Case Study

Canvey Wick

Managing a brownfield site 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: Richard Lytheer.

Shrill carder bee, Canvey Wick

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.

Mosaic of forage and nesting habitat in Compartment 3 at Canvey Wick

Site introduction

Canvey Wick is a joint Buglife and RSPB reserve on Canvey Island in Essex, owned by The Land Trust. This brownfield site is made up of areas of open mosaic habitat characterised by bare ground, scrub, dry grassland, woodland and ditches. Historically, the site was a landfill site and proposed oil refinery, with large, circular tarmac bases remaining, highlighting the uniqueness of the site.

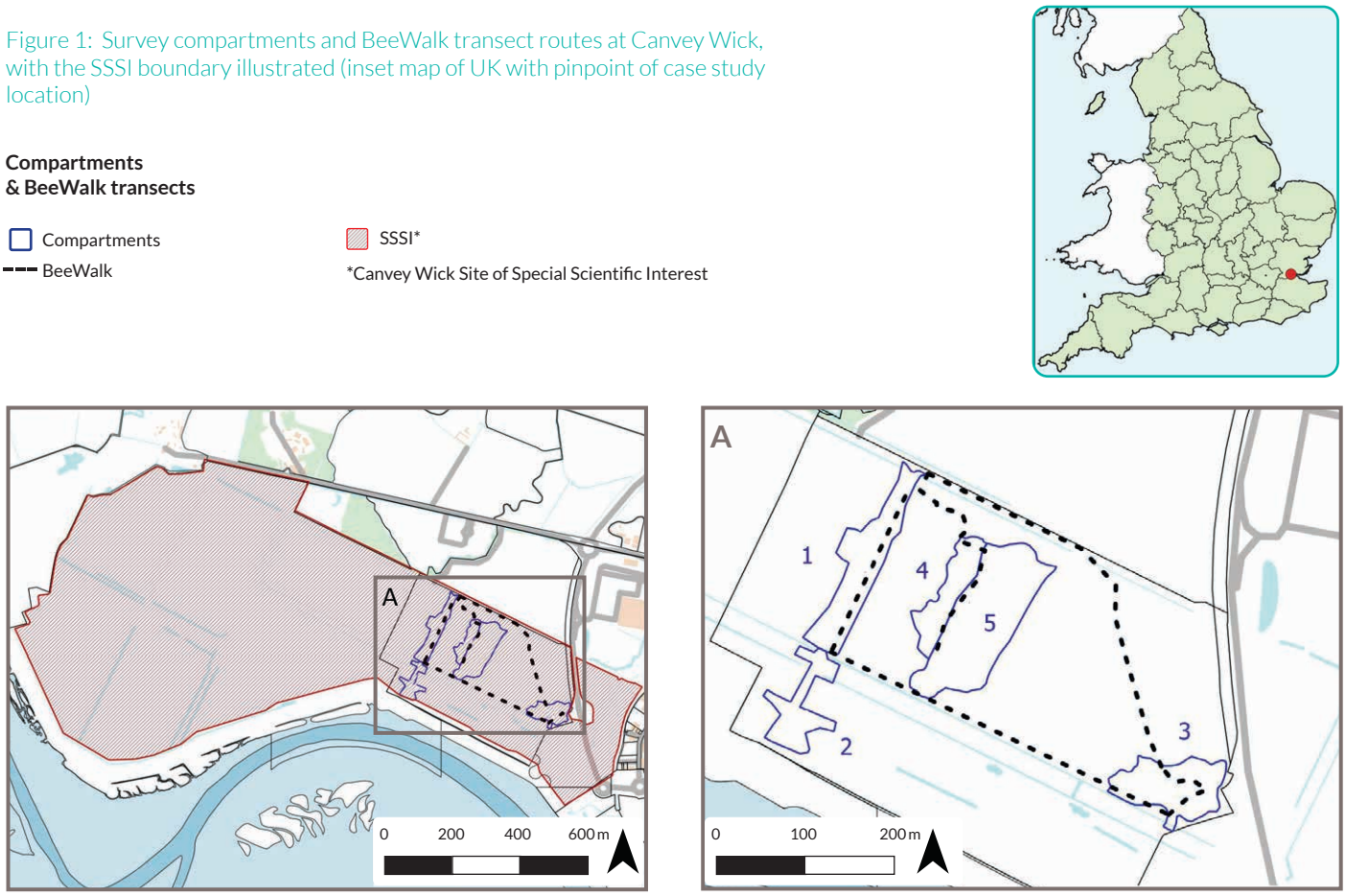
The site is 19 hectares and was designated as a Site of Special Scientific Interest (SSSI) in 2005 in response to the diverse range of invertebrates found there. It was officially opened to the public in 2014 and is a popular place with local naturalists and dog walkers. Shrill carder bee has been recorded on the site since at least 1999 and it is one of the best sites to observe this bumblebee in the Thames Estuary.

Methodology

Five compartments were selected for monitoring in 2018 and 2019 with help from volunteers. In each compartment, walkover surveys were conducted in June and August to record bumblebee species and forage availability. All plants in flower were recorded in each compartment and their relative abundance was scored using the DAFOR (Dominant, Abundant, Frequent, Occasional, Rare) scale. All bumblebees encountered were identified and their forage plant recorded.

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.

Figure 1: Survey compartments and BeeWalk transect routes at Canvey Wick, with the SSSI boundary illustrated (inset map of UK with pinpoint of case study location)



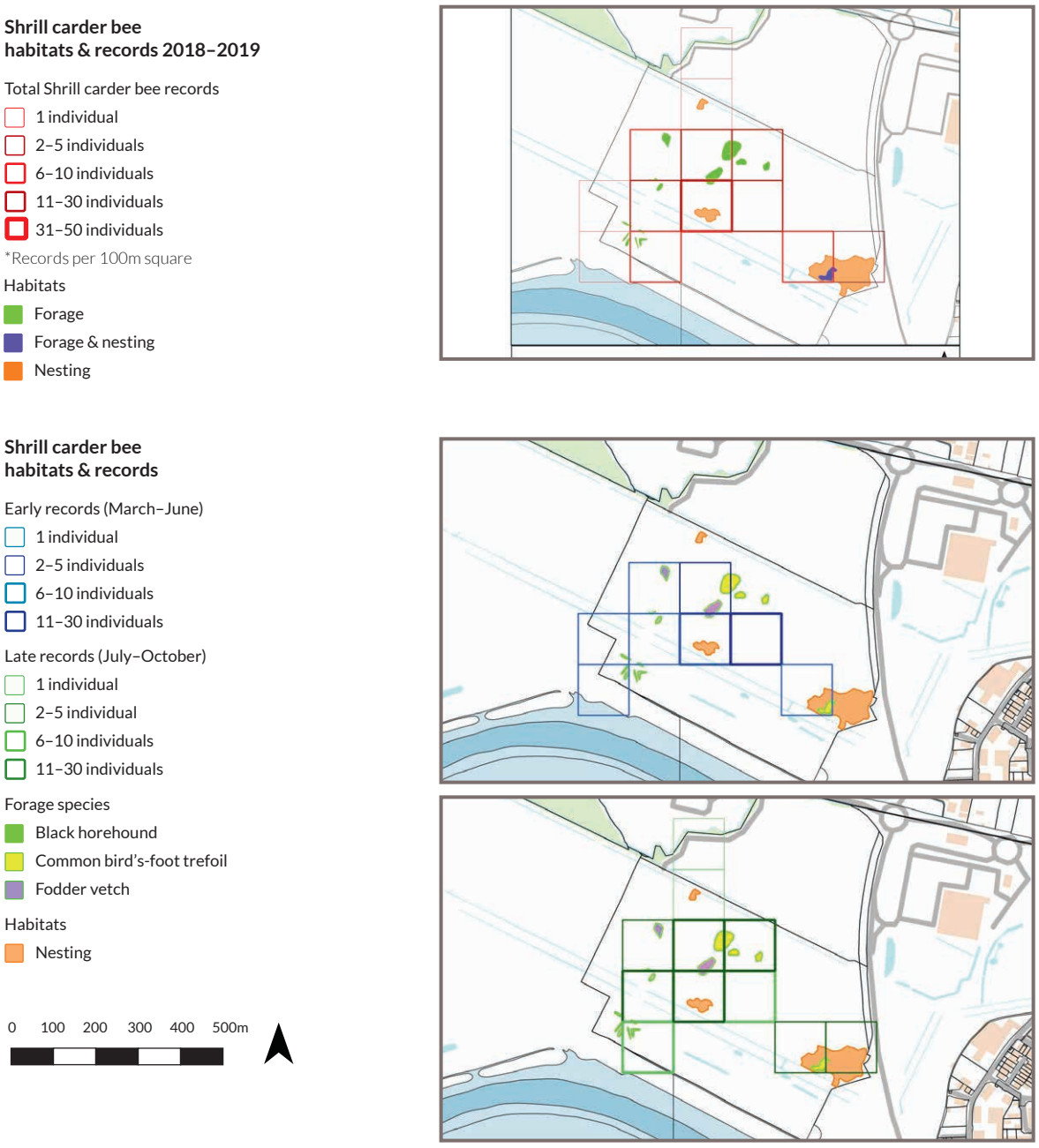
Habitat management for the Shrill carder bee

One of the main aims of habitat management at Canvey Wick is to maintain flower rich areas for Shrill carder bee and other bumblebee species, while also providing bare ground for a range of invertebrates. The management of the specific compartments is as follows:

- Compartment 1 – rabbit activity creates areas of bare ground that help to maintain the early successional habitat rich in flowering plants. Some trees and low scrub are controlled in the winter.
- Compartment 2 – a good quantity of Broad-leaved everlasting pea provides important forage for Shrill carder bee in this area. Bramble provides a source of nectar later in the year. There is limited management intervention in this area.
- Compartment 3 – flowers such as Red bartsia and Lucerne provide useful foraging opportunities alongside areas of longer, tussocky grassland that could be suitable for nesting. Selective scrub is removed in the winter to maintain the grassland and some vegetation is removed from south-facing banks to provide opportunities for nesting solitary bees and wasps.
- Compartments 4 and 5 – targeted tree and scrub control enables these areas to support good patches of Narrow-leaved bird's-foot trefoil and Meadow vetchling. Common reed and Goat's rue are controlled to ensure that they do not dominate.

Shrill carder bee queen on Broad-leaved everlasting pea at Canvey Wick

Figure 2: Summary of early and late season Shrill carder bee records at Canvey Wick from 2018-2019, with key areas of forage and nesting habitat in survey compartments highlighted



Results

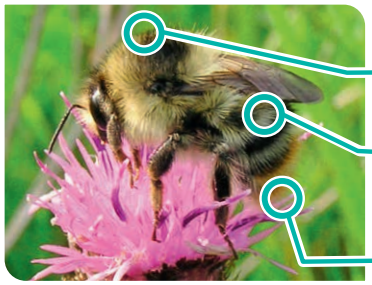
Twelve species of bumblebee were recorded, with three of these being notable; Brown-banded carder bee, Red-shanked carder bee and Shrill carder bee. The Shrill carder bee was the most frequently encountered bumblebee species on site, followed by the Brown-banded carder bee, and there was one record of a single queen of the Red-shanked carder bee, which was foraging on Fodder vetch. Narrow-leaved bird's-foot trefoil was the most frequently visited forage plant for the Shrill carder bee, with workers particularly attracted to it. Shrill carder bee queens foraged most frequently on Fodder vetch and Meadow vetchling. Early on in the season, 62 plant species were recorded in flower across the compartments compared with 52 species later in the season.

Looking ahead

The habitat management work at Canvey Wick aims to maintain the mixture of bare ground, flower rich grassland, and scrub – allowing Shrill carder bee and other bee species to thrive. It is quite labour intensive to sustain this balance, especially with invasive species such as Goat's rue that need to be kept in check. Volunteers are an important part of this, helping the site staff to carry out work on the ground, which is sometimes supplemented by externally funded work that can be carried out over larger areas with machinery.

Volunteers surveying bumblebees and plants at Canvey Wick

Have you seen **this** bumblebee?



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

The Bumblebee Conservation Trust is a registered charity (England & Wales 1115634 / Scotland SC042830). Company registration number 05618710 (England & Wales)
Registered Office: Bumblebee Conservation Trust, Lakeside Centre, Lakeside Country Park, Wide Lane, Eastleigh, Hampshire SO50 5PE.