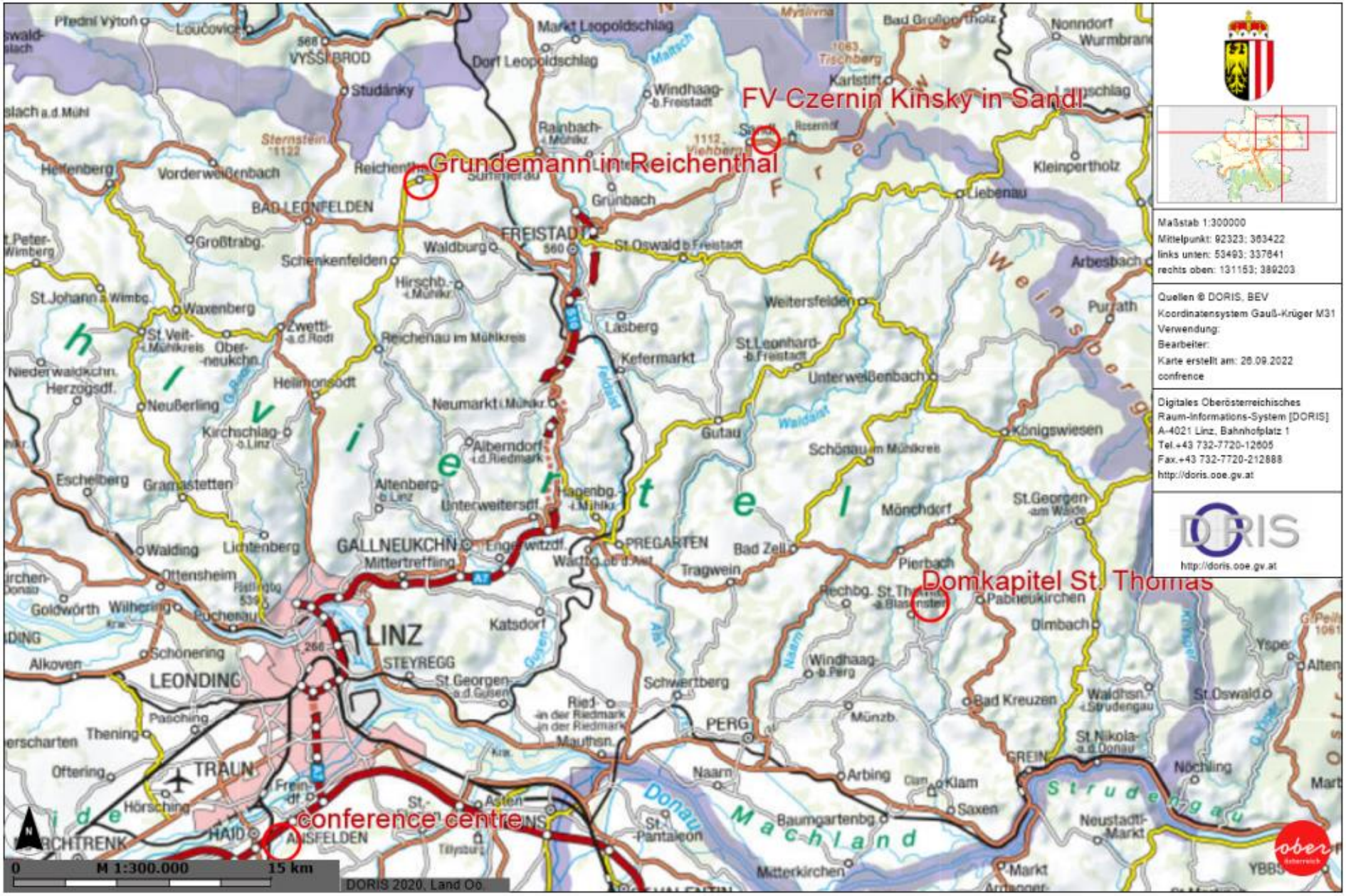
FV Czernin Kinsky in Sandl
Grundemann in Reichenthal
Domkapitel St. Thomas
conference centre
LINZ
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BAD LEONFELDEN
GALLNEUKCHN
PREGARTEN
LEONDING
TRAUN
PERG
Mühlviertel
Donau
Machland
Strudengau
Freiwald
Weinsberger
Maßstab 1:300000
Mittelpunkt: 92323; 363422
links unten: 53493; 337841
rechts oben: 131153; 389203
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FOREST ENTERPRISE GRUNDEMANN / REICHENTHAL

Site:
Altitude: 670 – 700 m above sea level
Averaged annual temperature: 6,6 °C
Averaged annual precipitation: 836 mm
Soil: Cambisol (A-B-C) with different thickness and characteristics (in the lower areas the soils are influenced by backwater (Stagnosol), average nutrient level.

- **Grand fir (*Abies grandis*):** Shows the fastest growth of all conifers, but the wood quality is lower than of silver fir (*Abies alba)*.
- **Eurp. beech (*Fagus sylvatica)*:** Of poor quality, lower than maple. Great effort is needed to reach a satisfying level of quality.
- **Sycamore maple (*Acer pseudoplatanus* in group):**
  Maple was grown in half shade conditions with rather small branches.
- **Douglas fir *(Pseudotsuga menziesii):***
  Not the perfect site, because of the soil, which is influenced by backwater; and also browsing effects. Pruning was conducted in 2010 to reach better stem qualities.
- **Silver fir *(Abies alba*) –old forest stand:**
  Height 29 – 38 m, breast height diameter up to 72 cm, excellent quality,
  10 – 20 % higher volume than *spruce* at the same height.
  The risk of bark beetle infests is significantly lower than for *spruce*.
  The roots of *silver fir* grow deeper, which brings advantages in stability and water accessibility.
- **Sycamore maple – Silver fir thicket*:***
  A snow break event in 1979 caused massive damages at spruce and also silver fir and sycamore maple were harmed. The disturbance led to varying light conditions where regeneration could develop well. Since 1989 the natural regeneration was protected from browsing by a fence. With further cuttings in the *spruce* stand the natural regeneration with maple and fir grew very well.
  In winter 2011/2012 the remaining old spruces were totally removed. The damage caused by logging was small.
- **Spruce stand with age of 75 years with regeneration:**
  The objective is to increase the amount of *maple, fir and beech* in the natural regeneration. Cuttings should take place soon.

- **Afforestation of beech *(Fagus sylvatica*), pendunculate oak (Quercus robur), small leaved lime (*Tilia cordata*) sycamore maple (*Acer pseudoplatanus*) wild cherry (Prunus avium)**

Tree Nr.	Trees-species	Height (m)	Stem without branches (m)	dbh [cm]				Dbh-increment	Ø dbh -
		2016	2016	2004	2009	2012	2016	2015-16 (cm/year)	increment /year (cm)
1	maple	20,4	8,1	10,2	16	19,6	24,7	1,4	1,21
2	maple	19,6	8,8	12,0	18	21,2	25,4	1,4	1,12
3/0	maple	9,0	8,4	10,8	15	16,8	19,0	0,8	0,68
4	maple	24,5	8,8	14,2	19,5	21,8	24,5	0,6	0,86
5	cherry	19,6	5,9	9,1	14,7	16,6	19,6	0,7	0,88
6	Li	16,9	7,0	9,2	14	17,1	23,1	2,1	1,16
7	cherry	19,6	6,6	11,6	20,4	27,3	33,7	2,0	1,84
8	oak			7,8	10,3	11,4			
9	cherry	19,8	5,8	13,1	23	27,8	33,1	1,8	1,67
10	oak	17,0	7,3	11,2	16,4	18,5	22,4	1,1	0,93
11	cherry	15,7	6,4	7,6	13,5	17,8	21,6	0,8	1,17
12/0	cherry	18	6,4	9,7	16	18,7	21,8	0,9	1,01
13	ash	15,1	7,0	7,6	12	13,7	16,2	0,9	0,72
14	ash	15,0	2,0	8,9	13	14,3	15,8	0,4	0,56
15/0	ash			8,2	11,2	11,8			
16	cherry	14,4	5,0	7,1	10,5	14,0	19,0	1,6	0,99
17/0	oak	14,6	6,9	7,7	11,5	12,5	14,3	0,8	0,55
18	cherry	16,8	6,3	8,8	13,5	16,5	19,8	1,0	0,92
19	ash			7,0	8,9				
20	ash			5,6	7,7				
31	beech	17,8	7,9			14,2	17,8	1,1	0,88
32	beech	15,7	7,1			12,4	16,3	1,2	0,97
33	beech	17,6	6,3			13,5	18,8	1,2	0,88

3/0; 12/0; 15/0; 17/0 crop trees were for demonstration purpose not treated. These trees have therefore a smaller green crown and will show lower increments in the next years.

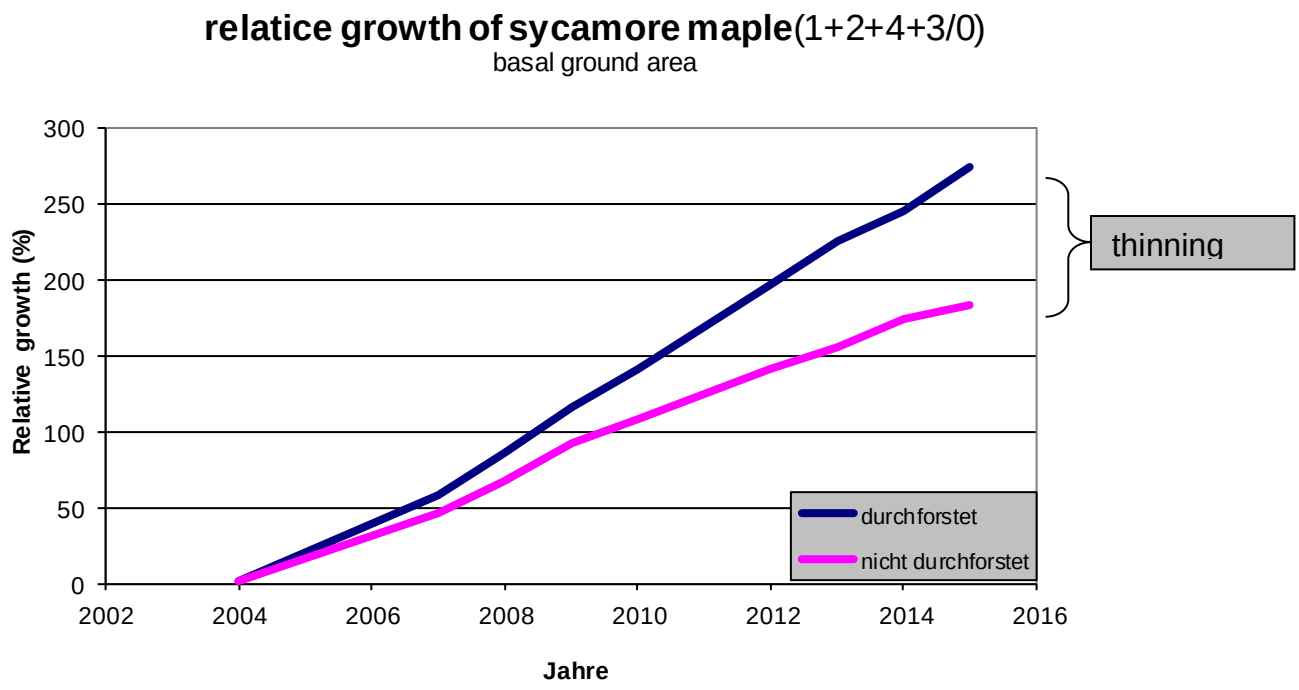
Before 2004: pruning events: repeating every 2 years
Removal of single trees to support potential future trees

2004/05: future tree selection and first thinning
2007/08: repetition of the tree selection + removal of competing trees

2009/10 repetition of the future tree selection + removal of competing trees
2011/12
2012/13 thinning events
2014/15

Sycamore maple (*A. pseudoplatanus*):

- Objective for the forest stand: stems of high quality with large diameters (> 60 cm dbh) in 60 – 80 years.
- Growth depends very much on soils – excellent growth on this site with deep soil depth. Trees were pruned, but afterwards this was not really necessary.



Beech (*Fagus sylvatica*): Due pruning quality of the stems is high. In the year 2010 future trees were selected. Planned rotation period: 90 years

Wild cherry (*Prunus avium*): In 50 – 60 years it is aimed to produce high valuable timber. Cutting of competitors - in time - is necessary for that.
Mistakes in pruning are visible for decades as wild cherry doesn´t lose dead branches.

Pendunculate oak (*Quercus robur*): Stocking at 700 m above sea level pendunculate oak – similar to wild cherry – shows high growth rates and high genetic quality. Provenance: Urnenhain Linz, in various provenance experiments one of the favorites.
Highly tolerant to climate change; planned rotation period: 100 to 120 years

European Larch (*Larix decidua*)

Tree Nr.	Height [m] 2016	Stem length-free of branches [m] 2016	2007 Dbh [cm]	2012 Dbh [cm]	2016 Dbh [cm]	Ø Dbh - Growth/year (cm)
1	18,7	7,6	18,0	22,0	25,0	0,78
2	18,6	7,4	15,8	18,4	21,1	0,59
3	19,5	7,8	21,2	24,7	27,6	0,71
4	18,5	8,3	17,8	19,9	23,0	0,58
5	18,2	8,0	17,3	19,8	21,3	0,44

2007 selection future trees, pruning und 1. Thinning
2009 thinning
2015 thinning

Larch provenance of high quality (P3 provenances from Viennese forest and Steyr). Dead branches were pruned with the expectation of high valuable timber production. Pure plantations of larch lead to slow litter degradation and causes the risk of a growth loss. Beech or hornbeam are important additional species. Repeated infestations of larch leaf miner (*Coleophora laricella*) led to a loss of growth.

Beech (*Fagus sylvatica*)

Poor quality of artificial beech regeneration (without pruning) implies fuelwood production. Nonetheless: the value of beech as additional tree species is high – also as future seed trees.

Red oak (*Quercus rubra*)

Soil depth is rather low on this site which leads to weak growth rates here. Still growth is higher compared to the native species pedunculate oak and sessile oak but price expectations are only half of them. Growth development and silvicultural treatment is similar to sycamore maple with the main difference that red oak reacts very sensible to free calcium in soils.

FOREST ENTERPRISE DOMKAPITEL LINZ / ST. THOMAS AM BLASENSTEIN

Forest area: 1844 ha with main parts in Mühlviertel (Bez. Perg)

Proportion of tree species: 77 % spruce (*Picea abies*)
11 % beech (*Fagus sylvatica*)
12 % other species

Natural forest communities: Beech dominated forests, beech-fir-spruce-forests

Sylvicultural objectives of the enterprise:

- forcing natural regeneration
- introduction of fir and broadleaved species (artificial regeneration) in pure spruce stands
- clear cuts only of small scale (< 0,5 ha)

Douglas fir in the forest district Klingenberg/St. Thomas am Blasenstein

Site:

Altitude:	600 – 680 m a sl
Geology:	Weinsberger Granit
Averaged annual temperature:	7,6 °C
Averaged annual precipitation:	866 mm (505 mm in vegetation period)
Soil:	Cambisol, nutrition supply is well

120 years ago, Douglas fir was introduced in this forests. Compared to other companies, where Douglas fir was limited on small trial areas, here many areas were planted with Douglas fir. They were lucky to use suitable provenances, as many of the artificial plantings where growing very well. Some decades Douglas fir was no longer forced, because of the lack of broad markets. Meanwhile Douglas fir is marketable well. With heights of more than 60 m, we find probably the highest trees in Upper Austria here.

1) Old stand of spruce with regeneration of spruce and fir
Age: 110 years
Yield class: 12
Growing stock: 850 cubic meters per ha

2) Old Stand with Douglas fir and spruce
Age: 115 years
Yield class: 14: Douglas fir, 13: spruce
Growing stock: 1100 cubic meter per ha

3) Natural regeneration with Douglas fir, spruce, fir and beech
Light demand of Douglas fir ranges between spruce and fir

4) Middle-aged Douglas stand developed from natural regeneration
Age: 30 years, developed by shelter wood-cutting