



What are Marteloscopes?

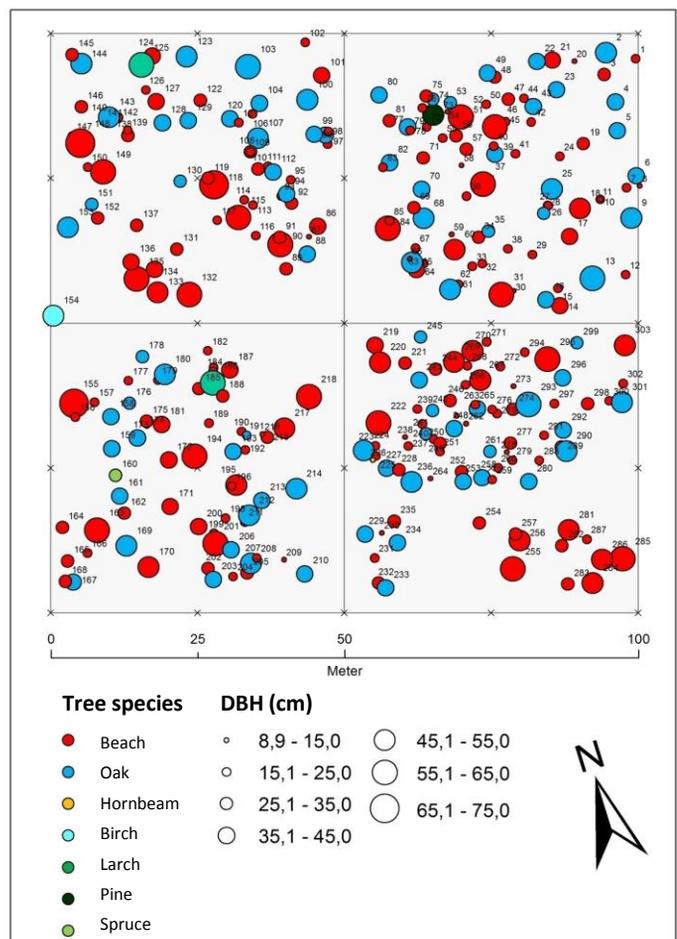
A main task in forest management is to decide, where, when and what kind of forest interventions are applied. Key factors influencing silvicultural decisions that practitioners make are their understanding of forest dynamics and their level of experience. Further, the presence of a wide range of theoretical strategies and concepts in forestry results in differences when implementing certain silvicultural practices. This may apply even when clear forest management guidelines are in place. Therefore it is important to ask how substantial are the consequences of different silvicultural approaches and to what extent do they affect forest biodiversity?

Experimental silviculture (“trial and error”) will not provide answers to the above question. Nonetheless simulating interventions applied by practitioners within the same stand can provide such insights.

This is what *‘Marteloscopes’* do: the term is derived from French and describes a more detailed examination of tree selections and their consequences for the remaining stand.

Marteloscopes are silvicultural training sites of usually one hectare in which all trees are numbered, mapped and recorded. Using an evaluation and simulation software virtual tree selection exercises can be performed. The software allows to display the results of silvicultural interventions and future impacts for the stand.

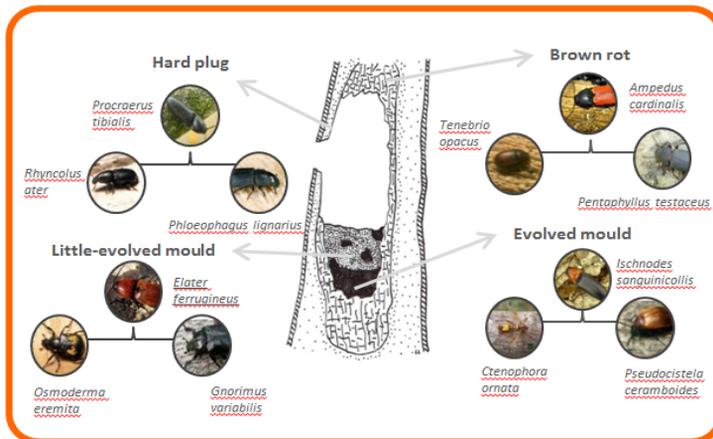
The application of different management goals and their effects on the economic and ecological values of the stand can then be objectively discussed by the participants on site.



Tree microhabitats - basis for ecological evaluation

Tree microhabitats are of prime importance for specialized and often endangered forest species of flora and fauna. A comprehensive microhabitat-catalogue comprising of 23 saproxylic and epixylic features serves as reference for recording tree microhabitats.

An **ecological value** (in points) is assessed for each tree in the Marteloscope based on recorded tree microhabitats, taking into account rarity of each habitat and duration for it to develop. Changes to the ecological value can then be derived for any virtual tree selection exercise.



Look into a mould cavity (adaped from Larrieu, 2014)

Saproxylic Microhabitats	Cavities	CV1	Woodpecker cavities
		CV2	Trunk and mould cavities
		CV3	Branch holes
		CV4	Dendrotelms and water-filled holes
	Injuries and Wounds	CV5	Insect galleries and bore holes
IN1		Bark loss / Exposed sapwood	
Bark	IN2	Exposed heartwood / Stem and crown breakage	
	IN3	Cracks and scars	
Deadwood	BA1	Bark pockets	
	DW1	Dead branches and limbs / crown deadwood	
Epixylic Microhabitats	Growth (and related) microhabitats	GF1	Root buttress cavities
		GF2	Witch broom
		GF3	Cankers and burrs
	Epiphytic krypto- and phanerogams	EP1	Fruiting bodies fungi
		EP2	Myxomycetes
		EP3	Bryophytes
			Foliose lichens
Nests and aeries		Lianas	
		Ferns	
		Mistletoe	
Other microhabitats	NE1	Nests / aeries	
	OT1	Sap and resin run	
	OT2	Microsoil	

List of tree microhabitats

Tree assortments and timber prices - basis for economic evaluation

The **economic value** (in €) is estimated for each tree based on tree volume, stem quality and corresponding local timber price lists. This allows the calculation of the value for the whole stand and the revenue resulting from any virtual tree selection exercise.

