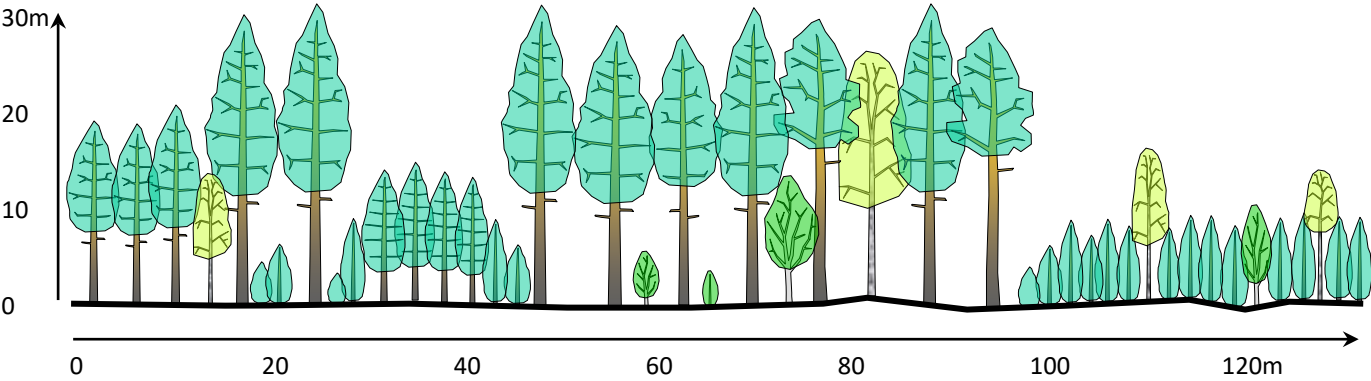
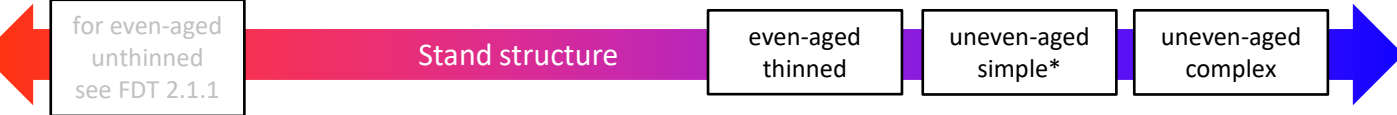
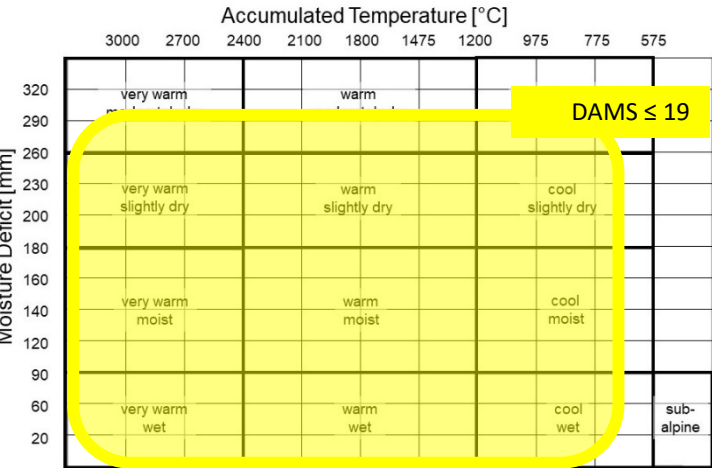




1. Structure and dynamics:
Vertically structured SP dominated stands of two or more storeys and multiple-aged. Supplemented by category B minor species (predominantly SBI and ROW).
Species distribution: SP 70 – 90% minor species: 10 – 30%
Stands will be managed by LIMA / CCF. SP regeneration may be by restocking but preferably by natural regeneration; minor species should regenerate naturally.



2. Ecological suitability:
Represents the NVC type W18 with elements of W17 or W16 in the upland and lowland climate zones, differs from FDT 2.1.1 by its more diverse structure. Appropriate on nutrient poor sandy soils with low to intermediate water supply where SP produces good timber quality without reaching its maximum productivity (GYC < 12), and is likely to regenerate.



		Soil Nutrient Regime					
		VP	P	M	R	VR	C
Soil Moisture Regime	VD	Ramblers and shingle					Rendzinas
	MD	Gravelly or sandy podzols and iron pan soils	Gravelly or sandy brown earths				
	SD						
	F	Loamy podzols and iron pan soils	Loamy brown earths		Loamy brown earths of high base status	Calcareous brown earths	
	M						
	VM	Podzols, gleys and peaty iron pan soils	Brown gleys		Brown gleys of high base status	Calcareous brown gleys	
	W	Unflushed peaty gleys and deep peats	Surface-water gleys		Surface-water gleys of high base status	Calcareous surface-water gleys	
	VW		Flushed peaty gleys and deep peats		Humic gleys of high base status and fen peats		

3. Management objectives:

Economic: SP – sawlogs, target DBH > 40cm in 100 – 140yrs
Environmental and social: Minor species increase diversity and improve soil conditions. Visually attractive with a range of tree sizes and some autumn colour. Provides good recreation environment. Presence of veteran trees and deadwood. The use of CCF / LIMA management will enhance environmental and social benefits.

4. General management principles for the FDT

This FDT is for productive SP stands of high timber quality and on low fertility sites where structural diversity is desirable and SP shows good potential to regenerate naturally. Stands should be established at higher density than 2500 trees/ha to provide scope for stem selection during the rotation. Management of young stands should aim to achieve tree stability, timber quality, and maintain even and rapid growth. Timber quality in SP is more variable than in other conifers, and quality selection during respacing and thinning therefore more important. Wolf trees and other undesirable stems should be eliminated as early as possible and the best individuals be promoted as FC trees. The growth response of SP 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. Thinning should start at 10 – 14m top height, generally as crown thinning. Thinning at later stages should aim to maintain tree stability and steady growth. LIMA / CCF methods such as strip, seed tree or shelterwood systems with quick canopy removal are most suitable to achieve the desired vertical stand structure.

5. Timeline

stage	H ₁₀₀ [m]	intervention
Establishment		Planting of 3000 – 8000 trees/ha or natural regeneration.
Young stand	< 3	- Protection against animals / plants as necessary. - Negative selective respacing (removal of wolf tree candidates). - Respacing if N > 8000 trees/ha (or lower if tree stability is a concern) at 1 – 2m tree height. - 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 300 – 400 FC tree candidates/ha if respacing in the previous stage has been missed.
Pole stage	10 – 14	- First selective crown thinning, mainly removing dominant / co-dominant trees with visible defects, coarse branching or poor shape. - Selection of 150 – 250 FC trees/ha, consider pruning.
Pole to small timber stage	14 – 20	Continue crown thinning at height growth intervals of 3m, focussing on the 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 SP becomes less responsive to thinning. - Plan for final harvesting when 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. - Ground scarification to expose the mineral topsoil will generally improve chances for natural regeneration. - In shelterwood scenarios, reduce BA to 25m²/ha initially, and further once regeneration has established. Design strip systems with regard to prevailing wind direction and climatic requirements of SP regeneration; keep strip width < 50m. In seed tree scenarios, consider retaining 20 – 50 seed trees/ha for a second rotation. - Monitor light level, ground vegetation, occurrence and growth rate of regeneration, supplement by planting if necessary, or restock.