

# Predator species help to buffer climate change impacts on biodiversity

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Dr Sam Ross monitoring the experiments at night. Credit: Trinity College Dublin

Predator species may buffer the negative impacts of climate change by mitigating against the loss of biodiversity, according to new research led by scientists in Trinity College Dublin and Hokkaido University.

The team of scientists behind the discovery say their findings underline the importance of conserving [biodiversity](#), and top predators in particular, and highlight the potential for species extinctions to worsen the effects of [climate](#) change on ecosystems.

The scientists assembled communities of freshwater organisms in experimental streams at the Tomakomai Experimental Forest in Northern Japan. The stream communities were exposed to realistic heatwaves, and some included a dominant [predator](#) (a sculpin fish), while others did not.

They found that heatwaves destabilized algal (plant) communities in the streams such that the differences normally found among them disappeared and they resembled each other much more closely—equating to a [loss of biodiversity](#)—but this only happened when the predator was absent from the community.

Algal communities are important in streams because they form the energy base for all other organisms, so loss of algal biodiversity can propagate to impact the entire ecosystem.

Additionally, the scientists discovered that important heatwave effects—such as shifts in total algal biomass—only emerged after the [heatwave](#) had passed, underlining that even catastrophic impacts may not be immediately obvious.

Dr. Samuel Ross, who led the experiment in Japan as part of his Ph.D. research in Trinity's Department of Zoology, says, "We found that predator extinctions can interact with heatwaves to further undermine the stability of ecosystems. This highlights how the climate and biodiversity crises are completely intertwined, really just two sides of the same coin."

"Taken together, our results show how the ecological consequences of heatwaves can amplify over time as their impacts propagate through ecological communities. However, [predator species](#) help to buffer such impacts, acting as allies in the fight against climate change."

Dr. Jorge García Molinos, Associate Professor in the Arctic Research Center at Hokkaido University, added:

"Amidst the accelerating global extinction crisis, climate change will expose most ecosystems to more frequent, intense and extreme climatic events, such as the heatwaves we examined in our study. Certainly, the disappointing outcome of the recent COP-26 discussions has ensured that this scenario is now unlikely to be avoided. Our work shows how intact ecological communities can play a critical role in mitigating against the effects of climate change, and underscores how conserving biodiversity is key to ensuring a sustainable future for humanity."

**More information:** Samuel R. P.-J. Ross et al, Predators mitigate the destabilising effects of heatwaves on multitrophic stream communities, *Global Change Biology* (2021). [DOI: 10.1111/gcb.15956](https://doi.org/10.1111/gcb.15956)

Provided by Trinity College Dublin

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