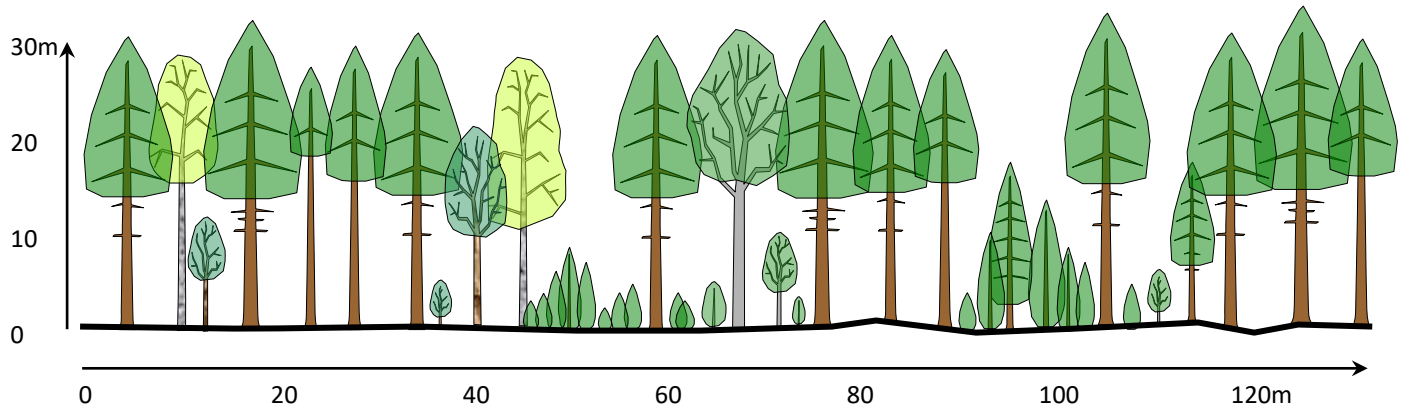
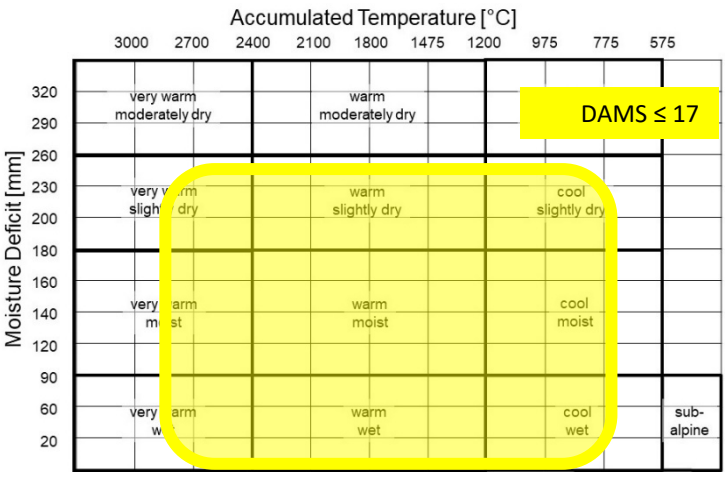
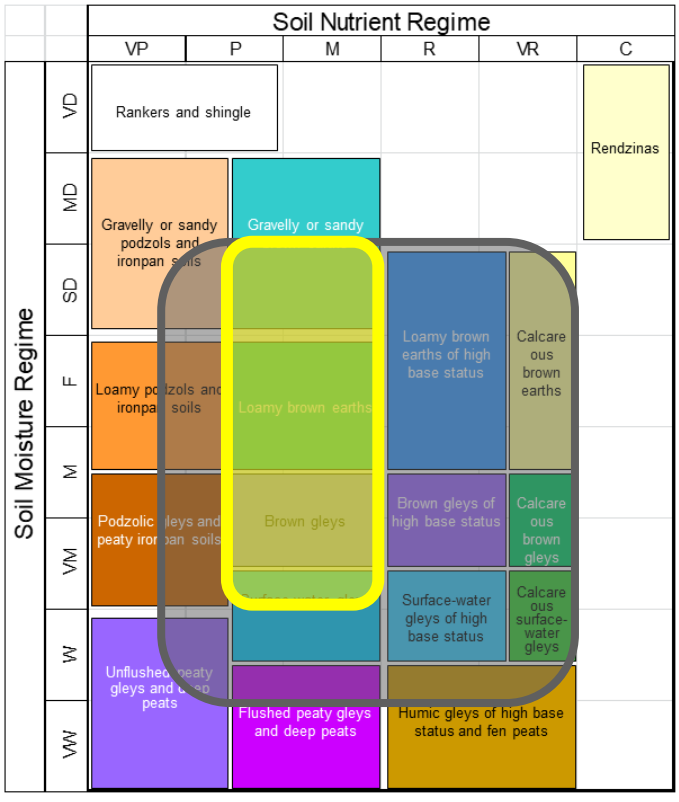
FDT 1.2.2 NS



1. Structure and dynamics:
Single to multiple-storeyed NS stands with category A minor species, admixed individually or in groups, mostly occupying suitable microsites and areas of difficult access.
Species distribution: NS 80 – 90% minor species: 10 – 20%
Stands may be managed under small scale clearfell-and-restock (LIMA) or CCF regimes, with management aiming to create a complex stand structure. Natural regeneration is to be used wherever possible and should account for the majority of NS and minor species component.

2. Ecological suitability:
Resembles NS-dominated natural woodland communities of central European mountain regions. Represents no NVC type but provides niches for elements of W4, W11, W15, W16 and W17. Suitable for freely draining to slightly gleyed soils of medium fertility and loamy texture.





3. Management objectives:

Economic (GYC > 12):	NS – sawlogs, target DBH > 50cm in 80 – 120yrs
Environmental and social:	Uneven-aged forest structure provides habitats for a range of species (red squirrel) and lends itself to low-impact management. Structural and species diversity improve stability with regard to risk factors over pure NS stands. Minor species contribute to maintaining soil fertility. High landscape and amenity value due to mixed components and more diverse stand structure.

4. General management principles for the FDT

This FDT is for stands of NS growing on better sites compared to FDT 1.2.1 and where more structural diversity can be achieved by use of LIMA / CCF. Natural regeneration of NS is often difficult to achieve and requires a long enough rotation as well as careful silvicultural practice in order to create suitable site conditions. Management of young stands must aim to develop vigour and stability of individual trees in order to allow flexible management of stand structure later on. Dense natural regeneration of NS is rare but will require respacing if it occurs. NS will respond well to thinning throughout its lifetime but in order to maintain good tree stability thinning must not be unduly delayed. Thinning should start at around 10 – 12m top height, generally as crown thinning. Crown thinning should be used as long as necessary to develop good individual tree stability, however the thinning type may eventually shift towards low thinning, particularly in areas of high wind risk. Final harvesting should be accompanied by establishment and differentiation of natural regeneration. Target diameter harvesting and complex stand structures may be considered in the most sheltered conditions; simple structures and CCF methods such as shelterwood systems may be preferable on more exposed sites.

5. Timeline

stage	H_{100} [m]	intervention
Establishment		• Planting of 2000 – 3000 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: • Release 300 – 400 FC tree candidates/ha in areas of difficult access or high wind hazard 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 150 – 250 FC trees/ha.
Pole to small timber stage	12 – 20	• Continue crown thinning at height growth intervals of 3m, focussing on the competition status of FC trees.
Timber stage		• Monitor species composition, stand density, stability and health, and thin accordingly. Apply crown thinning as long as necessary for the benefits of FC trees, otherwise thinning type may gradually change to low. • Plan for final harvesting when FC trees approach target DBH. • Decide on LIMA / CCF method (simple or complex) to be used and assess potential for natural regeneration – improve conditions if necessary.
Final harvesting and regeneration stage		• Carry out harvesting operations according to agreed LIMA / CCF method, time with mast years if possible. • In shelterwood scenarios, reduce BA to 35m^2/ha initially and then further once regeneration has established (usually at ages > 80yrs). • For complex scenarios, interventions should create an irregular canopy cover, encouraging regeneration in groups. • Monitor light level, ground vegetation, occurrence and growth rate of regeneration, supplement by planting if necessary.