

Home Farm

Managing an arable farm for the rare Shrill carder bee

What is the Back from the Brink Shrill carder bee project?

The Shrill carder bee project is a partnership led by the Bumblebee Conservation Trust and Buglife working to secure the future of this species, as part of the wider Back from the Brink project.



Photo-credit: Claire Fidler

Shrill carder bee queen foraging on Knapweed

The Shrill carder bee

The Shrill carder bee (*Bombus sylvarum*) is one of the UK's rarest bumblebees. Once widespread throughout southern England and Wales, its current distribution is now limited to five isolated populations. The Shrill carder bee is late emerging, with queens typically coming out of hibernation in April/May, and workers seen on the wing from mid-June. Males and new queens are produced from late August to September and the colony life cycle is completed by the end of September or early October. Nesting occurs in rough, often tussocky grassland either on or slightly below the surface of the ground. Old small mammal burrows may be used. New nests are constructed each year, and are occupied between April and October. Therefore, areas where nesting is suspected to take place should be left undisturbed during this period.

Habitat requirements

All bumblebees rely on flowers for food in the form of nectar and pollen, and a continuous supply of suitable forage throughout the colony lifecycle is needed for survival. Shrill carder bees have

been described to have a narrow dietary breadth; however studies across various locations indicate a broader range of forage plants utilised. As such, it is probable that local preferences are displayed according to the flowering plant species available. Example forage plants include bird's-foot trefoils, Black horehound, Comfrey, knapweeds, Red bartsia, Red clover, vetches and White dead-nettle. Plants in the Pea family (Fabaceae) are particularly important.

To better inform future land management advice, the Back from the Brink Shrill carder bee project has monitored four case study sites over the two project areas; two in Somerset and two in the Thames Estuary. This allowed the project team to gain a better understanding of how the Shrill carder bee uses different habitats and how these can be managed to best provide for them.

Site introduction

Home Farm is a conventional arable farm in Somerset. Brothers and owners Henry and Richard Lang manage the 400 hectares family farm. Apart from old hedgerows, traditional farm buildings, and old-fashioned cider orchards, the farm does not have any special designations. Despite this the Lang family have worked to encourage wildlife on the farm whilst maintaining a profitable farming business. The arable rotation includes winter wheat, oilseed rape, and spring linseed.

During a visit from Natural England in 2015 a Shrill carder bee was identified on the farm. The species has since been regularly recorded in low numbers across the farm in various habitats such as species rich grassland, pollen and nectar strips, margins, scrub and ditches.

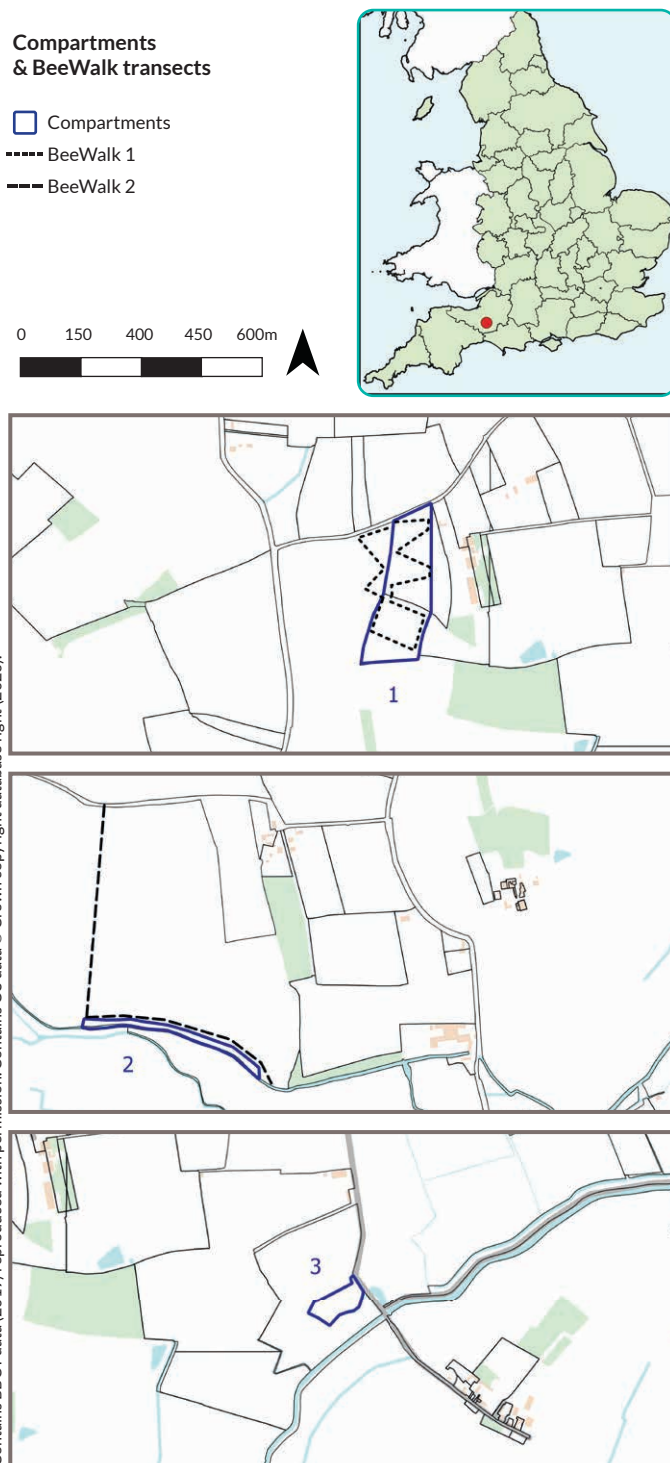


Pollen and Nectar Strip at Home Farm (inset: Moss carder bee (*Bombus muscorum*))

Methodology

Three compartments were selected for monitoring in 2018 and 2019. At Home Farm, this included a species rich hay meadow, arable field margin and wet arable margin. In each compartment, vegetation surveys were conducted in mid June and late summer (August and September) to monitor bumblebee forage plants availability and abundance throughout the season. All bumblebees encountered were identified and their forage plant recorded.

Figure 1: Survey compartments and BeeWalk transect routes at Home Farm (inset map of UK with pinpoint of case study location)



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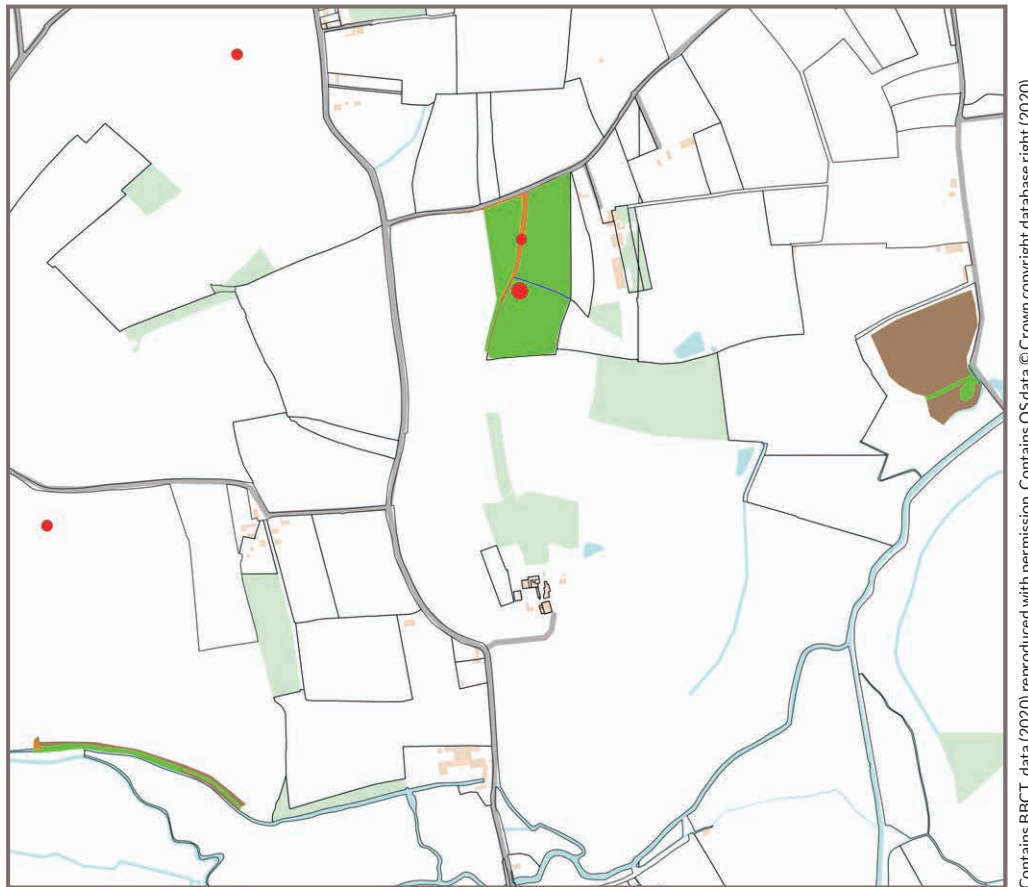
Bumblebees were also recorded using BeeWalk (see Figure 1). BeeWalk is the Bumblebee Conservation Trust's national bumblebee monitoring scheme. Bumblebees are counted monthly along a set route, between March and October, using a standardised survey methodology.

Habitat management for the Shrill carder bee

Home farm is in Higher Level Stewardship, with over 60 hectares in options suitable for the management of pollinators including nectar and pollen strips, species rich grassland management and wildflower margins. The management of the specific compartments is as follows:

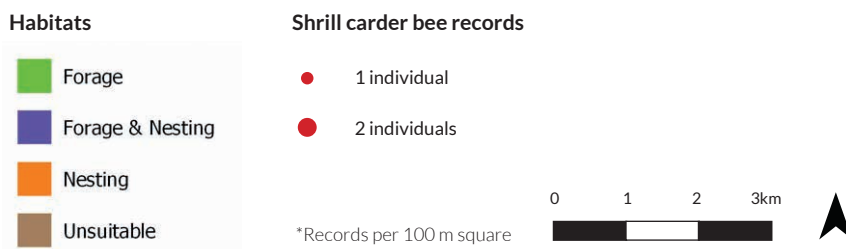
- **Arable Field Margin** – Floral field margins are vital for wildlife within the arable landscape. At Home Farm, 31 hectares of margins are cut for hay in late August, with 10% remaining uncut. By bailing the cuttings this helps to retain low soil fertility, therefore favouring wildflower growth. Uncut sections are allowed to grow to provide nesting habitat in close proximity to forage sources. This is important for Shrill carder bees which are known to forage at shorter distances from the nest compared with other bumblebee species.
- **Wet Buffer zone** – The farm is helping to reduce impacts on water quality by maintaining large margins as buffer zones on arable fields adjoining water courses. To promote greater uses for wildlife, wildflowers are encouraged however this can be more difficult on margins that are wetter. The Lang's therefore used more damp tolerant species such as Comfrey, Tufted vetch, Common knapweed and White dead-nettle, all of which are important forage plants for the Shrill carder bee.
- **Species rich hay meadows** – Home farm features 16 hectares of species rich hay meadows, several were created from ex-arable land. The ex-arable fields originally received higher payments in Stewardship being classified as arable reversion however these have since been reduced following their classification being changed to species rich grassland. To address this payment gap the Lang's now brush-harvest wildflower seed. The meadow is cut for hay in July. Removal of such a key forage source in mid-summer could cause Shrill carder bee colonies to fail through a lack of food. As a solution to this, a nectar and pollen strip has been planted in the adjacent field. This continues to provide forage sources when the hay meadow is cut and ensures late flowering through a rotational early cut.

Figure 2: Shrill carder bee records at Home Farm (2018-2019), with key areas of forage and nesting habitat in survey compartments highlighted



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**Shrill carder bee habitats and records
2018 & 2019***



Results

Ten bumblebee species were recorded during the BeeWalks, all are considered widespread and common except for two notable species: Moss carder bee (*Bombus muscorum*) and Shrill carder bee. Only one Shrill carder bee worker was identified during BeeWalks. However, a queen foraging on Knapweed and two workers were also recorded during ad-hoc surveys on an arable margin, meadow and nectar and pollen strip, respectively. This indicates that ad-hoc surveying may be required in addition to formal BeeWalk surveys in order to pick up the presence of the species, especially in areas where Shrill carder bee abundance is low. Flowering abundance varied greatly, with significantly more early flowering than late summer forage availability (see Figure 2). This was particularly prevalent within the species-rich hay meadow which was cut prior to the late survey (see mitigation options).

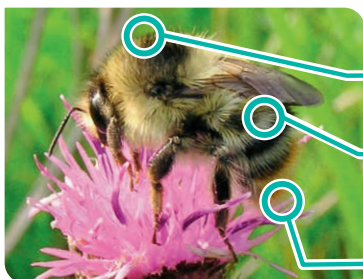
Looking ahead

Through the strategic placement of forage and nesting habitat across the farm combined with targeted management (e.g. varied cutting times), Home Farm provides a mosaic of different habitats for pollinators including the Shrill carder bee and continuity of flower availability which is vital for bumblebee colonies to complete their life cycle and produce new queens for the following year. Much of this has been made achievable by schemes such as Countryside Stewardship however, the Lang's have also had to rely on finding new sources of revenue to supplement and support these wildlife-friendly initiatives.



Lesser knapweed (*Centaurea nigra*) is found throughout the meadows and margins at Home Farm. It provides an important source of pollen and nectar for Shrill carder bee queens and workers throughout the summer.

Have you seen **this** bumblebee?



Black band between wings.

Black stripes on abdomen.

A mainly straw-coloured bee, with dull **reddish-orange** tail.

Back from the Brink

Back from the Brink is one of the most ambitious conservation projects ever undertaken. Its aim is to save 20 species from extinction and benefit over 200 more through 19 projects that span England; from the tip of Cornwall to Northumberland.

It's the first time ever that so many conservation organisations have come together with one focus in mind – to bring back from the brink of extinction some of England's most threatened species of animal, plant and fungi. The project is made possible thanks to the National Lottery Heritage Fund and the players of the National Lottery.

The Bumblebee Conservation Trust

The Bumblebee Conservation Trust was established in 2006 and is a science led organisation with projects across the UK. The Trust aims to inspire people to help provide the habitat these charismatic insects require across communities and the countryside to ensure that populations have a long term future in the UK.

Buglife

Buglife is the only organisation in Europe devoted to the conservation of all invertebrates. The organisation is actively working to save Britain's rarest little animals – everything from bees to beetles, worms to woodlice and jumping spiders to jellyfish. There are more than 40,000 invertebrate species in the UK, and many of these are under threat as never before. Buglife intends to inspire people across the country to discover and care for the small things that run the planet.

Find out more about Back from the Brink and our other projects at naturebftb.co.uk

buglife.org.uk
bumblebeeconservation.org

