. Of the 122 species, six are of conservation concern, a proportion of 4.9%, significantly less than the overall proportion and the poorest result of any compartment on this survey. The relatively poor result is repeated by the single RDB or equivalent species found, a proportion of just 0.8%. Three of the key species found here are now no longer of much conservation concern, including the single RDB species, none are deemed to be of particular conservation concern.

4.2.2 Compartment B

This is a relatively compact area in the southwest of the site and is relatively topographically varied due to numerous earth mounds creating good locations for nesting aculeates and other heliophilous invertebrates. Large parts are densely scrub covered or rank grassland and tall herbage, the more productive areas being around the margins and close to the power station. This compartment was sampled on each of the three visits. A total of 141 species were identified, very comparable with several other compartments. Of these nine are of conservation concern, a proportion of 6.4%, lower than the overall result but still a good result. Two of these are RDB or equivalent, which is a proportion of 1.4%, a good but not very high result. Four of these have increased in recent times so no longer of much conservation concern while one (*Micropeza lateralis*) is certainly scarce and particularly interesting within a Welsh context.

4.2.3 Compartment C

Although this is another large area, much of it as inaccessible scrub so all surveying was done either side of the road along the north of the compartment and in the open grassy area in the centre. Along the road and railway lines the habitat is ruderal with much exposed substrate and flower-rich. The mounded area in the centre is tall, coarse grassland with some floral diversity and surrounded by a good variety of trees and scrub. Some warm banks and slopes for nesting bees but these were more limited than in most compartments along the south of the site. Visited on each survey date, approximately the same transect walked each time. A total of 175 species identified, the best diversity of any compartment on the survey, probably due to the variety of habitats. Of these an impressive 14 are of conservation concern, a proportion of 8% which is very good. Two RDB species recorded, a proportion of 1.1% which is rather lower than the overall result. Half (7) of the species of conservation concern recorded here are probably not as important as their national status suggests (highlighted in grey in Table 1), only three species are of relatively high concern (highlighted in yellow in Table 1) but this includes the digger-wasp *Argogorytes fargei*, perhaps one of the most significant species recorded on this survey.

4.2.4 Compartment D

Although similar in size to adjacent compartments, this small area is dominated by tipped material, presumably fly ash or coal dust, almost completely devoid of vegetation. All the sampling was from the periphery of the compartment where flower-rich and ruderal areas are fringed by sallow and alder scrub. A feature of this site not present elsewhere were the reens with an emergent flora such as *Phragmites*. The banks of the ditches also provide sunny slopes for nesting aculeates. The compartment was sampled on each visit with the same transect walked each time. With 147 species recorded, this was the second most diverse compartment, a very good result considering the limited extent of habitat here, probably the presence of aquatic habitats enhanced this figure. Of these a very impressive 17 are of conservation concern, a proportion of 11.6% which is very impressive indeed. Six are of RDB or equivalent status, a proportion of 4.1%, an exceptional result. Of the 17 key species five are no longer of such high concern (highlighted in grey in Table 1), and five are really significant (highlighted in yellow in Table 1). This really does seem to be an area of very high conservation value. If just this compartment is compared with other sites I have survey it comes within the top 20, better than numerous nature reserves.

4.2.5 Compartment E

Compared to the other compartments this one has been much more disturbed in recent times. Large areas have been used to tip waste from industrial use and part was not long ago a carpark and had been flattened and cleared for that purpose. Much of the vegetation in these latter areas is of very recent origin so there has not been much opportunity for colonisation. However, there is also a large marshy area which has become well vegetated with *Typha*, *Phragmites* and with an abundance of flowers such as *Pulicaria dysenterica*, *Lotus* and many others. 140 species identified, which is a good sample, especially considering the unpromising habitat over much of the area. No doubt the wetland area contributed significantly to this diversity. Of these 13 are of conservation concern, an excellent proportion of 9.3%, which very high and second only to compartment D. Of these four species are of RDB or equivalent, again a high proportion only exceeded by compartment D on this survey. Only four of the key species are no longer of much concern, another four being of significant concern including the biodiversity action plan *Bombus sylvarum* (Shrill Carder-bee).

4.2.6 Compartment F

This is the largest compartment and while it was visited on each survey date, time was insufficient to get round the whole area on any one visit. However, over the tree survey dates, the whole area was sampled, with the areas of best potential along the railway lines sampled twice. The habitat adjacent to the railway lines was ruderal, flower rich and with much

exposed substrate. Largely flat but small topographical variations suitable for nesting bees, and along the north site taller coarse herbage dominated including many good pollen and nectar producing plants. The northern part of the compartment is separated from the southern part by a shelter belt. It is dominated by tall grassland with limited flora, but some marginal areas with a richer flora. A total of 124 species recorded, which is a good diversity but well down on most other compartments at this site. Of these, eight have conservation status, a proportion of 6.5%, which is good, but a lot less that the best of the compartments. Just one RDB species recorded (0.8%), the Bee Wolf *Philanthus triangulum* which is much commoner than formerly so of relatively little conservation concern. Only one species falls into the highest category of concern (highlighted in yellow in Table 1), notably the BAP bumblebee *Bombus sylvarum* (Shrill Carder-bee).

5 Key Species

5.1 RED DATA BOOK

5.1.1 *Mordellistena pseudopumila* RDBK

This elongate black flower beetle is one of several similar species which require dissection and critical examination for correct identification. Very little known in Britain with all records on the National Biodiversity Network (NBN) being in the south and east from Cornwall to Norfolk. In Wales, found in Carmarthenshire this year (pers. obs.) but very likely to be much overlooked. Known from chalk grassland where the larvae probably develop within plant stems. Adults recorded in May (Hyman & Parsons 1992). Swept in compartment B.

5.1.2 *Platypalpus luteolus* (RDB3) Nationally Scarce

Records of this small yellow Hybotid fly are widespread in England north to Yorkshire with 12 widely scattered localities known. In Wales it is known from Monmouthshire and Glamorganshire. Its status was recently downgraded from RDB3 based on its frequency in Yorkshire but this seems premature. Found along tree-fringed upland rivers and broadleaved woodland, perhaps with an association with riverine sediments. This does not seem to fit Uskmouth but perhaps the ash beds are mimicking one of its natural habitats. Larvae unknown but presumably predaceous, developing in the soil (Falk & Crossley 2005). Adults recorded from May to August (Mapmate data). Swept from fringing Sallow in compartments D and E.

5.1.3 *Campiglossa malaris* RDB1 (RDBK)

This attractive fruit-fly with patterned wings was not long ago a great rarity in Britain only known from the far east of Kent having been added to the British list in 1974 (Clemons 1996). Over the next 8 years it reached the eastern outskirts of London (Clemons 2004), so its arrival this far west in good numbers represents a veritable explosion in range. Now frequent on suitable sites in the west and in South Wales as far as Carmarthenshire (pers. obs.). To date usually found in coastal grassland where its foodplant, Ragwort, is abundant. Adults found in July and August. Swept in compartment D.

5.1.4 *Tephritis divisa* None (RDBK)

This attractive gall fly was recorded new to Britain from Sussex in August 2004, when they were swept off bristly oxtongue on the outskirts of Bognor Regis. Later the same month the fly was found to be present in large numbers at the original site and was also notes two other Sussex sites in September 2004. Examination of reference collection turned up another specimen from Newhaven, August 2002 showing that the species had been present in Britain for several years. Subsequently the species has been recorded in Essex where it is now well established along the Thames Gateway, with scattered records in North Essex (Hodge, 2005). There is even a recent record from Somerset and it was found in Newport last year at ABP. The larvae develop in the flower heads of *Helminthotheca* (*Picris*) *echioides* and possibly other related species. Swept in compartments B and D.

5.1.5 *Cnemacantha muscaria* (RDB3) pNationally Scarce

This small black Lauxanid fly with smoky wings has a very scattered distribution across the whole of Britain. There are several records in Wales along both the north and south coast (NBN). Much more often recorded than formerly and possibly no longer of much conservation concern. Its habitat requirements are unclear, it has been swept from riverside vegetation, from scrub on limestone, from upland grassland and ancient broad-leaved woodland. Nothing is known of its larval biology but other members of this family are generally believed to develop in decaying vegetable matter, including fallen leaves. Adults are recorded from May to August (Falk, Ismay & Chandler 2016). Found in compartments A & C

5.1.6 *Meroplius fukuharai* (RDBK) not assessed

This small black Sepsid fly was only added to the British list recently (Chandler 2002). It is probably an introduction, and with so few records it was not assessed in a recent review update (Falk, Ismay & Chandler 2016), so its RDB status is unofficial. It is very rare with specimens known only from Dorset, a sewage farm in Middlesex, and Purfleet, Essex (Essex Field Club), but possibly spreading as also found in Cornwall this year (pers. obs.). A single male swept in compartment C appears to be the first for Wales.

5.1.7 *Gorytes laticinctus* RDB3

This black and yellow solitary wasp is distributed across south-coast counties from east Devon to Kent and in East Anglia and north to Lincolnshire. In the west it is known inland in Wiltshire, and from Somerset in 2016 (pers. obs.). Very recently there has been a remarkable upsurge in records of this wasp including records in Bristol and South Wales. Usually associated with rough vegetation such as brambles in open situations (heathland, scrub, coastal dunes, coastal landslips and soft rock cliffs), quarries and occasionally gardens. Typically observed running over brambles and other low herbage. Nesting occurs in light soils, the cells being stocked with auchenorhynchus bugs such as *Philaenus spumarius*, *Cercopis* spp. and *Aphrophora alni*. Visits umbellifers such as wild parsnip (*Pastinaca sativa*), carrot (*Daucus carota*), hogweed (*Heracleum sphondylium*) and water-dropworts (*Oenanthe* sp.). Adults found from mid-June to mid-August (http://www.bwars.com, Falk 1991a). Found in compartment E.

5.1.8 *Philanthus triangulum* Bee Wolf RDB2

The Bee-wolf is a large, spectacular black and yellow wasp which not long ago was a great rarity in this country. Once confined to just a couple of sites on the Isle of White (Richards 1980) it is now widespread over southern England and expanding northwards rapidly (Edwards 1997). In the light of this great increase in range its status will have to be downgraded to Nb or probably removed altogether. In Wales it is confined to the south coast where it is well established at some sites (The UK Bees, Wasps and Ants Recording Society (BWARS)). It frequents warm sunny areas on light, well-drained soil where it digs nests up to 1m in length with 3-34 lateral chambers. These are stocked with worker honeybees *Apis mellifera* (Edwards op.cit.). Found in compartment F.

5.1.9 *Sphecodes niger* RDB3

This small cuckoo bee is confined to southern England from Dorset to Norfolk with most recent records from Kent. It appears to have undergone an expansion of range in recent years so its status may have to be downgraded. In Wales confined to the south, mainly The Gower and far southeast (BWARS). Found on chalk and limestone downland, soft rock cliffs and sandy heaths. A brood parasitoid of *Lasioglossum* bees, *L. morio* has been suggested as the most likely host. Adults recorded from April to October (Falk 1991a.). Two males found in compartments D and E.

5.1.10 *Sphecodes scabricollis* RDB3

This black and red cuckoo bee is found locally and sparingly in southern England and Wales. From the limited records available, South Wales seems to be an important part of its British distribution, with four records on NBN, three of them coastal, and it was found at ABP in 2018 (pers obs.). Found in open, broadleaved woodland and heath margins, and other open situations where it is believed to be a cleptoparasitoid of the mining bee *Lasioglossum zonulum*. Females are rarely found but the flight period of this sex is probably from early April to mid-September. Males are captured more frequently, from late July to late September (BWARS). Several specimens found in compartment D and E.

5.1.11 *Stelis ornatula* RDB3

This small white-spotted black cuckoo bee is a rare species known across southern England north to Oxfordshire but appears to have declined. Falk (1991a) states that it is known from only about a dozen post 1970 records across southern England, but it may be increasing again as it is now known from 24 post 1970 10km squares as far north as Merseyside (Edwards 1998). In Wales there are a scatter of records around the coast, especially on the Gower (BWARS). It occurs in many habitats including heathland, chalk grassland, open woodland and coastal landslips. This species is a cleptoparatitoid of the mason bee *Hoplitis claviventris* which nests in the hollowed out stems of *Rubus*, *Rosa* and *Senecio*. *Stelis ornatula* is on the wing from late May to late July and visits the flowers of *Potentilla* and *Crepis*. Requires sunny situations with a good floral structure and diversity and adequate bramble and rose scrub. Swept in compartment D.

5.2 NATIONALLY SCARCE

5.2.1 *Conocephalus discolor* Long-winged Conehead Nationally Scarce a

The Long-winged cone-head, once such an uncommon species of the south coast west to the New Forest, has shown a remarkable spread in recent years. In South Wales it is a fairly recent arrival following the M4 (NBN), and it is clear that this species is no longer of national conservation concern. Occurs in coarse, mainly ungrazed vegetation in warm places such as downland, coastal reedbeds, heath, bogs and disturbed areas. Nymphs emerge in May maturing in August sometimes surviving until November (Haes & Harding 1997). Noted in compartments C and D.

5.2.2 *Forficula lesnei* Nationally Scarce b

Lesne's Earwig is very similar to its much commoner congener Common Earwig *Forficula auricularia* but lacks functional wings and is a little smaller and paler. In Britain this species is on the northern edge of its range and largely confined to southern counties favouring base-rich soils. In South Wales records are relatively few (NBN), although it is likely to have been under recorded due to its superficial resemblance to the Common Earwig. It appears to be restricted to particularly favourable locations which have not yet been characterised (Haes & Harding 1997). It is frequently found in scrub and amongst common weeds, habitats which are ubiquitous in the country, so its absence from most areas suggests that very subtle habitat and environmental conditions, no doubt readily disturbed, are essential for its survival. Adult insects can be found from May to October. Frequent at this site, recorded from compartments A, C, D and E.

5.2.3 *Pentastiridius leporinus* Nationally Scarce b

This Cixiid leaf hopper occurs around the coast of southern England from Suffolk to Gloucestershire and South Wales but is very local. It has already been recorded from the banks of the River Usk (pers. obs.). It is a saltmarsh species, usually found in the grassy areas in the upper marsh sometimes extending some way up estuaries. There are also records from bogs in the new Forest and it is not a saltmarsh associated species on the continent. The nymphs are thought to be root feeders on various wetland grasses. Can be abundant where

found but colonies can be confined to a relatively limited area of saltmarsh. Adults found from May to August (Kirby 1992). Found in compartments A, D and E.

5.2.4 *Bembecia ichneumoniformis* Six-belted Clearwing Nationally Scarce B

The Six-belted Clearwing is, like all clearwings, an elusive species in the field looking more like a wasp than a moth. It is well distributed across southern England north to Cambridgeshire with records from Yorkshire and South Wales (Heath & Emmet 1985; NBN). Recently found much more widely in southern Britain; possibly no longer meriting its national status. Occurs on calcareous downland, cliffs, quarries which offer a south facing aspect and a warm microclimate. The eggs are laid on *Lotus* or *Anthyllis*, the larvae feeding in a silken tunnel within the root. Adults are on the wing from the end of June to mid-August. Frequent here, noted in compartments A, B, C and E.

5.2.5 *Hippodamia variegata* Adonis' Ladybird Nationally Scarce b

The Adonis Ladybird is a black and red species with a very variable number of spots on the elytra. Mainly found in southern and eastern England, very local elsewhere (Hyman & Parsons 1992) but in recent years it has shown a very rapid increase and northward spread. In Wales now well established in the south, especially near the coast, with scattered records elsewhere (NBN). Although it is mainly coastal it occurs on a variety of dry weedy habitats. Adults active from June to September, probably over wintering as an adult in dry situations (Hyman & Parsons 1992). Common here, noted in all compartments.

5.2.6 *Temnocerus longiceps* Nationally Scarce b

This small, metallic-blue weevil is widespread in Britain north to southern Scotland but local. Well distributed in Wales with a scatter of records in the north of the country and along the south coast (NBN). Recorded from broad-leaved woodland and scrub, especially where damp such as wooded heath, carr and fen. Associated with Goat Willow, Birch and possibly other *Salix* species. Adults recorded from June and July (Hyman & Parsons 1992). Swept in compartment D.

5.2.7 *Oxystoma cerdo* Nationally Scarce b

This small black weevil is widespread in Britain north to south Scotland with most records from the midlands and northern England. In Wales very local along south coast and with one from Anglesey (NBN), possibly spreading south. Occurs in woodland rides, grassland, fens and road verges. Associated with *Vetch* spp., particularly tufted vetch. Adults are found from May to July (Hyman & Parsons 1992). Found in compartment C.

5.2.8 *Polydrusus formosus* Nationally Scarce a

This brilliant green leaf-weevil has a very local distribution across England north to north Southern Scotland. In Wales most records are in south coast counties but becoming increasingly frequent (NBN). A rapidly spreading species that is no longer of much conservation concern. Occurs in broad-leaved woodland along rides, clearings and at the fringes. It is phytophagous, recorded from hazel, oak, alder, birch, cherry and rose. Adults are found from May to September (Hyman & Parsons 1992). Found in compartments D and F.

5.2.9 *Tanymecus palliatus* Nationally Scarce b

This relatively large weevil is widespread in Britain north to south Scotland, including South Wales. Confirmed Welsh records are confined to the Gower, Gwent and one in mid-Wales (NBN). Found along hedgerows, roadside verges, grassland, and coastal cliffs. Associated with thistles, nettles, knapweed and burdock where the larvae feed on the roots. Adults recorded from May to July (Hyman & Parsons 1992). One found in compartment C.

5.2.10 *Rhinocyllus conicus* Nationally Scarce a

Widespread in southern England with post-1970 records from south Devon, Dorset, Isle of Wight and Somerset. In Wales it is still confined to the southeast west as far as Cardiff (NBN), probably slowly spreading into the country. Frequents grassland, especially calcareous and usually near the coast, associated with thistles especially Musk and Spear thistles. Adults are recorded from April to September (Hyman & Parsons 1992). Noted in compartment D.

5.2.11 *Vanoyia tenuicornis* (Nationally Scarce) None

This small black and yellow soldierfly with, as its name suggests, long thin antennae is distributed across southern England north to the Humber and in South Wales but is extremely local. In Wales it is well recorded along the south coast and with several records on Anglesey (NBN). Most sites are fens and seepage meadows, also frequents coastal landslips, marshes and dune slacks. There is some suggestion that the presence of shrubs is an obligatory requirement for the adults. The larvae are thought to develop in damp soil or litter, probably including that away from standing water (Falk 1991b). Swept in compartments D and F.

5.2.12 *Neoascia obliqua* Nationally Scarce

This small hoverfly is most frequent in northern England, but it is widely scattered across the south and into Scotland. In Wales scattered across the south of the country, with a couple of records in the north (NBN). Usually associated with butterbur in wet areas, especially along woodland edges. Adults recorded from April to October (Stubbs & Falk 2002). One found in compartment D.

5.2.13 *Micropeza lateralis* pNationally Scarce

This long, slender stilt-legged fly is recorded from southern England north to Yorkshire and in Scotland. There are no records of this species for Wales on NBN, but there is at least one record for Glamorganshire (Mapmate /data). Mainly found on heathland, usually preferring lush damper areas near trees and bushes or beside streams. Occasionally on chalk or fixed dunes. Larval ecology unknown but a number of recent records state a close association with bushes of broom, and perhaps other Fabaceae (Falk, Ismay & Chandler 2016). Swept in compartment B.

5.2.14 *Acanthiophilus helianthi* Nationally Scarce

This gall-fly with very limited wing patterning has a decidedly scattered distribution across the southern half of England and a couple of records in Wales. Probably getting more frequent with the many records being recent, found at a number of sites this year (pers. obs). Frequents dry grassland, meadows and occasionally gardens where the larvae develop in the flower heads of knapweed. Adults are recorded from July to September (Clemons 1996; Falk 1991b). Swept in compartment B.

5.2.15 *Dioxyna bidentis* Nationally Scarce

This gall fly is widespread species with 38 post 1970 records in central England north to Yorkshire with isolated sites in Cornwall, South Wales and Scotland. Well scattered across Wales, the great majority of the records coastal (NBN). Habitat preferences not certain but occurs in marshes, and wet areas on commons and dunes. Probably develops in a range of composite hosts including bur-marigold. Adults recorded from May to October (Falk 1991b; Clemons 1996). Swept in compartment B and C.

5.2.16 *Homoneura notata* pNationally Scarce

A small, yellow fly with brown-spotted wings, known from southern counties in England and South Wales, from Cornwall, to Kent, north to Northamptonshire and Glamorgan (NBN). In Wales there are several records from the Gwent Levels and dune complexes in Glamorganshire. Recorded from a range of habitats including coastal scrub, fen, mid-dune

grassland and a site at the edge of the East Anglian Brecklands. Biology unknown; larvae of this family are generally believed to develop in decaying vegetable matter, including fallen leaves (Falk, Ismay & Chandler 2016). Swept in compartments D and F.

5.2.17 *Ditaeniella grisescens* Nationally Scarce

This snail-killing fly is widespread in Britain with about 20 post 1960 sites north to Durham with an isolated record in central Scotland. In Wales confined to south cast and a few localities in the north, particularly well recorded on the Gower (NBN). Most records are from coastal situations such as grazing levels so it at least tolerates brackish conditions. The larvae develop as parasitoides of snails but the preferred species in natural situations is unknown. Adults recorded from May to September in a series of broods (Ball & McLean 1986; Falk 1991b). Swept in compartment E.

5.2.18 *Tetanocera punctifrons* Nationally Scarce

One of the larger snail-killing flies which is widely distributed in Britain but local with about 20 post 1960 sites (Falk 1991b). In Wales it is well distributed and relatively frequent both coastally and inland (NBN; Ball & McLean 1986). It is becoming increasingly frequent and perhaps no longer merits its national status. Inhabits damp woodland, riparian situations, damp heathland and coastal marshes. The larvae probably develop as predators or parasitoides of snails; adults are recorded from June to August (Falk op.cit.). Swept in compartment E.

5.2.19 *Tiphia minuta* The Small Tiphia Nationally Scarce b

The Small Tiphia is an all-black solitary wasp; widely recorded in southern England north to Derbyshire with a few records for Wales and Scotland. In Wales it is distributed along the south coast, the north west and with a few inland records in the southeast (NBN). Its habitat preferences are unclear, recorded from heaths, downland and other grassland and coastal dunes. They are thought to be parasitoides of dung beetle larvae, if so it will have a requirement for mammal dung. However, populations seem to be able to survive in the absence of large grazing animals, presumably utilising those dung beetle species which feed on rabbit, badger, deer and dog dung. The adults are on the wing from May to August often to be found nectaring on umbellifers (Falk 1991a). Swept in compartments B and F.

5.2.20 *Argogorytes fargei* Nationally Scarce a

This black and yellow sphecid wasp was historically widespread in the southern half of England but seems to have declined considerably. Most recent records are from the Isle of Wight, the east coast from Yorkshire to Norfolk and inland Yorkshire. Very rare in the west with the few records all pre-1960, in Wales just one old record south of Cardiff (BWARS). Found in open habitats on light soils such as heaths, quarries, gravel pits, sandy riverbanks, dunes and soft rock cliffs. Requires vertical exposures of the mineral soil in which to dig its nests. Nests are stocked with froghopper nymphs especially *Philaenus* and *Aphrophora*. Adult are on the wing from May to August (Edwards & Telfer 2001). Two males found in compartment C.

5.2.21 *Nysson trimaculatus* Nationally Scarce b

This black and yellow 'cuckoo' wasp is widespread in southern England with a few sites as far north as Yorkshire with about 55 post-1970 sites (Falk 1991a). Perhaps becoming commoner, with a number of recent records in Somerset and Gloucestershire (pers. obs.), this would appear to be the first record for Wales (NBN). Inhabits a variety of open situations on light soils including heathland, dry grassland, open woodland, coastal cliffs and landslips and even suburban gardens. The host requires lush herbaceous vegetation and shrubs as a source of its prey. *N. trimaculatus* is a cleptoparasite of the solitary wasp *Gorytes quadrifasciatus* and perhaps at this site the much rarer *G. laticinctus* (Sphecidae) which digs nests in light soil and stocks them with hoppers, especially *Philaneus* (Hemiptera; Cercopidae). *N. trimaculatus* is

on the wing from June to August (Falk op.cit.). Not infrequent here being noted in compartments C, D and E.

5.2.22 *Andrena nigriceps* Nationally Scarce b

This solitary bee is distributed throughout England, South Wales and southern Scotland but it is always a scarce and very local bee. In Wales it is distributed around much of the coast, notably where large dune systems occur (NBN). In Gwent it was recorded at ABP in 2015 and 2018 (pers. obs.). Associated with flowery grasslands on lighter soils where it is recorded to visit a wide range of later summer-flowering plants. The nests are single in short turf or bare ground with adults active from July to September (BWARS). Recorded in compartment C.

5.2.23 *Andrena trimmerana* Trimmer's Mining Bee Nationally Scarce b

The Trimmer's Mining Bee is a large brown bee confined to southern England and south Wales, prefers the coast but also recorded from various habitats inland. In Wales it is well distributed along the south coast with a few records in the north, also coastal, inland records very rare (NBN). Possibly no longer merits its national status. Nests in sparsely vegetated grassland in warm, sunny situations; probably collects most of its pollen from *Salix* and *Prunus*. Double brooded flying from mid-March to late April and early July to late September (Falk 1991b). Found in compartment A.

5.2.24 *Bombus sylvarum* Shrill Carder Bee Nationally Scarce b, BAP

The Shrill Carder Bee is included as a national BAP species because of major declines across Britain, with only four or five remaining metapopulations in England and South Wales, and the East Thames Corridor. It seems to be doing very well in South Wales with strong populations from Pembrokeshire to the Gwent Levels (NBN). Bumblebee populations appear to operate at a landscape scale and it is probable that viable individual populations require minimum ranges of between ten to twenty sq. km of good matrix habitat within farmland, and *B. sylvarum* seems to require much larger areas of good habitat than Brown-banded Carder Bee *B. humilis*. Found on a variety of open, flower-rich situations, dunes, salt-marsh edges, shingle beaches, chalk downland and heathland. Pollen collected from a wide variety of flowers, Fabaceae, Lamiaceae and Scrophulariaceae preferred (Edwards & Telfer, 2001). Workers noted in compartments E and F.

5.2.25 *Colletes marginatus* The Margined Colletes Nationally Scarce a

A small brown-banded silk-bee which is confined to coastal areas of southern Britain from Cornwall to Kent north to Norfolk and Lancashire and the East Anglian Brecks with about 30 post-1970 sites. In Wales it is known from Anglesey and along the south coast from Merthyr-mawr to Pendine, and proved to be relatively frequent at ABP (NBN; pers. comm.). Very much a bee of coastal dunes and sandy heaths nesting in small aggregations in firm sparsely vegetated sand. Visits a wide range of flowers but its pollen requirements are not fully known. It is single brooded flying from June to mid-August (Falk 1991a). Found in compartment C.

5.2.26 *Hylaeus signatus* Large Yellow-faced Bee Nationally Scarce b

This is the largest of the yellow-faced bees and is widespread in southern England north to Norfolk and Warwickshire with about 30 post-1970 sites (Falk 1991a). There was evidence that this bee was becoming commoner, with many more sites found in the 1990's (M. Edwards pers.comm.) but over the last few years it has become scarce again. In Wales it is confined to the south of the country and has been recorded at a couple of nearby sites in Newport (NBN; pers. obs.). Occurs on downland, heathland, disturbed situations, gardens and open woodlands. It is closely associated with *Reseda* from which the adults collect all their pollen. Nests are known from banks with bare soil, the mortar in walls or in the dead stems of *Rubus* or *Rosa*. It is single brooded with adults found from June to September (Falk op.cit.). Noted in compartments C and E.

5.2.27 *Sphecodes crassus* Nationally Scarce b

This small black and red cuckoo-bee is very widely distributed in England and Wales as far north as Yorkshire. It is a very difficult species to identify so its true status is not easy to assess but it is certainly very local. In Wales well distributed, especially around the coast and not uncommon at ABP (NBN; pers. obs.). Lives in a variety of habitats including heathland, calcareous grassland, soft rock cliffs, landslips and abandoned quarries. It is a cleptoparasite of the mining bee genus *Lasioglossum*. Suspected hosts include *L. nitidiusculum*, *L. parvulum*, *L. morio*, *L. pauxillum* and *L. fulvicorne*, of which L. morio was recorded during this survey. Whatever the host is, it will almost certainly have a requirement for areas of bare soil or sparse vegetation in sunny spots where they can dig their nests. Adult females are on the wing from May to August, males from July to September; frequenting flowers such as *Calluna*, *Heracleum*, *Jasione*, *Achillea*, *Tripleurospermum*, *Angelica* and *Cirsium* (Falk 1991a). Found in compartments B and F.

5.3BAP/S41, LOCALLY SIGNIFICANT

5.3.1 *Malacosoma neustria* Lackey BAP

This moth with very distinctive, brightly striped caterpillars is still common and well distributed throughout southern England to Yorkshire. Placed on the BAP list (research only) because of evidence of a serious decline. Mainly found on the coast and in the lowlands of Wales, with scattered records further north. Widespread in Ireland and on the Channel Islands. Open, sunny habitats, especially hedgerows, scrubby places, gardens and open woodland. Larvae feed on many broadleaved trees and shrubs, initially communally in a web, including Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), cherries, Plum (*Prunus domestica*) and Apple (*Malus domestica*). Larvae noted in compartment C.

5.3.2 *Chiasmia clathrata* Latticed Heath BAP

A geometrid moth of a wide range of open habitats: grasslands, heathland, open woodland, cliffs, etc. The larvae feed on various species of clovers. It was described by Skinner (1984) as ‘widespread and locally common in England, Wales and southern Scotland’ and as ‘common’ by Waring & Townsend (2003). However, Fox et al. (2006) reported a decline of 87% over 35 years for this species. Still widespread and not uncommon in Wales, away from the upland areas (NBN). The indications are that action for this species will cover national monitoring and research programmes, and action through national agricultural and forestry policy measures. Seen in compartments B and C.

5.3.3 *Tyria jacobaeae* Cinnabar BAP

This very attractive and well known day-flying moth has recently been added to the Priority List of UK Biodiversity Action Plan Species. In South Wales it is still quite common and well recorded (NBN). Its addition is due to concern that the species is suffering a significant decline and probably that its food plant is in jeopardy due to potential new legislation. The larvae feed on Ragwort, a plant much persecuted by many landowners. Ragwort supports many insect species other than Cinnabar so this moth acts as a flagship for the whole Ragwort dependant fauna. Frequent here and noted in all compartments except B.

5.3.4 *Bombus humilis* Brown-banded Carder Bee BAP

The Brown-banded Carder Bee has declined dramatically in recent decades, although not included in Falk (1991a) it should probably now be viewed as Nationally Scarce. Historically widespread in England and Wales, it is now largely confined to local populations in the south and west. South Wales and particularly the Gwent Levels is an important stronghold for this species with numerous records in and around Newport (NBN; pers obs.). Bumblebee populations appear to operate at a landscape scale and it is probable that viable individual populations require minimum ranges of from ten to twenty sq. km of good matrix habitat within farmland. Found on a variety of open, flower-rich situations, dunes, salt-marsh edges,

shingle beaches, chalk downland and heathland. Important plant species used in early summer by queens include Fodder Vetch *Vicia villosa*, Red Clover *Trifolium pratense* and Broad-leaved Everlasting-pea *Lathyrus latifolius*. Workers forage on the flowers of species such as bird's-foot trefoils *Lotus spp.*, clovers, Black Horehound *Ballota nigra*, Lucerne *Medicago sativa* and Red Bartsia *Odondites verna*. A single worker noted in compartment C.

6 Site Evaluation

Overall this site is a fairly typical ex-industrial site where varied habitats have developed in open areas no longer being heavily used providing niches for a very good diversity of invertebrates from numerous taxonomic groups. The land around Uskmouth Power Station includes some very productive and high quality habitats of real value for the conservation of invertebrates in Wales. The high quality found here is not surprising as similar results have been found at other sites in and near Newport, but some parts of Uskmouth Power station are exceptionally good both in the sheer diversity found and the high proportion of scarce species, especially along the south and east of the site.

Pantheon analysis uses 383 (86%) of the species list to assess the condition of the invertebrate assemblages present. Flower-rich open habitats comes out as most important with scrub edge second, both of these judged by the program to be in favourable condition. This habitat is well represented across much of the site. All other Pantheon outputs are based on too small a number of indicator species so are not reliable. However, the Specific assemblage type (SAT) bare sand & chalk has a high Species Quality Index (SQI) at 263 and the SAT open short sward is even better with a SQI of 325. In both cases this highlights the importance for invertebrates of bare substrate sparsely vegetated with a wide diversity of ruderal and short perennial flowers. More detail can be seen at https://www.brc.ac.uk/pantheon/pantheon/summary?dynamic-sample_id=2456&dynamic-sample_type=scratchpad.

Despite habitat being limited, compartment D is exceptionally rich in scarce species, a quite remarkable result given that much of the area is devoid of vegetation The two adjacent compartments C and E are also of very high quality, while compartment A, especially the large area of mowed grass, it relatively poor, but still had much of interest.

7 Recommendations

Open, thermophilus scrub-grassland matrix with a rich floral diversity is an exceptionally valuable habitat, especially for aculeate Hymenoptera. This habitat is very typical of industrial sites and there are many examples in an around Newport. However, the area of this survey is of particularly high quality and also much more extensive than most equivalent areas in the region. Many of the conservation significant species that have been recorded at similar sites in Newport were also found at Uskmouth Power Station. Unfortunately, such industrial or ex-industrial sites are highly desirable for development so very few equivalent sites are likely to remain undamaged and still able to support the rich assemblages of invertebrates indefinitely. Even those that are not ear-marked for development, are not likely to be managed to maintain their invertebrate assemblages, so will be prone to scrub encroachment across open areas and siltation of any aquatic habitats.

Were all the open scrub-grassland matrix and wetland habitats at Uskmouth Power Station to be lost to development, this would be a serious and significant reduction in the available habitat for many scarce invertebrates in the Newport area. Indeed, given the real likelihood that many similar areas in Newport will be developed, the habitat at Uskmouth will become even more important.

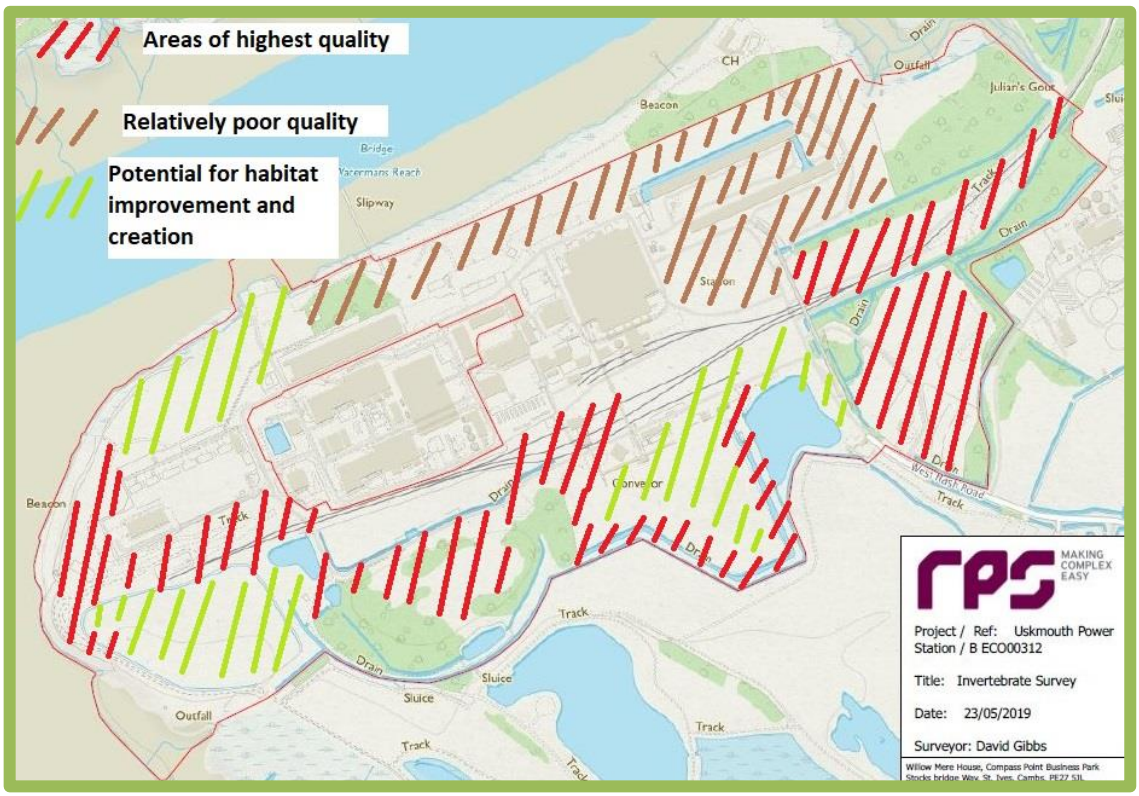
Apart from the areas of utility grassland and some relatively floristically poor areas (see Map below Fig 2), damage to or loss of any of the habitat at Uskmouth needs to include mitigation. Even without any loss through development, natural processes, especially scrub

encroachment, will eventually reduce the value of the habitat, so some management is highly desirable.

If substantial parts of the land around Uskmouth Power Station are very likely to remain undeveloped for the foreseeable future, then this raises the opportunity to offer valuable offsite mitigation to other development projects. Many sites around Newport and elsewhere in South Wales with similar invertebrate assemblages are under imminent development threat and should provide mitigation for the consequent loss of biodiversity. On many sites there is no space to provide adequate on-site mitigation, in some cased the footprint of the development occupies the entire available important habitat. Such developments could pay for the production of a management plan for an equivalent area of land at Uskmouth and then fund the management of that land for its invertebrates such that any potential biodiversity loss is off-set.

Land also comes under pressure for tree planting for carbon off-set, and at a site with a gas-fired power station this will seem by some to be an attractive option. This should be resisted on all but the most low quality land (brown-hatched below). Conversion of high quality open, sunny grassland-scrub matrix into low quality plantation is little different to development and will just as effectively eliminate the important invertebrate assemblages identified in the survey.

Figure 2: Map delineating areas of conservation importance



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9 Appendix 1: British conservation status categories – definitions.

The following definitions are those used by the JNCC review of the status's of scarce invertebrates of Great Britain.

Red Data Book Category 1. **RDB1-ENDANGERED**

- Taxa in danger of extinction if causal factors continue unabated. Includes species occurring as a single colony or only in habitats which are much reduced and highly threatened or which have shown a rapid and continuous decline.

Red Data Book Category 2. **RDB2-VULNERABLE**

- Taxa believed likely to move into the endangered category in the near future if the causal factors continue operating. Includes species of which most or all populations are decreasing and those which are confined to vulnerable habitats.

Red Data Book Category 3. **RDB3-RARE**

- Taxa with small populations that are not at present endangered or vulnerable, but are at risk; usually localised within restricted geographical areas or habitats or are thinly scattered over a wider range. Includes species estimated to exist in only fifteen or less post 1970 10km squares or, if more, then in vulnerable habitat.

Red Data Book Category 4. **RDBK – Data deficient**

- Taxa that are suspected, but not definitely known, to belong to any of the above categories, because of lack of information. Includes taxa recently discovered or recognised in Great Britain which may prove to be more widespread in the future; taxa with very few or perhaps only a single known locality but which belong to poorly recorded or taxonomically difficult groups; species known from very few localities but which occur in inaccessible habitats or habitats which are seldom sampled; species with very few or perhaps only a single known locality and of questionable native status, but not clearly falling into the category of recent colonist, vagrant or introduction.

Nationally Scarce Category a. **Na**

- Taxa which do not fall within the RDB categories but which are uncommon in Great Britain and are known to occur in 30 or fewer 10km squares or, in less well recorded groups, within seven or fewer vice-counties.

Nationally Scarce Category b. **Nb**

- Taxa which do not fall within the RDB categories but which are uncommon in Great Britain and are known to occur in between 31 and 100 10km squares or, in less well recorded groups, between eight and twenty vice-counties.

10 Appendix 2: Species list.

Order: Family	Species	Vernacular	National Status	A	B	C	D	E	F
Opiliones: Leiobunidae	*Dicranopalpus ramosus*							X	
Araneae: Araneidae	*Araneus diadematus*	Garden Spider				X			
Araneae: Pisauridae	*Pisaura mirabilis*					X			
Araneae: Dictynidae	*Dictyna arundinacea*						X		
Araneae: Thomisidae	*Misumena vatia*			X		X		X	
Araneae: Salticidae	*Salticus scenicus*								X
Odonata: Coenagriidae	*Ischnura elegans*	Blue-tailed Damselfly		X		X	X	X	X
Odonata: Coenagriidae	*Enallagma cyathigerum*	Common Blue Damselfly		X	X	X		X	X
Odonata: Coenagriidae	*Erythromma viridulum*	Small Red-eyed Damselfly					X		
Odonata: Aeshnidae	*Aeshna cyanea*	Southern Hawker					X		
Odonata: Aeshnidae	*Aeshna mixta*	Migrant Hawker				X			
Odonata: Aeshnidae	*Anax imperator*	Emperor Dragonfly				X	X		X
Odonata: Libellulidae	*Libellula quadrimaculata*	Four-spotted Chaser			X	X			
Odonata: Libellulidae	*Orthetrum cancellatum*	Black-tailed Skimmer						X	X
Odonata: Libellulidae	*Sympetrum striolatum*	Common Darter				X	X	X	X
Odonata: Libellulidae	*Sympetrum sanguineum*	Ruddy Darter				X	X		
Orthoptera: Conocephalidae	*Conocephalus discolor*	Long-winged Conehead	**Nationally Scarce a**			X	X		
Orthoptera: Phaneropteridae	*Leptophyes punctatissima*	Speckled Bush Cricket			X		X		X
Orthoptera: Acrididae	*Omocestus viridulus*	Common Green Grasshopper				X			
Orthoptera: Acrididae	*Chorthippus albomarginatus*	Lesser Marsh Grasshopper				X			
Orthoptera: Acrididae	*Chorthippus brunneus*	Common Field Grasshopper		X	X	X	X	X	X
Orthoptera: Acrididae	*Chorthippus parallelus*	Meadow Grasshopper			X				X
Dermaptera: Forficulidae	*Forficula auricularia*	Common Earwig		X		X	X	X	X
Dermaptera: Forficulidae	*Forficula lesnei*		**Nationally Scarce b**	X		X	X	X	
Hemiptera: Aphrophoridae	*Aphrophora alni*			X			X	X	X
Hemiptera: Aphrophoridae	*Aphrophora salicina*						X		
Hemiptera: Aphrophoridae	*Philaenus spumarius*			X	X	X	X	X	X
Hemiptera: Aphrophoridae	*Neophilaenus campestris*							X	
Hemiptera: Cicadellidae	*Populicerus albicans*								X
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Hemiptera: Cicadellidae	*Viridicerus ustulatus*								X
Hemiptera: Cicadellidae	*Psammotettix confinis*				X				
Hemiptera: Cixiidae	*Pentastiridius leporinus*		**Nationally Scarce b**	X			X	X	
Hemiptera: Delphacidae	*Chloriona glaucescens*							X	
Hemiptera: Delphacidae	*Criomorphus albomarginatus*					X			
Hemiptera: Saldidae	*Saldula saltatoria*							X	
Hemiptera: Lygaeidae	*Cymus melanocephalus*							X	
Hemiptera: Lygaeidae	*Nysius huttoni*				X	X	X	X	X
Hemiptera: Lygaeidae	*Peritrechus geniculatus*			X		X			
Hemiptera: Lygaeidae	*Scolopostethus affinis*			X					
Hemiptera: Miridae	*Adelphocoris lineolatus*			X					
Hemiptera: Miridae	*Capsus ater*			X					
Hemiptera: Miridae	*Lygus rugulipennis*						X		
Hemiptera: Miridae	*Notostira elongata*					X			
Hemiptera: Miridae	*Stenodema laevigata*					X			
Hemiptera: Miridae	*Stenotus binotatus*					X			X
Hemiptera: Miridae	*Sthenarus rotermundi*								X
Hemiptera: Acanthosomatidae	*Acanthosoma haemorrhoidale*	Hawthorn Shieldbug		X					
Hemiptera: Acanthosomatidae	*Elasmostethus interstinctus*	Birch Shieldbug				X			
Hemiptera: Acanthosomatidae	*Elasmucha grisea*	Parent Bug					X		
Hemiptera: Coreidae	*Coriomeris denticulatus*	Denticulate Leatherbug		X		X	X	X	X
Hemiptera: Pentatomidae	*Aelia acuminata*	Bishop's Mitre Shieldbug			X	X	X		
Hemiptera: Pentatomidae	*Dolycoris baccarum*	Hairy Shieldbug			X	X			
Hemiptera: Pentatomidae	*Eurydema oleracea*	Crucifer Shieldbug		X	X	X			X
Hemiptera: Pentatomidae	*Palomena prasina*	Common Green Shieldbug		X	X	X	X	X	
Hemiptera: Pentatomidae	*Pentatoma rufipes*	Red-legged Shieldbug							X
Hemiptera: Rhopalidae	*Corizus hyoscyami*					X	X		
Hemiptera: Rhopalidae	*Rhopalus subrufus*						X		
Hemiptera: Rhopalidae	*Stictopleurus punctatonervosus*							X	
Lepidoptera: Gracillariidae	*Euspilapteryx auroguttella*	a moth				X			
Lepidoptera: Gelechiidae	*Apodia bifractella*	a moth			X				
Lepidoptera: Gelechiidae	*Monochroa tenebrella*	a moth							X
Lepidoptera: Pterophoridae	*Stenoptilia zophodactylus*	Dowdy Plume		X		X	X	X	
Lepidoptera: Pterophoridae	*Adaina microdactyla*	Hemp Agrimony Plume				X			
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Lepidoptera: Tortricidae	*Ditula angustiorana*	Red-barred Tortrix						X	
Lepidoptera: Tortricidae	*Cochylis molliculana*	a moth							X
Lepidoptera: Tortricidae	*Grapholita compositella*	a moth					X		
Lepidoptera: Sesiidae	*Bembecia ichneumoniformis*	Six-belted Clearwing	**Nationally Scarce b**	X	X	X		X	
Lepidoptera: Zygaenidae	*Zygaena filipendulae*	Six-spot Burnet				X			
Lepidoptera: Zygaenidae	*Zygaena lonicerae*	Narrow-bordered Five-spot Burnet				X			
Lepidoptera: Hesperiidae	*Thymelicus lineola*	Essex Skipper				X			
Lepidoptera: Hesperiidae	*Thymelicus sylvestris*	Small Skipper				X			
Lepidoptera: Pieridae	*Anthocharis cardamines*	Orange-tip		X					
Lepidoptera: Pieridae	*Pieris rapae*	Small White				X			
Lepidoptera: Pieridae	*Colias croceus*	Clouded Yellow							X
Lepidoptera: Pieridae	*Gonepteryx rhamni*	Brimstone			X	X			
Lepidoptera: Nymphalidae	*Pararge aegeria*	Speckled Wood			X	X			
Lepidoptera: Nymphalidae	*Aphantopus hyperantus*	Ringlet				X			
Lepidoptera: Nymphalidae	*Maniola jurtina*	Meadow Brown		X				X	X
Lepidoptera: Nymphalidae	*Melanargia galathea*	Marbled White				X			
Lepidoptera: Nymphalidae	*Vanessa atalanta*	Red Admiral			X	X		X	
Lepidoptera: Nymphalidae	*Vanessa cardui*	Painted Lady		X		X	X	X	X
Lepidoptera: Nymphalidae	*Aglais io*	Peacock		X		X			X
Lepidoptera: Lycaenidae	*Lycaena phlaeas*	Small Copper				X			
Lepidoptera: Lycaenidae	*Aricia agestis*	Brown Argus				X		X	
Lepidoptera: Lycaenidae	*Polyommatus icarus*	Common Blue		X	X	X	X	X	X
Lepidoptera: Crambidae	*Chrysoteuchia culmella*	Garden Grass-veneer		X					X
Lepidoptera: Crambidae	*Agriphila tristella*	a moth		X		X			
Lepidoptera: Crambidae	*Agriphila geniculea*	a moth		X			X		
Lepidoptera: Lasiocampidae	*Malacosoma neustria*	Lackey	**BAP**			X			
Lepidoptera: Geometridae	*Idaea trigeminata*	Treble Brown Spot			X				
Lepidoptera: Geometridae	*Camptogramma bilineata*	Yellow Shell							X
Lepidoptera: Geometridae	*Epirrhoe alternata*	Common Carpet			X				
Lepidoptera: Geometridae	*Aplocera plagiata*	Treble-bar		X	X	X	X		X
Lepidoptera: Geometridae	*Chiasmia clathrata*	Latticed Heath	**BAP**		X	X			
Lepidoptera: Erebidae	*Orgyia antiqua*	Vapourer							X
Lepidoptera: Erebidae	*Callimorpha dominula*	Scarlet Tiger			X		X		
Lepidoptera: Erebidae	*Tyria jacobaeae*	Cinnabar	**BAP**	X		X	X	X	X
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Lepidoptera: Noctuidae	*Autographa gamma*	Silver Y						X	
Lepidoptera: Noctuidae	*Cucullia verbasci*	Mullein		X				X	
Trichoptera: Psychomyiidae	*Tinodes waeneri*	a caddisfly							X
Coleoptera: Carabidae	*Harpalus affinis*				X				
Coleoptera: Carabidae	*Stenolophus mixtus*							X	
Coleoptera: Carabidae	*Paradromius linearis*				X				
Coleoptera: Staphylinidae	*Stenus aceris*					X		X	
Coleoptera: Staphylinidae	*Stenus ossium*				X				
Coleoptera: Staphylinidae	*Xantholinus longiventris*			X					
Coleoptera: Scarabaeidae	*Hoplia philanthus*	Welsh Chafer				X			
Coleoptera: Scarabaeidae	*Phyllopertha horticola*	Bracken Chafer		X	X				
Coleoptera: Malachiidae	*Cordylepherus viridis*				X				
Coleoptera: Malachiidae	*Anthocomus rufus*						X		
Coleoptera: Kateretidae	*Brachypterolus pulicarius*				X				
Coleoptera: Phalacridae	*Phalacrus caricis*							X	
Coleoptera: Phalacridae	*Olibrus aeneus*							X	
Coleoptera: Coccinellidae	*Rhyzobius litura*				X	X			
Coleoptera: Coccinellidae	*Psyllobora vigintiduopunctata*	22-spot Ladybird		X					
Coleoptera: Coccinellidae	*Propylea quattuordecimpunctata*	14-spot Ladybird		X		X			X
Coleoptera: Coccinellidae	*Harmonia axyridis*	Harlequin Ladybird		X				X	
Coleoptera: Coccinellidae	*Adalia bipunctata*	2-spot Ladybird						X	
Coleoptera: Coccinellidae	*Adalia decempunctata*	10-spot Ladybird			X		X		
Coleoptera: Coccinellidae	*Coccinella septempunctata*	7-spot Ladybird		X	X	X	X	X	X
Coleoptera: Coccinellidae	*Hippodamia variegata*	Adonis' Ladybird	**Nationally Scarce b**	X	X	X	X	X	X
Coleoptera: Mordellidae	*Mordellistena pseudopumila*		**RDBK**		X				
Coleoptera: Tenebrionidae	*Lagria hirta*							X	
Coleoptera: Oedemeridae	*Oedemera nobilis*	Swollen-thighed Beetle		X	X	X	X	X	X
Coleoptera: Oedemeridae	*Oedemera lurida*			X	X	X	X	X	X
Coleoptera: Anthicidae	*Anthicus antherinus*							X	
Coleoptera: Anthicidae	*Omonadus floralis*					X			
Coleoptera: Scraptiidae	*Anaspis maculata*			X					
Coleoptera: Cerambycidae	*Leptura quadrifasciata*				X				
Coleoptera: Chrysomelidae	*Bruchus loti*					X			
Coleoptera: Chrysomelidae	*Donacia marginata*							X	
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Coleoptera: Chrysomelidae	*Oulema melanopus*			X	X				
Coleoptera: Chrysomelidae	*Chrysolina hyperici*			X	X	X		X	X
Coleoptera: Chrysomelidae	*Gastrophysa viridula*	Green Dock Beetle						X	
Coleoptera: Chrysomelidae	*Longitarsus flavicornis*			X					
Coleoptera: Chrysomelidae	*Cryptocephalus fulvus*			X	X		X	X	X
Coleoptera: Chrysomelidae	*Cryptocephalus moraei*				X				X
Coleoptera: Rhynchitidae	*Neocoenorrhinus germanicus*	Strawberry Rhynchites					X		
Coleoptera: Rhynchitidae	*Temnocerus longiceps*		**Nationally Scarce b**				X		
Coleoptera: Apionidae	*Omphalapion hookerorum*						X		
Coleoptera: Apionidae	*Stenopterapion tenue*				X	X			
Coleoptera: Apionidae	*Ischnopterapion loti*			X	X	X			
Coleoptera: Apionidae	*Holotrichapion pisi*					X			
Coleoptera: Apionidae	*Oxystoma cerdo*		**Nationally Scarce b**			X			
Coleoptera: Curculionidae	*Otiorhynchus singularis*	Raspberry Weevil							X
Coleoptera: Curculionidae	*Polydrusus formosus*		**Nationally Scarce a**				X		X
Coleoptera: Curculionidae	*Tanymecus palliatus*		**Nationally Scarce b**			X			
Coleoptera: Curculionidae	*Coelositona cambricus*			X					
Coleoptera: Curculionidae	*Rhinocyllus conicus*		**Nationally Scarce a**				X		
Coleoptera: Curculionidae	*Hypera postica*	Clover Leaf Weevil				X			
Coleoptera: Curculionidae	*Hypera rumicis*							X	X
Coleoptera: Curculionidae	*Cionus scrophulariae*	Figwort Weevil		X	X				
Coleoptera: Curculionidae	*Rhinoncus pericarpius*				X				
Coleoptera: Curculionidae	*Trichosirocalus troglodytes*								X
Coleoptera: Curculionidae	*Anthonomus rubi*	Strawberry Blossom Weevil		X					
Coleoptera: Curculionidae	*Rhinusa antirrhini*				X		X		
Diptera: Tipulidae	*Nephrotoma scurra*					X	X	X	X
Diptera: Tipulidae	*Nephrotoma submaculosa*			X				X	X
Diptera: Tipulidae	*Nigrotipula nigra*						X		
Diptera: Mycetophilidae	*Anatella minuta*					X			
Diptera: Ptychopteridae	*Ptychoptera contaminata*				X		X	X	
Diptera: Rhagionidae	*Chrysopilus asiliformis*						X		
Diptera: Rhagionidae	*Chrysopilus cristatus*						X		
Diptera: Tabanidae	*Chrysops relictus*				X	X	X		
Diptera: Tabanidae	*Haematopota pluvialis*								X
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Diptera: Stratiomyidae	*Beris vallata*								X
Diptera: Stratiomyidae	*Chorisops tibialis*						X	X	
Diptera: Stratiomyidae	*Nemotelus notatus*					X		X	X
Diptera: Stratiomyidae	*Vanoyia tenuicornis*		**(Nationally Scarce) None**				X		X
Diptera: Stratiomyidae	*Chloromyia formosa*					X			
Diptera: Stratiomyidae	*Microchrysa polita*								X
Diptera: Therevidae	*Thereva nobilitata*					X			
Diptera: Asilidae	*Leptogaster cylindrica*				X	X	X	X	X
Diptera: Asilidae	*Dioctria atricapilla*					X			
Diptera: Asilidae	*Dioctria baumhaueri*								X
Diptera: Hybotidae	*Platypalpus longiseta*							X	
Diptera: Hybotidae	*Platypalpus luteolus*		**(RDB3) Nationally Scarce**				X	X	
Diptera: Hybotidae	*Platypalpus minutus*					X			
Diptera: Hybotidae	*Platypalpus optivus*							X	
Diptera: Hybotidae	*Platypalpus pallidiventris*			X	X				
Diptera: Empididae	*Empis nigripes*							X	
Diptera: Empididae	*Empis livida*						X		X
Diptera: Empididae	*Rhamphomyia caesia*					X			
Diptera: Dolichopodidae	*Chrysotus gramineus*								X
Diptera: Dolichopodidae	*Dolichopus festivus*								X
Diptera: Dolichopodidae	*Dolichopus griseipennis*			X	X		X	X	
Diptera: Dolichopodidae	*Dolichopus latilimbatus*							X	
Diptera: Dolichopodidae	*Dolichopus nubilus*							X	
Diptera: Dolichopodidae	*Dolichopus plumipes*								X
Diptera: Dolichopodidae	*Dolichopus trivialis*								X
Diptera: Dolichopodidae	*Dolichopus ungulatus*			X	X				X
Diptera: Dolichopodidae	*Poecilobothrus nobilitatus*							X	
Diptera: Dolichopodidae	*Machaerium maritimae*								X
Diptera: Dolichopodidae	*Scellus notatus*			X				X	
Diptera: Dolichopodidae	*Medetera saxatilis*						X		
Diptera: Dolichopodidae	*Medetera truncorum*				X				
Diptera: Dolichopodidae	*Chrysotimus molliculus*			X					
Diptera: Dolichopodidae	*Syntormon pallipes*						X		
Diptera: Lonchopteridae	*Lonchoptera bifurcata*			X	X				X
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Diptera: Syrphidae	*Melanostoma mellinum*	a hoverfly			X		X		X
Diptera: Syrphidae	*Melanostoma scalare*	a hoverfly					X		
Diptera: Syrphidae	*Platycheirus albimanus*	a hoverfly				X			
Diptera: Syrphidae	*Platycheirus scutatus*	a hoverfly							X
Diptera: Syrphidae	*Paragus haemorrhous*	a hoverfly		X	X		X		X
Diptera: Syrphidae	*Episyrphus balteatus*	a hoverfly		X					X
Diptera: Syrphidae	*Eupeodes corollae*	a hoverfly						X	
Diptera: Syrphidae	*Sphaerophoria interrupta*	a hoverfly					X		X
Diptera: Syrphidae	*Sphaerophoria rueppellii*	a hoverfly			X		X		
Diptera: Syrphidae	*Sphaerophoria scripta*	a hoverfly		X	X	X	X	X	X
Diptera: Syrphidae	*Xanthogramma pedissequum*	a hoverfly				X	X		
Diptera: Syrphidae	*Cheilosia latifrons*	a hoverfly				X	X		
Diptera: Syrphidae	*Cheilosia pagana*	a hoverfly				X			
Diptera: Syrphidae	*Cheilosia proxima*	a hoverfly		X					
Diptera: Syrphidae	*Cheilosia scutellata*	a hoverfly				X			
Diptera: Syrphidae	*Rhingia campestris*	a hoverfly				X	X	X	
Diptera: Syrphidae	*Neoascia podagrica*	a hoverfly					X	X	
Diptera: Syrphidae	*Neoascia obliqua*	a hoverfly	**Nationally Scarce**				X		
Diptera: Syrphidae	*Eristalinus sepulchralis*	a hoverfly						X	
Diptera: Syrphidae	*Eristalis intricaria*	a hoverfly						X	
Diptera: Syrphidae	*Helophilus hybridus*	a hoverfly							X
Diptera: Syrphidae	*Helophilus pendulus*	a hoverfly			X		X		
Diptera: Syrphidae	*Myathropa florea*	a hoverfly					X		X
Diptera: Syrphidae	*Pipizella viduata*	a hoverfly		X	X	X	X	X	
Diptera: Syrphidae	*Syritta pipiens*	a hoverfly				X	X	X	X
Diptera: Syrphidae	*Tropidia scita*	a hoverfly		X	X		X		
Diptera: Pipunculidae	*Verrallia aucta*						X		
Diptera: Pipunculidae	*Cephalops varipes*							X	
Diptera: Pipunculidae	*Eudorylas longifrons*						X		
Diptera: Pipunculidae	*Eudorylas obliquus*					X			
Diptera: Pipunculidae	*Pipunculus campestris*					X			
Diptera: Pipunculidae	*Tomosvaryella kuthyi*			X	X	X			X
Diptera: Micropezidae	*Micropeza lateralis*		**pNationally Scarce**		X				
Diptera: Conopidae	*Thecophora atra*			X					
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Diptera: Conopidae	*Sicus ferrugineus*						X	X	
Diptera: Lonchaeidae	*Silba fumosa*	formerly in Setisquamalonchaea		X					
Diptera: Ulidiidae	*Herina lugubris*	a picture-winged fly					X		
Diptera: Platystomatidae	*Rivellia syngenesiae*	a picture-winged fly				X	X	X	X
Diptera: Tephritidae	*Urophora stylata*					X			X
Diptera: Tephritidae	*Acanthiophilus helianthi*		**Nationally Scarce**		X				
Diptera: Tephritidae	*Campiglossa malaris*		**RDB1 (RDBK)**				X		
Diptera: Tephritidae	*Dioxyna bidentis*		**Nationally Scarce**		X	X			
Diptera: Tephritidae	*Tephritis divisa*		**None (RDBK)**		X		X		
Diptera: Tephritidae	*Tephritis formosa*						X		
Diptera: Tephritidae	*Tephritis neesii*				X				
Diptera: Tephritidae	*Terellia serratulae*								X
Diptera: Tephritidae	*Anomoia purmunda*						X		
Diptera: Lauxaniidae	*Homoneura notata*		**pNationally Scarce**				X		X
Diptera: Lauxaniidae	*Calliopum aeneum*			X			X		
Diptera: Lauxaniidae	*Cnemacantha muscaria*		**(RDB3) pNationally Scarce**	X		X			
Diptera: Lauxaniidae	*Minettia tabidiventris*					X			X
Diptera: Lauxaniidae	*Minettia fasciata*			X	X			X	
Diptera: Lauxaniidae	*Minettia tubifer*			X	X				
Diptera: Lauxaniidae	*Sapromyza quadripunctata*				X	X	X		X
Diptera: Chamaemyiidae	*Chamaemyia aridella*				X				
Diptera: Chamaemyiidae	*Chamaemyia herbarum*			X		X			X
Diptera: Chamaemyiidae	*Chamaemyia polystigma*				X				
Diptera: Sciomyzidae	*Ditaeniella grisescens*		**Nationally Scarce**					X	
Diptera: Sciomyzidae	*Pherbellia cinerella*			X	X	X	X	X	X
Diptera: Sciomyzidae	*Pherbellia ventralis*							X	
Diptera: Sciomyzidae	*Coremacera marginata*				X	X			
Diptera: Sciomyzidae	*Dichetophora obliterata*				X	X		X	
Diptera: Sciomyzidae	*Ilione albiseta*							X	
Diptera: Sciomyzidae	*Limnia unguicornis*				X	X			
Diptera: Sciomyzidae	*Sepedon sphegea*							X	
Diptera: Sciomyzidae	*Tetanocera elata*								X
Diptera: Sciomyzidae	*Tetanocera ferruginea*						X		
Diptera: Sciomyzidae	*Tetanocera punctifrons*		**Nationally Scarce**					X	
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Diptera: Sepsidae	*Meroplius fukuharai*		**(RDBK) not assessed**			**X**			
Diptera: Sepsidae	*Sepsis cynipsea*			**X**					
Diptera: Sepsidae	*Sepsis fulgens*					**X**	**X**		**X**
Diptera: Sepsidae	*Themira lucida*						**X**		
Diptera: Agromyzidae	*Melanagromyza cunctans*	a leaf-miner fly			**X**				
Diptera: Agromyzidae	*Ophiomyia curvipalpis*	a leaf-miner fly				**X**			
Diptera: Agromyzidae	*Cerodontha lateralis*	a leaf-miner fly				**X**			
Diptera: Agromyzidae	*Phytomyza clematidis*	a leaf-miner fly		**X**					
Diptera: Agromyzidae	*Phytomyza plantaginis*	a leaf-miner fly		**X**					
Diptera: Opomyzidae	*Geomyza tripunctata*				**X**				
Diptera: Opomyzidae	*Opomyza germinationis*								**X**
Diptera: Opomyzidae	*Opomyza petrei*			**X**	**X**	**X**		**X**	
Diptera: Milichiidae	*Madiza glabra*							**X**	
Diptera: Chloropidae	*Chlorops calceatus*			**X**					
Diptera: Chloropidae	*Chlorops pumilionis*						**X**		
Diptera: Chloropidae	*Chlorops scalaris*							**X**	
Diptera: Chloropidae	*Meromyza saltatrix*								**X**
Diptera: Chloropidae	*Thaumatomyia glabra*			**X**	**X**	**X**	**X**	**X**	**X**
Diptera: Chloropidae	*Thaumatomyia notata*					**X**			**X**
Diptera: Chloropidae	*Lipara lucens*						**X**		
Diptera: Chloropidae	*Oscinella frit*			**X**	**X**	**X**	**X**	**X**	**X**
Diptera: Drosophilidae	*Scaptomyza pallida*			**X**					**X**
Diptera: Drosophilidae	*Scaptomyza flava*				**X**				
Diptera: Campichoetidae	*Campichoeta punctum*				**X**				
Diptera: Ephydridae	*Psilopa leucostoma*						**X**		
Diptera: Ephydridae	*Psilopa nitidula*						**X**		**X**
Diptera: Ephydridae	*Hydrellia griseola*			**X**	**X**				
Diptera: Ephydridae	*Hydrellia maura*			**X**					
Diptera: Scathophagidae	*Cordilurina albipes*					**X**			
Diptera: Scathophagidae	*Scathophaga litorea*				**X**				
Diptera: Anthomyiidae	*Anthomyia liturata*							**X**	
Diptera: Anthomyiidae	*Pegoplata infirma*						**X**	**X**	
Diptera: Muscidae	*Coenosia tigrina*			**X**					
Diptera: Muscidae	*Schoenomyza litorella*			**X**	**X**			**X**	**X**
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Diptera: Muscidae	*Lispe tentaculata*							**X**	
Diptera: Muscidae	*Mesembrina meridiana*								**X**
Diptera: Muscidae	*Helina lasiophthalma*			**X**					
Diptera: Calliphoridae	*Bellardia pandia*				**X**				
Diptera: Calliphoridae	*Lucilia sericata*			**X**					
Diptera: Calliphoridae	*Melanomya nana*			**X**		**X**	**X**		
Diptera: Rhinophoridae	*Phyto melanocephala*								**X**
Diptera: Rhinophoridae	*Rhinophora lepida*				**X**			**X**	
Diptera: Sarcophagidae	*Metopia argyrocephala*							**X**	
Diptera: Sarcophagidae	*Senotainia conica*				**X**				
Diptera: Sarcophagidae	*Sarcophaga filia*			**X**		**X**		**X**	
Diptera: Sarcophagidae	*Sarcophaga nigriventris*				**X**			**X**	
Diptera: Tachinidae	*Meigenia mutabilis*				**X**				
Diptera: Tachinidae	*Phryxe vulgaris*				**X**				
Diptera: Tachinidae	*Exorista rustica*					**X**			
Diptera: Tachinidae	*Siphona geniculata*							**X**	
Hymenoptera: Argidae	*Arge ochropus*	a sawfly						**X**	
Hymenoptera: Tenthredinidae	*Strongylogaster lineata*	a sawfly		**X**					
Hymenoptera: Tenthredinidae	*Athalia rosae*	a sawfly		**X**	**X**	**X**			**X**
Hymenoptera: Tenthredinidae	*Eriocampa ovata*	a sawfly						**X**	
Hymenoptera: Cephidae	*Cephus cultratus*	a sawfly			**X**	**X**			
Hymenoptera: Cephidae	*Calameuta pallipes*	a sawfly			**X**	**X**			**X**
Hymenoptera: Ichneumonidae	*Cryptopimpla errabunda*	an ichneumon			**X**				
Hymenoptera: Ichneumonidae	*Collyria trichophthalma*	an ichneumon			**X**	**X**			**X**
Hymenoptera: Ichneumonidae	*Temelucha interruptor*	an ichneumon							**X**
Hymenoptera: Ichneumonidae	*Aritranis director*	an ichneumon			**X**		**X**		
Hymenoptera: Ichneumonidae	*Mesostenus transfuga*	an ichneumon				**X**			
Hymenoptera: Ichneumonidae	*Trychosis legator*	an ichneumon				**X**			
Hymenoptera: Ichneumonidae	*Diplazon laetatorius*	an ichneumon			**X**	**X**	**X**		**X**
Hymenoptera: Ichneumonidae	*Promethes sulcator*	an ichneumon				**X**			
Hymenoptera: Ichneumonidae	*Sussaba erigator*	an ichneumon				**X**			
Hymenoptera: Ichneumonidae	*Sussaba pulchella*	an ichneumon						**X**	
Hymenoptera: Ichneumonidae	*Syrphoctonus elegans*	an ichneumon		**X**					
Hymenoptera: Ichneumonidae	*Amblyteles armatorius*	an ichneumon		**X**					
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Hymenoptera: Ichneumonidae	*Ctenichneumon panzeri*	an ichneumon					X	X	X
Hymenoptera: Ichneumonidae	*Hoplismenus bidentatus*	an ichneumon				X			
Hymenoptera: Ichneumonidae	*Ichneumon sarcitorius*	an ichneumon						X	X
Hymenoptera: Ichneumonidae	*Virgichneumon maculicauda*	an ichneumon				X			
Hymenoptera: Ichneumonidae	*Vulgichneumon suavis*	an ichneumon						X	
Hymenoptera: Ichneumonidae	*Colpognathus celerator*	an ichneumon					X		
Hymenoptera: Ichneumonidae	*Endromopoda detrita*	an ichneumon			X		X		
Hymenoptera: Ichneumonidae	*Scambus inanis*	an ichneumon					X		
Hymenoptera: Ichneumonidae	*Zaglyptus varipes*	an ichneumon					X		
Hymenoptera: Ichneumonidae	*Itoplectis maculator*	an ichneumon					X		
Hymenoptera: Ichneumonidae	*Pimpla contemplator*	an ichneumon				X			X
Hymenoptera: Ichneumonidae	*Pimpla rufipes*	an ichneumon					X		
Hymenoptera: Ichneumonidae	*Pimpla spuria*	an ichneumon							X
Hymenoptera: Ichneumonidae	*Acrotomus succinctus*	an ichneumon				X			
Hymenoptera: Ichneumonidae	*Cycasis rubiginosa*	an ichneumon				X			
Hymenoptera: Ichneumonidae	*Exyston pratorum*	an ichneumon						X	
Hymenoptera: Ichneumonidae	*Netelia dilatata*	an ichneumon		X					
Hymenoptera: Ichneumonidae	*Tryphon signator*	an ichneumon		X	X				
Hymenoptera: Ichneumonidae	*Tryphon trochanteratus*	an ichneumon			X				
Hymenoptera: Chrysididae	*Pseudomalus auratus*	a cuckoo wasp							X
Hymenoptera: Tiphiidae	*Tiphia femorata*	a solitary wasp			X	X	X		
Hymenoptera: Tiphiidae	*Tiphia minuta*	The Small Tiphia	**Nationally Scarce b**		X				X
Hymenoptera: Formicidae	*Lasius niger*	an ant				X			X
Hymenoptera: Pompilidae	*Anoplius concinnus*	a spider-hunter wasp						X	
Hymenoptera: Pompilidae	*Caliadurgus fasciatellus*	a spider-hunter wasp				X			
Hymenoptera: Pompilidae	*Priocnemis parvula*	a spider-hunter wasp							X
Hymenoptera: Eumenidae	*Ancistrocerus parietum*	Wall Mason Wasp			X				
Hymenoptera: Eumenidae	*Gymnomerus laevipes*	a mason wasp		X			X		
Hymenoptera: Eumenidae	*Odynerus spinipes*	Spiny Mason Wasp			X				
Hymenoptera: Sphecidae	*Ammophila sabulosa*	Red Banded Sand Wasp		X					
Hymenoptera: Crabronidae	*Argogorytes fargei*	a digger wasp	**Nationally Scarce a**			X			
Hymenoptera: Crabronidae	*Cerceris arenaria*	Sand Tailed Digger Wasp			X	X			
Hymenoptera: Crabronidae	*Crossocerus capitosus*	a digger wasp					X		
Hymenoptera: Crabronidae	*Crossocerus elongatulus*	Slender Digger Wasp		X		X		X	
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Hymenoptera: Crabronidae	*Crossocerus nigritus*	a digger wasp					X		
Hymenoptera: Crabronidae	*Crossocerus podagricus*	a digger wasp					X		X
Hymenoptera: Crabronidae	*Ectemnius continuus*	a digger wasp			X			X	
Hymenoptera: Crabronidae	*Ectemnius rubicola*	a digger wasp					X	X	
Hymenoptera: Crabronidae	*Gorytes laticinctus*	a digger wasp	**RDB3**					X	
Hymenoptera: Crabronidae	*Harpactus tumidus*	a digger wasp			X				
Hymenoptera: Crabronidae	*Lindenius albilabris*	a digger wasp				X	X	X	
Hymenoptera: Crabronidae	*Mellinus arvensis*	Field Digger Wasp			X			X	X
Hymenoptera: Crabronidae	*Mimumesa dahlbomi*	a digger wasp			X				
Hymenoptera: Crabronidae	*Nysson trimaculatus*	a digger wasp	**Nationally Scarce b**			X	X	X	
Hymenoptera: Crabronidae	*Passaloecus singularis*	a digger wasp			X		X	X	
Hymenoptera: Crabronidae	*Pemphredon inornata*	a digger wasp			X	X			
Hymenoptera: Crabronidae	*Pemphredon lethifera*	a digger wasp		X			X		X
Hymenoptera: Crabronidae	*Philanthus triangulum*	Bee Wolf	**RDB2**						X
Hymenoptera: Crabronidae	*Trypoxylon attenuatum*	Slender Wood Borer Wasp				X	X		X
Hymenoptera: Apidae	*Andrena bicolor*	Gwynne's Mining Bee				X		X	
Hymenoptera: Apidae	*Andrena denticulata*	a mining bee				X	X		
Hymenoptera: Apidae	*Andrena dorsata*	a mining bee		X		X	X	X	X
Hymenoptera: Apidae	*Andrena flavipes*	Yellow Legged Mining Bee			X	X	X	X	
Hymenoptera: Apidae	*Andrena labialis*	a mining bee			X		X		
Hymenoptera: Apidae	*Andrena minutula*	a mining bee			X	X	X	X	
Hymenoptera: Apidae	*Andrena nigriceps*	a mining bee	**Nationally Scarce b**			X			
Hymenoptera: Apidae	*Andrena nigroaenea*	a mining bee		X	X	X			
Hymenoptera: Apidae	*Andrena ovatula*	a mining bee				X		X	
Hymenoptera: Apidae	*Andrena semilaevis*	a mining bee		X	X	X	X		X
Hymenoptera: Apidae	*Andrena subopaca*	a mining bee			X			X	
Hymenoptera: Apidae	*Andrena trimmerana*	Trimmer's Mining Bee	**Nationally Scarce b**	X					
Hymenoptera: Apidae	*Andrena wilkella*	a mining bee			X		X	X	
Hymenoptera: Apidae	*Apis mellifera*	Honey Bee		X	X		X		X
Hymenoptera: Apidae	*Bombus humilis*	Brown-banded Carder Bee	**BAP**			X			
Hymenoptera: Apidae	*Bombus hypnorum*	a bumblebee		X					
Hymenoptera: Apidae	*Bombus lapidarius*	Large Red Tailed Bumble Bee						X	
Hymenoptera: Apidae	*Bombus lucorum sens. lat.*	White-tailed Bumble Bee		X	X				X
Hymenoptera: Apidae	*Bombus pascuorum*	Common Carder Bee		X	X	X	X	X	X
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Hymenoptera: Apidae	*Bombus pratorum*	Early Bumble Bee		X	X		X		X
Hymenoptera: Apidae	*Bombus sylvarum*	Shrill Carder Bee	**Nationally Scarce b, BAP**					X	X
Hymenoptera: Apidae	*Bombus terrestris*	Buff-tailed Bumble Bee		X	X	X	X	X	
Hymenoptera: Apidae	*Coelioxys rufescens*	a cuckoo bee		X					
Hymenoptera: Apidae	*Colletes daviesanus*	a mining bee					X		
Hymenoptera: Apidae	*Colletes marginatus*	The Margined Colletes	**Nationally Scarce a**			X			
Hymenoptera: Apidae	*Colletes similis*	a mining bee				X		X	
Hymenoptera: Apidae	*Epeolus variegatus*	a solitary bee			X				
Hymenoptera: Apidae	*Halictus tumulorum*	a mining bee		X	X		X		
Hymenoptera: Apidae	*Hylaeus annularis*	a solitary bee			X	X	X	X	
Hymenoptera: Apidae	*Hylaeus brevicornis*	Short Horned Yellow-face Bee		X		X	X	X	
Hymenoptera: Apidae	*Hylaeus communis*	Common Yellow Face Bee			X			X	
Hymenoptera: Apidae	*Hylaeus hyalinatus*	a solitary bee		X	X	X			
Hymenoptera: Apidae	*Hylaeus signatus*	Large Yellow-faced Bee	**Nationally Scarce b**			X		X	
Hymenoptera: Apidae	*Lasioglossum albipes*	a mining bee			X	X			
Hymenoptera: Apidae	*Lasioglossum calceatum*	Slender Mining Bee		X		X			
Hymenoptera: Apidae	*Lasioglossum leucopus*	a mining bee		X		X	X	X	X
Hymenoptera: Apidae	*Lasioglossum leucozonium*	a mining bee		X			X	X	
Hymenoptera: Apidae	*Lasioglossum minutissimum*	Least Mining Bee		X	X	X	X	X	
Hymenoptera: Apidae	*Lasioglossum morio*	Brassy Mining Bee		X	X	X	X	X	X
Hymenoptera: Apidae	*Lasioglossum smeathmanellum*	a mining bee				X			
Hymenoptera: Apidae	*Lasioglossum villosulum*	Shaggy Mining Bee		X		X			
Hymenoptera: Apidae	*Lasioglossum zonulum*	a mining bee		X		X	X	X	
Hymenoptera: Apidae	*Melitta leporina*	a mining bee			X		X		X
Hymenoptera: Apidae	*Nomada fabriciana*	a cuckoo bee			X	X		X	
Hymenoptera: Apidae	*Nomada flava*	a cuckoo bee						X	
Hymenoptera: Apidae	*Nomada flavoguttata*	a cuckoo bee		X	X	X	X	X	
Hymenoptera: Apidae	*Nomada goodeniana*	a cuckoo bee		X	X	X			X
Hymenoptera: Apidae	*Nomada obtusifrons*	a cuckoo bee				X			
Hymenoptera: Apidae	*Nomada sheppardana*	a cuckoo bee			X				
Hymenoptera: Apidae	*Nomada striata*	a cuckoo bee		X					
Hymenoptera: Apidae	*Osmia caerulescens*	a mason bee		X	X	X	X		
Hymenoptera: Apidae	*Osmia rufa*	Red Mason Bee				X			
Hymenoptera: Apidae	*Sphecodes crassus*	a cuckoo bee	**Nationally Scarce b**		X				X
Order: Family	**Species**	**Vernacular**	**National Status**	**A**	**B**	**C**	**D**	**E**	**F**

Hymenoptera: Apidae	*Sphecodes ephippius*	a cuckoo bee			X	X			
Hymenoptera: Apidae	*Sphecodes geoffrellus*	a cuckoo bee		X		X	X	X	X
Hymenoptera: Apidae	*Sphecodes gibbus*	a cuckoo bee					X		
Hymenoptera: Apidae	*Sphecodes monilicornis*	a cuckoo bee				X		X	X
Hymenoptera: Apidae	*Sphecodes niger*	a cuckoo bee	**RDB3**				X	X	
Hymenoptera: Apidae	*Sphecodes scabricollis*	a cuckoo bee	**RDB3**				X	X	
Hymenoptera: Apidae	*Stelis ornatula*	a cuckoo bee	**RDB3**				X		
		total diversity	**444**	**122**	**141**	**175**	**147**	**140**	**124**
		all scarce/RDB	**38**	**6**	**9**	**14**	**17**	**13**	**8**
		% scarce/RDB	**8.6**	**4.9**	**6.4**	**8**	**11.6**	**9.3**	**6.5**
		no RDB	**11**	**1**	**2**	**2**	**6**	**4**	**1**
		% RDB	**2.5**	**0.8**	**1.4**	**1.1**	**4.1**	**2.9**	**0.8**