

# Will plants found in the mountains cope with climate change?

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## Overview

We are in the midst of a climate emergency. Beyond the threats to our own living standards, there are organisms that will not be able to mitigate a warming climate. Our native, specialist plants are among the most vulnerable and we need to know if they will be able to cope with the projected temperature increases by changing their physiology.

## Aims

This project aims to use Jersey as a model of what the climate may look like in Scotland in the future to study the impacts on the physiology of arctic-alpine plants.

## Background information

Humans have been changing the environment for millennia, however, the rate of change that we are currently contributing to is staggering as shown in figure 1. High mountain ecosystems are some of the most vulnerable ecosystems in the UK. The landforms created by the last ice-age have created some of the most unique habitats with plants such as the *Sabulina rubella* (figure 2a & b), *Sagina nivalis* (figure 3a & b) and *Saxifraga cernua* (figure 4a & b) survive in a tiny pockets within the entire of the UK. We are going to study populations found within the Ben Lawers National Nature Reserve.

## Methodology

We are currently using the data from the Corrou field station to develop our model (micro)habitat, to consider abiotic stressors such as light intensity and wind. We will then monitor the soil conditions to ensure that they are stable prior to planting analogous plants.

Depending on the success of *ex situ* propagation by the University of Dundee, we will then look to transplant clones of the Scottish populations into our model habitat.

We will then measure the differences in leaf size, stomatal density, photosynthetic pigments, and responses to non-native competitors.

If these plants survive in our hotter climate, we will look to sequence the Aa\_G31521 gene to look for variability in year 3 of our study.



**Figure 1.** Biodiversity stripes showing the correlation between climate change and the loss of biodiversity in the UK.



**Figure 2a & b**

Mountain sandwort, *Sabulina rubella*. Image by Sarah Watts.



**Figure 3a & b**

Snow Pearlwort, *Sagina nivalis*. Image by Sarah Watts.



**Figure 4a & b**

Drooping saxifrage, *Saxifraga cernua*. Image by Sarah Watts.

## Results or Predicted results

We expect to see leaves changing to cope with more water loss, potentially by reducing their surface area to volume ratio, or by reducing the density of stomata. There may be a change in photosynthetic pigments produced by the plants.

## Next steps

To ensure our habitat is stable prior to planting this term, we are measuring soil pH and moisture levels.