Invertebrate Survey of

Troopers Hill

Bristol vc34 ST 62 73

Nomada guttulata

a report to

Bristol City Council

David Gibbs

2000

Invertebrate Survey of Troopers Hill, Bristol. vc34 ST 62 73

Summary

- 137 species found, a good diversity for a site of this type and size
- 13 Nationally Scarce and RDB species identified, 9.5% of total, higher than all but the very best sites in the region
- the endangered RDB1 nomad bee *Nomada guttulata* found
- the site pre-eminently important for the Hymenoptera
- bare ground caused by erosion very important for nesting bees and wasps
- broom and gorse support very scarce insects

Introduction

Troopers Hill is a small area of flower rich grassland developed on the very poor soils left over after metal mining operations. 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 has for long been known to harbour a small colony of Grayling *Hipparchia semele* (now probably extinct) and recently its great importance for less well known insects, particularly Hymenoptera, has been recognised. The present survey is the first attempt to characterise these insect communities and assess their conservation importance in a national and local context.

Survey Methods

The site was visited specifically for this survey on three occasions in the summer, data from two other casual visits have also been included. The visits were spread through the season on 2 May, 11 & 15 June, 30 July, 16 & 17 August. Weather conditions during these session were generally sunny and warm but often windy and with some cloud cover.

Surveying involved searching flowers for larger species, notably hoverflies, bees and wasps, but many specimens were taken by sweeping with a 14 inch diameter white-bag net. This net was swept through grass and herbaceous vegetation or used to beat insects from scrub and trees adjacent to the grassland. Beetles and ground bugs were usually found by close searching of areas of bare ground or sparse vegetation. Butterflies, 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. All specimens were pinned and set that evening or, in the case of soft-bodied invertebrates such as spiders, preserved in a solution of IMS.

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; 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.

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.

The national status Local, has not been used in the analysis of results as these (as presented in RECORDER) are highly subjective and inconsistent. Also such a large number of species would come into this category that to present biological information and analyse it would tend to be confusing and cumbersome.

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 county. Unfortunately the fauna of the county 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 present survey is confined to the open areas of grassland, scree and scrub of the Troopers Hill LNR and does not include the woodland immediately to the west of this area. The visits spread over the summer produced a total diversity of 137 species which for such a small, isolated site of relatively uniform habitat is surprisingly high. Of these 13 proved to be of Nationally Scarce or RDB status, 9.5% of the total diversity. This is a very impressive quality, only two sites in this area have as yet proved to harbour a higher proportion of conservation significant invertebrates (Dolebury Warren with 14% and Avon Gorge with 11.5%).

Table 1. taxonomic coverage of survey results.

Group	All species	Nb	Na	RDB
Araneae	4			
Odonata	1			
Orthoptera	5			
Dermaptera	1			
Hemiptera	4			
Lepidoptera	18			
Coleoptera	18	1		
Hymenoptera	59	2	4	3
Diptera	27	3		
totals	137	6	4	3

Table 1 shows the contribution to the total diversity and invertebrate quality from each of the taxonomic groups found. It is very apparent that the site is particularly important for the Hymenoptera with 59 species found 9 of them scarce or rare (15.3%). This high quality of Hymenoptera is amply supported by the considerable number of species which are exceedingly local in Gloucestershire and Somerset. Diptera are also fairly important with 11% of the species found being nationally scarce. The Lepidoptera did not produce any Nationally Scarce species but in a local context the site harbours very important colonies of species not seen in the region for over 50 years if at all.

Table 2. distribution within the site of Nationally Scarce and RDB species.

Species	status	2000	1999	1998
Cryptocephalus aureolus	Nb	X		
Tiphia minuta	Nb		X	
Nysson trimaculatus	Nb		X	
Philanthus triangulum	RDB2	X		
Andrena fulvago	Na		X	
Andrena humilis	Nb	X	X	X
Andrena labiata	Na	X	X	
Andrena tibialis	Na			X
Andrena trimmerana	Nb		X	
Sphecodes crassus	Nb	X	X	
Sphecodes reticulatus	Na	X		
Nomada fucata	Na	X	X	X
Nomada guttulata	RDB1	X		
Nomada integra	Na	X	X	
Nomada lathburiana	RDB3	X	X	
Bombus rupestris	Nb		X	
Chorisops nagatomii	N	X		
Bombylius discolor	Nb	X	X	
Micropeza lateralis	N	X		
Totals (all years=19)		13	12	3

Table 2 lists all the nationally Scarce and RDB species recorded by the surveyor over the last three years. Only those recorded this year are included in the main analysis. In 1998 only one visit was made and few specimens collected, the table clearly shows that in 1999 and 2000 when approximately equal time was invested the number of scarce species found remained remarkably constant.

Species Accounts

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 really should not merit the scarcity status given to it (Duff 1993). It likes open grassy places preferring light soils especially calcareous areas. Often to be found on yellow composites (Hyman 1992). One male found on 15 June but it would appear to be very scarce on Troopers Hill.

Philanthus triangulum **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. Locally it first turned up in Gloucestershire a few years ago (M. Smith pers. comm.) and is now established at Brean Down in Somerset (pers. obs.), but this is the first confirmed breeding record for vc 34. 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*.). Both sexes seen in good numbers and nest digging observed on 30 July and 17 August.

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) 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). A large healthy colony was found at Troopers Hill in 1998, which was still going strong in 1999 (pers. obs); rather low numbers recorded on 2 May 2000.

Andrena labiata **Nationally Scarce a**

A fairly small mining-bee easily recognised by the broad red band across the abdomen although care is needed not to mistake it for members of the genus *Sphecodes*. It is widespread in England and Wales north to Cumbria but mainly in the south. It has gone through a period of great scarcity contracting to the south coast counties (Falk 1991a) but in recent years the situation is much improved.

The national situation is reflected locally with only 5 old undated records from Gloucestershire and Somerset (Alexander 1999a; Perkins 1924); recently it has been found to occur in good numbers at Crook Peak (pers. obs.). Frequents coastal cliffs, grasslands and open woodland nesting in sandy banks fully exposed to the sun. Single brooded flying from late April to late June reportedly gathering pollen exclusively from *Veronica* (Falk a *op. cit.*) but it seems likely that *Ranunculus* are also important (pers. obs.). A few individuals seen on 2 May.

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. There are two old records from Gloucestershire (Alexander 1999a) and recently it has been found at several sites in Somerset (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*, none of which were recorded during this survey but *L. parvulum* does occur. 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). Taken on 30 July.

Sphecodes reticulatus **Nationally Scarce a**
Another black and red cuckoo-bee this species is a very scarce with confirmed records confined to southern England from Kent to Devon and north to Norfolk in the east. There are no historic records from Somerset or Gloucestershire but it was discovered at Radstock in 1999 (pers. obs.). It is known from various habitats on light soils including sandy heaths, soft rock cliffs, open woodland, sandpits and occasionally chalk grassland. It is a cleptoparasite of mining bees, although the specific host or hosts have not been determined it almost certainly attacks one or more species of *Lasioglossum* and/or *Andrena*. Suggested hosts include *L. prasinum*, *A. argentata*, *A. dorsata* and *A barbilabris*, none of which have yet been found at the site. 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 recorded from May to September, males from July to October; visits flowers such as *Angelica*, *Pastinaca*, *Daucus*, *Achillea*, *Tripleurospermum* and *Cirsium* (Falk 1991a). Individuals found on 15 June and 16 August.

Nomada fucata **Nationally Scarce a**
This black, yellow and red nomad bee is historically widespread in southern England but declined considerably and there are about 30 post-1970 sites (Falk 1991a). However, recently it has shown a remarkable recovery and is now one of the more frequently met with *Nomadas*. Its status as Na needs reviewing. Locally there are no historic records from Gloucestershire (Alexander 1999a) but it is recorded from north Somerset (Falk a *op.cit*.). Recently it has proved frequent with records from numerous sites especially in north Somerset (pers. obs.). Favours a wide variety of open sandy and grassy situations which offer a rich flora and bare, sunny cliffs and slopes. It is a cleptoparasite of the mining bee *Andrena flavipes* which forms dispersed or

concentrated colonies in bare sandy or clayey soils. They are known to be highly faithful to their developmental sites and reluctant to move to new areas so disruption of a colony, even if apparently suitable habitat remains close by, could be seriously detrimental to *A. flavipes* and even more so for *N. fucata*. *N. fucata* is, like its host, double brooded flying from April to May and July to August (Falk 1991a). A very strong colony exists at Troopers Hill, seen on 2 May and 30 July.

Nomada guttulata **RDB1**
This small black and red nomad-bee with small yellow spots has always been a great rarity in Britain and is now considered to be endangered. Historically it was known from Cornwall to Kent and north to Suffolk (Falk 1991a). Recently the species has only been recorded at four sites in Hampshire and Dorset (M. Edwards pers.comm.). It has never been recorded from either Somerset or Gloucestershire, indeed in the west all records are close to the south coast so its presence within the Bristol City boundaries is quite extraordinary. Usually found on sandy heathland, coastal cliffs and gravel pits. It is a cleptoparasite of the mining-bee *Andrena labiata* which collects pollen from *Veronica* (Falk a *op.cit*.) and possibly *Ranunculus*. *N. guttulata* flies from early May to June also visiting the flowers of *Veronica* and sometimes yellow composites. As discussed above *A. labiata* has become commoner in recent years and it is possible that this may allow *N. guttulata* to increase as well. However, *N. guttulata* was rare even when *A. labiata* was a common garden insect so its significance at Troopers Hill, its most northerly known extant site, cannot be underestimated. One male found on 15 June.

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 1999); in Somerset it is recorded from Kewstoke Woods (Perkins 1924) and recently from Dolebury Warren (pers.obs.). It is a cleptoparasite 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 a *op.cit*.). A strong colony is established at Troopers Hill, individuals seen on 2 May and 15 June.

Nomada lathburiana **RDB3**
This black, red and yellow wasp-mimicking nomad bee is widely distributed in southern England and Wales north to Yorkshire. It has undergone a considerable decline nationally, especially in lowland sites, but appears to be coming back (Falk 1991a). Locally there are no old records despite its host being common in a couple of areas in Somerset (Perkins 1924). Recently it has become well established in

Gloucestershire and especially north Somerset (Alexander 1999a; pers. obs.). Favours a variety of habitats including open woodland, chalk grassland, coastal landslips and moorland edge. It is a brood parasite of the mining bee *Andrena cineraria* which is also commoner than formerly and is abundant at Troopers Hill (pers.obs.). *N. lathburiana* is on the wing from April to June visiting the flowers of *Prunus*, *Ribes*, *Salix* and *Taraxacum*. The host nests in bare soil and collects pollen from a variety of trees and herbs; *Crataegus* and *Salix* are likely to be important. A strong colony is established at Troopers Hill, individuals seen on 2 May and 15 June.

Chorisops nagatomii **Nationally Scarce**
This small metallic green and yellow soldier fly is widespread but very local in southern England north to Yorkshire and south Wales. It is probably not too uncommon in Gloucestershire with six records (Alexander 1999b) and there is at least one record from north Somerset (pers.obs.). Its habitat preferences are far from clear, being taken in broadleaved woodland, parkland, wetlands and riparian habitats. The larval requirements are not known but circumstantial evidence suggests that it develops in damp leaf litter, perhaps close to streams. Adults are recorded from July to September; the male sometimes found in numbers around large trees (Falk 1991b). One swept from fringing shrubs on 16 August.

Bombylius discolor **Nationally Scarce b**
The Dotted beefly is a robust furry insect with conspicuous spots on the wings which has been chosen as a subject for the UK biodiversity action plan. Formerly this 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.). This fly is a cleptoparasite of mining bees, the primary host in this region is almost certainly *Andrena flavipes* which is very common at Troopers Hill. 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. Troopers Hill holds one of the strongest colonies of this species in the region; at least 6+ ovipositing females seen on 2 May.

Micropeza lateralis **Nationally Scarce**
This long, slender stilt-legged fly is recorded from southern England and one site in Scotland but appears to be very local (Collin 1945). There do not appear to be any previous records at all for either Somerset or Gloucestershire. Its ecological requirements are unknown but it appears to like warm sites with bare sandy areas such as soft-rock cliffs and dunes. A single female was found on 16 August.

Regional rarities
In addition to those species discussed above Troopers Hill proved to be very important for species which, while too common and widespread to achieve nationally scarce status are exceedingly rare in this region. This is probably due to the heathy nature of the site which is barely represented elsewhere locally so species like *Alydus calcaratus* a heathland bug can flourish. The moth *Coleophora saturatella* has not previously been recorded in west Gloucestershire (J. Langmead pers.com) perhaps because of the relative scarcity of its food plant Broom. Another moth *Batia lambdella* has not been seen in this area for over 50 years (M. Evans pers.comm.) despite Gorse, its food plant, being fairly frequent. The ground beetle *Amara tibialis* has not been found in Gloucestershire for over 50 years (Atty 1983) and there are only a couple of records for north Somerset recently (Duff 1993). *Harpalus rufitarsis* is another local species of sandy areas only once before recorded in Gloucestershire although it is a little more frequent in Somerset. The small black ladybird *Scymnus frontalis* is recorded from three sites in Gloucestershire (Atty *op.cit*.) and is no more common in Somerset (Duff 1993). The tiny broom dependant weevil *Apion fuscirostre* is unrecorded in Somerset but there are four sites in Gloucestershire (Atty *op.cit*.). The robberfly *Dioctria baumhaueri* is only known from a couple of sites each in Somerset (Audcent 1948) and Gloucestershire (Alexander 1999).

Batia lambdella

Site Assessment
Given the small size and isolation of this site its conservation significance for invertebrates is really quite extraordinary. The only sites so far investigated which have proved to be better than Troopers Hill are very large more diverse sites, often abutting other good areas in the wider countryside. If we has sufficient information to score all the species according to their rarity Troopers Hill would probably come out as the most important site of its type in the Bristol region. This is not only because of

the large number local rarities including some new county records but the presence of an endangered species, *Nomada guttulata*, massively increases its importance. Not even the spectacularly productive Dolebury Warren has any species so rare. Records from previous years only serve to confirm these conclusions.

The great value of Troopers Hill is probably derived from a combination of topography, history and geology which are virtually unique in the region.

- general south facing aspect
- varied topography with numerous slopes of different angles and aspects
- industrial history which has removed top soil leaving quarries, screes and spoil heaps which are very hostile to plant growth thus greatly arresting the succession to woodland
- becoming enclosed by housing at a time before widespread pesticide use so isolating the fauna from the effects of industrial farming
- public access maintaining areas of bare ground by erosion
- the development of flower rich grassland
- the development of a heathy vegetation with *Erica*, *Caluna*, *Ulex* and *Cytius*

Management Recommendations

Although the fortuitous history and geology of Troopers Hill have allowed the open grassland to survive for decades with little or no grazing or management this cannot be assumed to pertain indefinitely. It seems likely that much of Crews Hole was once open grassland and probably provided a much larger foraging and nesting area for the species we now find here and perhaps many more. The fate of the Grayling *Hipparchia semele* which does not appear to have been seen here for several years is a sign that the site is now too small for the long term survival of some species. It is very important that the area of open grassland is not further reduced and equally important that scrub mosaic is retained both within and around the site.

- develop a long term plan for the removal of much of the woodland in the eastern part of the reserve. This should be done by cutting out sheltered scallops around the fringes and driving a ride through which will allow the development of scrub mosaic and increase woodland edge.
- remove saplings (mainly birch) and bramble from the main areas especially where encroaching on bare areas or fine flower rich sward
- gorse and broom should be controlled with great caution ensuring that only very small proportions of any one area are removed in any one session preferably where it is encroaching on barer areas but allowing it to encroach into coarse grassland
- large areas of gorse or broom should be divided by fire brakes in case of vandalism
- it would be desirable to encourage the colonisation of *Veronica*, probably by opening up areas of woodland (consult a botanist)
- Do not take any action to reduce erosion but monitor to ensure it does not increase (or decrease) dramatically

Further Survey

The present survey, supported by data from previous years, are quite adequate to confirm the great importance of Troopers Hill for invertebrates. It should certainly be considered for SSSI designation. This much was no great surprise but the presence on the site of an RDB1 endangered species never before recorded in this region was most unexpected and warrants further investigation. Another interesting result which needs more research was the importance of the broom and gorse, and it is possible that the heath vegetation (*Calluna* and *Erica*) is more important than the present survey reveals.

- attempt to find breeding areas and foraging areas and plants for *Andrena labiata*, the host of *Nomada guttulata*
- close investigation of broom, gorse and heather for specialist insects
- the above can be done along with further search for new scarce species and *Andrena tibialis* (which was only seen in 1998 and its continued presence needs confirming) and monitoring of the populations of the scarce species with strong colonies.
- Light trapping focusing on moths of golden rod, broom, gorse and heather.

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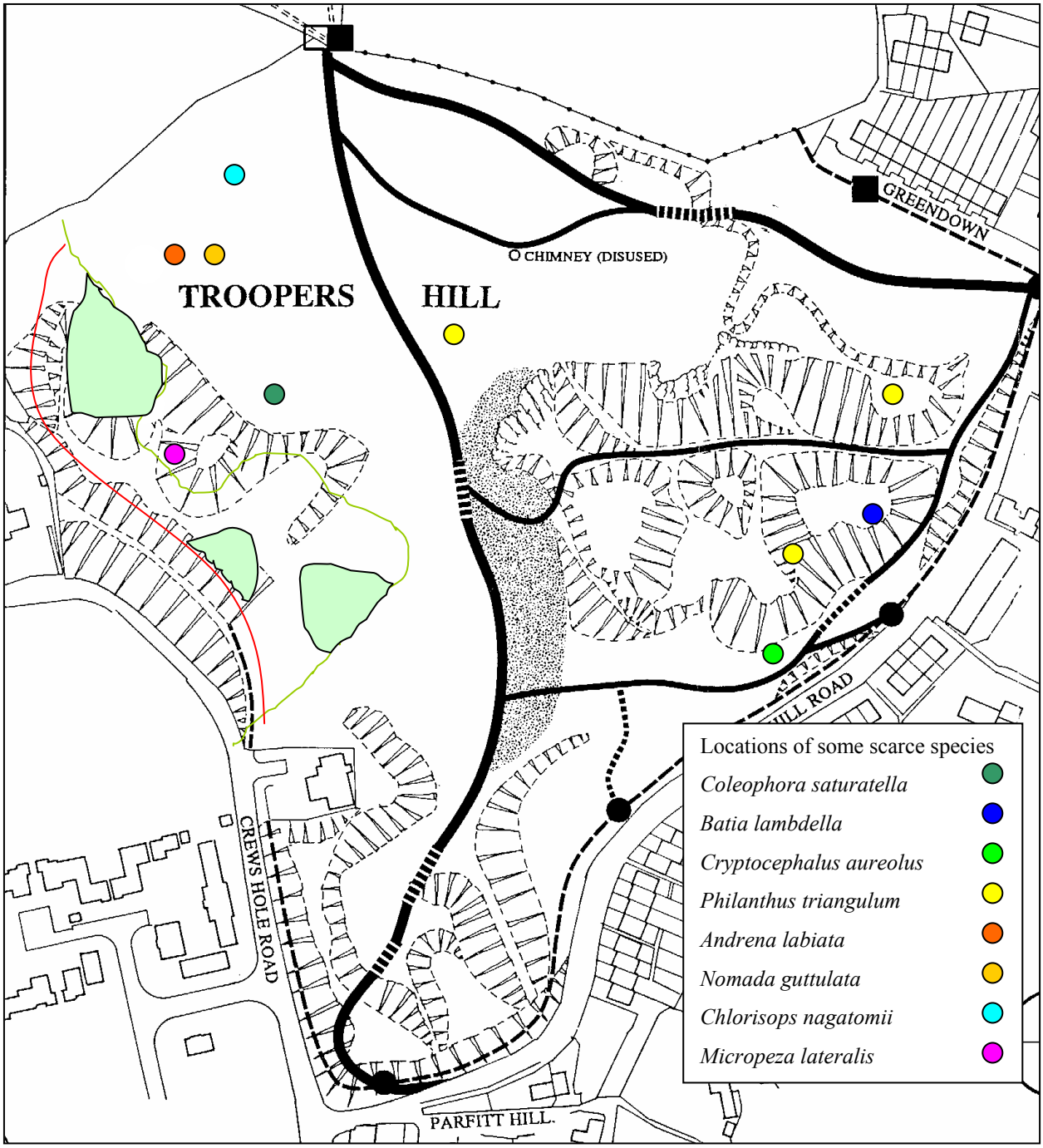
Map of Troopers Hill Local Nature Reserve



Invertebrate Survey of Troopers Hill, Bristol. Vc34 ST 62 73
Appendix 1.

Annotated Checklist

Araneae (spiders)
Xysticus erraticus (15.6)
Pisaura mirabilis (17.8)
Misumena vatia (17.8)
Araneus diadematus (17.8)

Odonata (dragonflies)
Platycnemis pennatus (15.6)

Orthoptera (grasshoppers and crickets)
Chorthippus brunneus (17.8)
Chorthippus paralellus (17.8)
Myrmelotettix maculata (17.8)
Pholidoptera griseoaptera (17.8)
Leptophyes punctatissima (17.8)

Dermaptera (earwigs)
Forficula auricularia (2.5); (17.8)

Hemiptera (true bugs)
Piezodorus lituratus (2.5)
Palomena prasina (17.8)
Aelia acuminata (17.8)
Alydus calcaratus **Local** (30.7)

Lepidoptera (butterflies and moths)
Nemophora degeerella (15.6)
Phyllonorycter messaniella (x mine 26.8)
Phyllonorycter ulmifoliella (x mine 23.8)
Coleophora deauratella (15.6)
Coleophora saturatella **[status?, first for W.Glouc.]** (30.7)
Batia lambdella **county rarity** (16.8)
Nomophila noctuella (17.8)
Ptrophora chlorosata (2.5)
Aglais urticae (2.5)
Inachis io (2.5)
Maniola jurtina (17.8)
Pararge aegeria (2.5); (17.8)
Pyronia tithonus (17.8)
Coenonympha pamphilius (15.6)
Lycaena phlaeas (2.5); (17.8)
Polyommatus icarus (17.8)
Euclidia glyphica (15.6)
Autographa gamma (17.8)

Coleoptera (beetles)
Notiophilus aquaticus (2.5)
Badister bipustulatus (2.5)
Amara tibialis **very local** (2.5); (15.6)
Harpalus puncticeps **local** (16.8)
Harpalus rufitarsis **second Glos. record** (2.5)
Metabletus foveatus (2.5)
Prosternon tessellatum (15.6)
Scymnus frontalis **very local** (15.6)
Halyzia 16-guttata (15.6)

Coccinella septenpunctata (2.5)
Meligethes aeneus (2.5)
Cylindrinotus laevioctostriatus (17.8)
Cryptocephalus aureolus **Nationally Scarce b** (15.6)
Bruchidius ater (2.5)
Strophosoma nebulosum (2.5); (16.8)
Apion fuscirostre **very local** (2.5); (17.8)
Apion ulicis (2.5)
Sitona regensteinensis (2.5)

Hymenoptera (bees, wasps, ants etc.)
Dolerus picipes (2.5)
Rhodogaster genistae (2.5)
Hedychridium roseum (30.7)
Anoplius nigerrimus (30.7); (15.6)
Vespula germanica (2.5); (30.7)
Vespula vulgaris (2.5)
Astata boops (30.7)
Tropoxylon medium (16.8)
Oxybelus uniglumis (30.7)
Pemphredon lethifer (30.7)
Ammophila sabulosa (15.6)
Philanthus triangulum **RDB2** (30.7); (17.8)
Gorytes quadrifasciatus (30.7)
Gorytes tumidus (30.7)
Cerceris arenaria (30.7)
Cerceris rybyensis (30.7); (16.8)
Colletes succincta (30.7); (16.8)
Hylaeus hyalinatus (30.7)
Andrena angustior (2.5)
Andrena armata(fulva) (2.5)
Andrena bicolor (2.5); (15.6)
Andrena cineraria (2.5)
Andrena flavipes (2.5); (30.7)
Andrena haemorrhoa (2.5); (15.6)
Andrena humilis **Nationally Scarce b** (2.5)
Andrena labiata **Nationally Scarce a** (2.5)
Andrena ovatula (2.5)
Andrena pubescens (2.5)
Andrena scotica (2.5)
Andrena wilkella (15.6)
Lasioglossum calceatum (2.5); (16.8)
Lasioglossum leucozonium (2.5)
Lasioglossum punctatissimum (15.6)
Sphecodes crassus **Nationally Scarce b** (30.7)
Sphecodes monilicornis (2.5); (15.6); (30.7)
Sphecodes reticulatus **Nationally Scarce a** (15.6); (16.8)
Panurgus banksianus (15.6)
Anthophora bimaculata (30.7)
Hoplitis claviventris (15.6)
Megachile willughbiella (15.6)
Nomada fabriciana (2.5)
Nomada flava (2.5)
Nomada flavoguttata (2.5)
Nomada fucata **Nationally Scarce a** (2.5); (30.7)
Nomada goodeniana (2.5)
Nomada guttulata **RDB1 1st for Glouc.** (15.6)
Nomada integra **Nationally Scarce a** (2.5); (15.6)
Nomada lathburiana **RDB3** (2.5); (15.6)
Nomada marshamella (2.5)

Nomada panzeri (2.5)
Nomada ruficornis (2.5); (15.6)
Nomada rufipes (30.7)
Bombus lapidarius (2.5); (15.6); (30.7); (17.8)
Bombus lucorum (2.5); (17.8)
Bombus pascourum (2.5); (15.6); (30.7); (17.8)
Bombus pratorum (2.5)
Bombus terrestris (2.5); (30.7); (17.8)
Bombus vestalis (2.5)
Apis mellifera (2.5)

Diptera (flies)
Tipula vernalis (2.5)
Chorisops nagatomii **Nationally Scarce** (16.8)
Microchrysa polita (15.6)
Bombylius discolor **Nationally Scarce b** (2.5) 6+ ovipositing females
Bombylius major (2.5) 3 ovipositing females
Dysmachus trigonus (2.5)
Machimus cingulatus (30.7)
Dioctria baumhaueri **county rarity** (15.6)
Rhamphomyia tarsata (2.5)
Epistrophe eligans (2.5)
Xanthogramma pedissequum (17.8)
Eristalis pertinax (2.5)
Eristalis tenax (17.8)
Myathropa florea (17.8)
Volucella bombylans (15.6)
Syritta pipiens (17.8)
Thecophora atra (16.8)
Micropeza lateralis **Nationally Scarce 1st for Glos.** (16.8)
Sphenella marginata (17.8)
Anomoia purmunda (17.8)
Tephritis neesii (2.5)
Tephritis vespertina (2.5); (16.8)
Leucophora personata (2.5)
Metopia (argyrocephala?)[female not certainly determinable] (30.7)
Carcelia lucorum (2.5)
Eriothrix rufomaculata (17.8)
Lydella grisescens (16.8)

Appendix 2

Nationally Scarce and RDB species recorded in previous years

Tiphia minuta **Nationally Scarce b** 1999
Nysson trimaculatus **Nationally Scarce b** 1999
Colletes succincta **Local** 1999
Andrena fulvago **Nationally Scarce a** 1999
Andrena humilis **Nationally Scarce b** 1998,1999
Andrena labiata **Nationally Scarce a** 1999
Andrena tibialis **Nationally Scarce a** 1998
Andrena trimmerana **Nationally Scarce b** 1999
Sphecodes crassus **Nationally Scarce b** 1999
Coelioxys conoidea **Local** 1999
Anthophora bimaculata **Local** 1999
Megachile maritima **Local** 1999
Nomada fucata **Nationally Scarce a** 1998, 1999
Nomada integra **Nationally Scarce a** 1999
Nomada lathburiana **RDB3** 1999
Nomada sheppardana **Local** 1999

Epeolus cruciger **Local** 1999
Bombus ruderarius **Local** 1999
Bombus rupestris **Nationally Scarce b** 1999
Bombylius discolor **Nationally Scarce b** 1999
Dysmachus trigonus **Local** 1999
Machimus cingulatus **Local** 1999