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Review

Climate change impacts on biodiversity in Switzerland: A review

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Abstract

A noticeable increase in mean temperature has already been observed in Switzerland and summer temperatures up to 4.8 K warmer are expected by 2090. This article reviews the observed impacts of climate change on biodiversity and considers some perspectives for the future at the national level.

The following impacts are already evident for all considered taxonomic groups: elevation shifts of distribution towards mountain summits, spread of thermophilous species, colonisation by new species from warmer areas and phenological shifts. Additionally, in the driest areas, increasing droughts are affecting tree survival and fish species are suffering from warm temperatures in lowland regions. These observations are coherent with model projections, and future changes will probably follow the current trends.

These changes will likely cause extinctions for alpine species (competition, loss of habitat) and lowland species (temperature or drought stress). In the very urbanised Swiss landscape, the high fragmentation of the natural ecosystems will hinder the dispersal of many species towards mountains. Moreover, disruptions in species interactions caused by individual migration rates or phenological shifts are

likely to have consequences for biodiversity. Conversely, the inertia of the ecosystems (species longevity, restricted dispersal) and the local persistence of populations will probably result in lower extinction rates than expected with some models, at least in 21st century. It is thus very difficult to estimate the impact of climate change in terms of species extinctions. A greater recognition by society of the intrinsic value of biodiversity and of its importance for our existence will be essential to put in place effective mitigation measures and to safeguard a maximum number of native species.

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Keywords

Amphibians; Birds; Insects; Fishes; Vascular plants; Reptiles