

Farmers help create 'Virtual safe space' to save bumblebees

August 13 2021



Foxglove. Credit: Matthias Becher

Solutions to help pollinators can be tested using a "virtual safe space" tool created by scientists at the University of Exeter in collaboration with farmers and land managers.

BEE-STEWARD is a decision-support [tool](#) which provides a computer simulation of [bumblebee](#) colony survival in a given landscape.

The tool lets researchers, farmers, policymakers and other interested parties test different land management techniques to find out which ones and where could be most beneficial for bees.

BEE-STEWARD—which is freely available online—is a powerful tool that can make bumblebee survival predictions, according to a new study.

"We know that pollinator decline is a really big problem for crops and also for wildflowers," said Dr. Grace Twiston-Davies, of the Environment and Sustainability Institute at the University of Exeter's Penryn Campus in Cornwall.

"BEE-STEWARD takes into account the many complicated factors that interact to affect bumblebees."

"This provides a virtual safe space to test out different bee-friendly management options."

"It's a free, user-friendly tool and we have worked with [land managers](#) and wildlife groups on the ground to create it together."

Disentangling the many factors that affect bumblebee colonies is incredibly complicated, meaning real-world testing of different methods by land managers is often not feasible.

This problem prompted the Exeter scientists to create the [BEEHAVE](#) (honeybees) and [Bumble-BEEHAVE](#) (Bumblebees) computer models. But to help bumblebees thrive across our landscapes, these tools need to be used by people on the ground and not just scientists.

BEE-STEWARD has been designed with and for land managers, farmers and conservation practitioners to test out different ideas for land management and predict the impact that these may have on bumblebee survival.



Bombus lapidarius. Credit: Matthias Becher

BEE-STEWARD is being used by the [Bumblebee Conservation Trust](#) to help test and guide land management to help bumblebees and farm business thrive in Cornwall. Using BEE-STEWARD, bee-friendly actions are being tested across 1,500 ha of land in collaboration with the Duchy of Cornwall Estate, the National Trust, Treiwthen Dairy and

Kellys of Cornwall.

BEE-STEWARD can simulate the growth, behaviour and survival of UK bumblebee species living in a landscape providing various nectar and pollen sources to forage on.

"The BEE-STEWARD model is a significant step towards enabling practitioners to support bumblebee populations," said Professor Juliet Osborne, who leads the team.

"The tool can be used to inform conservation and farming decisions and for assigning bespoke management recommendations."

Professor Osborne and team won the BBSRC Social Innovator of the Year 2017 award for creating the BEEHAVE models.

"We have worked with researchers and landowners who have been using the model and have given us valuable feedback so we could improve our models further" said model developer Dr. Matthias Becher.

"Testing the BEE-STEWARD tool has helped us predict how best to provide new and improved habitat for pollinators in an informed way, considering existing and proposed flora, flowering times and location. This has focused decision making by identifying pollinator habitats that are lacking in a particular landscape, enabling us to focus our attention to improve and protect these specific areas" Ashley Taylor, Assistant Land Steward, Duchy of Cornwall Estate

BEE-STEWARD could be an important virtual test-bed for scientists exploring the impacts of different stressors on bumblebees and used by those with little or no modelling experience. Enabling a shared methodology between research, policy and practice for bumblebee survival.

"The Bee-Steward model will be fantastic for conservation planning—it lets us time-travel to see the long-term results of changing management and compare all the possible options to see which one will work out best for bumblebees" Dr. Richard Comont, Science Manager, Bumblebee Conservation Trust.

The BEE-STEWARD tool sits alongside a wider body of research by Prof. Osborne, Dr. Twiston-Davies and Dr. Becher around pollinator-friendly land-management. Their work on the NERC-funded SWEEP programme has included providing advice on Managing Green Space to improve biodiversity and wildlife habitats and working on the 'Farming for the Nation' trial for a new Agri-environment scheme with Cornwall Area of Outstanding Natural Beauty.

The new tool, published in *Methods in Ecology and Evolution*, is entitled: "[BEE-STEWARD: a research and decision support software for effective land management to promote bumblebee populations.](#)"

More information: Grace Twiston-Davies et al, BEE-STEWARD: A research and decision-support software for effective land management to promote bumblebee populations, *Methods in Ecology and Evolution* (2021). [DOI: 10.1111/2041-210X.13673](https://doi.org/10.1111/2041-210X.13673)

Provided by University of Exeter

Citation: Farmers help create 'Virtual safe space' to save bumblebees (2021, August 13) retrieved 3 May 2024 from <https://phys.org/news/2021-08-farmers-virtual-safe-space-bumblebees.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.