

Wild bees need deadwood in the forest

June 23 2021



Bright wooded areas encourage the growth of blueberries on whose nectar wild bees like to feed. Credit: Tristan Eckerter

How many tree species are there in the forest? How are the trees scattered throughout? How high are the individual tree crowns? Are there fallen trees or hollowed-out tree trunks? Forest scientists characterize forests according to structural factors. "Structural richness

is very important for biodiversity in forests. But forests used for forestry are generally poor in terms of structure," says Tristan Eckerter from the Chair of Nature Conservation and Landscape Ecology at the University of Freiburg. Therefore, together with research teams from the Chair of Silviculture and the Black Forest National Park, he investigated whether structures such as standing timber in forests help to promote the diversity of wild bees. In addition, the researchers analyzed which other natural features of the spruce-dominated forest help wild bees survive. They found that creating deadwood in coniferous forests is a promising restoration measure to promote the abundance of aboveground nesting bees. The scientists recently published their findings in the journal *Forest Ecology and Management*.

Restoration experiment aims to strengthen biodiversity

As part of this long-term restoration experiment, structural richness was artificially created in 2016 on several sample plots in the Black Forest National Park. Researchers felled and uprooted 20 spruce [trees](#) per plot, creating deadwood and small gaps in six 50-by-50 meter plots. Six other plots were left in their natural state as a control group. "The restoration measures have increased what we call the structural complexity of the [forest](#) stands. That is, these plots provide a more diverse, varied habitat. We would not have thought to have found so many different wild bees as a result," explains Eckerter.

Standing deadwood promotes bee population

The researchers compared how many wild bees were in the different plots in June 2018 and 2019. Their results show that deadwood increases the abundance and biodiversity of wild bees. In this regard, standing deadwood particularly encourages above-ground nesting bees such as

masked bees. "We suspect that some of the bees use deadwood as a nesting site," says Eckerter. As a result, he recommends, "If the [bark beetle](#) has already flown out and the tree is already dead, it's important to leave the standing dead tree for the bees."

Increased blueberry growth

In addition, the thinner forest areas prove beneficial to bees, as the light stimulates the growth of flowering plants. Increased blueberry growth provides bees with more nectar, increasing the abundance and richness of the bee community. Looking toward the future, Prof. Dr. Alexandra Klein, head of the Chair of Nature Conservation and Landscape Ecology, emphasizes, "In the course of climate change, [forest areas](#) will be increasingly characterized by deadwood and sparse areas caused by storms, droughts or bark beetles. As a result, forest habitat will increase in importance for wild bees."

More information: Tristan Eckerter et al, Wild bees benefit from structural complexity enhancement in a forest restoration experiment, *Forest Ecology and Management* (2021). [DOI: 10.1016/j.foreco.2021.119412](#)

Provided by University of Freiburg

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