

Invertebrate Survey

of

Troopers Hill LNR,

Bristol

a report to

The Friends of Troopers Hill

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2007

Summary

- The four visits of this survey yielded 262 species, an excellent diversity.
- 30 of these species are considered to be of conservation significance.
- This is a proportion of 11.5% which is a quite exceptional result, exceeding most good nature reserves surveyed in comparable ways.
- Six of the species found (2.3%) have RDB or equivalent status, also a very high proportion.
- Of the three systematic surveys of Troopers Hill, this one has yielded the greatest proportion of scarce and rare species.
- It is reasonable to deduce from these results that invertebrate quality is certainly not decreasing, placing confidence on the current management regime.
- More scarce aculeates were found during this survey than on either of the previous two.
- *Nomada lathburiana*, which previously had a strong colony here, and should not have been overlooked, was not recorded.
- *Andrena labiata* and its cleptoparasitoid, the very rare *Nomada guttulata* also could not be found.

Introduction

Troopers Hill is a small area of flower rich grassland developed on the very poor soils left over after metal mining and smelting and the quarrying of Pennant Sandstone. It has been saved from development by its steep topography and from succession to woodland by the thin and probably toxic nature of the substrate. It was formerly known for its colony of Grayling *Hipparchia semele* (not seen for many years and certainly extinct), which was one of the primary reasons for Troopers Hill gaining its status as a Local Nature Reserve. More recently its great importance for less well-known insects, particularly Hymenoptera and the Dotted beefly *Bombylius discolor*, has been recognised. Although there had been some casual recording of these less well-known invertebrates, the first systematic survey was in 2000. This was followed up by a similar survey in 2006. The present survey builds on these surveys, expanding the taxonomic range of recorded invertebrates and assessing their conservation importance in a national and local context.

Survey Methods

The site was visited on four dates in 2007, on each occasion spending about 4 hours sampling all the open habitats on the Hill. The first visit on 19 April was at the peak for many spring insects for which Troopers Hill is known to be important. Subsequent visits on 24 May, 19 June and 18 July covered peak insect activity through late spring and summer. The whole site was covered on each visit with special attention paid to the quarried areas and localities where particular target species had been found in the past. All sampling was done in good conditions, warm and mostly dry, although on both occasions it was rather more cloudy than is ideal.

Surveying involved searching flowers for larger species, notably hoverflies, bees and wasps, examining plants for signs of larvae, and searching the ground for terrestrial species. Most specimens were taken by sweeping with a 14-inch diameter white-bag net through the grass, herbage, shrubs and from overhanging branches. Butterflies, some hoverflies and other conspicuous species were identified in the field but

specimens were always taken if there was any possibility of an incorrect identification. 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. Selected specimens were pinned and set that evening, the remainder placed a freezer until they could be identified.

The quality of the site for invertebrates has been assessed with reference to the species found which are considered to be of national scarcity by the various "Reviews of Nationally Scarce [Insects]" (see Falk 1991a; Falk 1991b; Hyman, 1992). 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 designations; these are as follows:-

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.

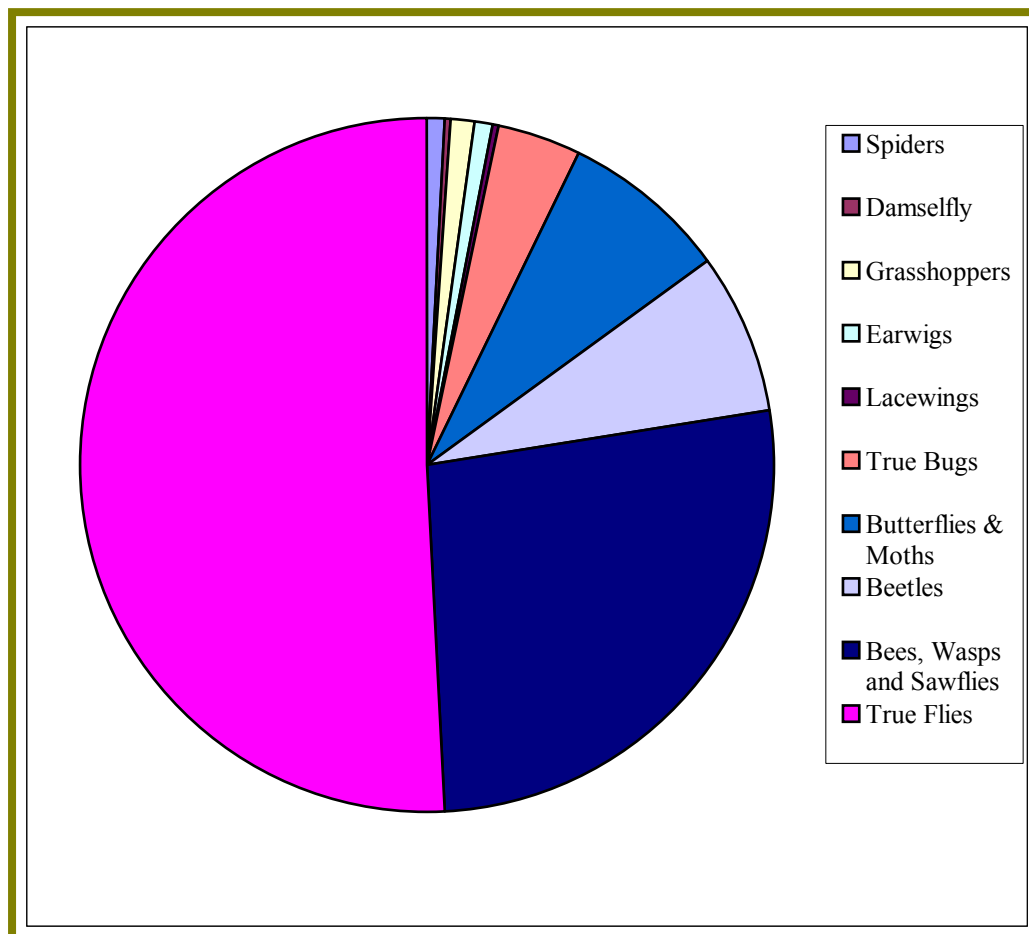
Many of the reviews from which these categories have been taken are now rather out of date. Various groups have been updated piecemeal and others are in the process of being updated but not all of these works have been published. In order to maintain continuity across taxonomic groups (those that have been updated recently and those that have not) and also to maintain comparability with earlier surveys, the old statuses are still used as the basis of this assessment. However, where new statuses are known, either published and thus now official or still in preparation so not yet official, these are given and discussed in the species accounts. Old statuses which have been superseded by the publication of new reviews and proposed statuses not yet published are given in parenthesis.

Additionally an attempt has been made to gauge the value of the site within a local context. Most of the nationally scarce species are also very uncommon in Gloucestershire and Somerset so the local significance will almost invariably be greater than the national significance of the site. Many species which do not merit inclusion in "The reviews of scarce insects" are none-the-less very rare within the region. Unfortunately the fauna of the region is too poorly documented to assess local scarcity for all groups. Good coverage is available for the beetles, moths and hoverflies only but even these publications are inconsistent in their presentation of the data. Much of the choice of locally scarce species and of the analysis of the health and importance on the invertebrate community as a whole is dependent on personal experience.

Results

The four visits of this survey yielded 262 species, which for a small, open site, predominated by acid grassland, is an excellent diversity and almost the same as found in 2006 when 276 species were found in slightly more time expended.

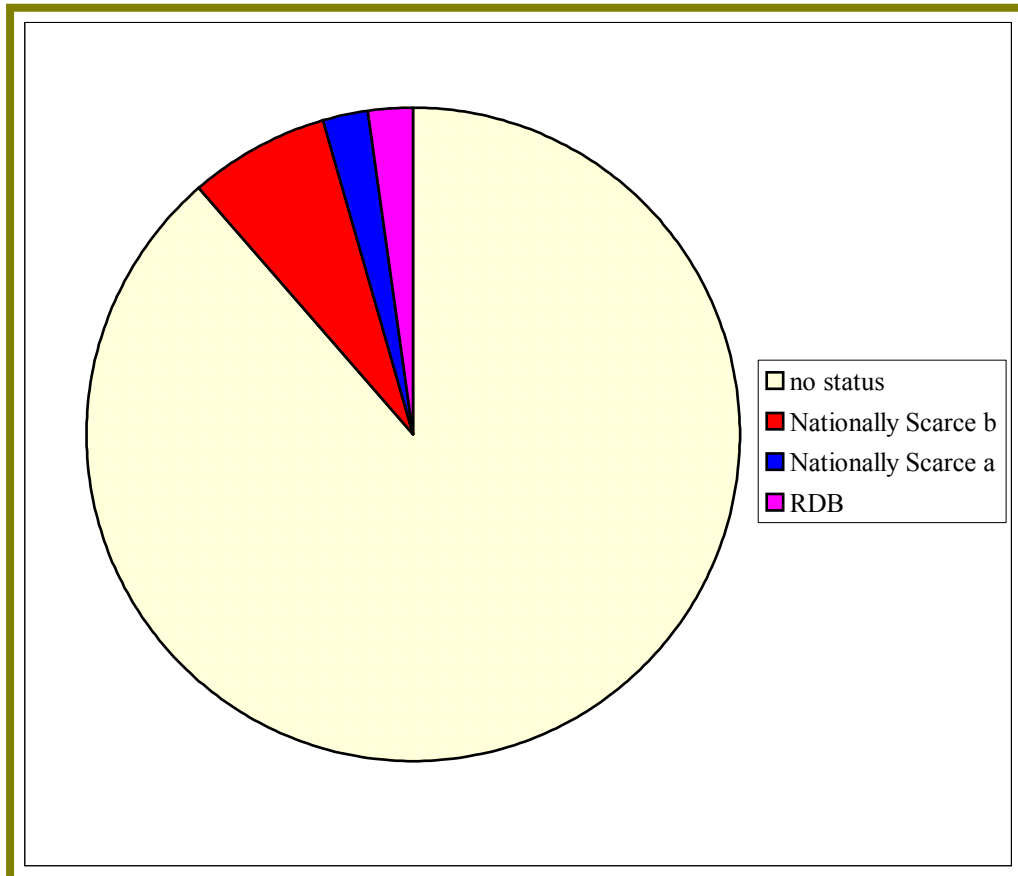
Fig 1. Taxonomic coverage of survey



The chart above presents the diversity found of each of the major orders sampled and is very similar to the 2006 result indicating that the survey techniques are consistent. As can be seen the True Flies (Diptera) are by far the most diverse making up over half of the dataset. The Diptera are the second largest order of invertebrates in Britain, only exceeded by the Bees and Wasps (Hymenoptera) which is predominately parasitica. The parasitica are so poorly known, both taxonomically and ecologically, that very few are included in survey work of this nature. Thus there are more readily identifiable Diptera in Britain than any other order. Further, the Diptera are very readily collected with a sweep-net, the primary survey method used, much more so than are the Beetles (Coleoptera). The Hymenoptera are also readily collected with a sweep-net and were the second most diverse group. The diversity found is good, higher than usually found at such a site but very comparable with the 2006 results. The Coleoptera are certainly under-recorded, this order is second to the Diptera for the number of readily identifiable species. However, the Coleoptera are not readily collected with a sweep-net and the pit-fall trapping and close ground searching needed to build a good list was not part of the survey techniques used. These comments also

apply to the True Bugs (Hemiptera). Similarly the butterflies and moths (Lepidoptera) are under-recorded because most species are nocturnal and only readily discovered by light trapping which was not part of the survey techniques employed. Spiders and caddisflies are also under-recorded because they were not particularly looked for. The remaining groups are all small orders with diversities much as expected.

Fig 2. Proportion of scarce and RDB species



The chart above shows the proportion of species found which are considered to be of conservation significance due to their scarcity or vulnerability to extinction. Of the 262 species found, 30 of them are considered to be of conservation significance, either because they have official JNCC status, are proposed for such status or have only recently lost this status. Species in the latter category are retained as being of conservation concern in order to permit comparability with other, earlier surveys (see Methods above). This is a proportion of 11.5% which is a quite exceptional result, exceeding most good nature reserves surveyed in comparable ways. Six of the species found (2.3%) have RDB or equivalent status, also a very high proportion.

Of the three systematic surveys of Troopers Hill, this one has yielded the greatest proportion of scarce and rare species.

Table 1. Comparison with previous surveys

	2000	2006	2007
Total species	137	276	262
scarce/RDB species	13	23	30
RDB species	3	5	6
% scarce/RDB species	9.5	8.3	11.5
% RDB species	2.2	1.8	2.3

As can be seen, the results from the different surveys are somewhat variable, dipping in 2006 but this years results are even better than the 2000 proportion of scarce species. Because it is impossible to control for all the variables that impinge on the collecting of such data, the observed variations are likely to reflect these rather than any overall changes in the quality of the site. What can be deduced from these results is that the quality of the invertebrate fauna at Troopers Hill is certainly not decreasing, placing confidence on the current management regime.

Although Troopers Hill provides a refuge for invertebrates of all groups, it is particularly important for aculeate Hymenoptera.

Table 2. Nationally Scarce Aculeate Hymenoptera

Species	Status	pre-2000	2000	2001-2005	2006	2007
<i>Tiphia minuta</i>	Scarce b	X				
<i>Aporus unicolor</i>	Scarce a				X	X
<i>Arachnospila minutula</i>	Scarce b				X	
<i>Microdynerus exilis</i>	Scarce b					X
<i>Crossocerus distinguendus</i>	Scarce a					X
<i>Nysson trimaculatus</i>	Scarce b	X				
<i>Philanthus triangulum</i>	RDB2		X		X	X
<i>Psenulus schencki</i>	Scarce a					X
<i>Andrena bucephala</i>	Scarce a			X		
<i>Andrena fulvago</i>	Scarce a	X				X
<i>Andrena humilis</i>	Scarce b	X	X	X	X	X
<i>Andrena labiata</i>	Scarce a	X	X			
<i>Andrena tibialis</i>	Scarce a	X		X		
<i>Andrena trimmerana</i>	Scarce b	X			X	
<i>Hylaeus cornutus</i>	Scarce a					X
<i>Bombus rupestris</i>	Scarce b	X				
<i>Nomada fucata</i>	Scarce a	X	X	X	X	X
<i>Nomada guttulata</i>	RDB1		X			
<i>Nomada integra</i>	Scarce a		X	X	X	X
<i>Nomada lathburiana</i>	RDB3		X	X	X	
<i>Sphecodes crassus</i>	Scarce b	X	X			X
<i>Sphecodes reticulatus</i>	Scarce a		X		X	
		10	9	6	9	11

The overall picture tabulated above is very positive with more scarce aculeates found this survey than on either of the previous ones, although the proportion found in 2000 was higher when these insects were more closely targeted. Most of the species not found in 2007 but known to occur are low-density species, never found in numbers, so easily missed when visits to a site are limited. The one exception is *Nomada lathburiana* which previously had a strong colony here and should not have been overlooked. This species seems to be undergoing a decline at the moment, perhaps because this species has a cyclical population dynamic. There is thus far no good reason to conclude that the present scarcity of this bee is due to habitat degradation or climatic factors.

It is again most disappointing to have to report that *Andrena labiata* and its cleptoparasitoid, the very rare *Nomada guttulata* could not be found. Considerable effort at the right time in the season was dedicated to trying to locate *Andrena labiata* but to no avail. Sadly it seems that the colony of *Andrena labiata* at Troopers Hill was transitory and has now disappeared, or at least persists at such low numbers that detection is very unlikely. Even if *Andrena labiata* is still present, it seems highly unlikely that the population is adequate to sustain *Nomada guttulata*. It is reasonable to theorise that a chance colonisation during very favourable conditions could not be sustained on so small a site when conditions marginally deteriorated.

Species Accounts

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. Locally it has recently been found to be quite frequent with several records from Bristol including Troopers Hill in 2003 and 2006. 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. 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 (Haes & Harding 1997). Found in April and May.

Bembecia ichneumoniformis **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). Recently found much more frequently locally, including the Avon Gorge in Bristol; 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 roots. Adults are on the wing from the end of June to mid-August. Swept in June.

Adonia variegata **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 1992) but a recent rapid expansion in range and abundance suggests that this species might no longer merit its national status. In Gloucestershire it was first recorded in 1975 and there have been about four records since (Atty 1983); it is no more common in Somerset with just two records, both of them on the coast (Duff 1993). 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 1992). Found in June.

Cryptocephalus aureolus **Nationally Scarce b**

This beautiful brilliant metallic green leaf-beetle is widespread but local in Britain north to Scotland. Locally it is quite common and was found at Troopers Hill in 2000 and 2006 (pers. obs.); it is probably too frequent to merit the scarcity status given to it nationally. It likes open grassy places preferring light soils especially calcareous areas. Often to be found on yellow composites particularly hawkweeds. The larvae are free-living in a case feeding on leaves. Adults recorded from May to July (Hyman 1992). Found in May.

Aporus unicolor **Nationally Scarce a**

This largely black spider-hunter wasp is very local in southern England north to Cambridgeshire and with recent records from South Wales. Known from about 15 post-1970 localities suggesting a general decline. There are no published records of this wasp from the region, the nearest being in the New Forest (Edwards 1997), but it was taken at Tucking Mill and Troopers Hill last year (pers. obs.). Frequents sparsely vegetated light soils in sunny localities, particularly chalky and sandy areas, such as south facing cliffs, heathland and well-grazed downland. It is known to be a parasitoid of the purse-web spider *Atypus affinis*, itself very scarce in the region. Adults found from June to September (Falk 1991a). Found in June and July.

Microdynerus exilis **Nationally Scarce b**

This mason wasp is found in Southern England from the Severn to the Wash, especially Dorset, Hampshire and Surrey. Recently it has started spreading north and west with several very recent records in the area (pers. obs.). Frequents a variety of habitats including woodland, downland and heaths. Nests in old beetle holes in dead wood stocking its nests with weevil larvae (Falk 1991a). Flies in June and July (Edwards & Telfer 2001). Found in June.

Crossocerus distinguendus **Nationally Scarce a**

This small, black digger wasp is largely concentrated in the south and east of England but is spreading north and west suggesting that it may be a recent colonist. Locally there are records from three of sites in Somerset (pers obs.) and it is known to have reached south Warwickshire (S. Falk pers comm.) and is becoming increasingly frequent. It is found in a variety of open habitats including sand and gravel workings and urban gap environments. Nesting aggregations are usually found in sandy soil and on one occasion in a rockery, abroad it also nests in dead wood. The females provision their nests with aphids. Adults are recorded from June to August (Falk 1991a). Found in July.

Philanthus triangulum **RDB2 (None)**

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. Locally it first turned up in Gloucestershire a few years ago (M. Smith pers. comm.) and is now established in the area, first found at Troopers Hill in 2000 (pers. obs.). 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.*). Noted in July.

Psenulus schencki **Nationally Scarce a**

An all black digger wasp, widely recorded in south-east England north and west to Oxfordshire but very local with records tending to be very scattered and based on single specimens. Like many wasps, probably spreading, but still very rare in this area, only two other records known, one of them this year (pers. obs.). Found in a variety of warm and sunny situations where there is encroaching scrub including gardens, heathland, open woodland and urban gap habitats. It nests in the stems of plants such as buddleia, elder and rose, which have been excavated by other sphecid wasps. They stock their nests with Psyllids collected from nearby trees. Adults are recorded from June to September (Falk 1991a). A single female found in July.

Andrena fulvago **Nationally Scarce a**

A small brown mining bee, the males rather nondescript but the females readily identified by the bright fulvous pollen hairs on their orange hind tibia. Historically widespread in the southern half of England but it has declined seriously, particularly at inland sites. Locally its decline may not have been so drastic, apart from Troopers Hill, where it was first recorded in 1999, there are colonies at and Stockwood Open Space, Dolebury Warren, Brean Down and Tucking Mill (pers. obs.); also previously recorded at Kewstoke (Perkins 1924). Prefers coastal grassland, inland it is largely confined to calcareous grassland. Nests in light soils in warm, sunny situations with sparse vegetation and bare soil. Although it can form dense colonies, nests are usually dispersed. It is single brooded with adults flying from May to August collecting pollen from yellow composites (Falk 1991a). Present in June.

Andrena humilis **Nationally Scarce b**

A medium-sized brown mining bee lacking conspicuous features in the field. Historically it was widespread in England north to Yorkshire but has declined considerably. In Gloucestershire there are only three localities all very old (Alexander 1999a); in Somerset it is only recorded from Kewstoke Wood (Perkins 1924), Radstock, Bleadon Quarry and Dolebury Warren (pers. obs.). Favours a variety of habitats particularly coastal landslips but also heathland and grassland. Nests in hard sand or stiff soil in sunny situations, including vertical banks. Can form large colonies but aggregations are usually small. It is single brooded flying from May to July the females gathering pollen exclusively from yellow composites (Falk 1991a). Good colony still present in May and June.

Hylaeus cornutus **Nationally Scarce a**

This distinctive small black bee is largely confined to southern counties of England with a very definite eastern bias extending north to Lincolnshire. The most westerly record is an old one from east Devon (Falk 1991a). Even in the south east it is generally rare but there has been a noticeable increase in records in recent years. In the Bristol region it is recorded from Bath and Hengrove Park (pers obs) and is probably a recent arrival in the area. Frequents various open habitats especially calcareous grassland where they probably collect pollen from a variety of flowers. The nesting requirements are poorly known but probably needs sunny situations where they utilise hollow dead stems of herbaceous plants (Edwards & Telfer 2001). Found in July.

Nomada fucata **Nationally Scarce a**

This nomad bee was historically widespread in southern England but declined considerably, however, recently it has shown a remarkable recovery and is now one of the more frequently met with *Nomadas*. Its status as Na may need reviewing, however, since 2003 this bee seems to have returned to its earlier abundance and is much less often seen than it was in the first few years of the 21st century. Locally there are several recent localities in north Somerset, but Troopers Hill is the only vc34 colony and one of the most reliable in the region. Favours a wide variety of open sandy and grassy situations which offer a rich flora and bare, sunny cliffs and slopes. It is a cleptoparasitoid of the mining bee *Andrena flavipes* which forms dispersed or concentrated colonies in bare sandy or clayey soils. *N. fucata* is, like its host, double brooded flying from April to May and July to August (Falk 1991a.). The good colony here still present in June and July.

Nomada integra **Nationally Scarce a**

A largely black and dark red nomad bee without any yellow spots, once widely distributed in southern England north to Yorkshire with a few sites in Wales; it has declined considerably in most areas with about 25 post-1970 sites (Falk 1991a). Locally there are only two very old records in Gloucestershire (Alexander 1999a); in Somerset it is recorded from Kewstoke Woods (Perkins 1924) and recently from Dolebury Warren and Cheddar Gorge (pers. obs.). At Troopers Hill it was first found in 2000 and is perhaps the strongest colony in the region. It is a cleptoparasitoid of *Andrena humilis*, itself a scarce Nb species, which favours a variety of habitats particularly coastal landslips but also heathland and grassland. *A. humilis* nests in hard sand or stiff soil in sunny situations, including vertical banks and collects all its pollen from yellow composites (Falk *op. cit.*). A good colony still persists, noted in April and May.

Sphcodes crassus **Nationally Scarce b**

This small black and red cuckoo-bee is very widely distributed in England and Wales as far north as Yorkshire, and recently Northumberland. It is a very difficult species to identify so its true status is not easy to assess but it is certainly very local. There are two old records from Gloucestershire (Alexander 1999a) and recently it has been found at several sites in Somerset (pers. obs.). Troopers Hill is the only known colony in Gloucestershire but it no doubt occurs elsewhere. Lives in a variety of habitats including heathland, calcareous grassland, soft rock cliffs, landslips and abandoned quarries. It is a cleptoparasitoid of the mining bee genus *Lasioglossum*. Suspected hosts include *L. nitidiusculum*, *L. parvulum*, *L. morio*, *L. pauxillum* and *L. fulvicorne*,

of which *L. parvulum* and *L. morio* are recorded from Troopers Hill. 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 June.

Sciophila nigronitida **Nationally Scarce**

This black fungus gnat is widespread in Britain but scattered and local. This would appear to be the first record for Gloucestershire. Found in both broadleaved woodland and open sites such as bog, heath, sandy grassland and dunes. Larval requirement unknown but related species develop in webs on tough lignicolous fungi where they probably feed on spores. Other species in this genus develop on terrestrial fungi. Adults recorded from April to September (Falk & Chandler 2005). A single male swept in June.

Bombylius discolor **Nationally Scarce b**

The Dotted beefly is a robust furry insect with conspicuous spots on the wings which was, until recently, a subject for a UK biodiversity action plan. Formerly it was a widespread and frequent fly of the southern half of England and Wales but it has undergone a dramatic decline almost completely disappearing from the eastern part of its range. In the west it has held its own well and there are numerous recent records, these are mostly of singletons but there are several strong colonies known especially in north Somerset (Alexander 1999b; pers. obs.). The colony at Troopers Hill was first found in 1999 and is one of the largest and most consistent in the region. This fly is a parasitoid of mining bees, the primary host in this region is almost certainly *Andrena flavipes*. The host requires areas of bare ground in which to dig its nests and open areas with numerous flowers especially composites. The fly is on the wing very early from late March to mid May so requires sheltered sunny areas in adjacent woodland or scrub in which to forage (Stubbs & Drake 2001). Very good numbers present in April.

Platypalpus incertus **(Nationally Scarce) None**

This small Hybotid fly is widely distributed across southern England but information of its limits are not available. Locally it is now known from several sites although this is the first from Bristol. Now considered to be too frequent to merit national status so this was recently removed. Most records are from chalk or limestone grassland with scrub, and it has been recorded on oxeye daises (Collin 1961). Adults recorded in May and June (MapMate data). Found in June.

Cheilosia soror **Nationally Scarce**

This all black hoverfly is very similar to several common species and is distinguishable only with microscopic examination. Most historical records are from the chalk of southeast England with unconfirmed records north to Durham; more recently it has been found in limestone districts from Somerset to Morecambe Bay (Stubbs & Falk 2002). In this area earlier collectors appear to have overlooked this species as it is now known to be frequent in Somerset and Gloucestershire especially on calcareous soils (Levy & Levy 1998; MapMate data). Frequents calcareous grassland, scrub and woodland, probably has a requirement for woodland. The larvae

are thought to develop in truffles which are associated with beech (Falk 1991b). Found in July.

Eudorylas arcanus **Nationally Scarce**

This elusive big-headed fly has a widely scattered distribution in Britain north to Perthshire. Only about a dozen recorded sites of which 7 are post 1960. This would appear to be the first record for the region. Habitat associations are unknown but probably grassland or woodland edges. Its biology is unknown but members of this genus are parasitoids of leafhoppers of the family Cicadellidae as larvae. Adults recorded from May to August (Falk & Chandler 2005). A single female found in June.

Homoneura interstincta **(RDBK)**

This species was originally placed on the British list on the basis of specimens identified by Collin. However, it has recently been shown that Collin misidentified his specimens and in fact they belong with a newly described species *H. mediospinosa*. The true *interstincta* was only discovered to be British when three specimens were caught in south Somerset in 2003 (pers obs.). Since then the species has been found at several other sites in Somerset and Bristol and there are a couple of records from outside this area. Nothing is known of its habitat requirements or life history but the similar *H. mediospinosa* frequents damp broadleaved woodland or wetlands. Larvae of this genus are generally believed to develop in decaying vegetable matter including fallen leaves (Falk & Ismay in prep.). So far always swept from willow or poplar; adults from June to August (pers. obs.). Swept from willow foliage in June and July.

Homoneura thalhammeri **(Nationally Scarce)**

This small yellowish fly has a scattered distribution over south England north to Yorkshire and in south Wales. It does not have official national status because it was not known in Britain when the relevant review was published; at the time it was confused with another species which was given Nb status. There are about 20 post-1960 records including several sites in Somerset and on in Bristol, Gloucestershire (pers obs). Where recording has been intensive this species has been found more frequently so is no doubt over looked and perhaps no longer deserving its national status. Most often found by sweeping scrub, isolated shrubs, trees and adjacent tall herbage or coarse grasses. Its biology is unknown but larvae of this genus are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from June to September (Falk & Ismay in prep.). Swept from willow foliage in June and July.

Colobaea punctata **Nationally Scarce**

This small snail-killing fly is known across England north to Northumberland and in south Wales. This is the third record for Gloucestershire and the region (Alexander 1999b; Ball & McLean 1986). Frequents lush marginal vegetation alongside lakes, rivers, ponds and ditches especially where low summer water levels leave water snails stranded. Larvae are specialised parasitoids of terrestrial and aestivating aquatic snails including *Planorbis corneus*, *Planorbis planorbis* and *Lymnaea peregra*. Adults are recorded from May to August (Falk 1991b). This is a very surprising find for Troopers Hill, being swept from dry grassland at the top of the hill, a very atypical habitat in this country. This suggests that this fly is exploiting terrestrial snails, as it known to do occasionally, at this site. Found in May.

Phytomyza sedi (RDBK)

This tiny dull blackish leaf-mining was recorded here new for Britain last year and is still not known from any other British sites. It is a European species so far known from France, Germany, Spain and Yugoslavia; not known outside Europe (www.faunaeur.org/). It is known to mine the leaves of stonecrop *Sedum*. At Troopers Hill it is associated with the extensive patch of reflexed stonecrop *S. rupestre* in the southeast corner of the site from which numerous adults have been reared. This is, of course, not a native species in Britain. It is impossible to know if *P. sedi* is an introduced species associated with garden stonecrops or a previously undetected native. It is interesting to note that rock stonecrop *S. forsterianum*, the closest relative to *S. rupestre* and native to Britain, is found not far away in the Avon Gorge. The larvae mine the lower leaves, hollowing them out such that they look paler, yellowish-green, pupariating inside the mine with the anterior spiracles poking through the cuticle (pers, obs.). Found in May.

Dicraeus tibialis **Nationally Scarce**

This small blackish frit fly is distributed across southern England north to Cambridgeshire and in south Wales, but very local. In the region there are confirmed records from several localities in north Somerset (pers. obs.) but the first Gloucestershire record was at Troopers Hill in 2006. Frequents grasslands, particularly calcareous to neutral unimproved meadows, but also waste ground and coastal grassland. The larvae develop in grass seeds, continental records include *Bromus erectus*, *B. inermis* and *Helicotrichon pubescens*. They probably leave the seeds and pupariate in the ground beneath. In Britain adults have been swept from *Bromus* species. Adults recorded in May and June (Falk & Ismay in prep.). Found in May.

Tricimba humeralis (RDBK)

This small chloropid fly was first noted in Britain as recently as 1996 based on a specimen from Isleworth, Middlesex. Subsequently specimens have been found from the same site in 1999, Berkshire and Kent in 1993, Bristol 2004 and Avonmouth 2007 (pers. obs.). So this is the third record for the region and suggests that it is becoming more frequent. The Isleworth specimens were swept from *Phragmites* infested with aphids, also from Japanese spindle flowers and the Berkshire specimen was found in a remnant of water meadow. Adults recorded in July and August (Falk & Ismay in prep.). Found in May.

Amiota alboguttata **Nationally Scarce**

This small black drosophilid fly is widely dispersed in England as far north as Yorkshire, also South Wales and Scotland. Locally there is a record from Ebbor Gorge, Somerset but this would appear to be the first record for Gloucestershire. Found in old broadleaved woodland, with a requirement for dead wood and old or diseased trees. The larvae develop in the fungus *Daldinia concentrica* on dead trunks and branches of trees such as beech (*Fagus*), birch (*Betula*), alder (*Alnus*) and probably others too. Adults recorded from June to August (Falk & Ismay in prep.). Another surprising find, Troopers Hill not being the preferred habitat; a single male swept from hawthorn foliage along the eastern boundary of the site.

Catharosia pygmaea (RDBK)

This small black parasitoid fly with infuscated wings was first recorded in Britain in 1996. The first British specimens were found in Coventry and subsequently at several

sites in London, but this is the first for the Bristol region. So far in this country it has been found in urban-fringe habitats such as old railway lines, on the continent prefers open country. Biology unknown but closely related species attack Lygaeid bugs. Adults recorded from July to September (Falk 1998; Tachinid recording scheme). Three males found in June.

Cistogaster globosa **RDB1 (RDB2)**

This attractive little parasitoid fly is known from a few localities in southern England: Wilts; Hants; Surrey; Berks (Falk & Pont in prep.). Just recently it has been found at many more sites and at one site in Wales (Howe & Woodman 2001) so it seems to be doing well at the moment hence the proposal in a forthcoming review to downgrade its status from RDB1 to RDB2. It seems probable that it will eventually lose its RDB status and be graded as Nationally Scarce. In Gloucestershire it was recorded for the first time in 1999 (Alexander 1999b) and in Somerset in 2001 with several localities now known (pers. obs). Frequents calcareous downland and grassland where it parasitises the hemipteran bug *Aelia acuminata* the Bishops Mitre. Adults recorded from June to September. Good colony still present in July.

Phasia barbifrons **(Nationally Scarce)**

This tiny black parasitoid fly was only discovered in Britain in 1999 in Kent, since then it has been reported at several more sites, nearly all close to or just west of London, with a single more northerly site in Nottinghamshire (S. Falk pers comm.). It has no official status but is being considered for inclusion in a forthcoming review. In Somerset it was first recorded at Radstock in 2005 and in Bath this year, but this seems to be the first for Gloucestershire (pers. obs.). Known from various grassy sites where it is presumed to parasitise Heteroptera. Adults recorded from May to October in two broods (Tachinid recording scheme). Found in July.

Regional rarities

A few other species are worth mentioning, the Ivy lace bug *Kalama tricornis* is nationally local and a county rarity, with just three old records reported. The sawflies *Rhogogaster genistae* and *Pachyprotasis simulans* are uncommon species, both with colonies at Troopers Hill and recorded several times before. Neither are recorded elsewhere in the region. The Small Heath *Coenonympha pamphilus* and Cinnabar *Tyria jacobaeae* have recently been added to the **UK BAP** list. Although both are still widespread and common locally, they have been identified as declining and with the potential to become scarce.

Management Recommendations

This has already been discussed in detail in the 2006 report and no data from the present survey requires that they be amended. Since 2006 a considerable amount of management work has been done and it can be seen that the site is opening out as scrub and trees are removed. It is very important that the hard work involved is not lost by failure to follow up and keep these areas clear until they revert to grassland.

Bramble clearance in particular will often not achieve a satisfactory long-term outcome because of the very considerable tenacity of this plant. Several of the patches cleared in early 2007 were already overgrown by the end of the summer. To make the best use of limited resources it is important to either:-

- Clear those areas where grassland still exists under the bramble canopy, i.e. where bramble has not become so robust to shade out all of the original flora.
- If dense bramble is to be cleared then this must be done with great thoroughness, removing roots and much of the humic soil, such that it is difficult for the bramble to simply re-sprout.

Clearing of deciduous trees has some of the same problems, they simply coppice back up. Once a tree is removed it is important to ensure that the rootstock is dead. This can be done with herbicides but on so small a site it should be possible to avoid this. For larger trees cut a small cavity in the cut top of the stump to allow water to gather. If opportunity allows then these stumps can be inoculated with lignicolous fungi which will hopefully establish, killing the stump and providing a new microhabitat for invertebrates. Smaller trees need to be re-cut every season until they stop coppicing.

Sapling clearance is one simple and important areas of management which does not seem to have been put into action yet. It is far better to clear trees when still very small so pre-empting damage to grassland. There are still numerous sapling holm oak and other trees across the remaining grassland which will ultimately cause a problem. Whenever there is a work party on the Hill, spend at least some time roaming the grassland pulling up by the roots (do not cut as they will just re-sprout) all saplings.

Further Survey

Monitoring every few years will prove informative and assist the direction of future management.

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**Appendix 1.
Annotated Checklist**

Order: Family	Species and Authority	Vernacular	National Status	April	May	June	July
Araneae: Gnaphosidae	Zelotes latreillei (Simon, 1878)			X			
Araneae: Salticidae	Heliophanus flavipes (Hahn, 1832)				X		
Odonata: Platycnemididae	Platycnemis pennipes (Pallas, 1771)	White-legged Damselfly				X	
Orthoptera: Acrididae	Chorthippus brunneus (Thunberg, 1815)	Common Field Grasshopper				X	X
Orthoptera: Acrididae	Chorthippus parallelus (Zetterstedt, 1821)	Meadow Grasshopper					X
Orthoptera: Acrididae	Myrmeleotettix maculatus (Thunberg, 1815)	Mottled Grasshopper				X	X
Dermaptera: Forficulidae	Forficula auricularia Linnaeus, 1758	Common Earwig				X	X
Dermaptera: Forficulidae	Forficula lesnei Finot, 1887		Scarce b	X	X		
Neuroptera: Chrysopidae	Nothochrysa capitata (Fabricius, 1793)					X	
Hemiptera: Membracidae	Centrotus cornutus (Linnaeus, 1758)		Local		X		
Hemiptera: Tingidae	Kalama tricornis (Schrank, 1801)		Local			X	
Hemiptera: Lygaeidae	Kleidocerys truncatulus ericae (Horvath, 1910)			X			
Hemiptera: Lygaeidae	Macrodema micropterum (Curtis, 1836)						X
Hemiptera: Lygaeidae	Megalonotus chiragra (Fabricius, 1794)			X			
Hemiptera: Coreidae	Coreus marginatus (Linnaeus, 1758)				X		
Hemiptera: Pentatomidae	Dolycoris baccarum (Linnaeus, 1758)				X		
Hemiptera: Pentatomidae	Palomena prasina (Linnaeus, 1761)					X	
Hemiptera: Pentatomidae	Piezodorus lituratus (Fabricius, 1794)			X			
Hemiptera: Acanthosomatidae	Acanthosoma haemorrhoidale (Linnaeus, 1758)				X		
Lepidoptera: Psychidae	Luffia lapidella (Goeze, 1783)			X			
Lepidoptera: Sesiidae	Bembecia ichneumoniformis ([Denis & Schiffermüller], 1775)	Six-belted Clearwing	Scarce b			X	
Lepidoptera: Coleophoridae	Coleophora deauratella Lienig & Zeller, 1846					X	
Lepidoptera: Gelechiidae	Teleiopsis diffinis (Haworth, 1828)					X	
Lepidoptera: Tortricidae	Grapholita compositella (Fabricius, 1775)						X
Lepidoptera: Pyralidae	Homoeosoma sinuella (Fabricius, 1794)				X		
Lepidoptera: Hesperidae	Thymelicus lineola (Ochsenheimer, 1808)	Essex Skipper					X

Order: Family	Species and Authority	Vernacular	National Status	April	May	June	July
Lepidoptera: HesperIIDae	Ochlodes faunus (Turati, 1905)	Large Skipper			X		
Lepidoptera: Pieridae	Anthocharis cardamines (Linnaeus, 1758)	Orange-tip		X			
Lepidoptera: Lycaenidae	Lycaena phlaeas (Linnaeus, 1761)	Small Copper		X			X
Lepidoptera: Lycaenidae	Polyommatus icarus (Rottemburg, 1775)	Common Blue		X			
Lepidoptera: Lycaenidae	Celastrina argiolus (Linnaeus, 1758)	Holly Blue					X
Lepidoptera: Nymphalidae	Vanessa atalanta (Linnaeus, 1758)	Red Admiral					X
Lepidoptera: Nymphalidae	Inachis io (Linnaeus, 1758)	Peacock		X			
Lepidoptera: Satyridae	Melanargia galathea (Linnaeus, 1758)	Marbled White				X	
Lepidoptera: Satyridae	Pyronia tithonus (Linnaeus, 1771)	Gatekeeper					X
Lepidoptera: Satyridae	Maniola jurtina (Linnaeus, 1758)	Meadow Brown					X
Lepidoptera: Satyridae	Coenonympha pamphilus (Linnaeus, 1758)	Small Heath	UK BAP			X	
Lepidoptera: Satyridae	Aphantopus hyperantus (Linnaeus, 1758)	Ringlet				X	
Lepidoptera: Arctiidae	Tyria jacobaeae (Linnaeus, 1758)	Cinnabar	UK BAP		X		
Coleoptera: Elateridae	Prosternon tessellatum (Linnaeus, 1758)	Chequered Click Beetle			X		
Coleoptera: Cantharidae	Cantharis decipiens Baudi, 1871				X		
Coleoptera: Cantharidae	Rhagonycha fulva (Scopoli, 1763)				X	X	
Coleoptera: Melyridae	Malachius bipustulatus (Linnaeus, 1758)	Malachite Beetle					X
Coleoptera: Phalacridae	Olibrus affinis (Sturm, 1807)					X	X
Coleoptera: Coccinellidae	Propylea quattuordecimpunctata (Linnaeus, 1758)	14-spot Ladybird				X	
Coleoptera: Coccinellidae	Coccinella septempunctata Linnaeus, 1758	7-spot Ladybird			X	X	
Coleoptera: Coccinellidae	Adonia variegata (Goeze, 1777)	Adonis' Ladybird	Scarce b			X	
Coleoptera: Tenebrionidae	Cylindrinotus laevioctostriatus (Goeze, 1777)			X			
Coleoptera: Oedemeridae	Oedemera nobilis (Scopoli, 1763)	Swollen-thighed Beetle			X	X	X
Coleoptera: Oedemeridae	Oedemera lurida (Marsham, 1802)				X	X	X
Coleoptera: Bruchidae	Bruchidius villosus (Fabricius, 1792)			X	X	X	
Coleoptera: Chrysomelidae	Cryptocephalus aureolus Suffrian, 1847		Scarce b		X		
Coleoptera: Chrysomelidae	Cryptocephalus fulvus Goeze, 1777					X	X
Coleoptera: Chrysomelidae	Cryptocephalus labiatus (Linnaeus, 1761)				X		
Coleoptera: Apionidae	Apion haematodes Kirby, W., 1808				X		

Order: Family	Species and Authority	Vernacular	National Status	April	May	June	July
Coleoptera: Curculionidae	<i>Strophosoma nebulosum</i> (Stephens, 1831)						X
Coleoptera: Curculionidae	<i>Trichosirocalus troglodytes</i> (Fabricius, 1787)			X		X	
Coleoptera: Curculionidae	<i>Tychius stephensi</i> Gyllenhal, 1836						X
Coleoptera: Curculionidae	<i>Mecinus pyrastrer</i> (Herbst, 1795)			X			
Hymenoptera: Argidae	<i>Arge berberidis</i> Schrank, 1802	Berberis sawfly		X			X
Hymenoptera: Tenthredinidae	<i>Periclista lineolata</i> (Klug, 1816)	a sawfly		X			
Hymenoptera: Tenthredinidae	<i>Rhogogaster genistae</i> (Benson, 1947)	a sawfly	Local	X			
Hymenoptera: Tenthredinidae	<i>Pachyprotasis simulans</i> (Klug, 1817)	a sawfly	Local	X			
Hymenoptera: Cephidae	<i>Calameuta pallipes</i> (Klug, 1803)	a sawfly			X		
Hymenoptera: Ichneumonidae	<i>Tromatobia oculatoria</i> (Fabricius, 1798)	an ichneumon				X	
Hymenoptera: Ichneumonidae	<i>Pimpla contemplator</i> (Müller, 1776)	an ichneumon			X		
Hymenoptera: Sapygidae	<i>Sapyga quinquepunctata</i> (Fabricius, 1781)	a solitary wasp			X		
Hymenoptera: Pompilidae	<i>Anoplius nigerrimus</i> (Scopoli, 1763)	a spider-hunter wasp				X	X
Hymenoptera: Pompilidae	<i>Aporus unicolor</i> Spinola, 1808	a spider-hunter wasp	Scarce b			X	X
Hymenoptera: Pompilidae	<i>Arachnospila spissa</i> (Schioedte, 1837)	a spider-hunter wasp			X		
Hymenoptera: Pompilidae	<i>Priocnemis exaltata</i> (Fabricius, 1775)	a spider-hunter wasp					X
Hymenoptera: Pompilidae	<i>Priocnemis pusilla</i> Schioedte, 1837	a spider-hunter wasp			X		
Hymenoptera: Eumenidae	<i>Microdynerus exilis</i> (Herrich-Schaeffer, 1839)	a mason wasp	Scarce b			X	
Hymenoptera: Sphecidae	<i>Ammophila sabulosa</i> (Linnaeus, 1758)	Red Banded Sand Wasp			X	X	
Hymenoptera: Sphecidae	<i>Astata boops</i> (Schrank, 1781)	a digger wasp					X
Hymenoptera: Sphecidae	<i>Cerceris rybyensis</i> (Linnaeus, 1771)	Ornate Tailed Digger Wasp			X	X	X
Hymenoptera: Sphecidae	<i>Crossocerus annulipes</i> (Lepeletier & Brulle, 1835)	a digger wasp					X
Hymenoptera: Sphecidae	<i>Crossocerus distinguendus</i> (Morawitz, A., 1866)	a digger wasp	Scarce a				X
Hymenoptera: Sphecidae	<i>Crossocerus podagricus</i> (Vander Linden, 1829)	a digger wasp				X	
Hymenoptera: Sphecidae	<i>Gorytes quadrifasciatus</i> (Fabricius, 1804)	4-banded Digger Wasp				X	
Hymenoptera: Sphecidae	<i>Lindenius albilabris</i> (Fabricius, 1793)	a digger wasp			X	X	X
Hymenoptera: Sphecidae	<i>Pemphredon inornata</i> Say, 1824	a digger wasp					X
Hymenoptera: Sphecidae	<i>Pemphredon lethifera</i> (Shuckard, 1837)	a digger wasp			X		
Hymenoptera: Sphecidae	<i>Philanthus triangulum</i> (Fabricius, 1775)	Bee Wolf	RDB2				X

Order: Family	Species and Authority	Vernacular	National Status	April	May	June	July
Hymenoptera: Sphecidae	Psenulus schencki (Tournier, 1889)	a digger wasp	Scarce a				X
Hymenoptera: Sphecidae	Tachysphex pompiliformis (Panzer, 1805)	a digger wasp					X
Hymenoptera: Sphecidae	Trypoxylon attenuatum Smith, F., 1851	Slender Wood Borer Wasp			X		
Hymenoptera: Apidae	Andrena angustior (Kirby, 1802)	a mining bee		X			
Hymenoptera: Apidae	Andrena bicolor Fabricius, 1775	Gwynne's Mining Bee				X	
Hymenoptera: Apidae	Andrena cineraria (Linnaeus, 1758)	Grey Mining Bee		X	X		
Hymenoptera: Apidae	Andrena dorsata (Kirby, 1802)	a mining bee				X	X
Hymenoptera: Apidae	Andrena flavipes Panzer, 1799	Yellow Legged Mining Bee		X		X	X
Hymenoptera: Apidae	Andrena fulva (Muller in Allioni, 1776)	a mining bee		X			
Hymenoptera: Apidae	Andrena fulvago (Christ, 1791)	a mining bee	Scarce a			X	
Hymenoptera: Apidae	Andrena humilis Imhoff, 1832	a mining bee	Scarce b		X	X	
Hymenoptera: Apidae	Andrena minutula (Kirby, 1802)	a mining bee		X		X	
Hymenoptera: Apidae	Andrena nitida (Muller, 1776)	a mining bee		X			
Hymenoptera: Apidae	Andrena ovatula (Kirby, 1802)	a mining bee					X
Hymenoptera: Apidae	Andrena semilaevis Perez, 1903	a mining bee				X	
Hymenoptera: Apidae	Anthophora bimaculata (Panzer, 1798)	a solitary bee				X	X
Hymenoptera: Apidae	Apis mellifera Linnaeus, 1758	Honey Bee					X
Hymenoptera: Apidae	Bombus lapidarius (Linnaeus, 1758)	Large Red Tailed Bumble Bee				X	X
Hymenoptera: Apidae	Bombus pascuorum (Scopoli, 1763)	Common Carder Bee		X		X	X
Hymenoptera: Apidae	Bombus terrestris (Linnaeus, 1758)	Buff-tailed Bumble Bee		X		X	X
Hymenoptera: Apidae	Bombus vestalis (Geoffroy in Fourcroy, 1785)	a bumblebee		X			
Hymenoptera: Apidae	Chelostoma campanularum (Kirby, 1802)	Harebell Carpenter Bee				X	
Hymenoptera: Apidae	Colletes similis Schenck, 1853	a mining bee				X	
Hymenoptera: Apidae	Colletes succinctus (Linnaeus, 1758)	a mining bee					X
Hymenoptera: Apidae	Halictus tumulorum (Linnaeus, 1758)	a mining bee				X	
Hymenoptera: Apidae	Hylaeus annularis (Kirby, 1802)	a solitary bee					X
Hymenoptera: Apidae	Hylaeus cornutus Curtis, 1831	a solitary bee	Scarce a				X
Hymenoptera: Apidae	Lasioglossum leucozonium (Schrank, 1781)	a mining bee					X
Hymenoptera: Apidae	Lasioglossum morio (Fabricius, 1793)	Brassy Mining Bee		X		X	X

Order: Family	Species and Authority	Vernacular	National Status	April	May	June	July
Hymenoptera: Apidae	Lasioglossum parvulum (Schenck, 1853)	a mining bee				X	X
Hymenoptera: Apidae	Lasioglossum villosulum (Kirby, 1802)	Shaggy Mining Bee			X	X	X
Hymenoptera: Apidae	Megachile willughbiella (Kirby, 1802)	Willughby's Leaf-cutter Bee				X	
Hymenoptera: Apidae	Nomada flavoguttata (Kirby, 1802)	a solitary bee		X		X	X
Hymenoptera: Apidae	Nomada fucata Panzer, 1798	a solitary bee	Scarce a	X		X	X
Hymenoptera: Apidae	Nomada goodeniana (Kirby, 1802)	Gooden's Nomad Bee		X			
Hymenoptera: Apidae	Nomada integra Brulle, 1832	a solitary bee	Scarce a	X	X		
Hymenoptera: Apidae	Nomada lathburiana (Kirby, 1802)	a solitary bee	RDB3	X			
Hymenoptera: Apidae	Nomada ruficornis (Linnaeus, 1758)	Red-horned Nomad Bee		X			
Hymenoptera: Apidae	Nomada rufipes Fabricius, 1793	Golden-rod Nomad Bee				X	X
Hymenoptera: Apidae	Nomada striata Fabricius, 1793	a solitary bee				X	
Hymenoptera: Apidae	Panurgus banksianus (Kirby, 1802)	a mining bee				X	
Hymenoptera: Apidae	Sphecodes crassus Thomson, 1870	a cuckoo bee	Scarce b			X	
Hymenoptera: Apidae	Sphecodes ephippius (Linnaeus, 1767)	a cuckoo bee		X		X	X
Hymenoptera: Apidae	Sphecodes geoffrellus (Kirby, 1802)	a cuckoo bee			X	X	X
Hymenoptera: Apidae	Sphecodes monilicornis (Kirby, 1802)	a cuckoo bee		X			X
Diptera: Tipulidae	Tipula cava Riedel, 1913			X			
Diptera: Tipulidae	Tipula vernalis Meigen, 1804			X			
Diptera: Limoniidae	Limonia nubeculosa Meigen, 1804						X
Diptera: Keroplatidae	Orfelia tristis (Lundström, 1911)					X	
Diptera: Mycetophilidae	Sciophila nigronitida Landrock, 1925		Scarce			X	
Diptera: Sciaridae	Schwenckfeldina carbonaria (Meigen, 1830)			X			
Diptera: Stratiomyidae	Beris geniculata Haliday in Curtis, 1830						X
Diptera: Stratiomyidae	Beris vallata (Forster, 1771)						X
Diptera: Stratiomyidae	Chorisops tibialis (Meigen, 1820)						X
Diptera: Stratiomyidae	Pachygaster atra (Panzer, [1798])						X
Diptera: Stratiomyidae	Pachygaster leachii Stephens in Curtis, 1824					X	X
Diptera: Stratiomyidae	Chloromyia formosa (Scopoli, 1763)					X	
Diptera: Stratiomyidae	Microchrysa polita (Linnaeus, 1758)						X

Order: Family	Species and Authority	Vernacular	National Status	April	May	June	July
Diptera: Bombyliidae	<i>Bombylius discolor</i> Mikan, 1796		Scarce	X			
Diptera: Bombyliidae	<i>Bombylius major</i> Linnaeus, 1758			X			
Diptera: Asilidae	<i>Dysmachus trigonus</i> (Meigen, 1804)			X		X	
Diptera: Asilidae	<i>Machimus cingulatus</i> (Fabricius, 1781)						X
Diptera: Asilidae	<i>Leptogaster cylindrica</i> (De Geer, 1776)				X	X	
Diptera: Asilidae	<i>Dioctria baumhaueri</i> Meigen, 1820				X	X	
Diptera: Hybotidae	<i>Drapetis ephippiata</i> (Fallén, 1815)					X	
Diptera: Hybotidae	<i>Platypalpus incertus</i> (Collin, 1926)		None (Scarce)			X	
Diptera: Hybotidae	<i>Platypalpus longiseta</i> (Zetterstedt, 1842)						X
Diptera: Hybotidae	<i>Platypalpus optivus</i> (Collin, 1926)					X	X
Diptera: Empididae	<i>Hilara maura</i> (Fabricius, 1776)			X			
Diptera: Empididae	<i>Rhamphomyia albohirta</i> Collin, 1926			X			
Diptera: Dolichopodidae	<i>Chrysotus gramineus</i> (Fallén, 1823)					X	X
Diptera: Dolichopodidae	<i>Medetera saxatilis</i> Collin, 1941					X	
Diptera: Dolichopodidae	<i>Medetera truncorum</i> Meigen, 1824					X	
Diptera: Dolichopodidae	<i>Sciapus longulus</i> (Fallén, 1823)					X	
Diptera: Lonchopteridae	<i>Lonchoptera bifurcata</i> (Fallén, 1810)					X	X
Diptera: Syrphidae	<i>Paragus haemorrhous</i> Meigen, 1822			X		X	X
Diptera: Syrphidae	<i>Epistrophe eligans</i> (Harris, [1780])			X			
Diptera: Syrphidae	<i>Episyrphus balteatus</i> (De Geer, 1776)				X		
Diptera: Syrphidae	<i>Sphaerophoria scripta</i> (Linnaeus, 1758)					X	
Diptera: Syrphidae	<i>Cheilosia impressa</i> Loew, 1840						X
Diptera: Syrphidae	<i>Cheilosia pagana</i> (Meigen, 1822)						X
Diptera: Syrphidae	<i>Cheilosia soror</i> (Zetterstedt, 1843)		Scarce				X
Diptera: Syrphidae	<i>Cheilosia urbana</i> (Meigen, 1822)			X			
Diptera: Syrphidae	<i>Myathropa florea</i> (Linnaeus, 1758)					X	
Diptera: Syrphidae	<i>Merodon equestris</i> (Fabricius, 1794)				X	X	
Diptera: Syrphidae	<i>Syrirta pipiens</i> (Linnaeus, 1758)				X	X	

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Diptera: Pipunculidae	<i>Eudorylas arcanus</i> Coe, 1966		Scarce			X	
Diptera: Pipunculidae	<i>Eudorylas obliquus</i> Coe, 1966				X		
Diptera: Pipunculidae	<i>Tomosvaryella geniculata</i> (Meigen, 1824)					X	
Diptera: Conopidae	<i>Sicus ferrugineus</i> (Linnaeus, 1761)						X
Diptera: Lonchaeidae	<i>Dasiops mucronatus</i> Morge, 1959				X		
Diptera: Lonchaeidae	<i>Lonchaea iona</i> MacGowan, 2001			X			
Diptera: Lonchaeidae	<i>Lonchaea tarsata</i> Fallén, 1820				X		
Diptera: Tephritidae	<i>Tephritis neesii</i> (Meigen, 1830)						X
Diptera: Tephritidae	<i>Tephritis vespertina</i> (Loew, 1844)			X	X	X	X
Diptera: Tephritidae	<i>Anomoia purmunda</i> (Harris, [1780])						X
Diptera: Lauxaniidae	<i>Homoneura interstincta</i> (Fallén, 1820)		RDB3			X	X
Diptera: Lauxaniidae	<i>Homoneura notata</i> (Fallén, 1820)						X
Diptera: Lauxaniidae	<i>Homoneura thalhammeri</i> Papp, 1978		Scarce			X	X
Diptera: Lauxaniidae	<i>Minettia longipennis</i> (Fabricius, 1794)				X		X
Diptera: Lauxaniidae	<i>Minettia longiseta</i> (Loew, 1847)					X	
Diptera: Lauxaniidae	<i>Minettia fasciata</i> (=rivosa) (Fallén, 1826)				X	X	X
Diptera: Lauxaniidae	<i>Sapromyza quadripunctata</i> (Linnaeus, 1767)				X	X	
Diptera: Chamaemyiidae	<i>Chamaemyia aridella</i> (Fallén, 1823)					X	X
Diptera: Chamaemyiidae	<i>Chamaemyia herbarum</i> (Robineau-Desvoidy, 1830)				X	X	X
Diptera: Chamaemyiidae	<i>Leucopis glyphinivora</i> Tanasijtshuk, 1958						X
Diptera: Sciomyzidae	<i>Colobaea punctata</i> (Lundbeck, 1923)		Scarce		X		
Diptera: Sepsidae	<i>Nemopoda nitidula</i> (Fallén, 1820)				X		
Diptera: Sepsidae	<i>Saltella sphondylii</i> (Schrank, 1803)						X
Diptera: Sepsidae	<i>Sepsis fulgens</i> Meigen, 1826						X
Diptera: Agromyzidae	<i>Agromyza johannae</i> de Meijere, 1924			X			
Diptera: Agromyzidae	<i>Agromyza idaeiana</i> (Hardy, 1853)						X
Diptera: Agromyzidae	<i>Ophiomyia beckeri</i> (Hendel, 1923)			X		X	
Diptera: Agromyzidae	<i>Ophiomyia cunctata</i> (Hendel, 1920)					X	

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Diptera: Agromyzidae	Ophiomyia pulicaria (Meigen, 1830)				X	X	
Diptera: Agromyzidae	Cerodontha denticornis (Panzer, [1806])						X
Diptera: Agromyzidae	Cerodontha atra (Meigen, 1830)				X		
Diptera: Agromyzidae	Chromatomyia nigra (Meigen, 1830)				X	X	
Diptera: Agromyzidae	Liriomyza hieracii (Kaltenbach, 1862)				X		X
Diptera: Agromyzidae	Liriomyza richteri Hering, 1927						X
Diptera: Agromyzidae	Napomyza lateralis (Fallén, 1823)					X	
Diptera: Agromyzidae	Phytomyza plantaginis Robineau-Desvoidy, 1851				X	X	
Diptera: Agromyzidae	Phytomyza ranunculi (Schrank, 1803)					X	
Diptera: Agromyzidae	Phytomyza sedi Kaltenbach, 1869		RDBK		X		
Diptera: Opomyzidae	Geomyza tripunctata Fallén, 1823				X		
Diptera: Opomyzidae	Opomyza germinationis (Linnaeus, 1758)					X	
Diptera: Milichiidae	Desmometopa sordida (Fallén, 1820)					X	
Diptera: Chloropidae	Meromyza femorata Macquart, 1835						X
Diptera: Chloropidae	Meromyza triangulina Fedoseeva, 1960				X		
Diptera: Chloropidae	Meromyza variegata Meigen, 1830					X	X
Diptera: Chloropidae	Thaumatomyia glabra (Meigen, 1830)				X	X	
Diptera: Chloropidae	Thaumatomyia hallandica Andersson, 1966				X	X	X
Diptera: Chloropidae	Thaumatomyia notata (Meigen, 1830)			X	X	X	X
Diptera: Chloropidae	Dicraeus ingratus (Loew, 1866)					X	
Diptera: Chloropidae	Dicraeus tibialis (Macquart, 1835)		Scarce	X			
Diptera: Chloropidae	Dicraeus vagans (Meigen, 1838)				X	X	
Diptera: Chloropidae	Incertella albipalpis (Meigen, 1830)					X	
Diptera: Chloropidae	Lasiambia palposa (Fallén, 1820)						X
Diptera: Chloropidae	Oscinella frit (Linnaeus, 1758)			X	X	X	X
Diptera: Chloropidae	Oscinella hortensis Collin, 1946				X		X
Diptera: Chloropidae	Oscinella maura (Fallén, 1820)				X		
Diptera: Chloropidae	Oscinomorpha minutissima (Strobl, 1900)					X	X
Diptera: Chloropidae	Tricimba humeralis (Loew, 1858)		RDBK		X		

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Diptera: Heleomyzidae	Suillia variegata (Loew, 1862)				X		
Diptera: Drosophilidae	Scaptomyza pallida (Zetterstedt, 1847)					X	X
Diptera: Drosophilidae	Amiota alboguttata (Wahlberg, 1839)		Scarce	X			
Diptera: Ephydriidae	Psilopa nitidula (Fallén, 1813)					X	
Diptera: Ephydriidae	Scatella tenuicosta Collin, 1930					X	X
Diptera: Ephydriidae	Hydrellia griseola (Fallén, 1813)					X	X
Diptera: Ephydriidae	Philygria vittipennis (Zetterstedt, [1838])			X			
Diptera: Anthomyiidae	Anthomyia liturata (Robineau-Desvoidy, 1830)				X	X	X
Diptera: Anthomyiidae	Delia florilega (Zetterstedt, 1845)					X	X
Diptera: Anthomyiidae	Delia platura (Meigen, 1826)					X	X
Diptera: Anthomyiidae	Heterostylodes nominabilis (Collin, 1947)				X		
Diptera: Anthomyiidae	Leucophora personata (Collin, 1921)			X	X		
Diptera: Anthomyiidae	Subhylemyia longula (Fallén, 1824)			X		X	
Diptera: Anthomyiidae	Pegomya meridiana (Villeneuve, 1923)					X	
Diptera: Fanniidae	Fannia armata (Meigen, 1826)					X	
Diptera: Fanniidae	Fannia manicata (Meigen, 1826)			X	X		
Diptera: Muscidae	Coenosia tigrina (Fabricius, 1775)						X
Diptera: Muscidae	Schoenomyza litorella (Fallén, 1823)					X	X
Diptera: Muscidae	Hydrotaea armipes (Fallén, 1825)			X			
Diptera: Muscidae	Helina lasiophthalma (Macquart, 1835)				X		
Diptera: Muscidae	Helina reversio (Harris, [1780])			X	X	X	X
Diptera: Muscidae	Phaonia pallida (Fabricius, 1787)					X	
Diptera: Calliphoridae	Lucilia sericata (Meigen, 1826)					X	
Diptera: Calliphoridae	Melanomya nana (Meigen, 1826)						X
Diptera: Rhinophoridae	Rhinophora lepida (Meigen, 1824)					X	X
Diptera: Sarcophagidae	Sarcophaga melanura Meigen, 1826						X
Diptera: Tachinidae	Dinera grisescens (Fallén, 1817)					X	
Diptera: Tachinidae	Eriothrix rufomaculata (De Geer, 1776)						X
Diptera: Tachinidae	Ramonda spatulata (Fallén, 1820)					X	X

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Diptera: Tachinidae	<i>Catharosia pygmaea</i> (Fallén, 1815)		RDBK			X	
Diptera: Tachinidae	<i>Phania funesta</i> (Meigen, 1824)				X	X	
Diptera: Tachinidae	<i>Cistogaster globosa</i> (Fabricius, 1775)		RDB1 (RDB2)				X
Diptera: Tachinidae	<i>Phasia pusilla</i> Meigen, 1824					X	X
Diptera: Tachinidae	<i>Phasia barbifrons</i> (Girschner, 1887)		Scarce				X
Diptera: Tachinidae	<i>Solieria pacifica</i> (Meigen, 1824)					X	
		Totals	262	61	73	127	112
		No. Scarce and RDB species	30(18,6,6)				
		% Scarce and RDB species	11.5				
		No. RDB species	6				
		% RDB species	2.3				