Saving the shorthaired bumble bee, *Bombus subterraneus*.

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*Bombus subterraneus* is one of four species of bumble bees which were imported from England over 100 years ago. Queens of all the species were released in the Christchurch/Lincoln/Tai Tapu area, and while the other three species are widely distributed and common in many regions, *B. subterraneus* has been recorded only from the eastern inland South Island south of the Waimakariri River.

Queens and workers can be distinguished from those of the other three species by a small area of black hairs right behind the head which divides the front yellowy-orange cross-band in half. Sometimes this black area is quite obvious, but on the other hand it can be rather obscure. Males are yellow-green over most of the body and so are easily separated from the males of the other species which are mainly a combination of black, yellow and white.

In the U.K. the species was widely distributed over much of England prior to 1960, but by 1975 the range had declined to only southern England. The last sighting was at Dungeness on the southern coast of Kent in 1988, and the bee was declared extinct in the U.K. in 2000. However the species is present over much of central Europe but it is now uncommon. The only area where numbers are still robust appears to be southern Sweden.

In the 1960s queens were abundant in spring at Tekapo with one person catching 80 in one day, and in the early 1970s queens made thriving colonies in six man-made hives near Twizel. However by early this century two researchers from the U.K. found only 38 bees, despite targeting areas where the species had previously been recorded.

By 2009 English entomologists had initiated a plan to restore *B. subterraneus* to England by importing queens from New Zealand. During the next three years half a dozen or more people spent many days collecting queens, but were hard pushed to capture more than 100 annually. Import regulations imposed by the U.K. allowed only new queens bred from the captured queens to be imported, and unfortunately this was not achieved so the project lapsed. Since 2014 queens have been imported from Sweden and released directly at Dungeness, but worker bees that were thought to be *B. subterraneus* were recently found by DNA analysis to be *B. hortorum* so it appears that the species may have not yet re-established.

So why did *B. subterraneus* decline to extinction in England, and why have numbers apparently declined here in New Zealand? English researchers have blamed habitat degradation due to the intensification of agriculture and the loss of favourite wildflowers which previously were sources of nectar and pollen. Perhaps the same changes have occurred here? Flower-visiting records for Europe total about 120 species, but for New Zealand there are only 14, all of which are of plants foreign to the country.
New Zealand now hosts the only representatives of the genotype of *B. subterraneus* which once ranged over most of England. In different areas of the remaining range of the species in Europe some characteristics such as the colour of the vestiture can vary, so it would be a tragedy if we were to lose the English genotype which appears to differ somewhat from that of the rest of Europe. There are two resources that are essential to the survival of *B. subterraneus* and they are a plentiful supply of the particular flowers they like to forage upon for nectar and pollen, and cavities within which to make their nests.

The flower most favoured by *B. subterraneus* in New Zealand and from which queens in spring and later workers obtain both pollen and nectar is red clover. This plant is grown on farms for forage, but also occurs as a wildflower along roadsides etc., and is the flower from which we caught most of the queens. Other common wildflowers foraged upon are Vipers bugloss and Russell lupin. At Twizel we caught queens on a *Weigela florida* shrub and *Silene dioica* in different domestic gardens, and at the southern entrance to the village on flowers of a grove of *Robinia pseudoacacia*. Unfortunately this grove has since been destroyed, but other plants occur among the roadside pine trees to the south.

One step that can be taken to promote the survival and nesting by queens in spring is for homeowners to cultivate these plants in their flower gardens to increase the supply of essential pollen and nectar.

The other essential resource is sites in which the queens can develop their nests. Queens need a cavity such as an abandoned mouse or rat nest or even a rabbit burrow which is protected from the sun and wind and rain and which contains some fine animal or plant fibre, and as mentioned above we know that Twizel queens will readily occupy man-made nest boxes that have these characteristics. At their simplest all that is required is a box measuring about 300 mm in all directions and with a removable waterproof lid and an entrance hole 25 mm in diameter just above the floor on one side. A piece of pink batts or Earthwool about 400 mm x 200 mm and folded once on itself and dropped into the box provides the necessary fibrous material. Nest boxes should be placed under shrubs in dappled sunshine, i.e. out of the full sun to prevent overheating. Alternatively, nest boxes are now available commercially and can be supplied by Ian Morton of Creative Woodcraft near Washdyke, see [http://www.creativewoodcraft.co.nz//bees](http://www.creativewoodcraft.co.nz//bees).

Queens begin to emerge from hibernation by early November, and most nests are founded a few weeks later, so nest boxes should be put in place no later than October, and plants that produce the flowers favoured by *B. subterraneus* should be established in spring for the coming season of bumble bee activity.

If the supply of the flowers favoured by *B. subterraneus* for nectar and pollen, and the number of nest boxes can both be increased, there is every possibility that the decline in the population of this bumble bee can be reversed and that the English genotype can thus be saved from extinction.

Further information on bumble bees is becoming increasingly available on the New Zealand
Bumblebee Conservation Trust website www.nzbct.co.nz