

# Reindeer counteract the effects of climate warming

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Reindeer grazing.

One of the consequences of a warmer climate can be that lowland and southern plants migrate higher up in the mountains. Ecologist Elina Kaarlejärvi shows in her thesis that reindeer, voles and hare can prevent these invasions. The public defense will take place at Umeå University, 21st of February.

Elina Kaarljeärvi concludes that climate warming does not always

automatically lead to increased plant biomass, invasions of new species and shrubification in tundra, opposite to previous predictions.

"Typical lowland [plants](#), which I planted out to the open tundra, for example Red campion and Fireweed, were eaten by [reindeer](#). Plants in open tundra are typically small, and therefore taller and more nutritious lowland plants become easily detected and eaten," says Elina Kaarljeärvi.

Earlier studies have reported that warming climate increases growth of shrubs in tundra. Shrubs grow faster, become taller and take more space. Can herbivores affect or regulate this somehow?

"his shrubification together with new species migration to open tundra would increase competition among plant species and thus threaten the existence of low-stature tundra plants," says Elina Kaarljeävrvvi. "My results from a field experiment in Abisko, in northern Sweden, indicate that reindeer grazing may protect the original tundra vegetation by keeping the vegetation low and preventing new species' invasions to the tundra."

Another experiment was carried out in Kilpisjärvi, Finland, where Elina Kaarljeärvi used mini greenhouses and fences against herbivores to study interaction of climate warming and grazing. Other two sub-studies took place in Dovrefjell and Finnmarksvidda in Norway.

Elina Kaarljeärvi's results highlight that herbivores, especially reindeer, are key [species](#) and play an important role in the mountains.

"Changes in mountain vegetation depend on local reindeer numbers," explains Elina Kaarljeävri- "Moderate grazing prevents [new species](#) upward shifts and reduces the growth of vegetation. Reindeer numbers vary significantly between different areas and different years. So we can expect more rapid changes due to [climate warming](#) in vegetation in the

areas that are not grazed."

Elina Kaarlejärvi grew up in Finnish Lapland and studied biology at the University of Turku, Finland.

Provided by Umea University

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