

1.3 Age of trees and structure of stands

■ The age structure of trees in Swiss forests is imbalanced. There is a lack of both trees younger than 60 years old and very old and decaying stands.

■ Not all Swiss forests are too old. However, in forests used for wood production or needed to provide protection against natural hazards, the uneven age structure of the trees causes problems.

■ The proportion of large old trees that are broad-leaf is currently low because conifers have been favoured for many decades. However, this is likely to change in the near future.

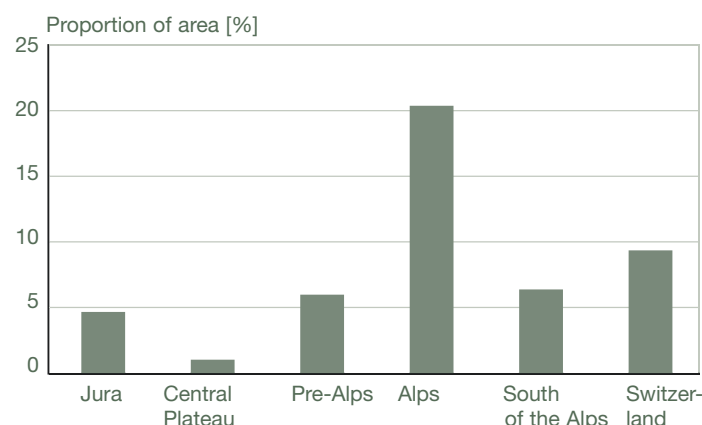
Age structure

A sustainable forest economy entails, among other things, regular use of the forest. In a forest managed sustainably, the area of trees felled should be the same each year. After several decades the forest would then consist of similarly sized areas each with trees of the same age. The resulting age structure of the forest would thus be evenly balanced with a new area of forest being regenerated annually. Forest owners who do not follow such a regular routine may well be in a position to fell a lot of wood in some phases, but subsequently they will have periods when little wood suitable for felling is available, and when they must, at the same time, invest a great deal in the management of newly forested areas. This can lead to financial difficulties, so that it is usually also financially advantageous for forest enterprises to maintain a balanced age structure.

The age of standing trees is not always easy to determine. Normally, the growth rings visible on a cross-section of the stem are counted. However, in order to do this the tree must be chopped down. If no trees have been felled, estimates must be relied on. With nearly three-quarters of the samples in the second

1.3.1a Old forest stands

Distribution of forested areas with stands over 160 years old in the different forestry regions and in the whole of Switzerland.



National Forest Inventory from 1993 to 1995 it was only possible to estimate their ages. A further 17% of the stands were unevenly aged with trees of different ages growing close to each other, so that the stands could not be classified as having any single age.

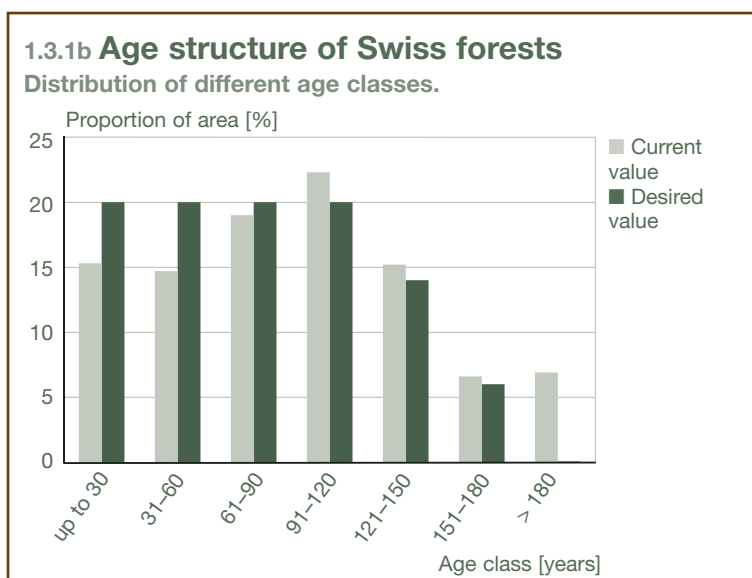
The National Forest Inventory showed that the age structure in Swiss forests is imbalanced. Measured according to standard forestry guidelines, they lack stands younger than 60 years old. Instead there are, from an economic point of view, too many old trees. The average age of Swiss forest trees over eight centimetres in diameter (measured at breast height) rose from 91 to 97 years between 1985 and 1995. This was because too few old forests were cut during this period.

On average, the higher the altitude of a forest, the older it is. Whilst in the Central Plateau only 1 % of stands are older than 160 years, the figure for the Alps is 20%. Trees in mountain forests, however, have a longer life expectancy due to the rough climate than those in the Central Plateau.

In spite of the lack of young forests, it would be wrong to label Swiss forests in general as too old. The imbalanced age structure of a forest can be seen as positive or negative depending

on what the forest owners and the public expect from the forest. If they want to use the timber commercially, this imbalance is a disadvantage. Having a high proportion of old trees is also a problem for protection forests. These require continual regeneration so that the forest can properly fulfil its protective function without interruption. On the other hand, a high proportion of very old and decaying trees can favour species diversity since some rare species are dependent on old and sturdy trees.

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Stand structure

The stand structure describes the vertical composition of the forest, which is defined in layers. For 36% of the forested area in Switzerland the stands have one layer, i.e. all the trees are the same height. For 55% of the forested area trees grow in at least two layers separated from one another. These forests are multi-layered (see photo). 8% consist of vertically well-structured or horizontally grouped stands, which occur e.g. in selection forests. They have trees with crowns in several layers, which cannot be distinguished from each other. Horizontally grouped structures are to be found in mountain and wooded pastures and are ideally suited for protection forests.

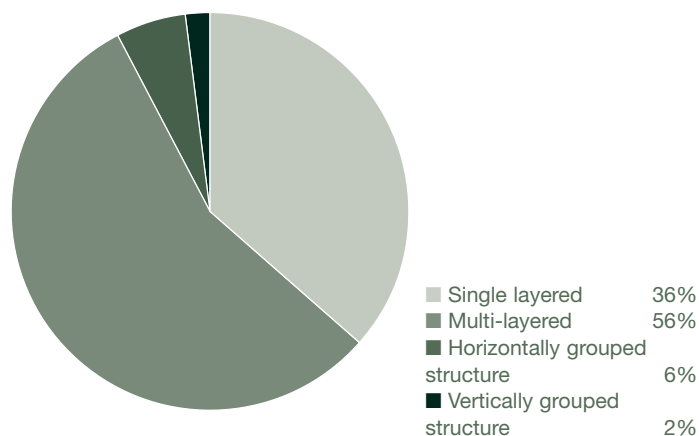
1.3.2 Multi-layered forests

In multi-layered forests there are trees of at least two different height classes growing one above the other.



1.3.3 Stand structures

Vertical composition of the Swiss forests.



FURTHER INFORMATION

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Measurements in 1995 showed that there are more thin than thick trees in Switzerland. This comes as no surprise since not all trees grow to be old and majestic. What is striking, however, is that there are so few broadleaf trees growing up into powerful, large trees.

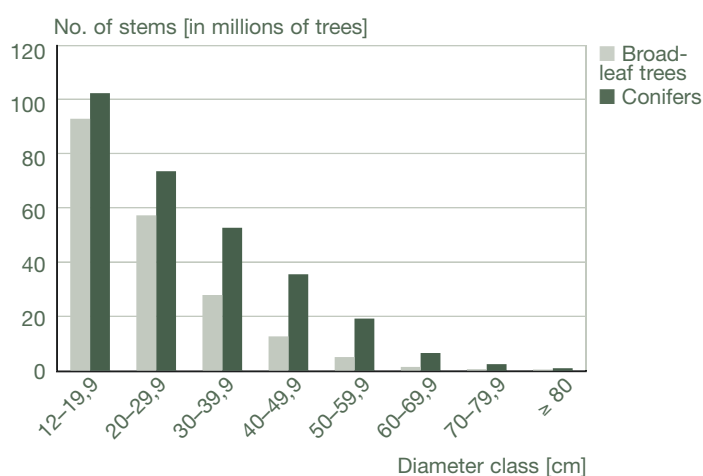
Tree diameters

The thickness of tree stems is also of interest. The diameter of a tree is measured 1.3 metres above the forest floor. Measurements in 1995 showed that there are more thin than thick trees in Switzerland. This comes as no surprise since not all trees grow to be old and majestic. What is striking, however, is that there are so few broadleaf trees growing up into powerful, large trees. This is a result of the management methods of the past 150 years. Up until a few decades ago conifers were favoured commercially. Only in the last 40 years have broadleaf trees been increasingly promoted in young forests, which is why the proportion of broadleaf trees is only slowly increasing. In a few decades it will be possible to find more broadleaf trees amongst the larger trees.

The total number of large trees increased between 1985 and 1995. This continuing trend has had a positive effect on the habitat of birds that breed in holes. The woodpecker, for example, is dependent on large old trees. The increase in large trees, however, is commercially problematic since the demand for thick stems is currently low.

1.3.4 Distribution of tree diameters

Distribution of diameter classes of broadleaf trees and conifers.



1.3.5 Measuring tree diameters

Tree diameters are measured 1.3 metres above ground.

