Genetic diversity is conserved in gene reserve forests and collections

Metla/Erkki Oksanen

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forest • knowledge • know-how • well-being

Metla is responsible for conserving genetic resources

The Ministry of Agriculture and Forestry has placed Metla in charge of conserving genetic diversity in forest trees, as well as promoting the sustainable use of genetic resources.

Genetic diversity forms the basis of species' adaptation to a changing environment e.g. climate change. Forest tree breeding makes direct use of such diversity, by developing better reproductive material for forest regeneration.

The primary tasks of genetic conservation are

- Creating and maintaining a gene reserve forest network
- Planning, establishing and maintaining gene reserve collections

A gene reserve forest is a unit specifically developed to conserve the genetic diversity of the species in question, in the area in which the population's genetic composition originally developed. Such a unit is representative of the local natural forest. The owner commits to regenerating the unit, either naturally or using seed collected from the very same stand.

A network of several gene reserve forests is established, in order to cover the species' natural distribution and adaptive variability in Finland. Since genetic conservation is performed on an extremely long-term basis, an individual gene reserve forest is expected to serve the related programme for hundreds of years. While most gene reserve forests are placed on state-owned land, some are owned by forest companies or private persons.

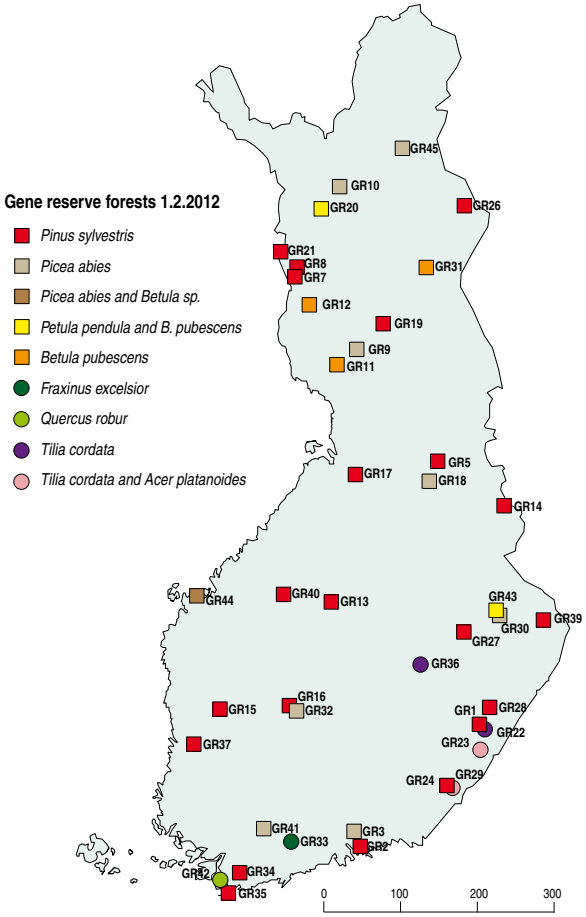
Gene reserve collections

Tree Species	Field collections		Material included		
	No.	Area, ha	Stands	Clones/ Families	Ramets/ Seedlings
Acer platanoides	2	1,19	41	262	1836
Fraxinus excelsior	3	0,74	17	84	1177
Juniperus communis	2	0,44	60	192	1529
Prunus padus	1	0,04	6	11	76
Quercus robur	1	0,46	17	132	895
Sorbus aucuparia	2	0,79	20	69	690
Tilia cordata	1	2,05	81	341	458
Ulmus laevis	1	0,81	19	120	225
Ulmus glabra	2	1,79	36	92	177
Total	**15**	**8,31**	**297**	**1303**	**7063**

Photo Metla/Erkki Oksanen

Gene reserve collections are designed to conserve genetic diversity outside of the natural habitat, in living trees which are well protected and taken care of. Collections are established either through grafting or with seedlings, using material sampled from several small natural stands. Because genetic collections represent the primary method used in the case of rare noble hardwoods, such collections are located in South-West Finland, within the natural distribution of rare broadleaves.

In the near future, all of these collections will be duplicated as a back-up measure in case of unforeseen disasters. The predicted climate change and the possible increase in new pests and diseases only serve to stress the importance of developing back-up measures, such as duplicate collections or cryopreservation.



More information

Leena Yrjänä
tel. +358 29 532 5240
leena.yrjana@metla.fi

Cover: A twig from an old oak is grafted onto a young seedling. The genes of the old oak will be conserved in this graft, beyond the lifespan of the old tree.