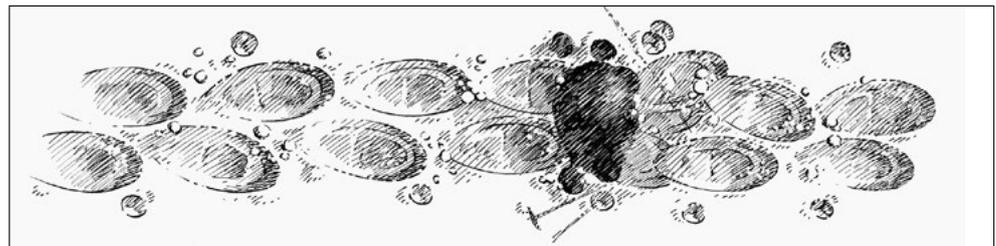
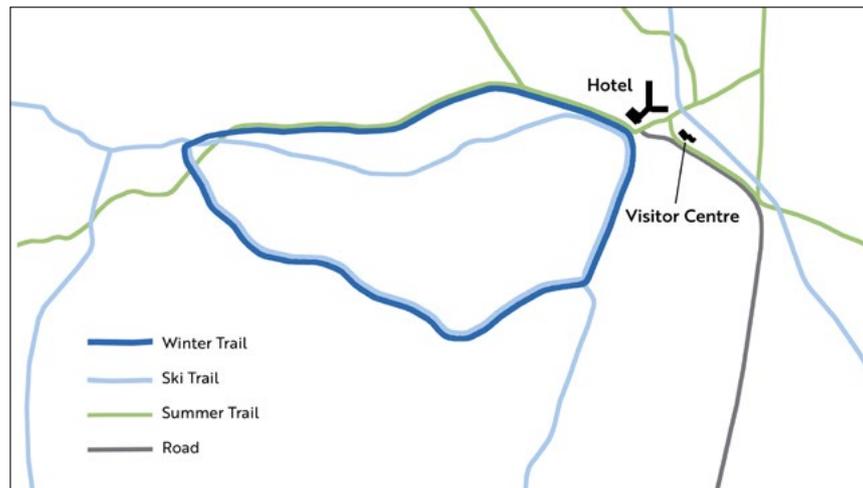


# Pallastunturi Winter Trail



## Welcome to the Winter Trail!

Here you can see how plants and animals adapt to snow and cold weather, and what kind of traces animals leave during their winter activities. The winter trail is about 2.5 km long and runs through the forest by the fell. The trail ends at the lower station of the Laukukero ski lifts from where you can get back to the hotel yard. You can walk or snowshoe on the trail depending on how much snow there is. Visit the Visitor Centre for more information and tell us about what you've seen! Happy trails!



## Seeds in Winter Wind

A dry and small seed stands the cold well. Seeds of many plants even need a cold period in order to germinate. In this way the plant avoids starting to grow in the autumn and will not begin to grow before spring.

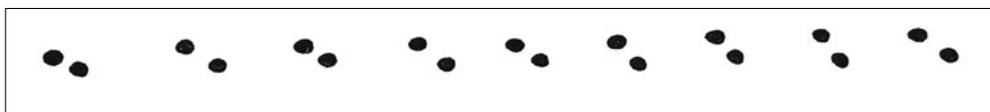
Many plants shed their seeds so that they can be transported by the winter wind. In good years, the snow crust in spring is teeming with spruce seeds. The same 'runway' is used by the grasses sticking up out of the snow.



Golden rod  
(*Solidago virgaurea*)  
and Meadowsweet  
(*Filipendula ulmaria*).



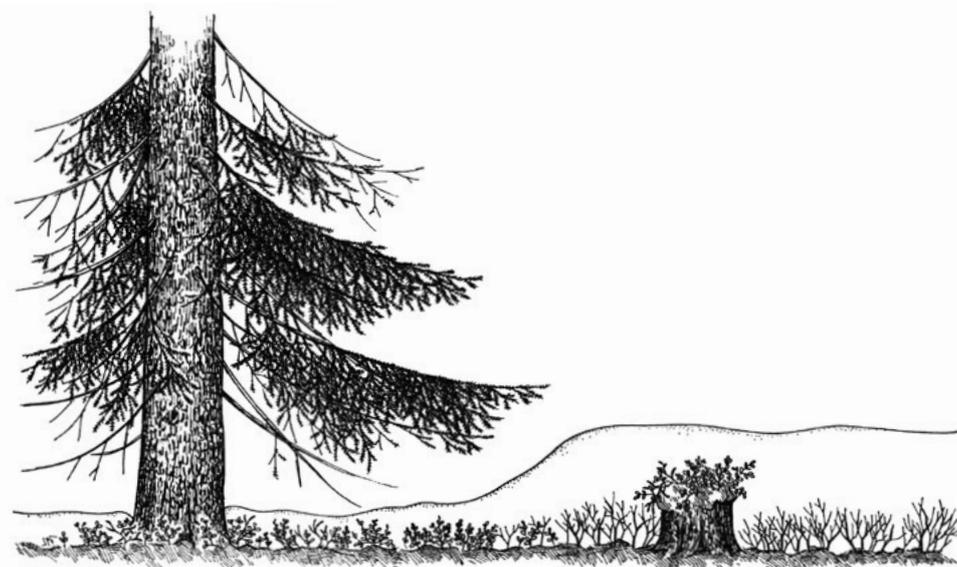
Red fox (*Vulpes vulpes*)



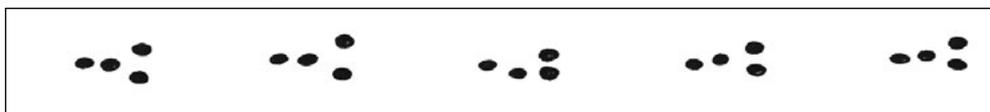
## Plants Under the Snow

All spots under the snow are not equally sheltered as the structure and thickness of the snow cover vary from place to place. Tussocks and places under trees are only covered by thin snow and they melt early. These are places where resistant plants such as the Lingonberry (*Vaccinium vitis-idaea*) thrive. The sensitive Bilberry (*Vaccinium myrtillus*) on the other hand prefers spots with thick and long lasting snow.

The windiest places on the fells may stay without snow all the winter. Only some hardy plant species inured to the cold survive on these windswept fell tops.



Mountain hare  
(*Lepus timidus*)



# Shelter

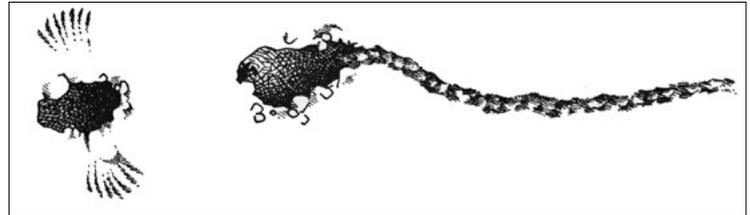
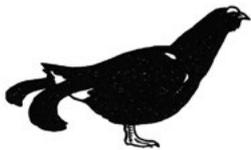
The thick and airy feather or hairy covering insulates well and reduces thermal loss. The white coat also protects against the gaze of enemies. If needed, the snow offers additional protection. The fowl spend the night in a closed snow hole. Snow cavities or holes are also sometimes used by mammals and some small birds to rest in. The fowl close the entrance of the cavity by kicking snow together and fly out through the snow roof of the hollow.

Wood grouse  
(*Tetrao urogallus*)



Black grouse  
(*Lyrurus tetrix*)

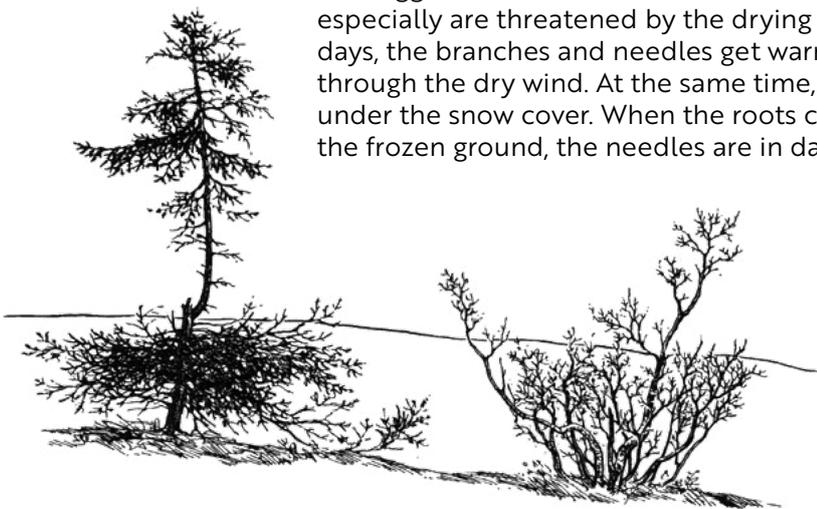
The snow burrow of a fowl depicted from above.



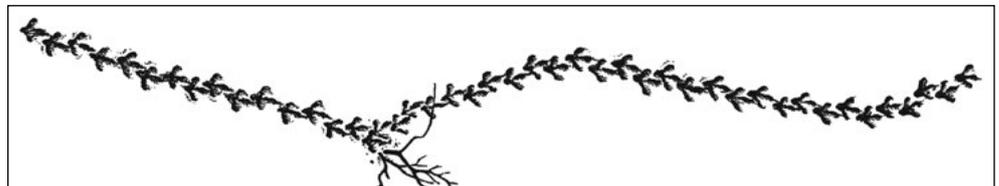
# Winter Shaves Trees

Winter is hardest close to the snow cover. The piercing wind speeds ice crystals which whip tree trunks and branches. This is the way winter mows down the majority of sprouts trying to rise on the snow.

The biggest threat in winter is not the cold but the dryness. The spruces especially are threatened by the drying effect of the cold. On sunny late winter days, the branches and needles get warm and their moisture evaporates through the dry wind. At the same time, there is not the slightest hint of spring under the snow cover. When the roots cannot get water for the treetop out of the frozen ground, the needles are in danger of drying out.



Willow grouse (*Lagopus lagopus*)

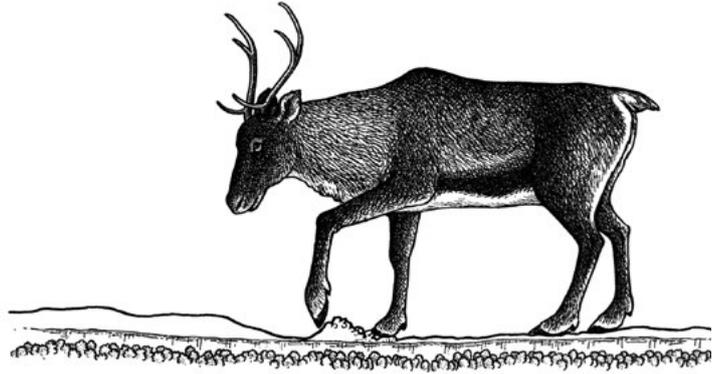


## Eating Keeps Warm

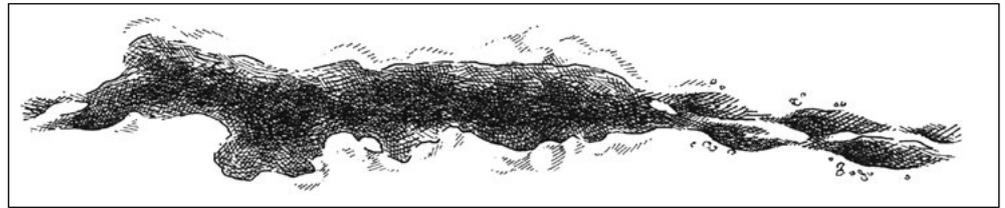
Not even the thickest fur can warm up a hungry animal. Mammals spend most of their time looking for food and a shortage of food is relieved by reserves stored in the fatty tissue during the autumn.

In winter, vegetable food is indigestible. The Reindeer (*Rangifer tarandus*) eats lichens that contain a lot of energy while the Mountain hare (*Lepus timidus*) gnaws the bark of deciduous trees. Of the predatory animals, it is only the Least weasel (*Mustela nivalis*) which is able to seek prey under the snow. The Red squirrel (*Sciurus vulgaris*), Stoat (*Mustela erminea*), Least weasel and small rodents all go to their own hoards of food.

*The wet autumn snow may freeze so hard that a Reindeer (*Rangifer tarandus*) cannot penetrate it to get to the lichens.*



*The digging tracks of a Reindeer in soft snow.*



## The Busy Day of Birds

In winter, birds only have a few hours of daylight in which to search for food. The food is also often harsh: the Willow grouse (*Lagopus lagopus*) munches the buds of the Mountain birch (*Betula pubescens* ssp. *czerepanovii*), whereas the Wood grouse (*Tetrao urogallus*) eats bitter Scots pine (*Pinus sylvestris*) needles. Many birds gather food supplies for winter in summer. For example in summer the tits stick great amounts of seeds and insects into slits in the bark. Those whose instinct does not lead them to store up food for the winter have to wander to find food or be content with the supply available.

Unlike other birds, the owl mostly seeks for its prey in the dark. They snatch voles which pop up onto the snow from under the surface of the earth. A bad winter for voles makes owls migrate.



*The owl has caught a vole running on the snow.*



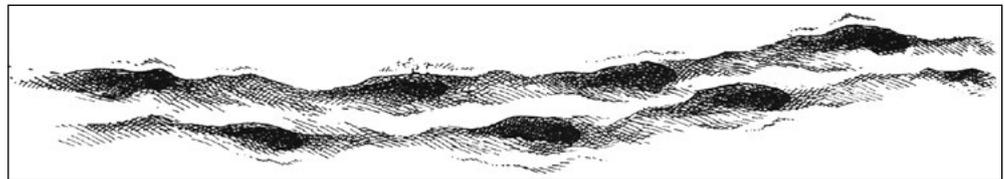
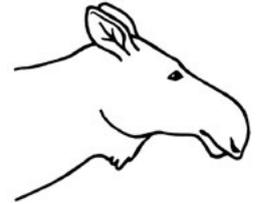
## Works of Art Created by the Frost

Water vapour freezes in the clouds into small crystals. The crystals join up together forming snowflakes. In the snow cover the flakes change; they crumble, rejoin, melt and condense. At the same time, different layers with different hardness and consistency are being formed.

When a frost sets in, the cold freezes the moisture on the trees, forming hoar frost. The earth and all the horizontal surfaces become covered with frost as well. Rainwater is termed 'supercooled' if it freezes as soon as it touches an object. Together, the snow and frost shape the coniferous trees on the fells, covering them with layers of packed snow which bend and break branches.

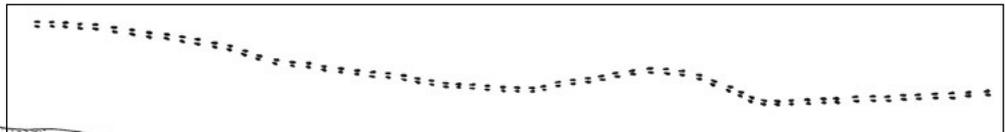
*Snow crystal shapes.*

*Moose (Alces alces) and its traces in soft snow.*



## Life Under the Snow

Snow is an insulator which divides nature into two parts. Above, the winter is harsh and freezing whereas under the snow a silent darkness dominates, with the thermometer being around zero. Between the snow and the surface of the earth, there creep and crawl many kinds of creatures. The voles and lemmings chop food from the wintering plants – sometimes they even reproduce under the snow. Shrews scrape up insects for their meals. Spiders, mites, springtails and beetles move around all winter, even though the majority of small animals winter as eggs or pupae.



*Vole*



# A Fell Takes off its "Fur Coat"

In the late winter when the spring is approaching, the snow cover becomes granular. A part of the snow melts and a part evaporates in the dry spring winds. Bare spots with no snow appear here and there on the fell tops. However, on the northern slopes and in deep gorges, snow can even be found at Midsummer.

In riverbeds, the power of the floodwater crushes the waterside vegetation and carries loose material away. A thick snow cover and the quickly warming spring weather cause both small and large rivers to overflow. When the rivers cannot discharge themselves quickly enough into the sea, the water floods the low-lying country.



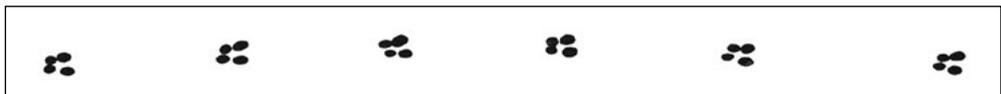
European otter (*Lutra lutra*)

# The History of Ski Tourism

Skiing on the fells began in the 1920s. Under Kaarina Kari's leadership, the Finnish Association of Women's Physical Education began to organize skiing courses in the Pallas fell area and built there the so-called Women's Cabin. Skiing became very popular and soon skiing camps for school children were held during the Easter holidays. Good experiences led to the establishment of skiing holidays in the Finnish schools.



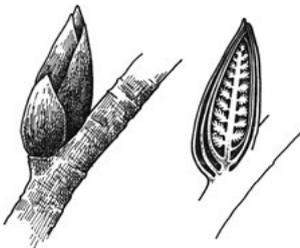
Red squirrel (*Sciurus vulgaris*)



# A Long, Cold and Dark Winter

Winter is a very hard time for nature. Migratory birds flee the gloomy season, but all the others have to adapt. The winter eliminates the weakest ones so that at least the strongest ones are able to survive.

The snow is a prerequisite for life in the North in winter. It covers the sleeping Brown bear (*Ursus arctos*) as well as the smallest creatures. The snow sheet also protects the majority of resting plants. The tracks in the snow also prove that with good equipment you are able to meet the winter on the snow.



A winter bud and a cross-section of it.



The evergreen plants have a strong surface and protected stomata. The needle evaporates less water than a leaf which is flat and broad.

## The Plants Become Hardened to Winter

When the days get shorter, the plants withdraw to rest. The cells change in order to endure the cold and the growing points will shut down into small buds called hibernacula. Valuable substances move from the leaves to the roots.

Evergreen plants do not waste time growing new leaves every year. In spring, evergreens such as the coniferous trees and Lingonberry (*Vaccinium vitis-idaea*) are one step ahead of the others; the green surface is ready to bind sun energy for new growth.

Reindeer (*Rangifer tarandus*) and its tracks on the hard snow.



# Insects on the Snow

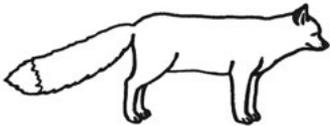
The thaw in the late winter melts the snow around the trees; a connection between the worlds under and above the snow is created. This route is used by some insects to climb up onto the snow, until the cold chases them back under the snow.

Springtails belong to the smallest snow insects. On warm winter days you can also meet snow flies, spiders, flies and mosquitoes. The spiderlike snow gnat is the only insect which can stand temperatures close to  $-10^{\circ}\text{C}$ .



Winter gnat (*Trichoceridae*), Springtail (*Collembola*), Snow fly (*Boreidae*), Snow gnat (*Chionea*) and Fly (*Brachycera*).

Red fox (*Vulpes vulpes*)

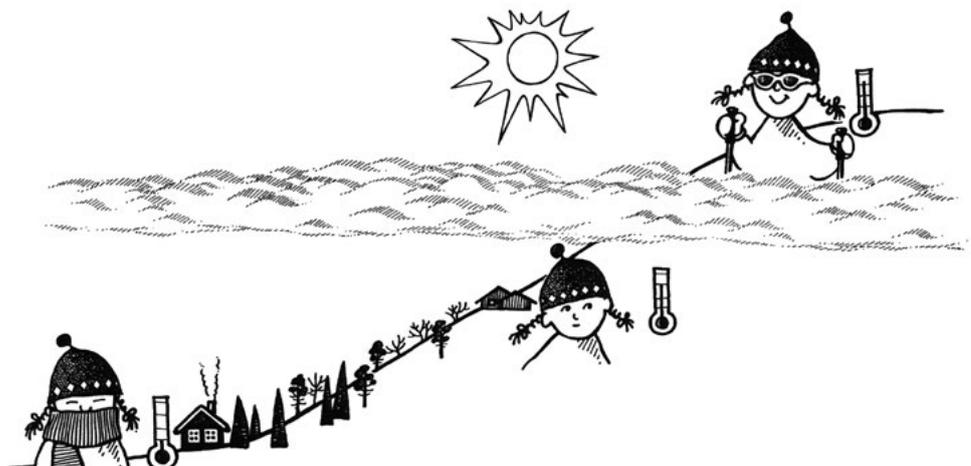


# Twilight and Light in the Spring

During the twilight period, the landscape can only be seen a short time in a delicate light around midday. The snow creates a bluish atmosphere in the silent nature. After midwinter, the snow sparkles in the sun for the whole winter.

The tops of the Pallas fell rise about 500 metres above the villages in the neighbourhood.

Differences in altitude cause abrupt changes in the weather. On the fell, the weather is often soft enough for skiing whereas the villages shiver at the same time in the cold. On the fell top, you may have nice weather even though the lower slopes are covered in fog.



Stoat (*Mustela erminea*) and Least weasel (*Mustela nivalis*).

