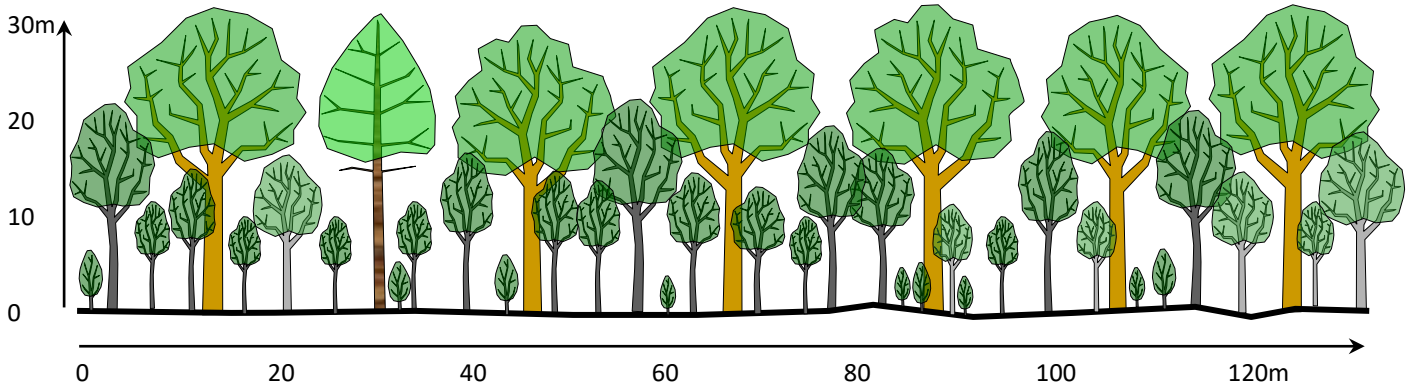
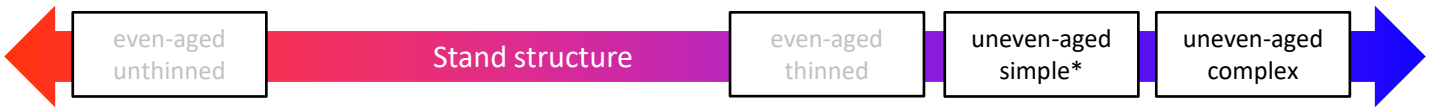
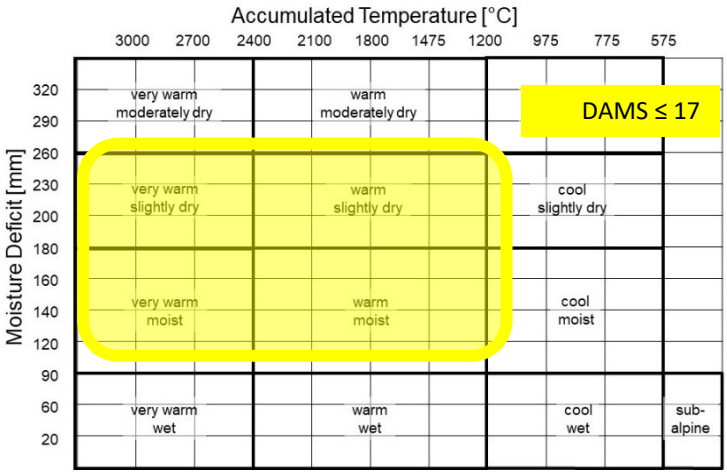
FDT 5.1.1 POK and HBM

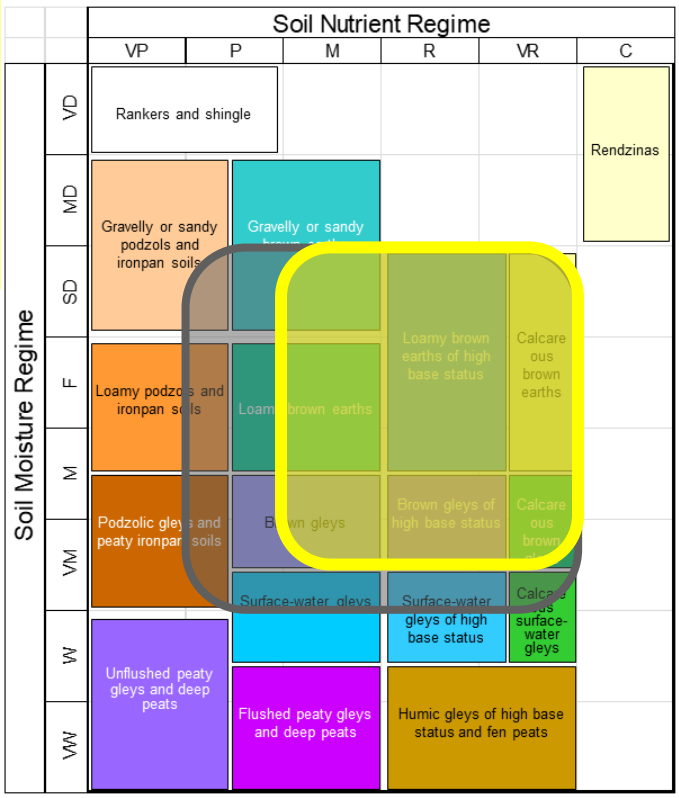


1. Structure and dynamics:
Two- or multi-storeyed stand of dominating POK with admixed HBM in middle and understorey. HBM in single tree to small group mixture. Minor species of category C may include BE, SLI, BI, ASP, ROW, AR, WCH, EM and others.
Species distribution: POK 70 – 90% HBM 10 – 30% minor species: < 10%
Likely originating from POK stands underplanted with HBM, minor species from infill. Stands should be managed under LIMA / CCF regimes with best possible use of natural regeneration of POK.



2. Ecological suitability:
Resembles NVC types W8 and W10 of the lowland climatic zones. Suitable for moister soils of good nutrient supply (heavier clay loams) where POK grows at its full potential (GYC > 6) and is capable of producing high quality timber. A good option for conversion of pure POK stands requiring diversification by enrichment planting.





3. Management objectives:

Economic (POK GYC > 6):	POK – veneer / planking grade, target DBH > 70cm in 120 – 160yrs
	POK – sawlogs, target DBH > 60cm in 100 – 140yrs
	HBM – sawlogs, target DBH > 40cm in 80 – 140yrs
Environmental and social:	Diverse woodland of natural appearance and high conservation value. HBM element serves to improve timber quality and control ground vegetation. Attractive to visitors because of its diverse structure and tree size.

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4. General management principles for the FDT

This FDT aims to produce high quality timber in a two-storey stand structure. POK as the more light demanding primary species must always dominate the overstorey. Careful selection of FC trees for timber quality is essential. Due to the good self-pruning ability, weak apical dominance and phototropic growth behaviour of POK management by Q/D approach is advised, achieving timber quality first and ensuring FC trees can grow into large dimensions later. POK and HBM are very compatible to grow in mixture (CS = 1) and both species respond well to thinning interventions throughout their lifetime. Thinning should start when the majority of FC trees have achieved the desired length of clean bole, usually at 16 – 18m top height and generally as crown thinning. Thinning at later stages must maintain a two-storey stand structure. Rotation length is driven by target DBH. LIMA / CCF methods should be the preferable option for final harvesting / restocking, diversifying the stand structure further.

5. Timeline

stage	H_{100} [m]	intervention
Establishment		• Natural regeneration in densities of > 10000 seedlings/ha, or planting of 5000 – 10000 trees/ha, or direct seeding. Numbers can be reduced by planting 20 – 30 individual POK per cluster (0.3 – 1m spacing), with the number of clusters corresponding to the envisaged number of FC trees. HBM is either planted throughout the POK matrix, around POK clusters, or may be introduced later by underplanting.
Young stand	< 3	• Protection against animals / plants as necessary. • Regulation of species composition and minor species as required.
Thicket stage	6 – 10	• Negative selective respacing – removal of wolf and other undesirable trees. Cleaning or pollarding of aggressive infill if necessary. • Closed canopy must be maintained to ensure self-pruning and differentiation (remove no more than 5 – 10% of trees).
Pole stage	10 – 14	• Continue negative respacing if necessary, otherwise the focus should shift to positive selection – carefully promote up to 200 FC tree candidates/ha by removing 1 – 2 competitor(s). Maintain closed canopy for ongoing self-pruning and differentiation process.
Pole to small timber stage	16 – 18	• Thinning interventions start when the majority of FC tree candidates have reached the desired length of clean bole. Select 50 – 80 FC trees/ha, and apply crown thinning to release their crowns from competing neighbours. • Retain sub-dominant and suppressed trees to develop a diverse stand structure, consider underplanting if HBM has not been established together with POK.
Timber stage		• Monitor the development of FC trees and continue thinning to keep them free from competition. Live crown length should be > 50% of tree height. • Maintain and develop the understorey in order to suppress epicormic growth in POK, and to control ground vegetation. Prevent understorey trees from encroaching into the crown area of FC trees. • Plan for final harvesting when FC trees approach target DBH.
Final harvesting and regeneration stage		• Apply irregular shelterwood methods for harvesting, or use selective target diameter harvesting to achieve a more complex stand structure. • Remove understorey immediately before harvesting and time operations with POK mast years if possible. • Monitor light level, ground vegetation, occurrence and growth rate of regeneration, supplement by planting if necessary, or restock.