Bumblebee Conservation Trust

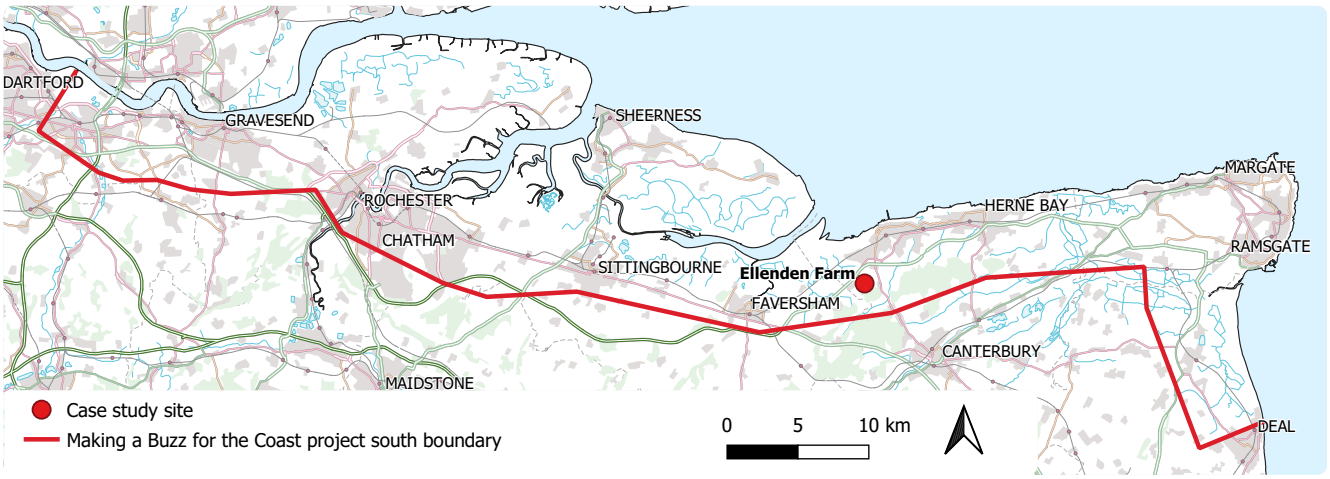
Case Study

Ellenden Farm

Land management options for Shrill carder bee *Bombus sylvarum*

Making a Buzz for the Coast

The north Kent coast is recognised nationally for the diversity of bumblebee species its supports with 22 of the 24 UK species, including five of the seven nationally rare and scarce bumblebees. Much of Kent's cultural and economic heritage is intrinsically linked to bees, with a landscape of orchards, arable flowering crops and grassland. Kent's bumblebee diversity can be linked to its varied habitats and the milder southern climate.



The Making a Buzz for the Coast project was set up to re-address the decline and help to conserve wild bees in north Kent. Making a Buzz for the Coast is working to safeguard Kent's wild bees, focusing on coastal areas from Dartford to Deal. The aims of this ambitious project, are 1) to create and restore flower-rich habitat 2) recruit, train and support volunteers to take action for bumblebees and other wild bees 3) raise awareness about the value of these important insects and their conservation needs.

Making a Buzz for the Coast is a multi-partner project led by Bumblebee Conservation Trust (BBCT) and with key partners including Kent Wildlife Trust, Kent County Council, Natural England, Royal Society for the Protection of Birds, Swale Borough Council, Thames Water and Thanet District Council, as well as numerous landowners and supporters. Its primary funder is the National Lottery Heritage Fund.

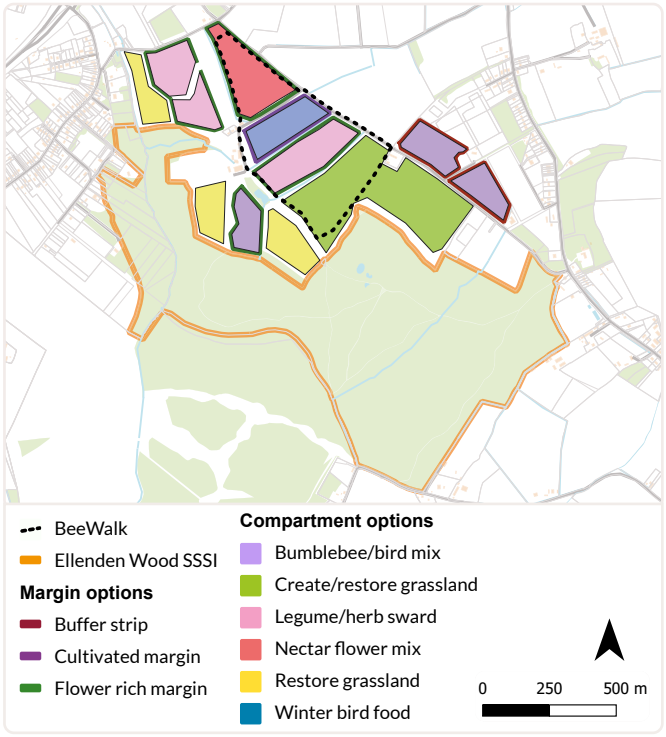
Photo-credit: Bex Cartwright/Bumblebee Conservation Trust

Shrill carder bee worker foraging in legume plot.

Site introduction

Ellenden Farm is managed by brothers Mark and Blair Hart. The farm comprises 70ha of arable fields, hay meadows, hedgerows and semi-natural grassland areas. In addition, 90ha of SSSI woodland, part of the wider Blean Woodlands, forms part of the farm habitat complex. The farm is in the Canterbury District of Kent and located approximately 2km south of the north-Kent coast at Seasalter. Soils are seasonally wet base-rich loam and clay. Drainage can be poor so timing of cultivation and seeding operations is critical. No herbicides or pesticides are used anywhere on the farm.

A combination of various cereals, Oilseed rape and Rye grass crops have been grown across the farm in the last decade. Since 2016 however, the farm has been gradually converting to conservation management with the aim to have the whole farm in whole-field conservation management options including nectar and pollen rich plots, species-rich margins and plots and creation of species-rich grassland by 2021.



An initial site visit by Bumblebee Conservation Trust staff in September 2018 confirmed the presence of the Shrill carder bee (*Bombus sylvarum*) on site. This farm represents one of a small number of known inland sites for this species in Kent. Many populations are now restricted to coastal areas where much of the open flower-rich habitat this species requires still remains. The farm is one of a cluster of sites in this area where populations of Shrill carder bee were recorded for the very first time in 2018. A Woodland Trust site with large areas of open flower-rich grassland sits adjacent to the farm and supports three rare or scarce species of bumblebee. Also neighbouring the farm is a local nature reserve (Canterbury City Council/ Kent Wildlife Trust) consisting of flower-rich unimproved grassland and scattered scrub also with Shrill carder bee and Brown-banded carder bee (*Bombus humilis*) present.

The Shrill carder bee *Bombus sylvarum*

The Shrill carder bee is one of the rarest and most vulnerable bumblebee species in England and Wales. Once widespread across southern England and Wales, the species has suffered serious declines and is now only found in five isolated population areas. The Shrill carder bee is a species of open, flower-rich landscapes and requires abundant forage close to suitable nesting areas, throughout its flight season (April–October). This long-tongued bee prefers to forage on plant species with tube-like flowers including white dead-nettle, black horehound, red bartsia and red clover.

The Shrill carder bee is a late-emerging species, with queens typically coming out of hibernation from late-April. Workers can be seen from mid-June. Males and new queens are produced in late August to September and the colony life cycle is completed by the end of September or early October.

Nesting sites should be warm, sheltered and undisturbed. Nesting takes place on or close to the surface of the ground in undisturbed long vegetation or in grass tussocks in sunny areas. 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. Ideally nesting habitat should be cut on a 2–3-year cycle to allow a denser sward to develop or managed by light grazing.

Land management options for Shrill carder bee

With support from a local Natural England advisor, an ambitious stewardship scheme was developed. This new scheme commenced in January 2020. The following outlines the options in place that benefit rare bumblebees in particular.

Nectar-flower plot | 6ha in 1 field parcel: This option aims to provide abundant nectar throughout mid-late summer. The initial sowing of this 6ha plot pre-dates the stewardship scheme and was initially sown with support from the BBCT Making a Buzz for the Coast project. A mix of nectar-rich legumes including Red clover, Alsike clover, Bird's-foot trefoil and Sainfoin was sown in autumn 2018 alongside a 1ha trial plot of perennial wildflower mix including Common knapweed, Self-heal and Wild carrot.

Cutting half of the plot area between April and May extends the flowering season by causing a later flowering of the cut area. This early summer cut should be rotated between the two halves of the plot each year. The whole plot is then cut and baled after flowering in late summer. The mix contains no grass species and generally needs to be re-established every 3–4 years. Alsike clover and Bird's-foot trefoil have been particularly successful and perhaps are better suited to the soil conditions on this farm. The Sainfoin failed to establish on the heavy clay.

Creation and restoration of species-rich grassland: Work on the first 5ha of what will be ca. 25ha of species-rich grassland creation or restoration was started in September 2020. This option aims to increase the diversity and abundance of native wildflowers to benefit a range of invertebrates and other wildlife.

The majority of the species-rich grassland will be established by cultivating the soil and breaking up the existing sward to create a fine, firm seedbed onto which a general-purpose species-rich, native wildflower seed mix is sown. Seeding is best carried out in late summer/ early-autumn but can be carried out in spring if ground conditions are suitable. In the future the grassland will be managed by a late summer hay cut and/or grazing.

Autumn-sown bumblebird mix | 7.5ha over 3 field parcels: This mix is designed to provide abundant seed resource in the winter for farmland birds with the inclusion of triticale, winter barley and fodder radish. Throughout the summer, Clover, Bird'-foot trefoil, Phacelia and Vetch sp. provide abundant nectar and pollen resource for a range of pollinating insects.

Photo-credit: Dan Taylor

Volunteer planting native, mixed species hedgerow.

Photo-credit: Bex Cartwright/Bumblebee Conservation Trust

Nectar and pollen rich legume mix year 2.

Photo-credit: Bex Cartwright/Bumblebee Conservation Trust

Leaving field margins uncut retains flowers into late summer and autumn.

In the second spring after sowing, topping the whole plot will encourage spring and summer flowering of legumes. This mix must be resown and re-established every 2–3 years.

Legume and herb-rich swards | 10.2ha over 3 field parcels: This option aims to produce a sward containing a range of grass species, legumes and perennial herbs suitable for grazing. The sward should comprise 10% cover of Red clover, a key forage plant for long-tongued bumblebees including Shrill carder bee.

The sward should not be grazed for at least a 5-week period between 1st May and 31st July to allow for maximum flowering. After this time period, the sward should be managed by cutting or grazing.

Other measures

Comfrey and borage plot This option does not form part of the stewardship scheme but is an inexpensive and low-maintenance method for providing a source of abundant nectar, particularly for long-tongued bumblebees. Comfrey is a robust, attractive plant and this option is particularly suited for areas which are otherwise unused and may be highly fertile, next to compost heaps, near farm buildings or damp areas. The plant is easily established from root or crown cuttings. Be sure to obtain a sterile variety (e.g. Bocking-14) to avoid the plant seeding and spreading where it is not wanted. Comfrey will flower from late spring to late summer.

Following flowering the plant can be cut back to its base and it will regrow. This way multiple flowering periods can be achieved in a single year.

Hedgerow management: Existing mature hedgerows across the farm are sensitively managed and grow thick and dense providing abundant forage for pollinators and connecting corridors for wildlife to the adjacent woodland SSSI and other local wildlife sites nearby. Hedgerow bases are managed sensitively, leaving wildflower-rich margins to flower and provide forage and nesting opportunities. In autumn 2019 a new 200m section of native, species-rich hedge was planted with the help of Bumblebee Conservation Trust volunteers.

Sunflower plots: Sunflower plots are an inexpensive and attractive option that benefit Shrill carder, providing a forage resource in late-summer. As annuals requiring warmth and moisture to germinate, sunflower seed needs to be drilled no earlier than April each year. Any earlier and the seeds may rot or be taken by birds or rodents. Worker Shrill carder bees were seen visiting flowers in late 2019. The 2020 plot failed to establish due to drought conditions following sowing.

Photo-credit: Bex Cartwright/Bumblebee Conservation Trust

Shrill carder worker on sunflower.

Grass Buffer Strips: Maintaining broad 4–6m grass buffer strips along field margins, ditch edges and hedgerow bases has multiple benefits and can help protect watercourses and hedgerows from run off and soil erosion. Buffer strips with tussock forming grasses can provide ideal nesting opportunities for carder bumblebees. Manage the strips annually by mowing up to half of the width of the margin. The remainder of the strip should only be mown every few years to control and prevent woody growth. Ideally the margins should be managed on rotation with one third of the margins cut every year.

Cultivated Strips for annual plants: These are fallow margins or plots that are cultivated annually in spring or autumn to create a fine tilth. The annual cultivation encourages germination of a range of wildflowers such as fluellen species, field pansy and fumitory species, and can also include some rare and threatened arable plants, as well as species that are valuable forage for bumblebees and other pollinators. The cultivated plot should ideally be a relatively open sward with some bare ground providing opportunities for ground-nesting solitary bees.

Photo-credit: Bex Cartwright/Bumblebee Conservation Trust

Leaving field margins uncut retains flowers into late summer and autumn.

Bee survey results

Surveys at this site and sites adjacent have shown that important forage plants for emerging queens in this area include White dead-nettle and Black horehound, workers are seen most frequently foraging on Red bartsia and legumes such as Red clover and Bird's-foot trefoil through the summer months. Members of the daisy family such as Common knapweed and Common fleabane are especially important later in the season for males. Shrill carder bees are frequently seen using the legume-nectar plot, foraging on Alsike and Red clover in particular.

BeeWalk

A monthly bumblebee survey transect 'BeeWalk' has been walked at the farm since June 2019 in order to monitor populations and will, in the future, help to measure the impact of the conservation work. BeeWalk is the Bumblebee Conservation Trust's national bumblebee monitoring scheme. A set route is walked at least monthly between March–October and all bumblebees recorded as well as flowers the bees are visiting.

Ten species of bumblebee have been recorded on BeeWalks at Ellenden Farm to date. Of these, five species are considered common and widespread, two are cuckoo bumblebee species and three are considered rare or scarce. The species in the latter category are Brown banded bumblebee (*Bombus humilis*), Large garden bumblebee (*Bombus ruderatus*) and Shrill carder bee.

Ad-hoc records

In the first year of surveys in 2018, even before any new measures were put in place, small numbers of Shrill carder bees were recorded foraging on wildflowers such as Black horehound that was left to grow around farm buildings. Subsequent surveys in 2019 and 2020 have found Shrill carder bees foraging in large numbers in the legume plot and also the sunflower plot.

Subsequent surveys have also recorded the presence of Brown-banded carder bee. As well as rare bumblebees, several rare solitary bees have also been recorded at the farm and have been seen to be foraging in the new flower-rich areas. During 2020, three females of the rare and declining Long-horned bee (*Eucera longicornis*) were recorded using the legume mix. The Red bartsia bee (*Melitta tricincta*) is also recorded annually on the farm in areas where this important forage plant has been left to bloom and thrive.

The Future

This farm is only at the very start of its journey into conservation management and already they have achieved so much and with wildlife responding rapidly. It will be very exciting to see the impact that their continuing hard work and clear dedication will bring to local pollinators and how the habitats develop over time. In 2020, the conservation work at Ellenden Farm was recognised with a national Defra Bees Needs Farmers' Champion award.

ELLENDEN FARM WHITSTABLE

NATURAL ENGLAND

MAKING A BUZZ FOR THE COAST

HERITAGE FUND

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