Installation of a genetic monitoring network for beech and spruce in Germany

to evaluate the genetic adaptability of species to climate change

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Within the recently started project "GenMon" a genetic monitoring network will be installed for beech (*Fagus sylvatica*) and spruce (*Norway spruce*) in Germany for the first time.

The main goal is to assess the genetic variation and the status of the genetic system of different populations as well as its dynamics in time and space on the basis of criteria, indicators and verifiers.
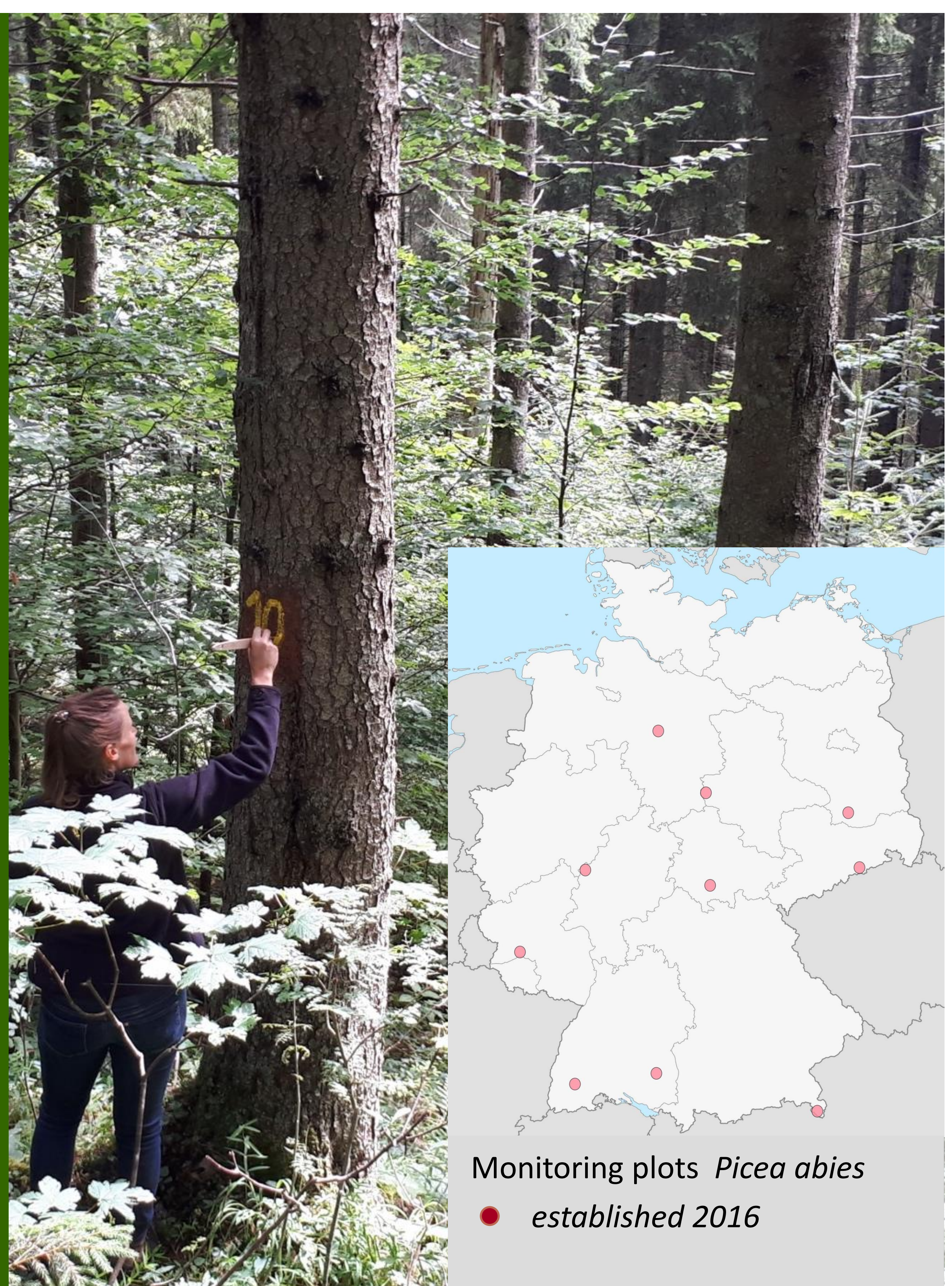
For this purpose the genetic as well as the phenological and physiological levels are taken into consideration in order to follow temporal developments and to estimate influencing factors.

Bud flush of beech
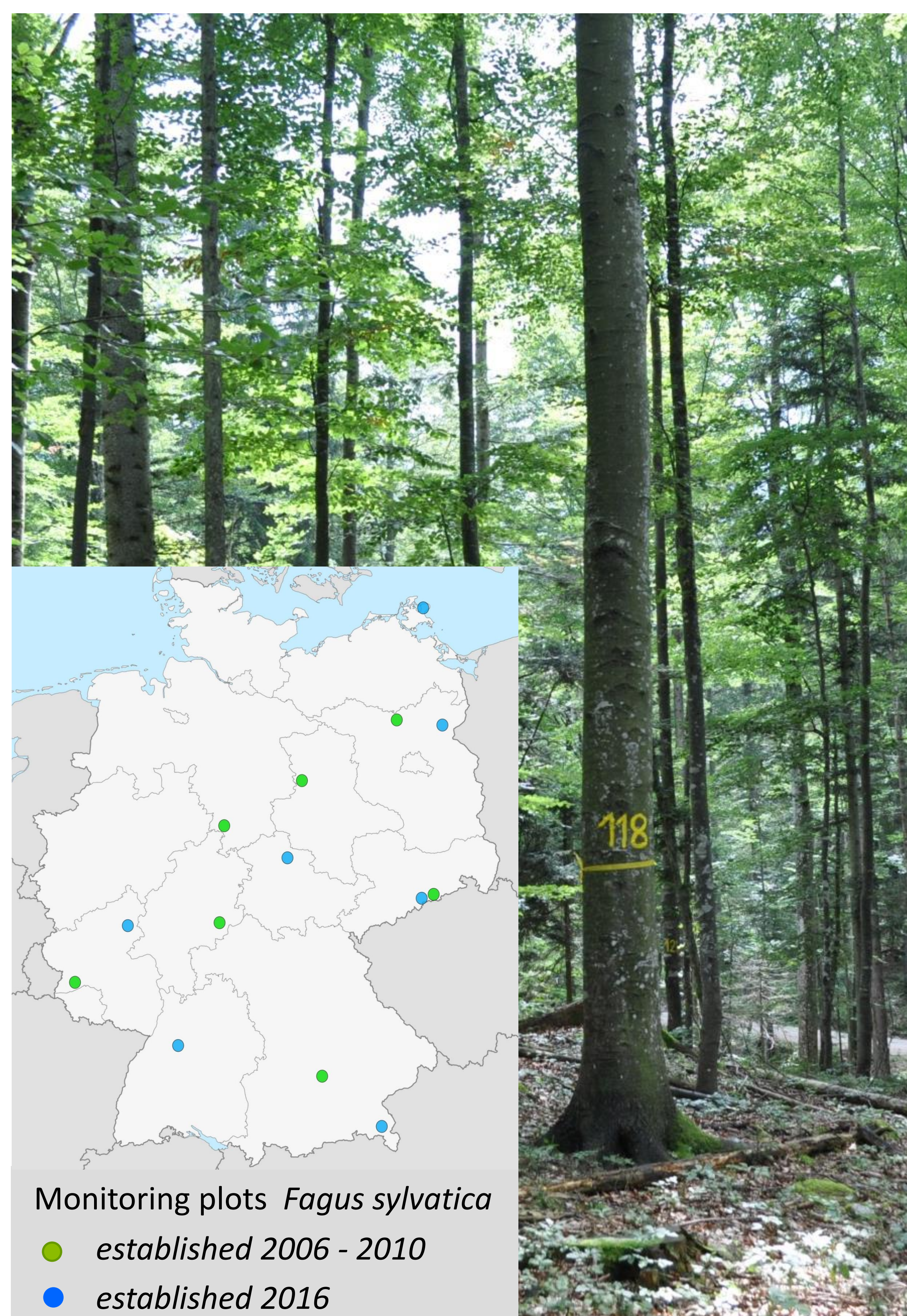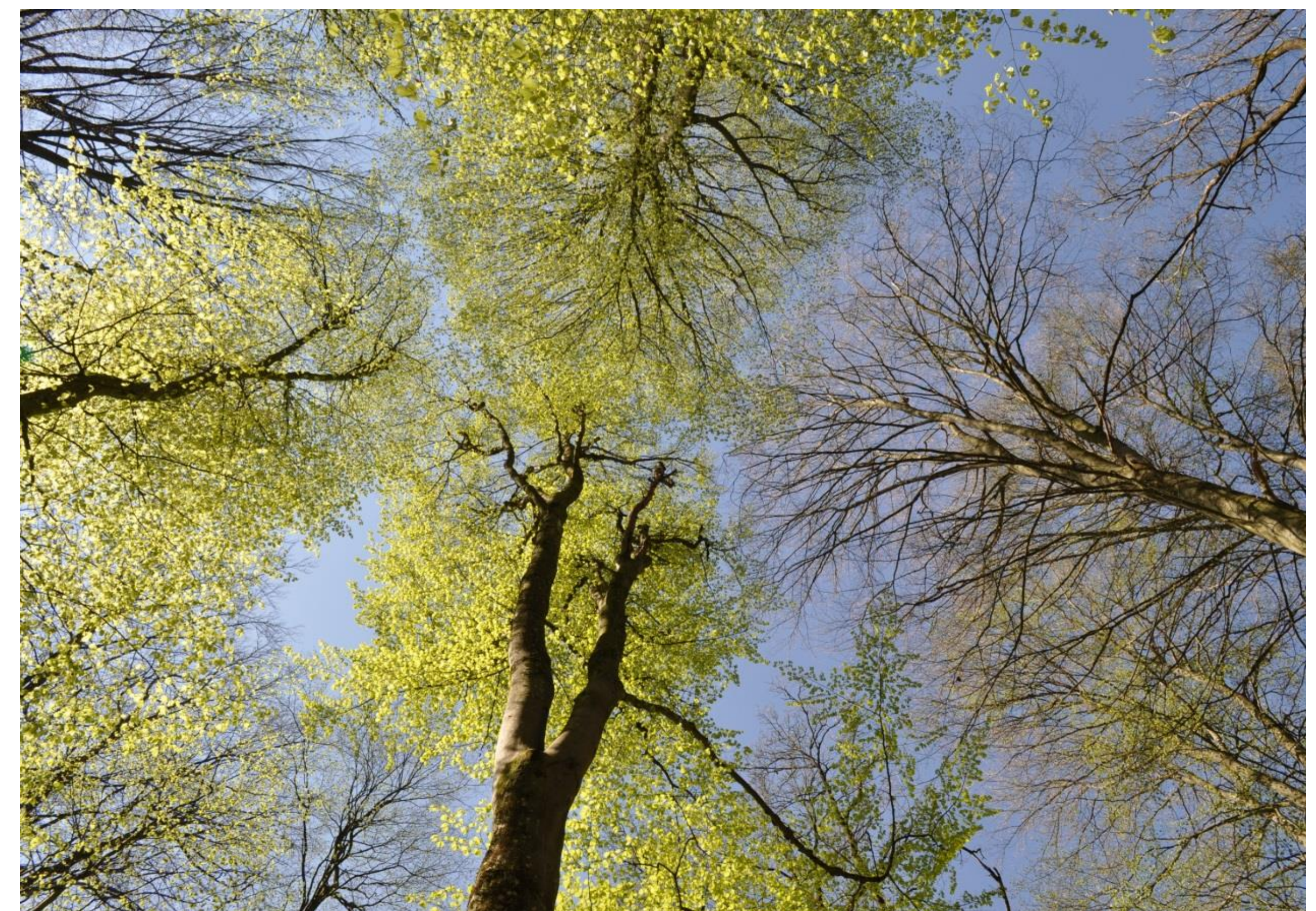
Strategy for performing forest genetic monitoring

➢ basic genetic inventory of the reproducing trees in the monitoring plot (stand) - *once*

➢ assessing the genetic composition of natural regeneration of an adequate sample *(e.g. every 10 - 15 years)*

➢ performing inventories concerning the extent of flowering and fructification of selected trees periodically *(e.g. every 1 - 2 years)*

➢ carrying out genetic studies on the seeds of different seed years; assessing empty grains and germination percentage *(e.g. every 5 years)*

➢ calculating the given verifiers for genetic processes based on the genotypes of the old trees, natural regeneration and the seeds

Monitoring plots *Fagus sylvatica*
● established 2006 - 2010
● established 2016

Monitoring plots *Picea abies*
● established 2016

The genetic monitoring network will comprise 14 plots for beech and 10 plots for spruce.

Ideal „intactness" of the genetic system is given, if „natural" population genetic processes are facilitated without limitation.

By assessing **changes of the genetic system**, which become apparent only in succeeding forest generations on superordinate monitoring levels like e.g. stand structure, vitality and natural regeneration, forest genetic monitoring contributes essentially as an **early warning system**.

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