



## **A solitary mining bee *Andrena hattorfiana* at Gwithian Towans**

**By ECM Haes<sup>1</sup>**

A small population of this striking-looking, dark, solitary mining bee *Andrena hattorfiana*, the size of Honey Bee *Apis mellifera* workers, has been monitored almost annually on the calcareous sand dunes at Gwithian (SW580408) since its presence here was confirmed by George Else in the hot summer of 1989.

As this bee is a national rarity, status RDB Vulnerable (Red Data Book), this, and the several other Cornish populations, are of national importance. For the last eight years therefore Spalding Associates (Environmental) Limited has undertaken the monitoring of the site at Gwithian (as well as sites at Gear Sands) for Cornwall County Council.

The bee is dependant on the pollen of Field Scabious *Knautia arvensis* as the sole source of food for its overwintering larvae in their subterranean cells. For details of *Andrena hattorfiana*'s life cycle and the appearance of the adults see Appendix I.

From 1989 until 1994 the mainly rabbit-grazed, stabilised rear-dune area occupied by the bee at Gwithian remained essentially undisturbed. However from the hot summer of 1995 the area became a popular place for random car parking, camping, picnicking and the very destructive burying of rubbish. In consequence, from this time, Gwithian Towans, a Site of Special Scientific Interest (SSSI) for the bee, as well as some other insects, and a rich and diverse calcareous dune flora, was ably managed for the County Council by Philippa Hoskin (Assistant Warden) and her team of volunteers. This period included the concentration of 'travellers' into a specially contained area, with the costly and effective provision of a system of low but substantial barriers to prevent vehicular entry to the area east of the road down to the main Gwithian dune car park and the arable land along the road Gwithian village. This area includes the sites A, B and C (see Map 1), which are the three original locations for the bee found by ECM Haes and George Else in 1989.

After the 'travellers' left, this restricted 'upper car park' was returned to public use. The bee colonies around sites A, B and C, together with the newly found site D, on private land, continued in a reasonable state through the summers of 1996 to 2001. These sites were supplemented by the discovery of two further colonies west of the road to the main Gwithian dune car park, at sites E and F, and at G, a new site within the traffic free zone itself. But unfortunately troubles were looming.

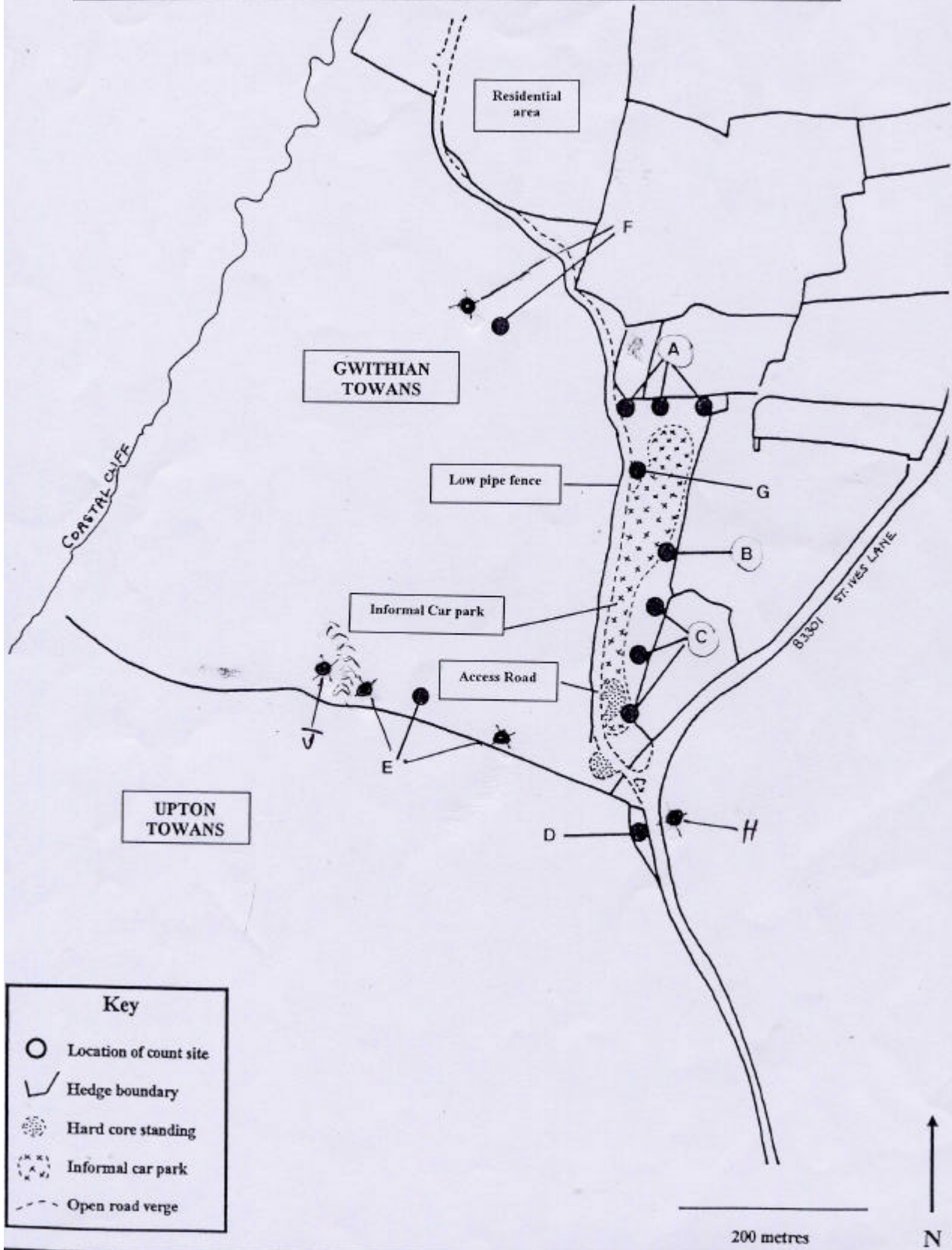
In late 2001 Philippa was given another posting and a small team of contractors was taken on by the County Council. They endeavoured to follow, as far as possible, the agreed system of management for the bee, but there were two major complications. The property behind site A changed and a

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Map 1: Outline map of Gwithian Towans showing location of monitoring count sites for *Andrena hattorfiana* in 1998 and 1999 & 2003



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cleared path was cut hard by the south-facing wall to provide an easy footpath. This effectively destroyed the main breeding ground for the bee colony at this site. Even more drastic, if understandable, was a request by the farmer of the adjacent arable land to have casual access to the field prevented, by allowing a tall Bramble *Rubus fruticosus* agg. and scrub screen to be developed. Under this new, wide cover Rabbits *Oryctolagus cuniculus* found considerable safety from predators. This would not have been too serious but for the fact that Rabbits relish Field Scabious. Within a year they had effectively demolished the supporting plants for the bee colonies at sites B and C.

Thus Philippa's gift for persuading and explaining, rather than officiously enforcing management requirements, was lost, just when other major factors had turned against the *Andrena hattorfiana* population at Gwithian.

All has not been total loss during 2002 and 2003 however. The three-part population at site E has continued to flourish (despite dog faeces, trampling and picnicking (including the destructive instant barbecue sets)), as Rabbits have so far lacked easy covered access to the Field Scabious at this site. Additionally, the seemingly lost colony at site D has been replaced by a bee population just over the road at the now strong Field Scabious colony at site H, by the scrub-cleared entrance for a campsite footpath. It is also possible that another Field Scabious clump, at site J, may eventually attract bees from site E, although there is a very abrupt dune ridge between the two sites which, with the prevailing westerly winds, may prevent easy crossing, even for this strong-flying bee.

From 2002 the Cornwall Wildlife Trust has been given the task of protecting the Local Nature Reserve of Upton Towans and this area is now one of the Trust's actively managed reserves. As there is a very rich fauna and flora along the boundary footpath between Upton and Gwithian Towans it seems reasonable to suggest that Trust protection could be extended perhaps some twenty metres into Gwithian to cover the bee colony at site E, as well as the site of other key habitat indicator insects, spiders and both flowering and non-flowering plants.

Table 1 lists the colonies of *Andrena hattorfiana* in Cornwall currently known about (post-1980); details of earlier records are given in Appendix II.

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**Table 1. Currently known colonies of *Andrena hattorfiana* in Cornwall, post-1980** (sites west to east).

1. St Uny Churchyard, Lelant SW547377	A substantial population of Field Scabious in the 'old', unmanaged section of the cemetery ground, supporting a currently very viable population of the bee. Discovered by ECM Haes in June 2001. This colony extends northwards along the railway cutting almost to the footbridge, where there are clumps of Field Scabious at intervals.
2. Gwithian Towans SW581407 to SW582410, and west to SW578407	As detailed in this paper.
3. Gear Sands a) SW775554 and SW776555 b) SW774557 c) SW779556 and SW778561	In three separate places, as indicated by the grid references. The middle population has been noticeably reduced recently, but the first and third populations remain much as they have been for the last ten years.
4. Constantine Bay, Trevoise Farm SW859755 to SW864755	Colony discovered by Ken Preston-Mafham in 1998 in extensive area of Field Scabious across an area of rough acquired by the golf course for possible extension, but now conserved as part of the Trevoise Head and Constantine Bay SSSI.
5. St Minver Rock, Quarry Car Park SW929758	Small population re-discovered on Field Scabious by GMS Trebetherick in 1984 and seen again by him in 1985. Unfortunately it became urgently necessary to develop the car park very extensively about 1992, with the loss of the only known colony of <i>Andrena hattorfiana</i> north of the Camel Estuary in Cornwall.

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Shirt, DB (ed), 1987. *British Red Data Books: 2. Insects*. Nature Conservancy Council.



## **APPENDIX 1**

### **Appearance of adults: life cycle and selected population counts of *Andrena hattorfiana***

Both males and females are the same size as the worker Honey Bee but are much darker. The male has a distinctly bristly look and this 'upper lip' on the face has a 'Tom & Jerry smile' effect, being shining white. The female has a dark band near the tip of the abdomen and in some this is reddish. The pollen baskets quickly fill with the orange coloured Field Scabious pollen.

The subterranean nests contain several separate cells, each with a single egg on a pollen mass. Grubs pupate in winter and the adults leave the pupal case some time before emergence. Males fly from about late June and, attracted by scent, head for the females, as they emerge in early to mid July, to mate with them as they seek nectar from various flowers. Once mated, females make their nests from about mid July to mid August.

Adults counted at the four surviving sites in 2001/2002:

- (a) St Uny Churchyard, Lelant: 16 adults (6 males) in 2002.
- (b) Gwithian Towans: 14 adults (5 males) in 2002.
- (c) Gear Sands: 25 adults in 2002 (including 22 marked by Spalding Associates (Environmental) Ltd).
- (d) Constantine Bay: 9 adults (2 males) in 2001. Site not visited in 2002.
- (e) St Minver, Rock: GMS Trebetherick saw 1 female in 1984 and 6 females in 1985.



## APPENDIX II

### Earlier (pre-1940) history of known sites for *Andrena hattorfiana* and its exclusive 'cuckoo' *Nomada armata* in Cornwall

- (a) In the 1907-1940 period the Reverend A Thornley, who lived at Carbis Bay for many years, knew the bee in the dune area by the St Ives railway at Carbis Bay (SW5239) in 1933 and 1937, and on 'clay banks' at Lelant (SW5437) in 1929 and St Erth (SW5535) in 1928.
- (b) In the St Minver area (SW9677) K Le Marchant (during frequent Summer visits) recorded the bee in this locality (then far less built-up) between late June and early August of 1911, 1912, 1916, 1917, 1918, 1923, 1928, 1929, 1933 and 1937. He placed many specimens in the British Museum.
- (c) In the immediate post-Victoria County History of 1906, Professor J Clark, in the *Reports of Royal Cornwall Polytechnic Society* recorded the bee at Loe Pool (SW6424) in 1907, "much scarcer than formerly". The *Nomada armata* was also recorded from three mid-Cornwall sites on outcrops of calcareous basalts in SX06, SX16 and SX26, presumably with its host (specimens are in the British Museum), as well as at St Minver.
- (d) The *Victoria County History* (1906) includes records from Professor J Clark and from the comprehensive and detailed list by ECH Davies (1901-1905) used by E Saunders in his *British Hymenoptera Aculeata* from entries in the *Entomologists Monthly Magazine* from 1902. Sites for *A. hattorfiana* at this period included the well-known site at Loe Pool on the Lizard, Trevaylor (SW4632) and elsewhere at Penzance and at Falmouth; Bishop's Wood, Truro (SW8248 - before the post 1920 afforestation schemes) and the banks of the River Lynher (SX36).
- (e) ED Marquand in the Penzance Natural History and Antiquarian Society noted the singleton specimens of *N. armata* captured by Bailey at Gulval (SW4831) in 1883 and Mousehole (SW4626) in 1893.

From the above much abbreviated data it seems clear that although *A. hattorfiana* was widespread from Penzance to the River Lynher, it was even then not generally distributed and its 'cuckoo' distinctly rare. Fortunately the marine biologist GM Spooner, for whom Aculeate Hymenoptera were a major hobby, contributed extensively to the British Museum collection and after his death in June 1989 his widow gave his vast lists to GR Else and M Edwards, and Stella Turk was able to add these to the former Cornish Biological Records Unit, so that they are available for posterity (all data now held at ERCCIS).

The national distributions of both *Andrena hattorfiana* and *Nomada armata* are shown in the *Provisional Atlas of the Aculeate Hymenoptera of Britain and Ireland Part 3*, edited by R Edwards (maps 158 and 165 respectively).