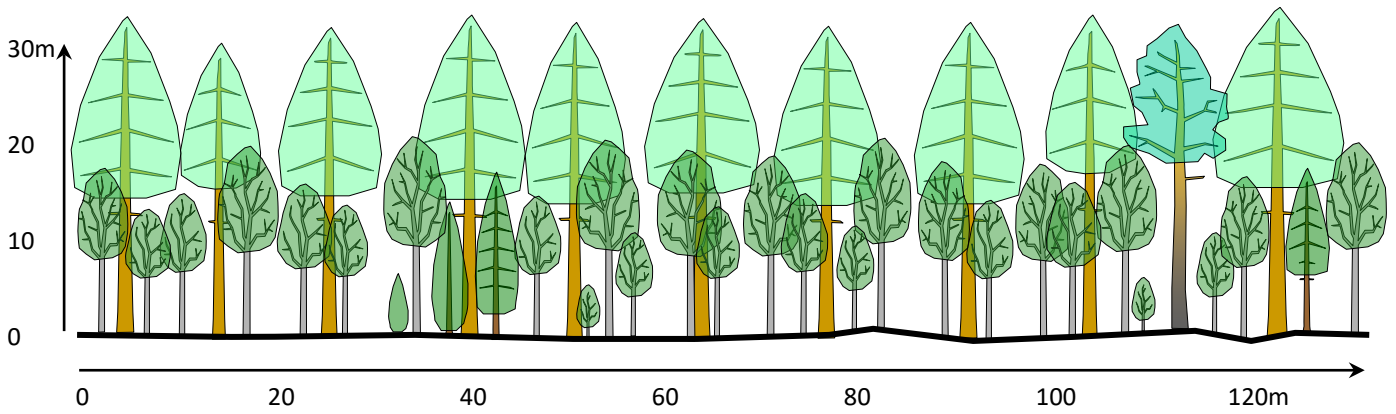
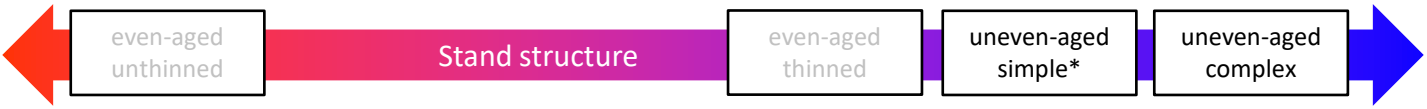
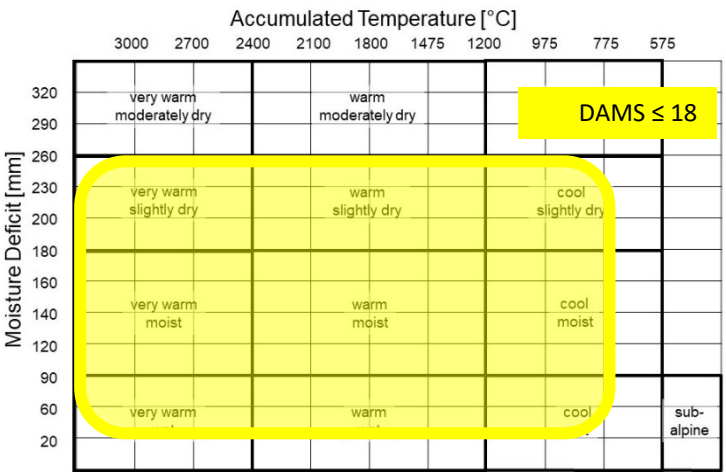
FDT 2.4.3 LA and BE

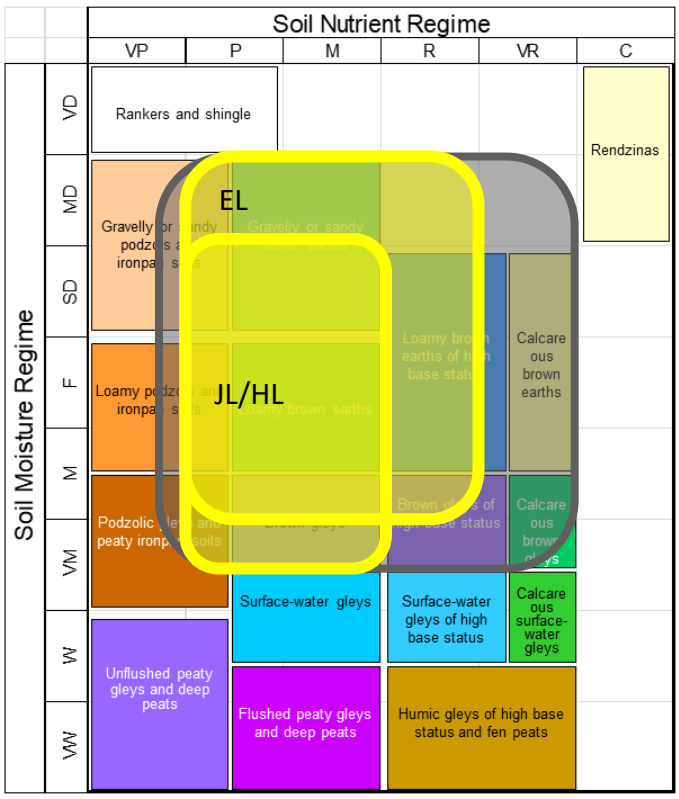


1. Structure and dynamics:
Initially two-storeyed stands of LA (preferably EL) overstorey and BE understorey, but likely to develop a more complex structure later. Minor species of category B.
Species distribution: LA 50 – 80% BE: 10 – 40% minor species: < 10%
Likely to originate from LA underplanted with BE. Management via LIMA / CCF systems offers options to use natural regeneration, however clearfell-and-restock scenarios are also possible.



2. Ecological suitability:
Represents no current NVC type but contains substantial elements of W14 and W15. This FDT should be considered to mitigate disease risk, to add productivity in good quality LA stands and to facilitate the transition from LA to broadleaved stands via CCF. Suitable for soils of better fertility and loamy texture. Unsuitable for frost hollows and sites of poor air circulation.





3. Management objectives:

Economic (LA GYC > 8):	LA – joinery grade, target DBH > 70cm in 100 – 140yrs
	LA – sawlogs, target DBH > 50cm in 80 – 120yrs
	BE – optional, sawlogs, target DBH > 50cm in 60 – 120yrs
Environmental and social:	Attractive woodland due to mixture type and spring / autumn aspect. BE component adds diversity, acts as soil improver, controls ground vegetation and thus facilitates natural regeneration of LA.

4. General management principles for the FDT

This FDT is for productive LA stands of high timber quality. Due to their high light demand, low shade casting and relative long rotation required to achieve large timber dimensions, LA are very suitable species to be underplanted. The role of BE is to add productivity and diversity whilst controlling ground vegetation. The BE component will be established by natural regeneration or underplanting after the early thinning phase in LA, leading to a distinct two-storey stand structure. Species compatibility is therefore irrelevant but careful timing of BE establishment is important to prevent the understorey from growing into the LA canopy too soon. The growth response of LA to thinning interventions peaks early in life and diminishes rapidly thereafter; thinning must therefore not be unduly delayed and should focus on pole and small timber stage. Management of LA similar to FDT 2.4.1. BE will eventually catch up with LA in height growth, at this point the FDT needs to be reviewed. Further management will depend on the decision of continuing with a LA dominated FDT or switching to BE; in either case LIMA / CCF methods should be the preferable option for final harvesting / restocking.

5. Timeline

stage	H_{100} [m]	intervention
Establishment		• Planting of 1500 – 2500 trees/ha or natural regeneration.
Young stand	< 3	• Protection against animals / plants as necessary. • Respacing if N > 3000 trees/ha at 1 – 2m tree height. Reduce N to 1500 – 2500 trees/ha; in areas of difficult access, along exposed edges and on sites of high wind damage risk reduce N to 800 – 1000 trees/ha. • Clearing of any damage caused by felling / extraction of overstorey trees. • Promotion of minor species as required.
Thicket stage	3 – 10	• Generally no interventions, except for: • Negative selective respacing and careful promotion of 150 – 300 FC tree candidates/ha if respacing in the previous stage has been missed.
Pole stage	10 – 12	• First selective crown thinning, mainly removing dominant / co-dominant trees with visible defects, coarse branching or poor shape. • Selection of 100 – 150 FC trees/ha, consider pruning.
Pole to small timber stage	12 – 20	• Continue crown thinning at height growth intervals of 3m, focussing on competition status of FC trees.
Timber stage		• Monitor stand density, stability and health, and thin accordingly. Apply crown thinning as long as necessary for the benefits of FC trees. Reduce thinning intensity and / or lengthen thinning cycles as LA becomes less responsive to thinning. • Establish BE, by natural regeneration or underplanting. Stocking density may be slightly lower than in open ground scenarios. • Respace and thin BE according to guidance in FDT 6.1.1 / 6.1.2. • Review FDT and plan for final harvesting when BE start growing into LA canopy and LA FC trees approach target DBH. • Decide on LIMA / CCF methods to be used and assess potential for natural regeneration – improve conditions if necessary.
Final harvesting and regeneration stage		• Carry out harvesting / restocking operations according to agreed method. • Monitor light level, ground vegetation, occurrence and growth rate of regeneration, supplement by planting if necessary, or restock.