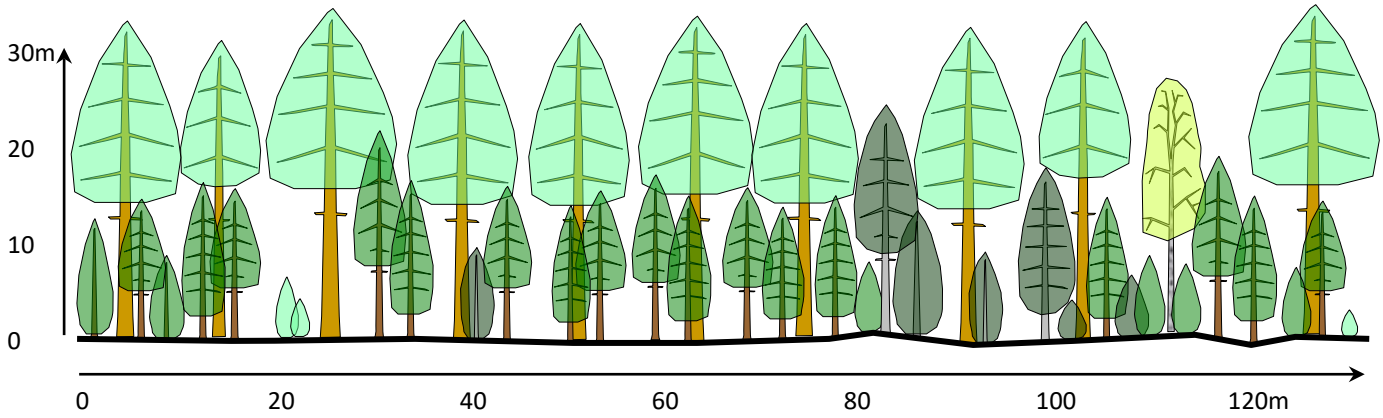
FDT 2.4.2 LA and shade tolerant conifers (XCST)

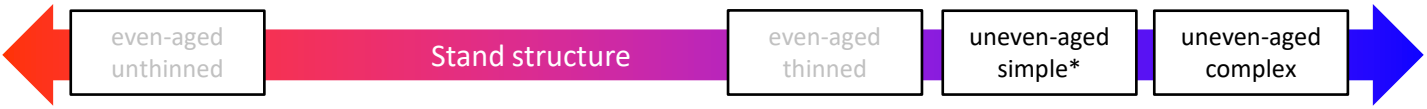


1. Structure and dynamics:

Stands initially with a LA overstorey and XCST understorey, but likely to become more structurally diverse over time. XCST options include WH, WRC, DF, firs, spruces and others; minor species of category A.

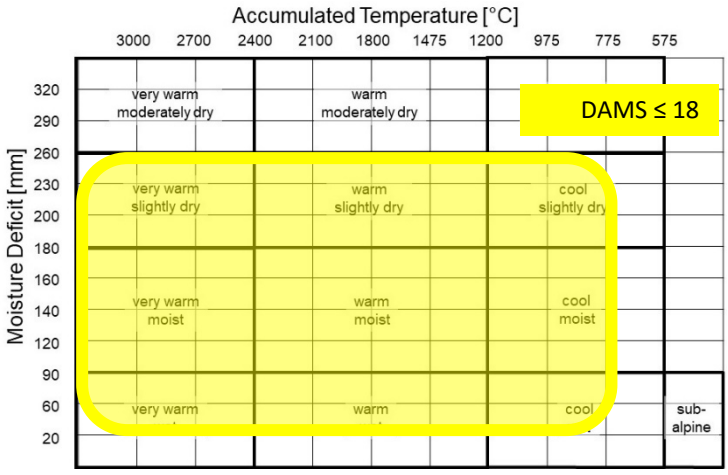
Species distribution: LA 60 – 80% XCST 20 – 40% minor species: < 10%

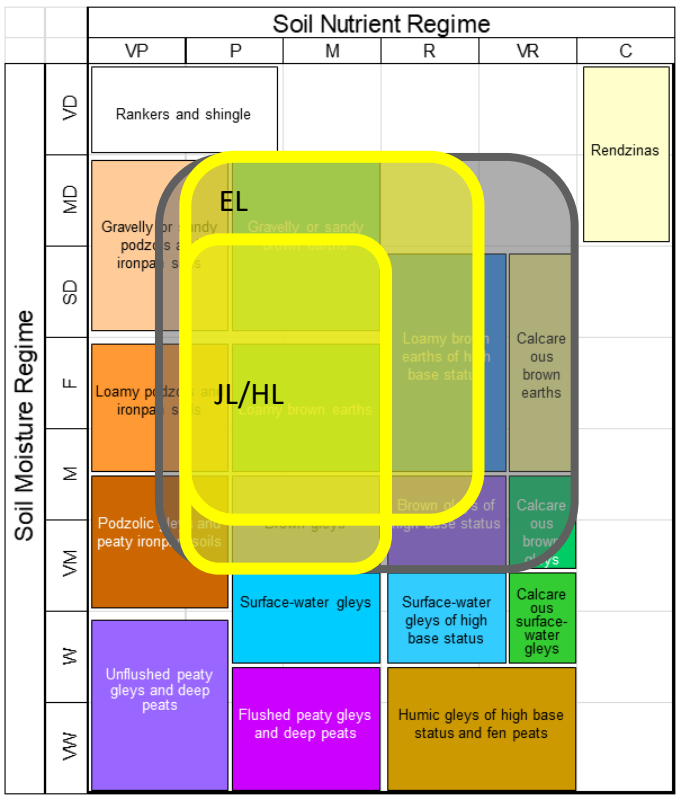
Several XCST species may be present and include emerging species. CCF / LIMA techniques are likely to be adopted in order to maximise the use of natural regeneration. Management objectives and future FDT will have to be reviewed, particularly where there is a high disease risk with LA.



2. Ecological suitability:

Represents no NVC type but may provide niches for elements of most upland and lowland types. A good option to mitigate against disease risk to LA on sites where timber productivity is an important objective. Appropriate on medium fertility sites with loamy soil texture where LA achieves GYC > 8. Unsuitable for frost hollows and sites of poor air circulation.





3. Management objectives:

Economic:	LA – sawlogs, target DBH > 50cm in 80 – 120yrs XCST – logs / pulp / biomass
Environmental and social:	The XCST component adds diversity and mitigates against disease risk in LA. Stands are visually attractive due to their structure, mix of species and contrasting colours, thus enhancing value for recreation and amenity.

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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 relatively long rotation required to achieve large timber dimensions, LA are very suitable species to be underplanted. The role of XCST is to add productivity and diversity whilst controlling ground vegetation. The XCST 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 XCST 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. XCST 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 XCST; 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 XCST, either by natural regeneration or underplanting. Stocking density may be slightly lower than in open ground scenarios. • Respace and thin XCST according to species specific guidance. • Review FDT and plan for final harvesting when XCST 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.