

## Impacts of climate change already visible in fell habitats

***In fell areas, climate change causes gradual advancement of pine forests, increasing damage to mountain birch forests as new geometrid moth species spread into the area and shorter duration of snow cover.***

The dominant features of the landscape in northernmost Lapland are bare fells and mountain birch forests. There are fell areas also elsewhere in Lapland and Koillismaa, the southernmost one being Iso-Syöte at Pudasjärvi. In connection with the assessment of Finnish threatened habitat types, detailed definitions of Finnish fell areas were drawn up.

### **Slightly over one third of fell habitat types threatened**

In the assessment process, 53 fell habitat types were identified with a total area of 1.3 million hectares. Of all fell habitat types 20, or 38%, were estimated to be threatened. The share is also almost the same of the total area covered by these fell habitat types.



Snow patches are among the most threatened fell habitat types. They usually lose their snow cover in June–August. Snow patch in the Pallas-Yllästunturi National Park. Photo Arto Saikkonen.

The most threatened fell habitat types are snowbeds, snow patches and mountain birch forests. One fourth of the fell habitat types (13) were assessed as near-threatened, but their area covers about a half of all the fell habitat types. Particularly, wide-stretching mountain heath types belong to near-threatened habitats. The number of non-threatened fell habitat types is 20 (38%), but their area covers only 6% of the overall area of fell habitat types. Non-threatened habitats include all mountain bedrock outcrop and boulder field types, the mountain forests with aspen, pine or spruce north of the continuous coniferous forest zone, and part of mountain meadows.

Compared to the previous assessment, made 10 years ago, snowbeds, snow patches and mountain birch forests are now more threatened than before. It was assessed that their status had genuinely changed, in addition to the changes in the assessment method and increase in knowledge affecting their higher threat-level classification. The estimate was that the status of these habitat types will deteriorate further.

### **The combined effect of climate change and grazing pressure significant**

Climate change and reindeer herding and their combined effects are the most important factors affecting the status of fell habitat types. Global warming causes the coniferous zone timberline to spread into the fell area and overgrowth of bare fells. Damage to mountain birch forests will become a more common

phenomenon, since the number of extremely cold winter days diminishes and new geometer moth species will spread into the area. The duration of snow cover will become shorter, which leads to the diminishing of areas with snowbeds and snow patches. With weaker frost, the status of habitats that need frost action will deteriorate.



*Damage caused by the winter moth in the Kaldoaivi Wilderness Area in Utsjoki. Photo Arto Saikkonen.*

Reindeer grazing is part of the fell area nature. However, a heavy all-year grazing pressure weakens the status of many fell habitat types that of dry lichenized fell habitats in particular. Heavy summer grazing weakens the renewal of mountain birch forests. Moderate grazing pressure has also beneficial impacts on biodiversity, particularly on herb-rich habitat types.

The decisive factor is the combined effect of climate change and grazing. An example of this are the mountain birch forests that increasingly often suffer from damage caused by geometrid moths over larger areas. In summer grazing areas, the recovery of birch forests from geometrid moth-caused damage has become more difficult, because the reindeer eat the shoots and saplings, thus preventing the renewal of birch forests. This will gradually lead to disappearance of birch forests.

Climate change and grazing may also have opposite effects and compensate the impacts of one another. For example, on mesic mountain heaths and mountain meadows reindeer grazing may have positive effects, since it may prevent overgrowth of the habitat and maintain biological diversity. Since reindeer herding is practised in the whole fell area, grazing has either positive or negative impact on almost all fell habitat types.

### **Steps for improving the situation and comprehensive land use planning**

The preservation of fell habitat types requires that action aimed at mitigating climate change be enhanced. More research should be aimed at monitoring the changes in the biodiversity of fell habitats and at finding the causes and effects of such changes. To reduce the harm caused by heavy grazing pressure, the team of fell habitat experts proposes regulation of grazing pressure and the development of rotational grazing practices.

The rapidly growing tourism in Lapland, the utilisation of natural resources and other land use plans significantly increase the land use pressures in different parts of the fell area. Therefore, the fell habitats and their state must be protected by means of comprehensive land use planning.

### **For further information, please contact**

Nature Conservation Specialist **Elisa Pääkkö**, Metsähallitus, tel. +358 40 735 2505, [firstname.lastname@metsa.fi](mailto:firstname.lastname@metsa.fi)

Senior Researcher **Katariina Mäkelä**, Finnish Environment Institute, tel. +358 40 0148 686, [firstname.lastname@ymparisto.fi](mailto:firstname.lastname@ymparisto.fi)