

Restricting competitors could help threatened species cope with climate change

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Chamois goats in the Italian Alps are shown. Credit: Dr. Tom Mason

Threatened animal species could cope better with the effects of climate change if competition from other animals for the same habitats is restricted, according to new research by Durham University.

The Durham team studied the impacts of climate on the Alpine Chamois, a species of mountain goat, and the effects that domestic sheep had on the goats' movements.

Observing the goats in the Italian Alps during the summer, the researchers found that Chamois tended to move to higher altitudes where it is cooler on hotter days and in the middle of the day, but moved much higher - about 100m higher - when sheep were present.

They say their research, published in the journal *Global Change Biology*, provides a valuable insight into how managing the interaction of different species could influence changes in animal distributions predicted under [climate change](#).

The researchers looked at how daily variation in temperature affected the altitude at which Chamois occurred, at times when sheep were either present or absent. To their surprise, they discovered that competition with sheep had a far greater effect on Chamois than the predicted effects of future climate change.

Study co-author Dr Stephen Willis, in Durham University's Department of Biological and Biomedical Sciences, said: "As the global climate warms, many animals are moving to higher latitudes and altitudes, where it is cooler.



Chamois goats in the Italian Alps are shown. Credit: Dr. Tom Mason

"Many mammals in mountain environments also respond to daily changes in temperature by moving to different altitudes, following their preferred temperature range and moving to higher altitudes to avoid the midday heat.

"The presence of flocks of sheep - which compete with Chamois for food - disturbed the normal

behavioural patterns of Chamois, forcing them to much higher elevations than they would normally use."

Lead author and former Durham PhD student Dr Tom Mason said: "Species might be squeezed in future due to a combination of climate change and competition with new species expanding into their current habitat.

"Our finding offers an intriguing new possibility to help some threatened species cope with climate change by potentially restricting the expansion of competitors in some situations.

"In the case of Chamois in the Alps, this could involve restricting sheep from higher elevations in some areas," added Dr Mason who is now based at Laval University, Canada.

The study, funded by The Natural Environment Research Council (NERC) also revealed that Chamois can alter their behaviour in the face of warmer temperatures, seeking shelter during hot periods rather than moving to higher altitudes.

The researchers said that an ability to adjust their behaviours could make some [species](#) more adaptable to climate change than previously thought. However, they added that a better understanding of the costs of these behaviours was required.

More information: Predicting potential responses to future climate in an alpine ungulate: interspecific interactions exceed climate effects, Mason T; Stephens PA; Apollonio M; and Willis SG. Published in *Global Change Biology*, [DOI: 10.1111/gcb.12641](https://doi.org/10.1111/gcb.12641)



Provided by Durham University

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Fellow study co-author Dr Philip Stephens, also in Durham University's Department of Biological and Biomedical Sciences, added: "We often think of climate as the major determinant of where animals live.

"However, this study shows that the effects of species interactions could be more important than the predicted impacts of climate change."

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