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Action for biodiversity: BAP aculeates

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Action for Biodiversity

BAP Aculeates

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Contents

Summary

This report summarises work carried out on twelve species of Aculeate Hymenoptera listed on the Government Biodiversity Action Plan. The survey work was carried out in England by a number of entomologists working for the Aculeate Conservation Group during 2000.

The jewel-wasp *Chrysis fulgida* was not recorded during the year, but its host wasp *Symmorphus crassicornis* was recorded at six localities in Surrey. A summary of the current known habitat requirements of C. *fulgida* and its host are presented.

The spider-hunting wasp *Homonotus sanguinolentus* was not recorded at any of its known Dorset sites during 2000. A single adult was reared from a cocoon collected in 1999 in the New Forest, Hampshire. What are presumed to be *H. sanguinolentus* cocoons and larvae were collected at further sites in the New Forest during 2000 and it is hoped to rear these to adults in 2001. No evidence of *H. sanguinolentus* was found at a number of sites surveyed in Surrey.

The spider-hunting wasp *Ceropales variegata* was recorded from two heathland sites in Surrey. Searches at two further sites produced negative results. No observations which would reveal the host species of C. *variegata* were made at either locality which hold populations of the species.

The sphecid wasp *Cerceris quinquefasciata* was recorded from six localities in Essex during 2000. Prey items were collected and identified from females recorded at nesting aggregations. Suggestions for the scarcity of the species in Britain, and the currently identified habitat requirements are presented.

The sphecid wasp *Cerceris quadricincta* was not recorded during survey in Essex in 2000.

The Dark Guest Ant *Anergates atratulus* was not recorded during 2000, but good populations of its host ant species *Tetramorium caespitum* were found at four localities in southern England. An outline of the biology and habitat requirements of *T. caespitum* are presented. Suggestions for further survey work is presented.

The effects of grazing, vegetation composition and hydrology were studied on a population of the Black Bog Ant *Formica candida* in Hampshire. Nest distribution in comparison with vegetation height and composition, soil pH and water levels are recorded. Further sites which support colonies of *F. candida* within the New Forest are presented.

The progress of four nests of the Red Barbed Ant *Formica rufibarbis* at one site in Surrey during 2000 was monitored. Two nests produced sexual alates, while two nests are now thought to be no longer viable. A laboratory reared nest was established at the same site. No access was available at a second locality in Surrey where two nests are known. The success of these nests is unknown.

The mining bee *Andrena ferox* was studied at localities in Surrey and Hampshire. No sightings were made of the bee in Surrey. At the population in the New Forest, Hampshire, nesting aggregations were observed, and pollen collected from females was identified as being

solely from oak *Quercus* sp. Numbers of females recorded was lower than that in 1999, but the population currently remains viable.

The cleptoparasitic bee *Nomada errans* was searched for in three localities in Dorset and one in Wiltshire, where its host, the mining bee *Andrena nitidiuscula* is present. Good nesting aggregations of the host species were recorded but no sightings of *N. errans* were made.

The mason bee *Osmia xanthomelana* was searched for at its only formerly known sites on the Isle of Wight. No sightings of the bee were made at any of its former sites, and it is concluded that due to various factors there are few remaining suitable sites left for this species.

The mason bee *Osmia parietina* was recorded from two known localities in Cumbria and three in Lancashire. A number of other suitable looking localities were surveyed but did not appear to support populations of the bee. The current known habitat requirements of *O. parietina* in north west England are presented.

Introduction

The Aculeate Conservation group was formed during 1999 with the aim of progressing research on those species of Aculeate Hymenoptera which had been included on the Government Biodiversity Action Plan. Its role will also be in co-ordinating other research for the conservation of Aculeate Hymenoptera.

Many of the species studied for this report were already subject to some monitoring under the English Nature Species Recovery Programme.

All of the survey work carried out has been funded by the English Nature Species Recovery Programme.

Species accounts

Chrysididae: *Chrysis fulgida*

Surveyors: David Baldock and Mike Edwards

1. Introduction

At the time of writing the BAP for the RDB1 jewel-wasp *Chrysis fulgida*, the last known records were from the heathlands around Farnborough and in north Hampshire. Since then, further modern records have been made in the same area and in Surrey. The identification of the eumenid wasp *Symmorphus crassicornis* as the host of this chrysid gives firmer backing to the suggested decline of the species, as the host itself has undergone a significant decline. Elucidating the distribution, life-history and habitat requirements of *S. crassicornis* holds the key to the conservation of *C. fulgida* and the realisation of the BAP.

No *C. fulgida* were recorded at any of the survey sites during 2000.

2. Modern records and the host of *C. fulgida*

Published information on this species in the UK suggests *C. fulgida* is a cleptoparasite on bees of the genus *Osmia*, the eumenid wasp *Odynerus spinipes* and sphecid wasps of the genus *Trypoxylon*. Kunz (1994) quotes *C. fulgida* as being cleptoparasitic on *Symmorphus crassicornis*, with a non-British species, *S. murarius*, as a second host.

In 1988 *C. fulgida* was taken at a sandy/clay heathland site near Farnborough. Survey at the nearby Eelmoor Marsh in 1998 produced numerous specimens of *S. crassicornis* from low-growing willow *Salix* spp, as well as specimens of *O. spinipes*. Subsequently three specimens of *C. fulgida* were recorded from a Malaise trap on the site.

Chrysis fulgida was recorded flying around an old tree stump at Castle Bottom NNR near Yateley, north Hants in 1997. During 1994 both *S. crassicornis* and. *O spinipes* were found in a nesting aggregation on a banked trackway here.

Chrysis fulgida was recorded from Bagmoor Common Nature Reserve, Surrey in 1998 and again in 1999, with a further record coming from nearby at Mare Hill Common.

Symmorphus crassicornis and *O. spinipes* were both recorded from Botley Wood, Hants, along with a possible sighting of *C. fulgida* during 1999.

Whilst both *O. spinipes* and *S. crassicornis* are present at most of the sites with modern records of *C. fulgida*, there are no sites with only *O. spinipes* present which have *C. fulgida*. In addition, all of the sites for *C. fulgida* have good stands of aspen *Populus tremula*, particularly in the suckering stage which support large populations of the leaf beetle *Chrysomela populi*, the prey of *S. crassicornis*. This all adds up to extremely strong circumstantial evidence for *S. crassicornis* being the host of *C. fulgida*, as suggested by Kunz.

3. *Chrysis fulgida* and *Symmorphus crassicornis* in Surrey

Five old records of C. *fulgida* from three localities exist for Surrey from the period 1862 to 1945. *Symmorphus crassicornis* was only known from Surrey in 1917 and 1933 before being refound in numbers by K. Guichard flying around aspen at Longross Halt between 1971 and 1973.

Bagmoor Common, Nature Reserve

A female C. *fulgida* was taken flying around a dead birch *Betula* sp, stump on Bagmoor Common, Elstead during a survey in 1998. No S. *crassicornis* were recorded at this site, but the rarer S. *connexus* was recorded on this occasion.

A search for aspen here in 1999 revealed a large, regularly managed grove growing beneath a line of electricity pylons. Much of the re-growth is about 1 metre in height, providing ideal conditions for the leaf beetle *Chrysomela populi*. *Symmorphus crassicornis* was recorded in numbers here flying amongst the aspen. Two further specimens of S. *connexus* were also recorded.

No nesting aggregations of S. *crassicornis* were found, but there are many exposed sandy rootplates present on site. A possible female C. *fulgida* was recorded here in 1999, and a single male was taken in July basking on a dead pine trunk near to some root plates.

Symmorphus crassicornis was common at this site in 2000, but no C. *fulgida* were recorded.

Mare Hill Common, Witley

This small common is about 2 miles from Bagmoor, with many small regenerating aspen bushes, and the Chrysomelid beetle C. *populi*. A single male C. *fulgida* was taken flying around a dead beech *Fagus sylvatica* in 1999 along with a number of S. *crassicornis*.

No C. *fulgida* were recorded here in 2000, but S. *crassicornis* was recorded commonly.

Other Surrey sites

Symmorphus crassicornis was taken flying around aspen at Arbrook Common, Esher in 1999, another site where aspen is regularly cut beneath overhead power cables.

During 2000, S. *crassicornis* was recorded at Whitmoor Common; Guildford, Brentmoor Heath; West End and at two locations in Brookwood Cemetery near Woking. At all sites this species was recorded at or around small bushes of aspen. At Wisley Common a search was made of the aspen bushes but much of the available aspen had been defoliated by the cattle which have been introduced to graze the site.

4. Suggestions for Further survey

In 2001 it is intended to search more aspen sites, as well as to revisit the recently found ones, with the hope of finding a nesting site of S. *crassicornis*. Rootplates at Bagmoor Common, Surrey currently seem to be the most hopeful location. It seems clear that the beetle, and therefore the wasp, prefers small aspens growing in damp localities, but the nesting sites may

be located some distance from the aspens, making them difficult to find. The beetles, which hibernate as adults, emerge over a protracted period which means that their larvae are available for the wasps over a number of weeks. The male wasps emerge in early June and the females in mid-June and both continue flying until the end of July.

Surrey

Information is being collected about sites in Surrey with suitable areas of aspen, preferably with the beetle C. *populi* known to be present. A number of stands of aspen have been reported at Chobham Common, one small area of this Common has recently been surveyed, the rest will be completed in 2001.

North Hampshire

Several areas would be worth searching for nesting aggregations of the host: Castle Bottom NNR and the Farnborough area, including Eelmoor, should be surveyed as both host and parasite have been recorded in the recent past. Local botanists should be consulted for information on other likely areas.

South Hampshire

A population of *S. crassicornis* was found at Botley Wood in 1999, and one at Netley Common in 1998. Both areas would be worth further exploration. Small stands of scrubby aspen occur around the Beaulieu estuary, and these should also be searched.

Berkshire

Attention has been drawn to Wildmoor Heath, a BBONT reserve between Sandhurst and Crowthorne where the aspen has populations of the beetle C. *populi* present. Other suitable areas may be located nearby.

Pompilidae: *Homonotus sanguinolentus*

Surveyors: Mike Edwards, Bryan Pinchen, George Else and Stuart Roberts

1. Introduction

Homonotus sanguinolentus is an RDB 1 spider-hunting wasp which was one of a number of species considered in the Bare Ground Invertebrates Report, September 1994 for the English Nature Lowland Heath Programme. (Edwards 1994). This report concluded that the available evidence suggested that this species was associated with humid heath conditions and not bare ground. Possible conflicts between life histories of *H. sanguinolentus* and its reputed prey spider, *Cheiracantheum erraticum* (Walkenaer) (Araneomorphae: Clubionidae) were raised.

Research in 1996 showed that the spider, *Cheiracantheum erraticum*, had a much longer adult period than had previously been supposed, with gravid females being found in late July and August.

Parasitised spiders found in their retreats in the heads of grass stems and the flowering heads of cross-leaved heath *Erica tetralix* at Bloxworth Heath, Dorset in 1997 were retained. During the summer of 1998 adult *H. sanguinolentus* were reared out. However, a proportion of these cocoons did not hatch, while some proved to be those of an ichneumon. A monitoring transect of spider retreats was established at Bloxworth Heath during 1998. A cocoon was collected from the New Forest by B Pinchen and two from Chobham Common by M Edwards in 1999. The cocoon from the New Forest produced a female *H. sanguinolentus*, the first from the New Forest since 1991, while those collected at Chobham Common produced ichneumons.

Homonotus sanguinolentus is currently confirmed from two sites in the New Forest, Hants, and three sites in Dorset. A further two New Forest sites and two Dorset sites are awaiting confirmation by rearing the adult wasp.

2. *Homonotus sanguinolentus* in Dorset in 2000

The fixed transect was walked by M Edwards and B Pinchen on 24/7/00. No parasitised spiders were found, and the number of retreats were well down on those recorded on previous transects. Seventy one retreats were found, contrasting with over 100 on previous visits, only two of the retreats contained gravid female spiders. It is likely that the cool weather of 2000 had delayed the emergence of *H. sanguinolentus* more than it had delayed the maturation of *C. erraticum*. It is likely that numbers of *H. sanguinolentus* at Bloxworth will continue to be depressed in 2001.

Rotational management of the rides, as agreed between EN and the FC, was carried out under the guidance of Mark Warne of the FC.

The Uddens area, near Ferndown, identified as a possible *H. sanguinolentus* location during 1999 was searched by S Roberts, B Pinchen and M Edwards on 24/7/00. Very few retreats of *C. erraticum* were found and no evidence of *H. sanguinolentus*. We concluded that further searches of this area were not a high priority for future work.

3. *Homonotus sanguinolentus* in Surrey in 2000

Two areas on Chobham Common were searched by M Edwards on 6/7/00 and 29/8/00. Very few *C. erraticum* retreats and no *H. sanguinolentus* were found. One of the search areas has been given a change of management regime in that the grassland is now being cut on a two year + rotation. This may increase the population of *C. erraticum*, whose retreats were previously being destroyed just after they held eggs or young, the co-operation of the Ranger, Andy Wragg is acknowledged. Several retreats were discovered in this area during 2000.

Horsell Common was searched by M Edwards, D Baldock and J Pontin on 7/8/00. A large population of *C. erraticum* was present in one area, but no *H. sanguinolentus* were found. Whitmoor Common was also searched by M Edwards and D Baldock on 7/8/00. A few *C. erraticum* retreats were found but the overall vegetation structure was rather short. The heath appears to have the necessary areas of humid heathland habitat and may be worth further searches in the future.

Moat Pond at Thursley Common NNR has been searched by M Edwards and D Baldock, but not intensively, during 2000. It covers a large area of suitable looking habitat, with plenty of

humid heath and cotton grass *Eriophorum* sp. Further searches of this site would be worthwhile.

4. *Homonotus sanguinolentus* in the New Forest, Hampshire in 2000

Following the rearing of *H. sanguinolentus* from Duckhole Bog, a renewed effort was made in parts of the New Forest where grazing pressure is lowest. B Pinchen surveyed the following areas; Wilverley Bog West on 26/7/00, Duckhole Bog/Markway Inclosure on 29/7/00 and Hinchelsea Bog on 9/7/00. *Cheiracantheum erraticum* was present at all sites, but no *H. sanguinolentus* were found. Kingston Great Common NNR was visited on 11/8/00. One cocoon of (presumably) *H. sanguinolentus* was found here and retained for rearing out. A parasitised spider and larvae was also found and retained, but the spider subsequently died.

B Pinchen, G Else and M Edwards searched the southern end of Cranesmoor on 6/8/00 in the area where *H. sanguinolentus* was recorded in 1991. No retreats of *C. erraticum* were found in this now heavily grazed area. A search was made of the northern section of the Cranesmoor at Vales Moor and several retreats of *C. erraticum* containing what appear to be *H. sanguinolentus* were found. The highest density of *C. erraticum* appeared in the humid zone of the heathland among taller vegetation, along the seepage zone at the bog edge. Cocoons were found in retreats in folded purple moor grass *Molinia caerulea* leaves, bog myrtle *Myrica gale* leaves and flowerheads of cross-leaved heath. The majority of cocoons were in the seed heads of cotton grass *Eriophorum* sp, and many of the seed heads which remained anchored to the plant had, in fact, been anchored by the activities of spiders. A total of 5 larvae and 3 cocoons of (presumably) *H. sanguinolentus* were found and these have been retained for rearing through for confirmation.

5. Suggestions for further survey

This project has managed to establish the existence of two populations of *H. sanguinolentus*, one in Dorset and one in south Hampshire. No populations have been found in north Hampshire, Berkshire or Surrey.

Although there is plenty of opportunity for further survey it is recommended that this is carried out at a low level, targeting just one area per year for intensive searching, with Thursley Common being targeted in 2001. More intensive searches of Chobham, Horsell and Whitmoor Commons in Surrey could be carried out in 2002.

Suitable locations for searches in north Hampshire and in Berkshire should be sought.

The monitoring at Bloxworth will need to be continued, some time may remain on this occasion to search elsewhere in Dorset. The monitoring for further populations in the New Forest should also continue.

Monitoring the effects of the altered management at Chobham Common on the population of *C. erraticum* should be continued, with searches of this area continued in any spare time from this task.

The findings of this project in terms of the implications for grazing management of heathlands should be communicated to the Heathland HAP Group. The seriously damaging practice of burning the New Forest bogs in order to provide grazing is severely damaging for

populations of both the wasp and its host. This point needs raising most strongly, to the Forestry Commission, the English Nature Local team and the New Forest Verderers.

Pompilidae: *Ceropales variegata*

Surveyor: David Baldock

1. Introduction

The RDB 1 Spider-hunting wasp *Ceropales variegata*, has always been considered to be one of the rarest wasps in Britain with very few records from dry heathlands in Surrey, East Dorset and the New Forest in Hampshire. Most of these records date from the late 19th and early 20th Century, the most recent record being from Parley in Dorset in 1953. The last record for Surrey was in 1902, and the New Forest in 1911. With no further records for over 40 years, it was feared that the species might have become extinct.

In 1996 a single female C. *variegata* was taken in a Malaise trap on Thursley Common NNR, Surrey. In 1999 it was found to be the commonest species of pompilid at another Malaise trap site on Thursley Common.

Between 20/8/96 and 10/9/1996 another female was caught in a Malaise trap sample situated in an area of extensive dry heathland in the centre of Thursley Common. A second specimen was found in a further trap on the reserve about 1 kilometre from the previous record, this specimen had been caught between 10/9/96 and 30/9/1996.

During August 1999 another Malaise trap was running on the reserve in a new site, which was sunny and sheltered and recently cleared of pines. A large number of C. *variegata* were caught in roughly equal numbers of male and female. The trap had contained sixteen species of pompilid but C. *variegata* was the most numerous.

Ceropales variegata was recorded from two sites in Surrey during 2000.

2. Survey and Research in 2000

Thursley Common NNR

From the collected data, it had become apparent that C. *variegata* was obviously common at this site, and further studies of the species in the field were required. Searching by sight was ruled out, with C. *variegata* being so small and, being a cleptoparasite, is thought most likely to move more slowly than other pompilids.

On 16/8/2000 a flower lure, using a water-filled bottle containing cut flowers of wild carrot *Daucus carota* and angelica *Angelica sylvestris* was placed amongst a clump of heather. A twenty minute search of the surrounding heath produced only specimens of *Priocnemis exaltata* and *Auplopus carbonarius*. On returning to the lure a single specimen of *Ceropales* sp, was observed moving slowly across the carrot. The specimen could not be netted but both observers; D Baldock and M Edwards, were confident that it had been C. *variegata*.
On 19/8/00 D Baldock visited the site again and caught a single C. *maculata* at the flower lure. The following day four more flower lures were placed amongst the heathers, all

containing wild carrot and angelica. Five male C. *variegata* were recorded at these lures in the space of about one hour.

3. Other Surrey Sites

Hankley Common, three kilometres west of Thursley Common was visited on 22/8/00. The vegetation was similar to that on Thursley where C. *variegata* had been recorded. Four flower-lure bottles were placed amongst the heathers in a recently cleared area on a steep south facing slope. Within minutes a single male C. *maculata* had been caught, and a possible C. *variegata* seen. On the following day during a one hour visit a single male C. *variegata* was caught at the flower lure along with four C. *maculata*.

Mare Hill Common at Witley is a small dry heath three kilometres south-east of Thursley Common. There is less bare ground here than at the two previous sites. Two flower lures were placed amongst heathers along a wide sandy track on 2/9/00. A single C. *maculata* visited the flower lure, but thereafter the weather deteriorated and no further *Ceropales* sp, were seen.

4. Suggestions for further survey

It is recommended that further studies should be made on the habits, habitat requirements and behaviour of C. *variegata* at those sites where the species has been recorded during recent surveys.

There is a definite need to establish which species of pompilid C. *variegata* is a cleptoparasite on. Some of the species recorded at Thursley and Hankley Common such as *Cryptocheilus notatus* would seem too large for such a small species as C. *variegata* to chase away from their prey. The two smallish species which were common at both sites were *Priocnemis pusilla* and *P. exaltata* and these two are perhaps the most likely candidates.

Further searches of other suitable heathland sites in Surrey using the flower lure method should be carried out, and the possibility of carrying out similar survey in the New Forest should also be explored.

Sphecidae: *Cerceris quinquefasciata*

Surveyor: Peter Harvey

1. Introduction

The RDB 3 *Cerceris quinquefasciata* is a medium-sized yellow-and-black wasp which nests gregariously in areas of bare sand in places exposed to the sun. It provisions its nest with weevils, and may often be common where it occurs.

It has been recorded from 49 ten km squares in southern and eastern England, but has been found in only 14 ten km squares since 1980, largely in south-eastern England in Essex, Kent, Norfolk, Oxfordshire and Suffolk.

Eight sites in south Essex C. *quinquefasciata* were visited on a number of occasions between July and September. Efforts were to be made to study the autecology of this species.

Cerceris quinquefasciata was recorded from seven localities in Essex during 2000.

2. Survey and Research in 2000

Despite the first male being recorded on 6th July, the season in general for C. *quinquefasciata* appears to have been very late. No females were recorded until 11th August, when mating pairs were found in numbers at East Tilbury silt lagoons by P Harvey and M Edwards.

Middlewick Ranges and several other sites near Colchester, north Essex were visited on 23 August. The presence of *Cerceris quinquefasciata* and the cleptoparasite *Hedychrum niemelai*, first discovered by A Knowles in July, was confirmed and prey was collected from female C. *quinquefasciata*.

Further records of C. *quinquefasciata* were received from D Scott, who collected specimens on two occasions in August at Brightlingsea, N. Essex.

Cerceris quinquefasciata was recorded at three new sites in south Essex; the sea wall at Aveley Bay, the rifle butts at Aveley Marshes (both part of the inner Thames Marshes SSSI) and at Canvey Northwick.

Nest site areas were identified and weevil prey was collected from eight C. *quinquefasciata* females returning to nest holes in a footpath at East Tilbury silt lagoons, a bank in front of the rifle butts at Aveley/Wennington Marshes and at Place Farm, East Heath Cliff Paddock near Colchester.

In seven cases the prey items were the common Pea and Bean weevil *Sitona lineatus* which is abundant in lowland Britain. In one case the weevil prey was *Anthonomus rubi*, also common throughout most of Britain.

3. Factors Affecting the Distribution of C. *quinquefasciata* in Britain

In view of the common occurrence of these prey weevils, the rarity of C. *quinquefasciata* in Britain suggests that:

a. climatic influences may be a major factor determining its current distribution and abundance;

b. the wasp has complex or specific habitat characteristics which determine its occurrence.

All sites for C. *quinquefasciata* known to P Harvey in Essex and the East Thames corridor, contain a mixture of flower-rich grasslands developed on poor drought-stressed substrates with bare sandy or friable nesting areas, which are either unmanaged, subject to occasional disturbance or very low level grazing.

In Essex there appears to be a close relationship between the occurrence of C. *quinquefasciata* and the cleptoparasite *H. niemelai*, which is often frequent and obvious at C. *quinquefasciata*

sites. This suggests that C. *quinquefasciata* may be the main host of *H. niemelai*, whose occurrence should instigate thorough searches for the less easily distinguished *Cerceris* wasp.

Sphecidae: *Cerceris quadricincta*

Surveyor: Peter Harvey

1. Introduction

The RDB 1 *Cerceris quadricincta* is a medium-sized yellow-and-black wasp which nests gregariously in areas of bare sand in places exposed to the sun. It provisions its nest with weevils. Known sites are sandy grasslands on south-facing slopes.

This sphecid wasp has been recorded from 10 ten km squares in Kent and Essex. There are only four post 1970 records, three from Kent and one from Essex during 1995.

No sightings of this species were made suggesting that it may only be present in extremely low numbers.

2. Survey and Research in 2000

Middlewick Ranges and a number of other sites near Colchester, N. Essex were searched for this species on 23 August.

No specimens were recorded at any of the sites visited.

Formicidae: *Anergates atratulus*

Surveyor: Simon Hoy

1. Introduction

The RDB K, Dark Guest Ant *Anergates atratulus*, is an obligate workerless social parasite of another ant, *Tetramorium caespitum*. The Species Action Plan for *A. atratulus* identified the current status and threats, and proposed appropriate management to ensure its future as a British species.

The host ant *T. caespitum* may be considered a characteristic or perhaps indicator, species of certain lowland heath and coastal habitats, particularly in central and southern England.

This report summarises survey work carried out in 2000 which aimed to provide more information on the likely current status of *A. atratulus* and its host species in Britain.

Along with background biological information, some initial views on the likely current status of *A. atratulus*, further research needs and appropriate management action are provided.

Anergates atratulus was not recorded during 2000, but the survey has allowed a picture of the health of the host species populations at various sites to be developed.

2. Biology

Anergates atratulus is a permanent social parasite (or inquiline) in the nests of *T. caespitum* and closely related species. *Anergates atratulus* is unusual amongst ants in that it does not have a worker caste, the only individuals produced are males and gynes (known as queens once mated). The parasite queen relies upon the host *T. caespitum* workers to perform all of the normal nest building and foraging activities.

Male *A. atratulus* have no wings and there is no reproductive or nuptial flight. Mating occurs within the host nest, presumably between May and August. Once mated, the queens fly from the host colony and disperse to find a suitable new host colony. It is likely that *A. atratulus* queens enter a suitable host nest by stealth, and emanate odours or pheromones which mask their identity, or which pacify or attract the host workers. It has been observed that *A. atratulus* queens attach themselves to host workers by grasping their antennae, and walk about within the nest for some time (Donisthorpe 1927). Donisthorpe (1927) also suggests that *A. atratulus* queens often only usually succeed in securing adoption of old *T. caespitum* colonies where the host queen has already died. A feature of this, which has been noted by a number of observers, is that parasitised *T. caespitum* colonies usually appear to be mature and extensive, with numerous large dark workers. Without a *T. caespitum* brood to care for, the entire resources of the host colony are diverted to producing large numbers of new *A. atratulus* gynes and males. *Anergates atratulus* queens must generate as many new gynes and males as possible before the host colony dies out in two to five years.

3. Status and distribution in Britain and Ireland

In Britain, *A. atratulus* is classified as Insufficiently known by Falk (1991), but is undoubtedly an uncommon species.

Most British records are historical (pre- 1970) and there have been few recent sightings. Although it is difficult to ascertain, due to the sparsity of records, there are some indications that *A. atratulus* may be in decline, particularly on its heathland sites.

The distribution of *A. atratulus* is inevitably linked to that of its host, which itself is only locally common. In Britain *T. caespitum* is predominantly a southern species with the greatest population densities found along the south coast and on the lowland heaths of Dorset, Hampshire and Surrey. It also occurs on the Isle of Man in the north west, on the east coast of Northumbria and along the coast of southern Ireland.

4. Habitat and Nesting Biology

Since *A. atratulus* is completely dependant upon *T. caespitum*, any consideration of its habitat requirements relate to those of its host species. *Tetramorium caespitum* is a highly thermophilous species requiring habitats which provide high levels of insolation and thereby warmth at ground surface. Certain minimum hours of sunshine and minimum mean spring and summer temperatures probably limit its distribution in Britain. The largest populations of *T. caespitum* are found in sun-exposed, rocky or shingle coastal sites with short, sparse maritime vegetation. Many lowland heaths in southern England also support strong

populations of *T. caespitum*, but only where the vegetation is short or sparse with patches of bare ground. As with most ground nesting ants, *T. caespitum* is more commonly found on free-draining friable soils and sands rather than on heavy damp clays. Nests of *T. caespitum* are large, ramifying structures, often with no clear structure or nest centre. The subterranean tunnel system may extend over many square metres, but with no obvious signs of their presence above ground. Colony size ranges from approximately 1,000 - 30,000 (ave. 11,000) individuals (Brian 1983) and there is typically only one queen per colony. Workers are generalist predators and scavengers of animal and plant material (including seeds), they also tend aphids (mainly on plant roots) for their honeydew.

5. Survey Work in 2000

This preliminary survey was intended to focus on establishing some background knowledge of the status, 'health' and requirements of the host *T. caespitum* populations.

Visits were made to sites near some of the last known records for *A. atratulus* and notes of the ant populations, and habitat types found at each site were compiled. Many old records for *A. atratulus* are vague and state only a site name, with more detailed location information being largely unrecorded or unavailable.

The survey during 2000 covered three main areas:

- the pebble beds around Dungeness in Kent;
- heathland sites around Ash Ranges and Longmoor in Surrey and Hampshire;
- and the heaths around Wareham and Purbeck in Dorset.

A brief visit was also made to the cliffs at Bolberry Down in Devon. No visits were made to known former sites within the New Forest, Hampshire.

All survey work was carried out in optimal conditions between April and July. This period was chosen to coincide with the period when the parasite would be most numerous in the host nest, and a time when most records for the species have been previously made.
The sites were surveyed in an informal manner, and no rigourous sampling or transect techniques were undertaken. However, where possible, sites were walked and sampled in a fairly regular search pattern. At each site, small areas (approximately 50- 100 m 2) of apparently suitable *T. caespitum* habitat were chosen and searched in detail by hand, covering as much of each area as possible. Occasional sweep netting of vegetation was undertaken to try to catch any dispersing *A. atratulus* gynes. The presence, identity and location of any ants found was recorded. Any readily accessible nests of *T. caespitum* were lightly disturbed at the surface and examined to check for obvious signs of *A. atratulus*.
No formal floristic, geographic or topographic surveys of sites were undertaken, however, the general nature, patterns and growth stage of vegetation, the soil type and aspect were noted for each of the survey sites.

6. Sites surveyed

Dungeness, Kent: 29 May 2000

This is a large flat site, just above sea level. The substrate (Sandwich soil series) is composed of small shingles packed into a sand/soil matrix, and is commonly known as 'the pebble

beds'. The site is very open and windy, with a dwarf maritime vegetation growing sparsely on the thin, nutrient poor substrate. The pebbles are exposed to high levels of insolation and a number of interesting thermophilous ant species nest beneath them.

Tetramorium caespitum was abundant at this site, and was the dominant ant species, along with *Lasius alienus*. Most colonies of *T. caespitum* were found with large numbers of sexual brood. There was no evidence of *A. atratulus*. The RDB3 species *Leptothorax interruptus* was recorded at this site in good numbers.

Another site, where winged gyne *A. atratulus* have been previously recorded, at nearby Greatstone-on-Sea was also visited. No *T. caespitum*, or suitable habitat was recorded in this area.

Given the large number of *T. caespitum* colonies found at Dungeness, it is quite likely that *A. atratulus* is still in existence here.

Wyke Common, near Ash Ranges, Surrey: 14 July 2000

This is an undulating site at 70-110 m above sea level. The substrate (Hollidays Hill and Southampton soil series) is acid sand over clays, with humose soil horizons and plateau gravel/flint over sand on the higher terraces. The site is quite open with scattered birch and pine *Pinus* sp, mixed age heathers (ling and Erica sp,) and gorse *Ulex* sp. Bare areas are present near to trackways and recent erosions. The site is predominantly south and east facing with gentle sun-exposed slopes, there is some dense woodland to the south of the area. The Ash Ranges, where *A. atratulus* has previously been recorded were not visited, due to live firing on the ranges.

Tetramorium caespitum was also abundant at this site, along with *Lasius alienus*. A number of other interesting species were recorded, including *Myrmica lobicornis* and *Leptothorax acervorum* nesting in open heath, and the slave-making ant *Formica sanguinea*. This was a good habitat for *T. caespitum* and a number of very large colonies with plenty of worker and sexual brood were found. There was no evidence of *A. atratulus* being present, but only a small part of this extensive heathland was investigated, further effort may yet locate *A. atratulus* here.

Woolmer Ranges, near Longmoor, Surrey: 14 July 2000

The precise location for the Longmoor record for *A. atratulus* could not be ascertained, and during the survey period much of the area was closed for military training. A short visit was made to the accessible and, apparently suitable heathland habitat nearby. The substrate here was generally well-drained acid sand (Shirrell Heath 2 soil series).

Although there were some apparently suitable nest sites for *T. caespitum* at the edges of trackways and in patches of open heath, this particular site did not contain many host colonies. Other nearby areas, visible within the firing range, did appear potentially suitable and worth investigating in the future. A number of strong colonies of *F. sanguinea* were noted here, and these may have exerted some competition pressure against other ants on the site. Other ant species were notably less abundant than in other similar sized areas of heathland without so many *F. sanguinea*.

Studland Heath, Purbeck Dorset: 15 July 2000

This is a low-lying, gently undulating open heathland site dominated by low growing ling and heathers *Erica* sp, with occasional areas of birch, pine, and gorse. Bracken *Pteridium aquilinum* dominates some areas which border the woodland. The site is on tertiary sand (Sollom 2 series) which is well drained on higher ground and slopes, but occasionally waterlogged and humose in level areas or troughs.

The survey at this site explored the areas on either side of the B3351 road leading from Studland to South Haven ferry terminal. The area to the west of this road is of heavy damp soil and did not contain any ant species. In direct contrast, the drier raised area to the east, between the road and 'Little Sea' lake was very productive in both numbers of ant colonies and species.

The higher, drier areas of Studland Heath proved to be ideal habitat for *T. caespitum*, but again there was no trace of *A. atratulus* in any of the nests examined. The Nationally Scarce ant *Tapinoma erraticum* was recorded at this site, this being one of very few recent records for the species. Many of the *T. caespitum* and *Tapinoma* nests were alongside tracks through heather, where the vegetation was close cropped, where ridges had been raised up, or where slight erosion had occurred. This indicates that some appropriate ground disturbance can be a positive factor in encouraging these species.

Godlingston Heath, Purbeck, Dorset: 16 July 2000

This is the neighbouring area of heathland to the south and west of Studland Heath. It is dominated by more mature ling and gorse, although there are some sparsely vegetated gravel hills in the middle of the site. The survey here was concentrated on tracks around and within the Newtown Heath conifer plantation. Here, raised sand and gravel mounds were thought most likely to be suitable habitat for *T. caespitum.*

This site proved to be disappointing for *T. caespitum*, and no *A. atratulus* were found. Much of the habitat here proved to be inhospitable to *T. caespitum*, with nests being concentrated around hill tops where the vegetation was sparse. Much of the surrounding vegetation at this site was too rank, or situated on marshy ground.

Middlebere Heath, Purbeck, Dorset: 16 July 2000

This is a low lying, gently undulating heathland site dominated by mixed growth stage ling and heathers, with occasional stands of birch. There are two raised gravel and flint hillocks. The site is on tertiary sand (Sollom 2 series) which is well drained on higher ground. To the north it surrounds a large area of waterlogged marsh (Isleham 1 series) with wet heath/*Molinia* plant communities.

Tetramorium caespitum was the dominant ant species, and nest densities in this area of sparsely growing heather were high. No *A. atratulus* were recorded here, despite having been recorded here in the past. Further searches for *A. atratulus* at this site are recommended.

New Mills Heath, Purbeck, Dorset: 17 July 2000

This is a similar area of open heathland to Middlebere Heath, except for the heather being more dense and uniform in growth. A brief visit was made to assess the suitability of the site for *T. caespitum.*

Tetramorium caespitum colonies here were found in great abundance, but no *A. atratulus* were recorded. The dense, single age ling monoculture here does not provide for much insolation at ground level for the more thermophilous ant species.

Slepe Heath, Purbeck, Dorset: 15 July 2000

This area lies at the northern end of Hartland Moor and is much covered with conifer plantation. A trackway leading along the southern edge of the plantation provides access to the heathland on either side. The plantation is thinly planted in places and provides some large areas of suitable *T. caespitum* habitat between the trees. The exposed south facing bank of the trackway itself is particularly suitable for *T. caespitum.*

The edge of the trackway, and areas of heathland amongst the trees hold high populations of *T. caespitum.* No *A. atratulus* were recorded here, but a single worker of *Tapinoma erraticum* was recorded here.

Bolberry Down, south Devon: 23 April 2000

A brief visit was made to this site, where G Spooner had previously recorded *A. atratulus* in 1969. The site slopes to the sea in a transition from sheep and rabbit *Oryctolagus cuniculus* grazed rough grassland, through to steeper, rocky cliffs with typical maritime vegetation.

A number of *T. caespitum* nests were found low down on the cliff-face on sun-exposed sites where the vegetation was thinly scattered between the rocks. No evidence of *A. atratulus* being present was recorded here.

7. Suggestions for further survey

Further surveys for the host *T. caespitum,* are recommended in the New Forest and on the Surrey and Purbeck heaths. Ideally, in one or two of the most promising sites for *A. atratulus,* there should be a more formal and rigourous sampling regime along set transects. This could hopefully be used to find *A. atratulus* as well as providing more detailed autecological information on *T. caespitum* population densities and habitat requirements, e.g. substrate, vegetation, insolation and temperature/humidity preferences.
If further experimental information can be gathered (perhaps also through literature searches) then some modelling of host and parasite populations could be considered.
Long term monitoring of *T. caespitum* at key sites needs to be considered.

Formicidae: *Formica candida*

Surveyor: Dr Ray North

1. Introduction

The RDB 1 Black Bog Ant *Formica candida* shows a preference for humid conditions on valley mires and wet heaths. Previous studies have shown it to be most abundant in the New Forest, Hants, in association with *Narthecium ossifragum/Sphagnum papillosum* and *Hypericum elodes/Potamogeton* type plant communities (North 1998). Nests are constructed inside tussocks of purple moor grass M. *caerulea*, heathers *Erica* sp, and cushions of sphagnum moss, they are often surrounded by standing water. The structure and pattern of the vegetation appears to influence the distribution of colonies. Controlled grazing regimes appear necessary to maintain the open nature of the habitat, and viable populations of the species.

The object of this contract is to begin to understand the level and programme of grazing required to maintain viable populations of *F. candida* and to understand the hydrological requirements of the species. The distribution and density of nests was to be recorded in relation to vegetation height, effects of grazing animals on the vegetation structure and composition. Research was also to highlight those areas with the highest population densities where further, more detailed, studies can be carried out in future years. A population of *F. candida* was studied on the Hampshire Wildlife Trust reserve at Roydon Wood, near Brockenhurst, Hampshire, where a controlled grazing regime operates, as opposed to sites within the New Forest which are subjected to uncontrolled, all year, grazing pressure.

Formica candida was also recorded or re-recorded from a further 10 sites in the New Forest and searched for, but not found, at three other sites.

2. Work carried out in 2000

The study site at Roydon Wood SSSI is an area of mire/wet heath habitat of approximately 4 hectares, studies were carried out in this area during July and August.

The mire is sheltered by woodland to the north and east, and a conifer plantation to the south. Much of the study site comprises purple moor grass, birch-bogmoss scrub and wet heath. The study site was divided into five compartments based on their structure and vegetation composition. All five compartments were subject to different levels of grazing, as a result of different individual preferences of the grazing stock, the underfoot conditions and availability of grazing elsewhere on the reserve. The site is grazed between May and August, typically 12 cattle are used, but during 2000 only five were available, resulting in the site being not as heavily grazed as it would normally have been.

Distribution of nests

The population density and distribution was estimated by placing two, 2 metre belt transects north-south, east-west through the compartments. The number of nests were counted at approximately $1m^2$ intervals along the transects. The largest numbers of ant nests were

grouped in two of the five compartments (3 and 4), no nests were found in the driest compartment. The majority of the nests recorded were grouped together, although some nests were isolated.

Vegetation height

The vegetation height in each compartment was estimated by walking a series of randomly placed transects and recording vegetation height at each metre. Ant nests within 10 cm of the point of measurement were also noted. Measurements were taken to the highest point of growth; flowering stalks of grasses were not included in this measurement. Between 50 and 60 measurements were taken along each transect. *Formica candida* nests were found in both grazed and ungrazed parts of the mire study area. Vegetation height did not correlate significantly with the density of nests per m^2. In the main concentration of nests the vegetation had a mean maximum height of 70.1 cm while the vegetation on the tussocks which supported nests had a mean maximum height of 58.1 cm, these tussocks had been cropped by grazing animals. Vegetation on tussocks which did not support nests was longer, with a mean maximum height of 75.1 cm. Nests were always located in clearings within the vegetation.

Vegetation structure and composition

Five randomly placed 1 m x 1 m quadrats were placed in each of the five compartments. Vegetation cover was estimated using the DOMIN scale. Bare ground was also recorded together with a measure of the wetness of the peat. The vegetation structure and composition does not appear to reflect the distribution of *F. candida* nests. All five compartments had a high coverage of purple moor grass, although one compartment had less purple moor grass, more rush *Juncus* sp, and no nests.

Soil pH

The degree of acidity of the soil was recorded using a (rapitest) garden pH testing kit. The soil pH in the area with the greatest nest density was recorded at approximately pH 5.5. Where the study site sloped, the top of the slope was pH 4.5, while at the bottom it was pH 6.5.

Effect of cutting vegetation on movement of nests

The vegetation in two 2 metre quadrats was cut back to approximately 10 cm high in the compartment that contained the highest density of *F. candida* nests to simulate grazing. It is intended that these quadrats be observed throughout 2001 for the appearance of ant nests. The composition and structure of vegetation in the quadrats was recorded after cutting.

Hydrology

Most of the nests recorded in this study were found on the damp, but not waterlogged, areas, with only two being found on dry peat. Fewer nests were found where the ground sloped towards the valley bottom and became increasingly boggy.

3. Additional *F. candida* sites in the New Forest, Hants

A further 10 new and rediscovered sites were recorded in the New Forest during the survey, these were located at:

Harvest Slade, 2 nests on a grazed *Molinia* tussock (9/9/00); Dogwood Bottom, 1 nest in a tussock of *Molinia/Calluna* (10/9/00); Vales Moor, 1 nest in *Molinia* (6/8/00 B Pinchen, G Else, M Edwards); Ferny Crofts, 1 nest on wet heathland (16/9/00); Ridley Bottom, 2 nests on seepage slope in *Molinia* tussocks (14/9/00); Ackercombe Bottom, 3 nests on seepage slopes in *Molinia* tussocks (8/9/00); Duckhole Bog, 1 nest in *Molinia* (29/7/00 B Pinchen); Wivelery Bog West, 4 nests in *Molinia* (26/7/00 B Pinchen); Kingston Great Common NNR, 2 nests in *Molinia* (10/8/00 T Sunderland/B Pinchen) and Acres Down, 1 nest in *Molinia/ Sphagnum* (11/9/00 B Pinchen).

The following suitable looking sites were searched but no nests were found: White Moor; Withybed Bottom and Shappen Bottom.

4. Suggestions for further survey

Further studies on the effect of grazing on *F. candida* colonies at Roydon Wood needs to be carried out in the area with the greatest density of nests. Part of this area should be fenced to enable one half to be grazed while the other is left ungrazed, this will provide a control in order that comparisons can be made with other sites.

Grazing pressure at this study site will probably increase in 2001 when the grazing stock levels are returned to their previous numbers. The established transects, quadrats and vegetation measurements will need to be repeated in order to monitor the effect this will have on nest density and distribution.

Further studies on the relationship between soil pH and nest distribution could be carried out.

A comparison of the available prey in each of the five compartments could be conducted.

Formicidae: *Formica rufibarbis*

Surveyor: Dr John Pontin

1. Introduction

The RDB1 Red Barbed ant *Formica rufibarbis* is one of the most thermophilous species of the *Formica* genus. It requires an open habitat in order to obtain sufficient warmth through insolation. In Britain it nests in short, lowland grass and heather, or maritime heath overlying loose or sandy soils. Nests are excavated in the ground or under stones; a small solarium of soil and vegetation fragments may be raised around a supporting grass tussock.

Formica rufibarbis has been considered a rare species since it was first found in Britain in 1896. It was previously recorded from six mainland British sites and one in the Scilly Isles. All of the mainland sites are, or were formerly, the Surrey heathlands.

Formica rufibarbis is restricted in Surrey to just two sites; Chobham Common and Stickledown Rifle Range.

Four nests were identified during survey in 1998, and have been monitored in respect of their sexual alate productivity since that time.

In 1998 only the parent nest on Chobham Common produced alates. Alate females hatched on 13/7/98 and one was observed calling on the grass stems over the nest on 20/7/98. Two more were recorded on 24/7/98.

In 1999 the same nest produced alate females which hatched on 28/6/99 and ascended the grasses on 4, 5 and 6/7/99. Two males from an unknown source appeared on 4/7/99 followed by a few more on subsequent days. Females outnumbered them 10:1 and three matings were observed. Alate females were produced from another nest on 10/7/99, but no males were seen. Five more mating pairs were observed at this nest.

2. The Chobham Common population in 2000

There are now four active nests on Chobham Common which are large enough to produce alate sexuals. Two nests here are thought not to be viable, these latter nests are one which had been thought extinct, and a branch nest which had been started during 1998. Both have emitted single foragers on only one occasion during June 2000.

One of the four populous nests (the largest in 1998) changed from producing almost 100% female sexuals to 100% males, and probably no workers at all during 2000. It is thought likely that the only queen has now died of old age. This nest appeared to be the original parent of most of the other nests in the area. A queenless nest may persist for another year or two, but will presumably soon die out. Nothing is known about queen replacement in the *F. fusca* group of species.

Two of the other nests produced only males, and the fourth nest (second largest) female alates only. The workers produced were conspicuously smaller than usual (many only 4-5 mm long compared with 5-7 mm) although the number produced was similar to previous years.

3. The timing of alate production and mating behaviour in 2000

The nests were visited each week until alates hatched, and then visited each morning until no more alates were observed.

The weather was in some ways exceptional and may have caused a lower success rate. April and May had twice the average rainfall for the 1961-90 period. In June temperatures were 0.7°C above average, although hours of sunlight are more crucial than air temperature. This being the critical month for development in *F. rufibarbis*. July was unusually cold, but this did not appear to affect mating behaviour.

The parent nest produced males on 17/7/00 which persisted on top of the nest each morning until 21/7/00. All had left by 11:00 hrs after emerging at around 10:00hrs in temperatures of

17°C+. No other alates emerged from the parent nest. One female emerged from a younger nest, and this was the only female producer this year.

Alate females were next seen on 26/7/00 and these copulated with two of only three males that arrived. Four more alate females emerged on 27/7/00 but flew away when no males arrived, two were captured and subsequently found to be infertile.

No further alates were seen on following dates and the total alate female production observed was only 10%, at the most, of that in 1999.

4. Stickledown Rifle Range population in 2000

There are still two nests here actively producing alates. These were not further investigated during 2000 because the main firing time at the range coincided with the production of alates and prevented access.

5. Sunlight and the ecology of *F. rufibarbis*

Further work is required on this area of the ecology of the species, but if the observations of 2000 are a realistic assessment of the effects of variable weather on *F. rufibarbis* then its continued existence in Britain is extremely precarious. Global warming, if it gives increased sunlight hours, may be beneficial but increased average recorded air temperatures do not necessarily mean less cloud.

The distribution map (Chandler & Gregory 1976) of hours of June sunshine does not correspond well with the distribution of *F. rufibarbis*. Its absence in the New Forest and presence in the Scillies is enough to invoke other factors of importance. An integration of the number of hours per year of bare surface temperature over a critical value might give a better correlation.

6. Laboratory nest performance

Three nests with queens collected in 1999 were successfully kept in laboratory conditions and increased their worker numbers to approximately 50 each by August 2000. The nests are easily kept and the ants readily eat small caterpillars or immature stages of other ant species. These established nests are intended to be released into the field to strengthen existing populations or establish new ones.

7. Establishment of new nests in the field from laboratory nests

As a trial of a new technique for *F. rufibarbis*, one of the laboratory nests was put out at Chobham Common on 10/8/00. The chosen site satisfied the following requirements: No significant shading from sunlight, and a bare soil surface available. Good drainage to prevent waterlogging and ideally a south facing slope with no *Formica* sp, or *Lasius* sp, present.

The nest was placed in a natural mound in dry heathland, the drainage was improved with a small trench dug around it. An exit hole was provided, but the nest was buried in the substrate up to its top to prevent the ants immediately scattering in panic. The nest was

covered with a perspex cover to aid inspection, and a removable paving slab over this to provide a sun-heated surface and darkness for the nest.

One of the few hot spells of the year followed nest placement, and to prevent the ants drying out before they had tunnelled into the soil a second paving slab was placed over the first. The second slab was removed on 12/8/00 when exit tunnels had been made into the substrate. The nest was still surviving well on 5/10/00.

8. Suggestions for further survey

The remaining field colonies on Chobham Common and Stickledown Rifle Range will be monitored during 2001, and their progress recorded.

The released nest will need monitoring in spring 2001 and possibly given supplementary food. Worker pupae should be produced in June or earlier given hot weather.

Other laboratory nests could be used to further strengthen the existing Surrey populations, or to re-establish the species within the historical range, if suitable sites and conditions can be found.

Horsell Common and Oxshot Heath have already been identified as suitable receptor sites.

Apidae: *Andrena ferox*

Surveyors: Graham Collins, George Else and Stuart Roberts

1. Introduction

Andrena ferox is an RDB 1 mining bee known from a small number of sites in southern England. It is a species of open deciduous woodland where females forage for pollen at oak *Quercus robur* catkins and, unusually for an *Andrena* sp, nests in communal burrows. It flies in May.

Since 1980 it has been recorded only at single sites in South Hampshire, Surrey and East Kent.

The aim of this survey was to discover the extent of populations in the New Forest and Surrey and to identify typical nesting areas as well as pollen and nectar sources.

Andrena ferox was recorded in good numbers at one site in the New Forest during 2000, but not recorded in Surrey.

2. Survey in 2000

Reigate Heath, Surrey

Andrena ferox was recorded here on 11th May 1998 by R Hawkins, as a single female flying around the edge of a golf course, carrying pollen.

The site was visited on 8th and 15th May 2000 in good weather. The fairway where the bee had been seen is lined on either side with mature oaks which were flowering. The short turf and aggregations of dead oak leaves were strongly reminiscent of the known New Forest site. No *A. ferox* were recorded at the flowering oak or nearby Hawthorn *Crataegus monogyna*. *Nomada flava*, a cleptoparasite bee that had been seen entering *A. ferox* burrows in the New Forest, was seen in numbers on 8th May. Despite the discovery of an aggregation of *N. flava* no nests of *A. ferox* were found.

Hollands Wood, Brockenhurst, Hampshire

Andrena ferox was discovered at this site on 7th May 1998. A visit by G Else and S Roberts on 9th May 1999 recorded at least 50 females nesting in a large mound of soil. Pollen laden females were observed entering burrows beneath a pile of fallen oak leaves. Pollen collected from these females was identified by P Westrich as belonging solely to *Quercus*.

In 2000, four visits were made by G Else on 29th April, 7th May (with S Roberts), 12th May, and on 14th May (with G Collins). The visit on 29th April was timed to coincide with a hoped for emergence of males; none were recorded. The first female was recorded on 7th May, but, while many were associated with the nesting mound identified in 1999, their numbers were reduced. The nesting mound is approximately 4 metres by 2.5 metres in extent and greatly domed. All of the *A. ferox* nest burrows were situated on the south facing side. The exact nesting site was located by observing the activities of female *Nomada flava* which were patrolling low over the dead leaf litter. Further nesting burrows were found nearby and others suspected, after pollen-laden females were observed flying low over the leaf litter. Two females with pollen loads were collected here. The pollen was again identified by P Westrich as belonging solely to *Quercus*. Only one flower visit was recorded, a female *A. ferox* visiting the flowers of hawthorn. No male *A. ferox* were recorded during 2000.

Ramnor Inclosure, near to Hollands Wood, and the site of an *A. ferox* record in 1966 was also extensively surveyed. No *A. ferox* were recorded during any of the visits.

3. Discussion

Very little progress in understanding the bee's ecology was made, as many of the results of the survey were negative ones. Weather conditions during the survey period were poor with relatively few sunny days.

Visits to the New Forest in the best conditions available suggested that numbers of the bees were down on the previous year.

Lack of success in Surrey was probably a combination of a small population and failure to find the actual nest site.

The apparent rarity of the bee could be due to it spending most of the time in the tree canopy and the habit of communal nesting - it being easier to overlook a small number of clumped nests than many nests spread widely over a large area.

4. Suggestions for further survey

To continue to monitor the population in the New Forest, and to search other areas nearby which may also hold populations.

Further searches at Reigate in Surrey need to be carried out to establish the locality of a nesting population.

A examination of the exact nesting habitat requirements needs to be carried out at sites where populations are known.

Apidae: *Nomada errans*

Surveyors: Stuart Roberts and George Else

1. Introduction

The RDB 1 bee *Nomada errans*, is a small species of anthophorine bee and is a cleptoparasite upon the RDB3 mining bee *Andrena nitidiuscula*. It was first recognised as British from three females caught at Durlston Head, Dorset in 1944 and only recorded on a few occasions since, the most recent record being on 26th July 1982. All records have come from, or near to, its original locality. Searches at the only known British site since 1991 have failed to confirm its continued existence. However, the small size of *N. errans*, its limited flight period and the continued presence of strong populations of its host in a number of coastal sites, together with the discovery of new host populations on Salisbury Plain mean that it may have been overlooked.

Targeted primary survey work for *N. errans* was centred on searching for the species and its host in the vicinity of Durlston Head and Anvil Point, Dorset, and at the newly discovered host colonies on Salisbury Plain in Wiltshire.

A search was to be made for historic records of populations of the host bee *A. nitidiuscula* in Great Britain, with a specific emphasis on Dorset and south Wiltshire.

No *Nomada errans* were recorded during 2000.

2. Survey work in 2000

Dorset

Durlston Head was visited on 29th July in bright sunny conditions with a moderate breeze. A short squally shower passed over during the afternoon. The area between the Country Park visitor centre and Anvil Point, and the paths leading east and west along the coast below the lighthouse were surveyed.

Three nesting aggregations of *A. nitidiuscula* were found, all were constructed in a loose red-brown rendzina soil, or amongst desiccation cracks. Populations varied from many tens of females to a few tens. Females were seen entering the burrows with full pollen loads, and nearby at the flowers of wild carrot.

Gad Cliff was visited on 30th July in bright, sunny and warm conditions. The area searched included south west facing cliffs above Brandy Bay and Hobarrow Bay, and the undercliff on Gad Cliff itself.

No nesting aggregations of *A. nitidiuscula* were found despite good numbers being seen visiting cliff top flowers of wild carrot. It is quite likely that the nest site was close by on the unstable ledges of the Brandy Bay cliff immediately below where *A. nitidiuscula* was found. The Gad Cliff undercliff has little flowering Apiaceae, but there are significant areas of bare ground, *A. nitidiuscula* was scarce here.

Worbarrow Bay was visited on 30th July in bright, sunny and warm conditions. Three distinct areas were searched here:

i. Worbarrow Tout, a grassy limestone prominence at the eastern extremity of Worbarrow Bay. A steep sloping south-facing calcareous grassland with cliffs to the north and west. *Andrena nitidiuscula* was plentiful at the flowers of wild carrot over most of the Tout, but no nesting aggregations were found.

ii. Poundfield Cove is a similar area to that described above, the cliffs held abundant wild carrot and supported small numbers of *A. nitidiuscula.*

iii. Worbarrow Bay, a line of south west facing cliffs stretching from Tyneham Gwyle to below Flowers Barrow was searched. The clay cliffs are unstable and suffer frequent slumping, creating suitable nest sites for soil mining bees. Both sexes of *A. nitidiuscula* were observed in numbers visiting flowers of wild carrot, a large nesting aggregation was discovered about 35 metres above the beach in a west facing bank.

Wiltshire

Salisbury Plain (West)

Visited on 4th August on an overcast but warm day following a number of days with heavy rain showers. An area of calcareous grassland at Ladywell, Imber was searched. A small nesting aggregation of *A. nitidiuscula* was found in exposed grey rendzina soil on a track running up a gully north of Ladywell. The colony only numbered a few tens, but pollen-laden females were observed entering nest burrows, and both sexes were seen visiting flowers of wild carrot in the adjacent grasslands.

3. Suggestions for further survey

Further priority needs to be given to surveying for this species in the Durlston Head area during 2001. The limited time available during this survey meant that only a relatively superficial survey could be undertaken.

Concentration of effort in the Durlston area in searching for aggregations of the host bee and sweeping of forage flowers in the vicinity of known nesting localities remains the most likely way of tracking down *N. errans*.

Of equally high priority is further investigation of Tilly Whim and Anvil Point at Durlston.

If time and weather conditions permit, it would be worthwhile checking other Dorset coastal localities known to support colonies of *A. nitidiuscula*.

Apidae: *Osmia xanthomelana*

Surveyor: Adam Wright

1. Introduction

The RDB 1 mason bee *Osmia xanthomelana* has been known to survive on the south coast of the Isle of Wight since the 1850's. In recent years the species has only been recorded near Shanklin in 1977, and more recently at Red Cliff near Sandown (Else 1995). The status of the bee was to be investigated at its only known recent site, and an assessment made of the likelihood of it being found elsewhere on the Island. The flight period for *O. xanthomelana* in Britain extends from late April to mid July, with most records being from mid May to mid June. Two major requirements of the bee are the presence of its pollen resources (bird's foot trefoil *Lotus corniculatus*, and horseshoe vetch *Hippocrepis comosa*), and the presence of mud in the correct consistency for nest building.

Despite searches at several sites in 2000, *O. xanthomelana* was not recorded on the Isle of Wight. It seems unlikely that the species occurs on the Island except in the Sandown Bay area.

2. Survey in 2000

Four areas on the south coast of the Isle of Wight were surveyed where the bee had been recorded previously, or where there appeared to be suitable habitat available.

Red Cliff, near Sandown

Three visits were made to this site, on 16th May, 27th May (with M Edwards and B Pinchen) and 3rd June (visit by M Edwards, B Pinchen, G Else and C Clee). The forage plant *L. corniculatus* was flowering in abundance during all of the visits, but only a few small suitable seepage lines providing mud for nest construction were found. No *O. xanthomelana* were recorded on any of the visits, and it is concluded that this area may now be too dry to support a viable population of the bee.

Shanklin Chine to Monks Bay

This section of cliffs was surveyed during good weather on 27th June. Large areas of the cliff face are inaccessible and support little flowering plant life, *L. corniculatus* was present only near the top of the cliff. Two areas, known as Horse Ledge and Dunnose Point contained

the best areas of *L. corniculatus* and a number of seepages, but there was no evidence of *O. xanthomelana* being present at either site.

The southern area of this cliff at Luccombe is now being encroached by scrub in the drier areas, while the wetter areas are being colonised by common reed *Phragmites australis* and horsetail *Equestum* sp.

With the possible exception of the Horse Ledge area it is thought that the habitat along this section of Sandown Bay may no longer be suitable for *O. xanthomelana.*

St Catherine's Landslip

This areas was visited several times as part of an entomological survey for the National Trust. The area has large areas of low cliffs and terraces with *L. corniculatus*, seepages and wet flushes are abundant. The exposed mud here is Gault Clay rather than the Lower Greensand of Red Cliff. No *O. xanthomelana* were recorded here.

Puckaster

The terraces here were visited in late May and found to be extremely wet with oozing mud being colonised by horsetail and common reed. *Lotus corniculatus* was only present in small quantities, and much of the area was being invaded by scrub.

This site is clearly now unsuitable for *O. xanthomelana.*

3. Suggestions for further survey

It is proposed that monitoring the sites in the Sandown area for the presence of the bee should continue during 2001.

Sites on the mainland containing the correct habitat at Highcliffe, Milford-on-Sea and at Lepe, Hampshire, should also be surveyed for the presence of the bee.

Apidae: *Osmia parietina*

Surveyor: Neil Robinson

1. Introduction

The RDB 3 mason bee *Osmia parietina* favours *L. corniculatus* in sun-trap situations, where shelter is afforded by scrub in North West England . Temperature requirement appears to be a critical factor in their activities. Females frequently interrupt foraging activity to settle and bask on exposed surfaces such as rock or bare ground as though absorbing warmth. Observations on 12th May show that if early warm weather brings the bees out before *L. corniculatus* is flowering the females will visit other flower species. However, once *L. corniculatus* is flowering it is clearly the preferred forage species.

Osmia parietina was confirmed in Lancashire at three sites, while in Cumbria it was confirmed at two sites, but not found at a third locality. Several other possible sites were

visited but no new populations were located. Unseasonably warm weather at the beginning of May resulted in females emerging to forage early, on 12th May, before *L. corniculatus* was flowering on some sites.

2. Survey during 2000

Lancashire

Yealand Hall Allotment was visited on seven occasions between 12th May and 28th June. Several females were observed at a new site in this area on 12th May, on an area of open limestone pavement. The bees were observed nectaring at a yellow hawkweed *Hieracium* sp, and *L. corniculatus*. A single female was also observed foraging at Crab Apple *Malus* sp,. This site appears to hold the largest population of *O. parietina*, with an estimated total of 12 females being seen in 2000. It would appear from this site that even small amounts of *L. corniculatus* are able to support populations of this bee.

Carnforth Ironworks was visited on 13th May and 13th June. Single *O. parietina* females were observed foraging at *L. corniculatus* on 13th May, but none were seen on 13th June, when weather conditions may have been too windy for flight. The population of *O. parietina* has declined at this site since 1995 as a result of natural succession in the limestone grassland.

Gait Barrows NNR was visited on six occasions between 13th May and 15th July. A single male and two females were recorded on 22nd May at flowers of *L. corniculatus* but no further sightings were made in subsequent visits. At this site *L. corniculatus* appears to be heavily suppressed by the combined effects of rabbit grazing and extensive growth of tor grass *Brachypodium sylvaticum*. Management of the woodland by coppicing for the benefit of butterflies will prevent progression to dense woodland, but at this site may not create new habitat for *L. corniculatus*, which is a colonist of bare ground. At present there appears to be sufficient *L. corniculatus* to support a population of *O. parietina* but only at a low density.

Cumbria

Meathop Crag was visited on six occasions between 13th May and 27th June. *Osmia parietina* was recorded on two visits only, on 13th May, and a worn female foraging at *L. corniculatus* on 27th June. This site probably only supports a small population of *O. parietina*.

Gowbarrow was visited on three occasions between 13th June and 20th July. There are widespread areas of *L. corniculatus* present, ranging from altitudes between 600 ft to 900 ft. Two female *O. parietina* were observed at *L. corniculatus* flowers, and also observed briefly visiting flowers of tormentil *Potentilla erecta*.

Many of the areas of *L. corniculatus* here are extensively sheep grazed, and as a result do not produce many inflorescences. Despite this, a small population of *O. parietina* is still able to persist at this site for the time being.

Township Plantation was visited on seven occasions following the sighting of a single female *O. parietina* in 1999. No further sightings were made during these visits but there was enough *L. corniculatus* in flower to support what may only be a small population here.

3. Other potential sites visited

Yewbarrow; Cumbria, was visited on 31st March. The grassland here is too heavily grazed, while the woodland is too dark and dense. No further searches of this area are thought necessary.

White Scar Foot; Cumbria. Negative results are recorded at this site despite extensive searches in 1999 and 2000. There is *L. corniculatus* present in scrub at the foot of the cliff face. Further visits are recommended for 2001.

Warton Crag; Lancs, the RSPB reserve and nearby Local Nature Reserve were visited but both were found to be supporting unsuitable habitat for *O. parietina*, the grasslands being either too nutrient enriched or too scrubby. At the nearby Warton Crag Quarry LNR suitable looking habitat was found and will be searched during 2001.

Dumail Raise; Cumbria, was visited on two occasions, areas of base-rich flush with scattered patches of *L. corniculatus* were identified and searched with negative results. Further survey in 2001 may be worthwhile.

Sawrey; Cumbria, was visited on 4th July, this is a location where G Spooner took a pair of *O. parietina* in 1950. Patches of *L. corniculatus* were found in the grassland and searched but no *O. parietina* were found.

4. Suggestions for further survey

It is recommended that visits should be made to suitable looking sites in the vicinity of areas which currently hold populations of *O. parietina.*

Discussions relating to habitat management on sites which currently support populations of *O. parietina* are essential for the future survival of the species. This will involve discussions on a site-by-site basis with a number of different landholders and land managers.

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