

# Biodiversity loss raises risk of 'extinction cascades'

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New research shows that the loss of biodiversity can increase the risk of "extinction cascades", where an initial species loss leads to a domino effect of further extinctions.

The researchers, from the University of Exeter, showed there is a higher risk of [extinction](#) cascades when other [species](#) are not present to fill the "gap" created by the loss of a species.

Even if the loss of one species does not directly cause knock-on extinctions, the study shows that this leads to simpler ecological communities that are at greater risk of "run-away extinction cascades" with the potential loss of many species.

With [extinction rates](#) at their highest levels ever and numerous species under threat due to human activity, the findings are a further warning about the consequences of eroding biodiversity.

"Interactions between species are important for ecosystem (a community of interacting species) stability," said Dr Dirk Sanders, of the Centre for Ecology and Conservation at the University of Exeter's Penryn Campus in Cornwall. "And because species are interconnected through multiple interactions, an impact on one species can affect others as well.

"It has been predicted that more complex food webs will be less vulnerable to extinction cascades because there is a greater chance that other species can step in and buffer against the effects of species loss.

"In our experiment, we used communities of plants and insects to test this prediction."

The researchers removed one species of wasp and found that it led to secondary extinctions of other, indirectly linked, species at the same level of the food web.

This effect was much stronger in simple communities than for the same species within a more complex [food web](#).

Dr Sanders added: "Our results demonstrate that biodiversity loss can increase the vulnerability of ecosystems to secondary extinctions which, when they occur, can then lead to further simplification causing run-away extinction cascades."

The study, supported by France's Sorbonne Université, is published in the journal *Proceedings of the National Academy of Sciences*.

The paper is entitled: "Trophic redundancy reduces vulnerability to extinction cascades."

## How extinction cascades work

The [loss](#) of a predator can initiate a cascade, such as in the case of wolves, where their extinction on one mountain can cause a large rise in the number of deer. This larger number of deer then eats more plant material than they would have before. This reduction in vegetation can cause extinctions in any species that also relies on the plants, but are potentially less competitive, such as rabbits or insects.

**More information:** Dirk Sanders et al., "Trophic redundancy reduces vulnerability to extinction cascades," *PNAS* (2018).

[www.pnas.org/cgi/doi/10.1073/pnas.1716825115](http://www.pnas.org/cgi/doi/10.1073/pnas.1716825115)

Provided by University of Exeter

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