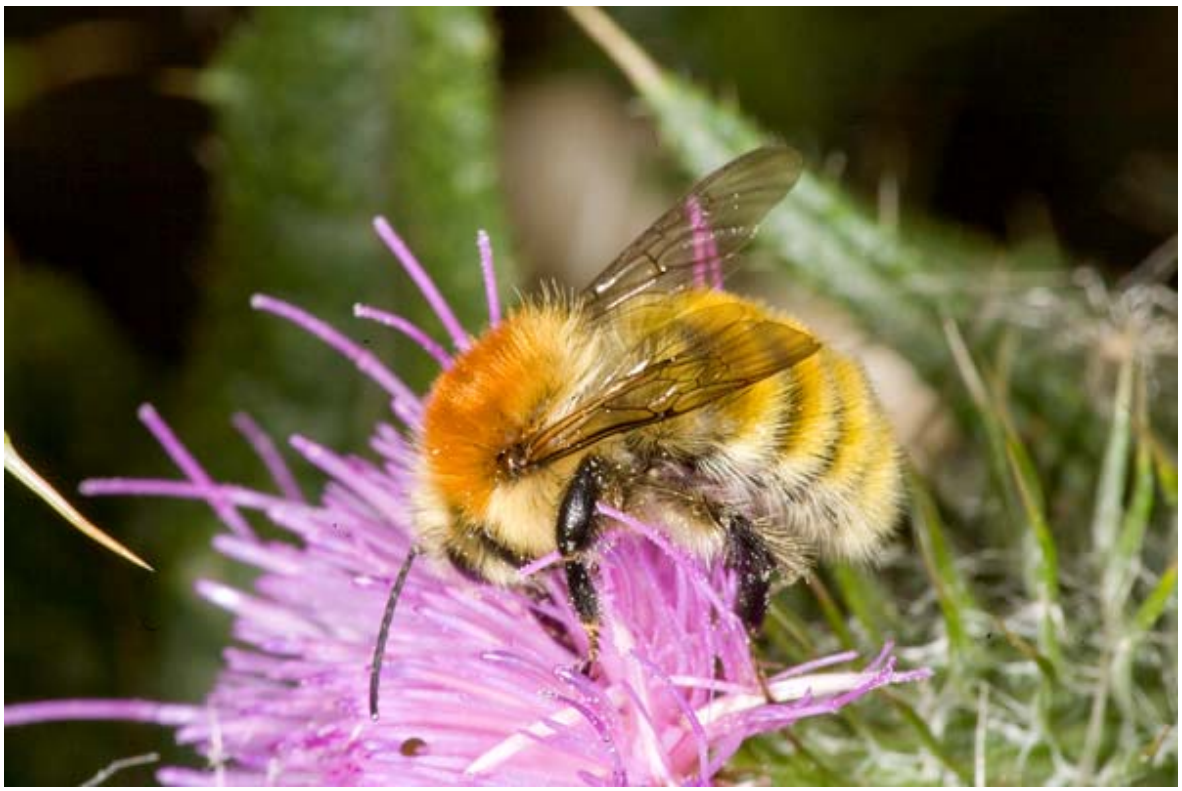
Hymettus

The possible replacement of *B. muscorum* by *B. humilis* in Kent, August 2008.



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Cover photograph:
Bombus muscorum male by Mike Edwards

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1. Background

1.1 Previous Work

At the extension of the Biodiversity Action Plan process in 1998 (intermediate list) the bumblebee *Bombus humilis* was included on the priority species list. The bumblebee *Bombus muscorum* was not included as a BAP species until the review of 2006, but *Bombus sylvarum* was the first bumblebee species to be looked at in 1996 (Short List). During the period 1996 to 2007 records of all three species have been kept by myself whilst undertaking BAP associated research and other surveying.

From these records it is clear that all three species have always been present in the North Kent Marshes area. However, the detailed distribution and relative abundance of the three has been quite different. *B. muscorum* has been the most widespread, being found regularly over much of the grazing marsh area, *B. sylvarum* has been localised but sometimes frequent; concentrated, but not exclusively, in the dryer areas and *B. humilis* the scarcest, being in only the driest parts, such as the RSPB Reserve at Cliff Pools TQ77. On the south-facing bank of the Thames the reverse has been the situation, with *B. humilis* the most widespread and B. *muscorum* the least (until the coastline heads north).

During the spring of 2007 I went to one area (RSPB Eastborough Farm TQ7676), where *B. muscorum* had been on previous visits the only one of these three bees present, in order to photograph queens. I was greatly surprised to find large numbers of *B. sylvarum* queens (10+) and that most of the brown queens appeared to be *B. humilis*, including all but one which I photographed.

At the same time a number of reports of the expansion of *B. humilis* into new areas were also being received. I had previously known about the loss of *B. muscorum* in the Chichester Harbour area during the late 1980s and the subsequent discovery of *B. humilis* in the area (it was always adjacent on Portsdown Hill), but had treated this as a one-off event.

Many of the reported changes did not involve *B. humilis* moving back into areas where it had recently existed but had gone extinct, but areas where there were no, or very few, previous records.

1.2 Survey Aims

These observations raise the questions as to whether this modern movement is part of a much more general retreat on the part of *B. muscorum* and an advance on the part of *B. humilis* and, if so, what could be driving it.

2. Methods

2.1 Site selection

In 2008 I was commissioned by Hymettus to return to areas in North Kent which I had surveyed in the previous 15 years to find out whether there were any consistent changes in the distributions of *B. humilis* and *B. muscorum*. For this I re-visited

- Sandwich Bay, TR3538;
- Graveney Marshes, TR0564;
- Oare Marshes, TR0062;
- RSPB Elmley, Spitend Marshes, TQ9667 (2 samples);
- and Eastborough Farm, TQ7676.

These sample sites had been surveyed previously at least twice. All these sites had previous records of *B. muscorum* only, although some had *B. sylvarum* present as well.

2.2 Survey methods

At each site I made a round walk counting bees of each species. The time spent and distance of each walk was noted, but this was not standard as different sites required different lengths of walk. All visits had two persons recording as David Baldock accompanied me to all sample sites.

For many male specimens recording was fairly easy, the fresh *B. muscorum* males being distinct by virtue of their much denser coat and rather larger appearance. However, a sample was retained for microscopic examination later.

All workers were caught and examined in a marking cage for dark hairs on the thorax. Again a sample was retained for microscopic examination. There have been a number of workers of both species reported which do not fit this hair character readily. However, the proportion of these is small and the object of the exercise was to see if *B. humilis* was present in areas where it had previously been absent.

3. Results

The results of the counts are presented in Table 1. All sample specimens of both males and workers proved to be the expected species.

Table 1: Counts of *B. humilis* and *B. muscorum* at sample sites in North Kent.

Site	**Date**	**Time**	**Distance**	**Number of *B. muscorum***		***Number of B. humilis***		***No. of B. sylvarum***
	2008			**workers**	**males**	**workers**	**males**	
Elmley 1	8 August	90min	1km	4	26	0	0	no
Elmley 2	8 August	30min	0.5km	0	7			yes, as before
Eastborough Farm	8 August	90min	1km	0	1	11	1	yes, not before
Sandwich	27 August	120min	1.5 km	5	11	0	0	no
Graveney	27 August	45min	0.5km	2	0	1	0	yes, not before
Oare	27 August	90min	1km	7, 1q	0	1	0	yes, as before

4. Discussion

B. humilis was clearly present in three out of the five areas where it had previously been absent. It was very clear that, in North Kent at least, nests of *B. muscorum* complete their development before those of *B. humilis*, although there was overlap. Whether this reflects a different timing of queen founding or a different length of colony cycle is not known.

The situation on the managed grassland at Eastborough Farm was very interesting. When first surveyed this had been in a fairly intensive, 'autumn wader' regime of hay cut and hard sheep grazing. There was very little in the way of flowers. In fact my first visit was to look at the potential for establishing bumblebee habitat on a small area of rising ground which was not in this management regime. On going into the managed grassland on this visit the changes were very apparent. Apart from the numbers of *B. humilis* and, particularly, *B. sylvarum* present, there were large stands of Narrow-leaved Bird's-foot Trefoil *Lotus glaber* throughout. In discussion with the RSBP staff it was established that the major change had been to a less intensive, more or less continuous cattle-grazing regime, with occasional topping. Although this had not been established for the benefit of bumblebees, the overall habitat improvement compared with the simple, but severe, 'keep it short at all times' regime of former years, was most marked. The Reserve staff are to be congratulated on the development of the management regime.

5. Acknowledgements

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