Forestry in Germany: On the track towards a "close to nature"

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Forestry in Germany: On the track towards a „close to nature“- forest

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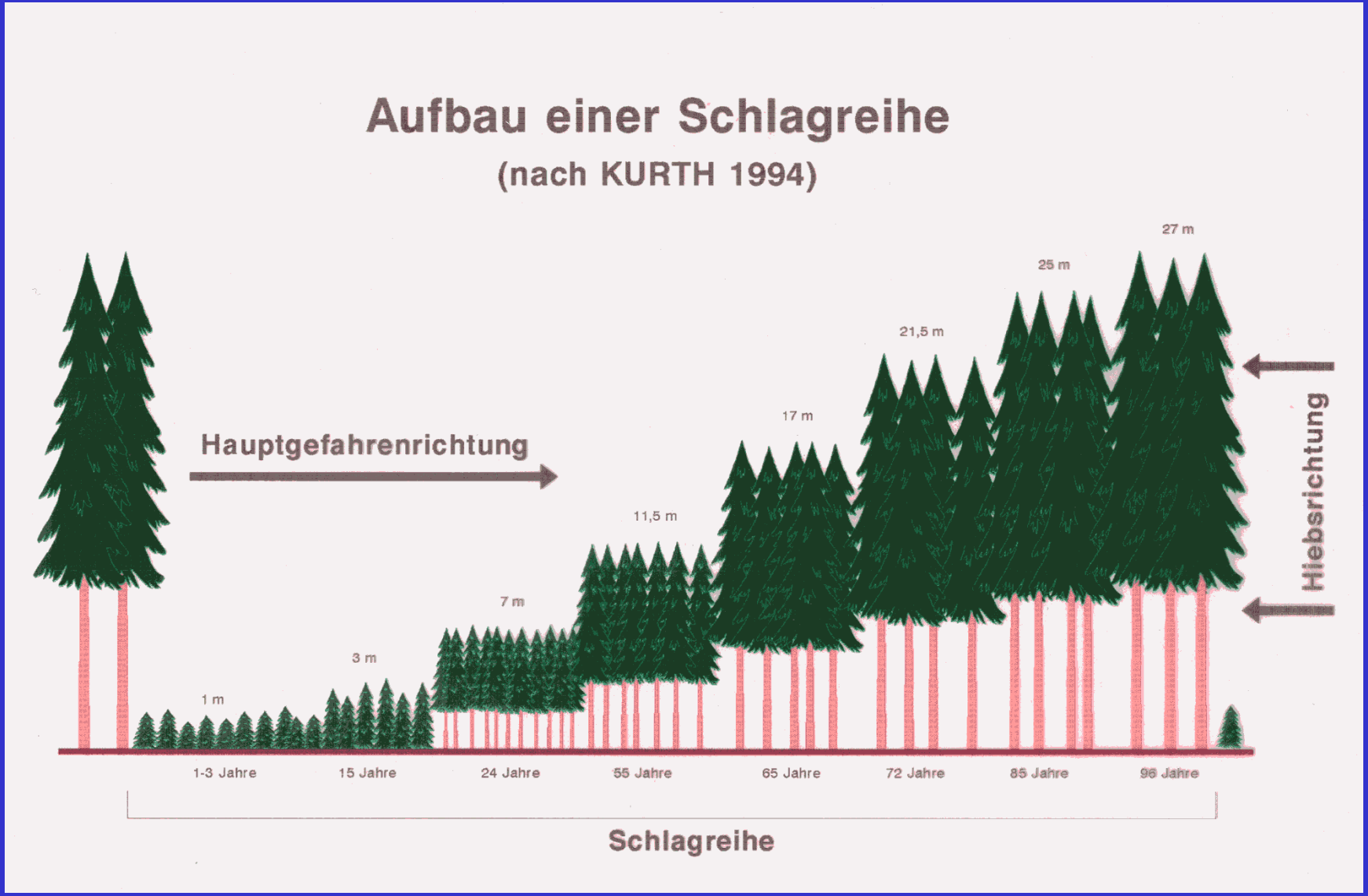
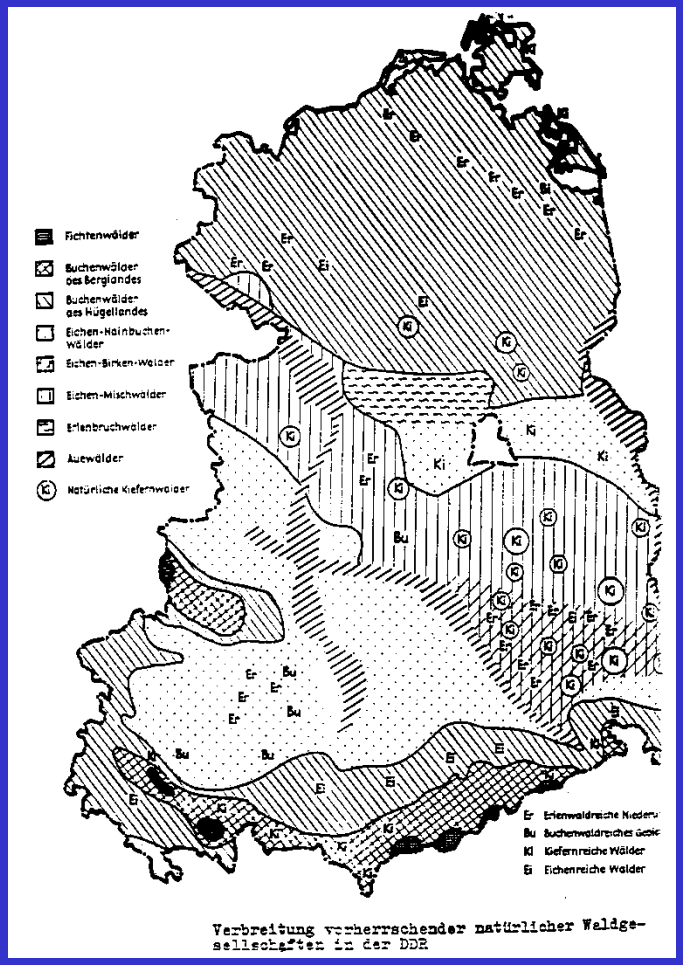
1. **The old objective of Forestry: the age class forest**
2. **Deficiencies of the age class forest**
    1. High susceptility for damages
    2. Low economic performance
    3. Reduced suitability for multipurpose forestry
3. **The new objective of Forestry: The „close to nature“- forest**
    1. Requirements and characteristics
    2. Appearance
    3. Management of a „close to nature“- forest by ecological silviculture
4. **Evaluation of the progress towards the new objective**
5. **Some conclusions**

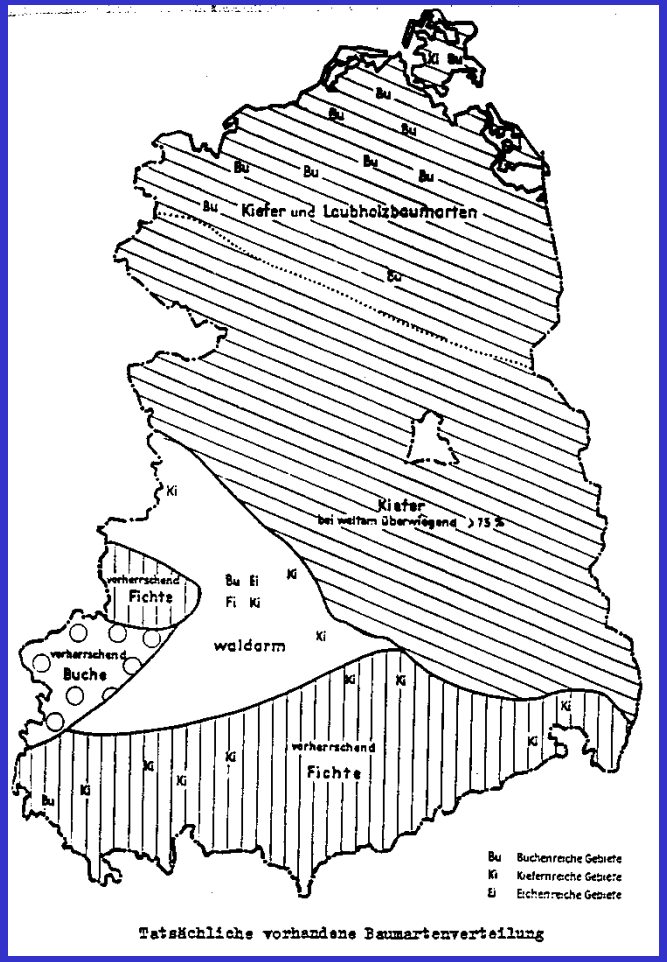
Age class forest



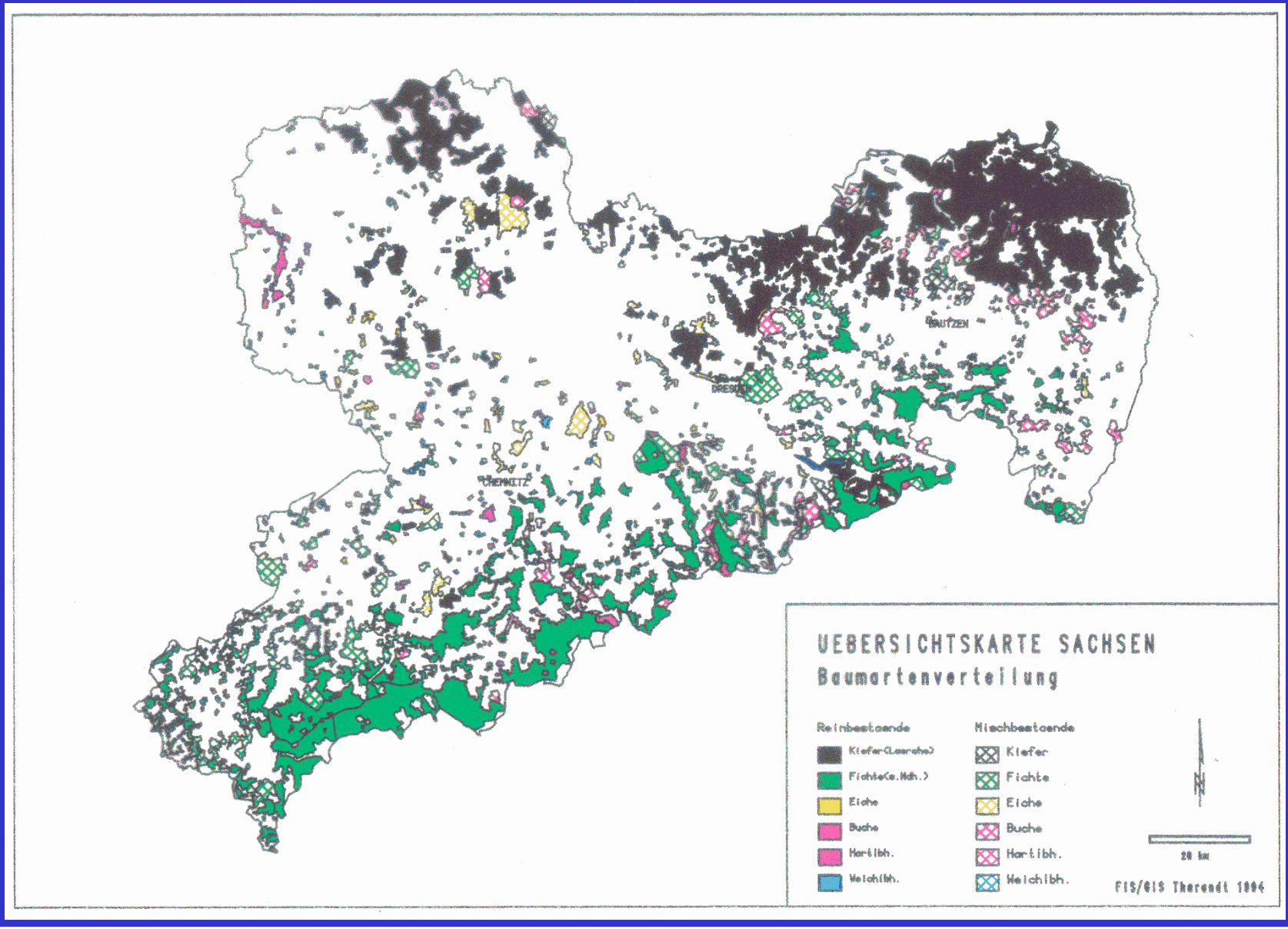
Pure spruce stand

Natural Forests (left) and actual forests (right) in East Germany

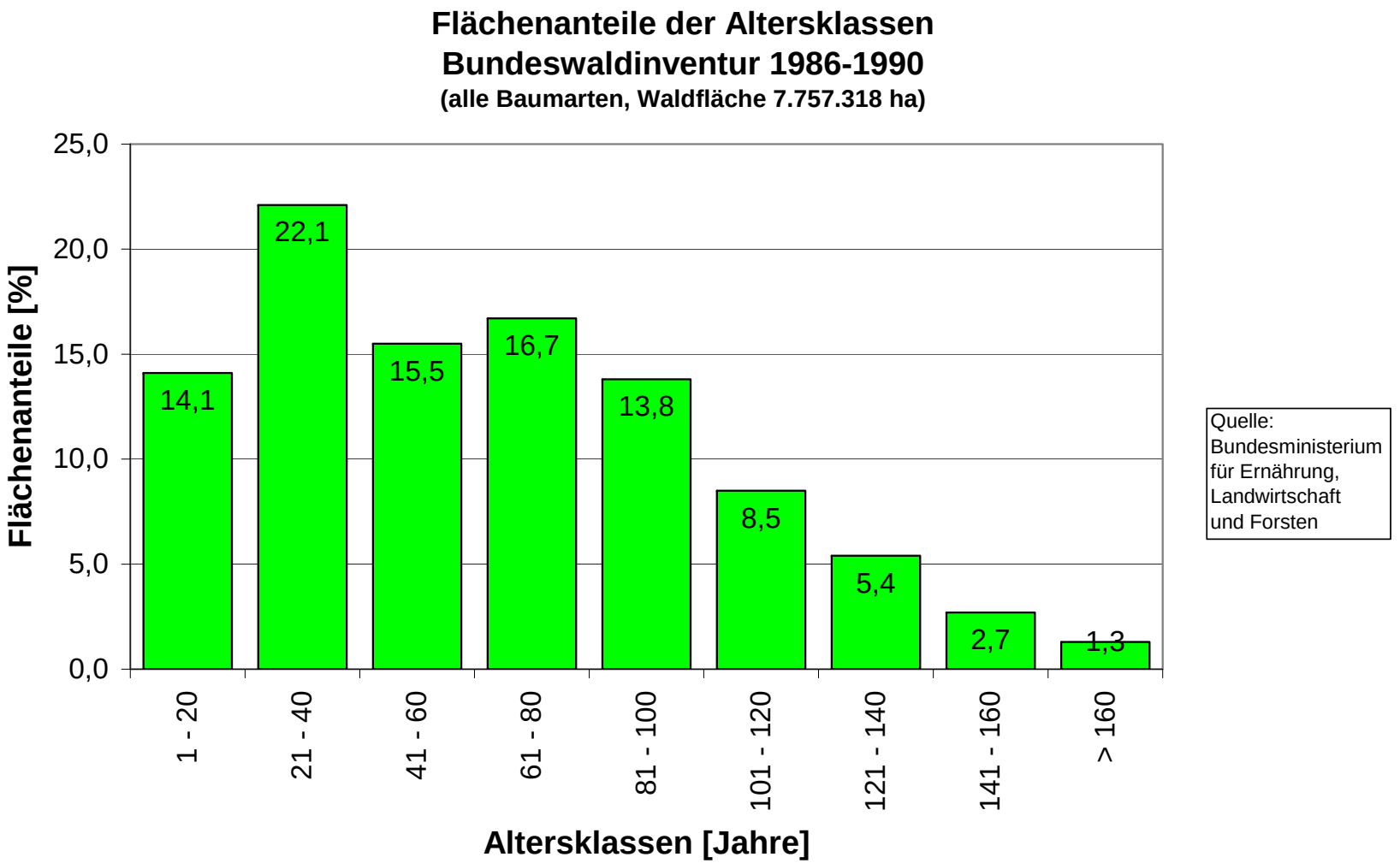




Tree species composition in Saxonia

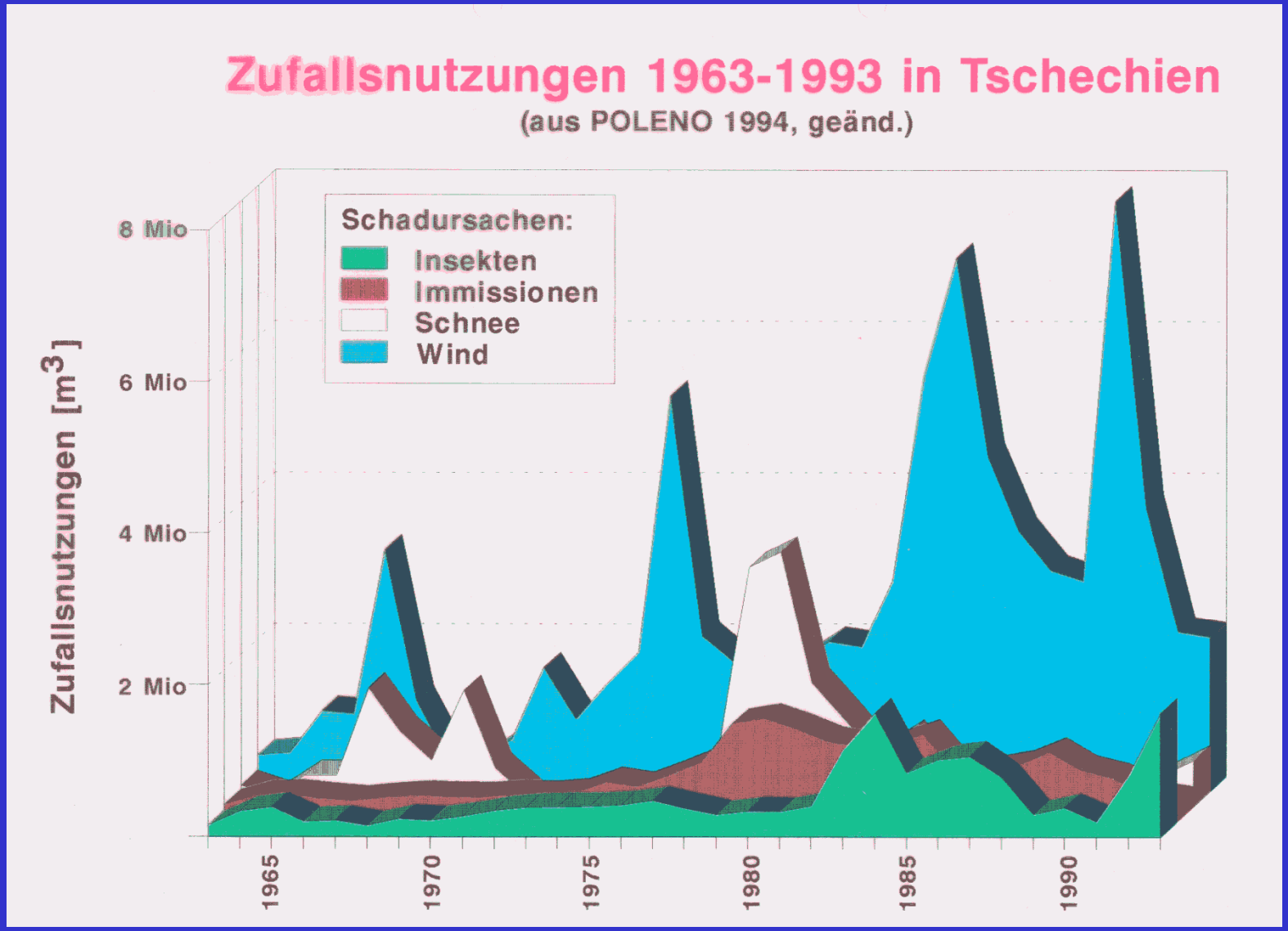


Forest age classes in Germany

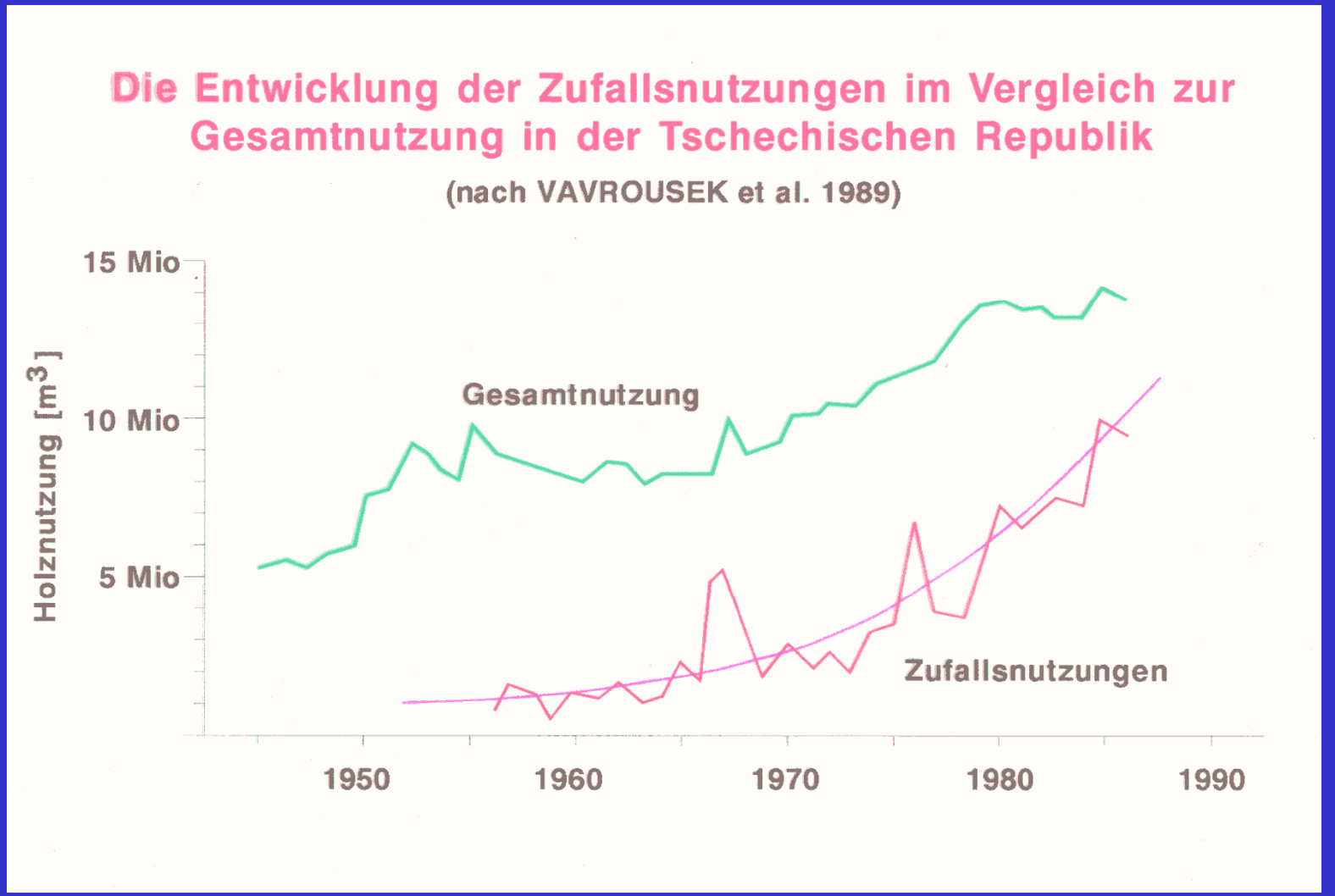


Salvage felling in Bavaria caused by storm and bark beetle

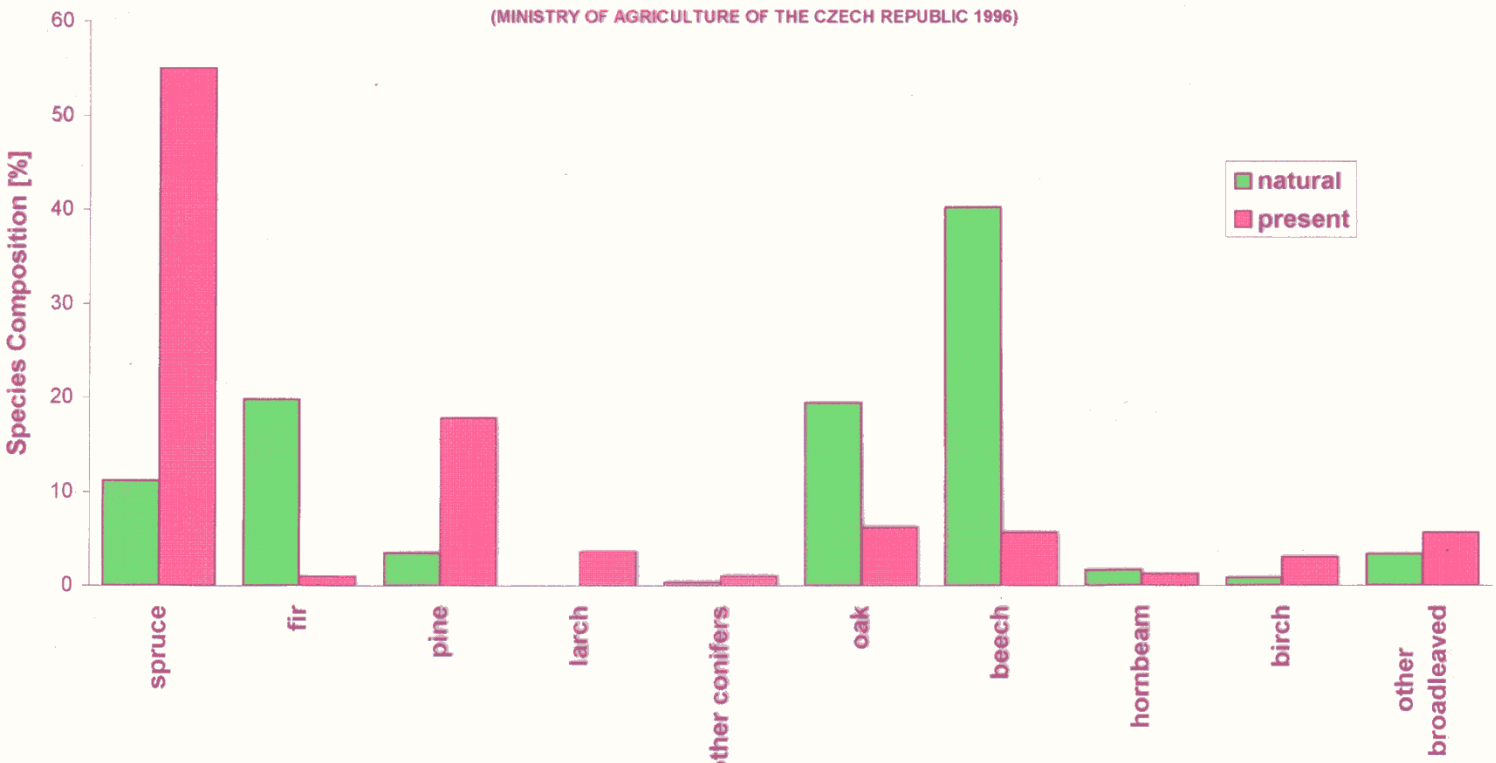
Salvage felling in Czech Republic 1963-1993



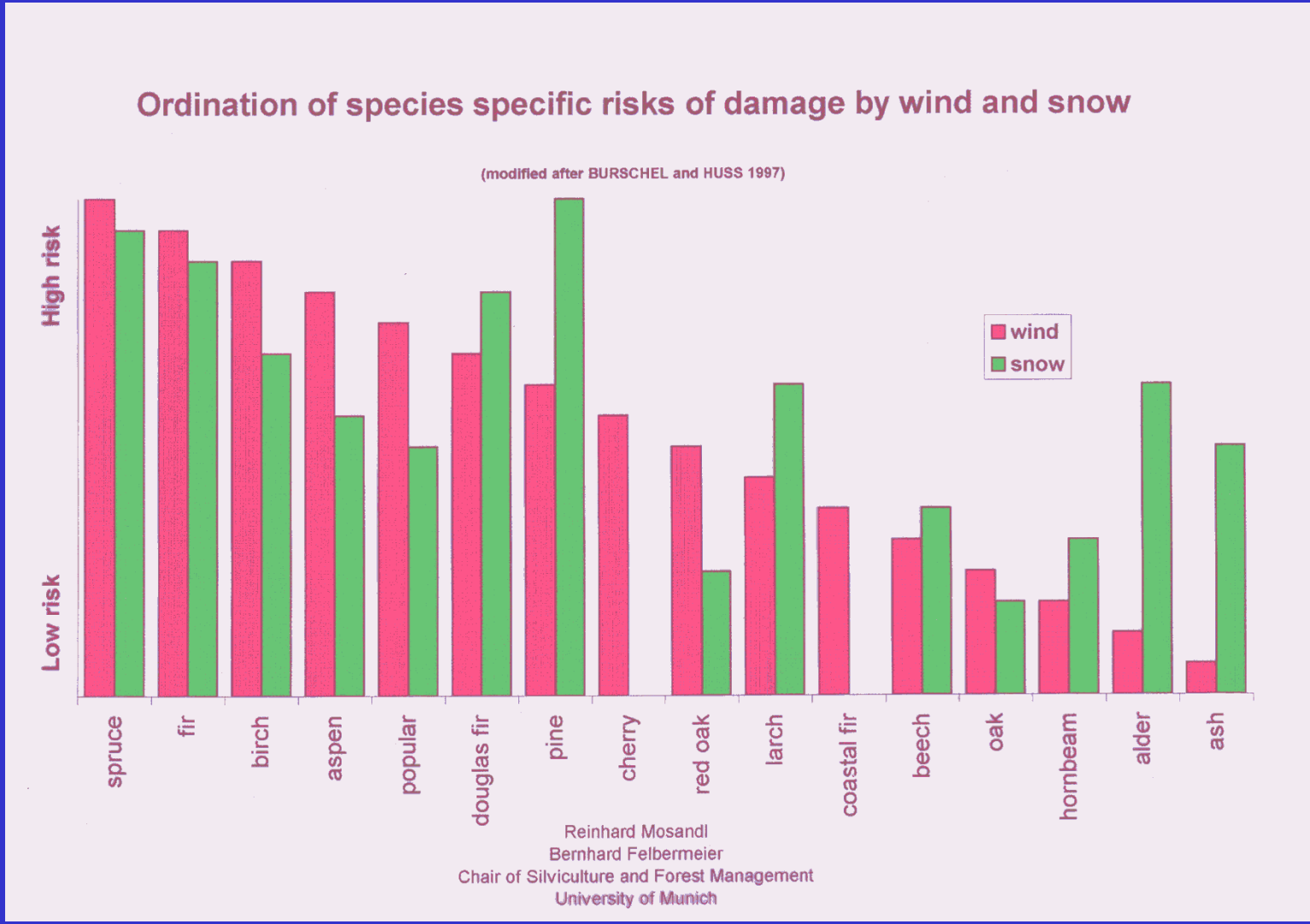
Development of salvage felling in Czech Republic



Composition of Czech forests

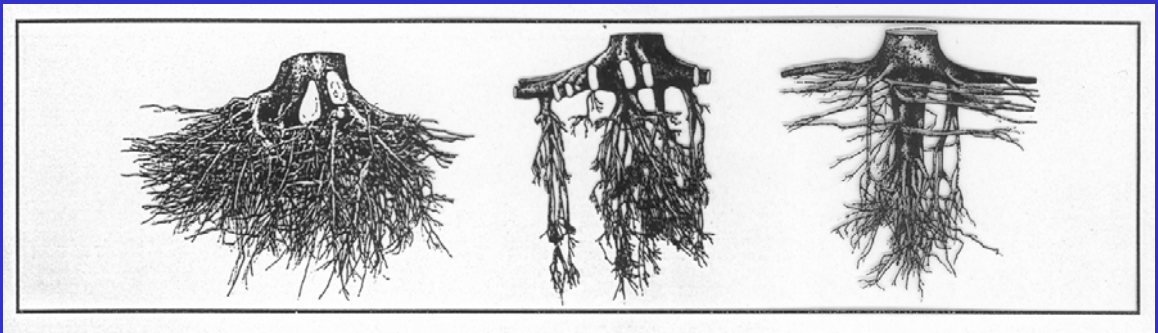


Risk of damage by wind and snow

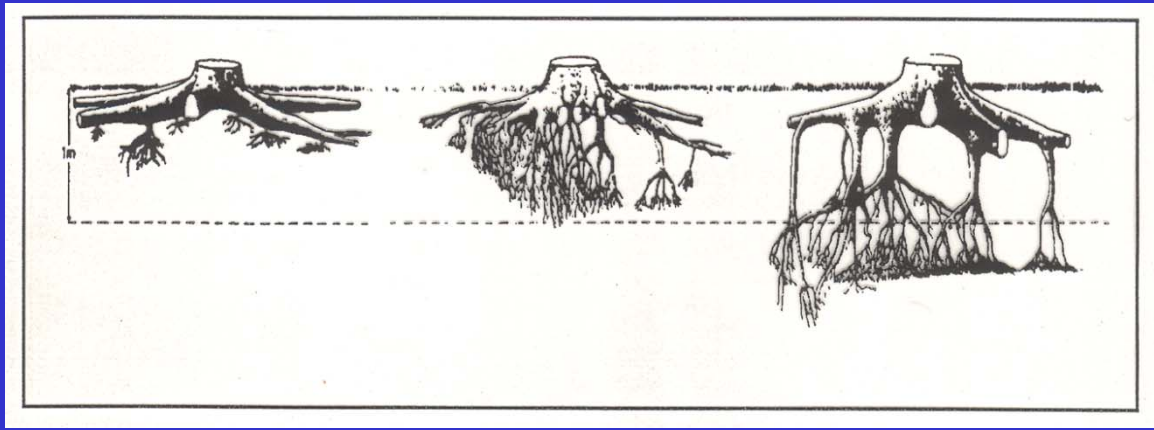


Root morphology

Fagus sylvatica	Picea abies	Pinus sylvestris
Heart root	Flat root	Pile root

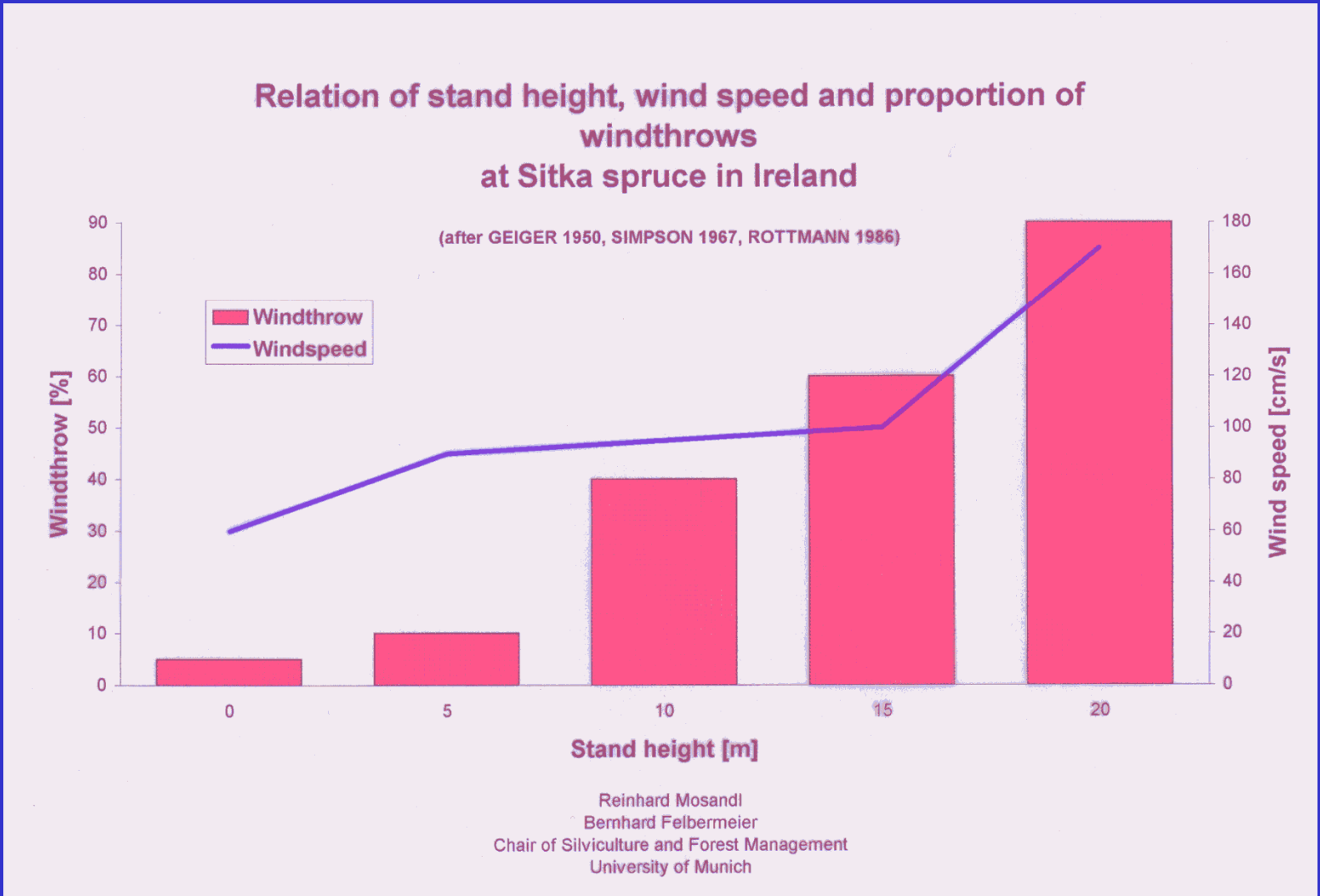


Root morphology of Picea abies on different sites in Southeren Bavaria

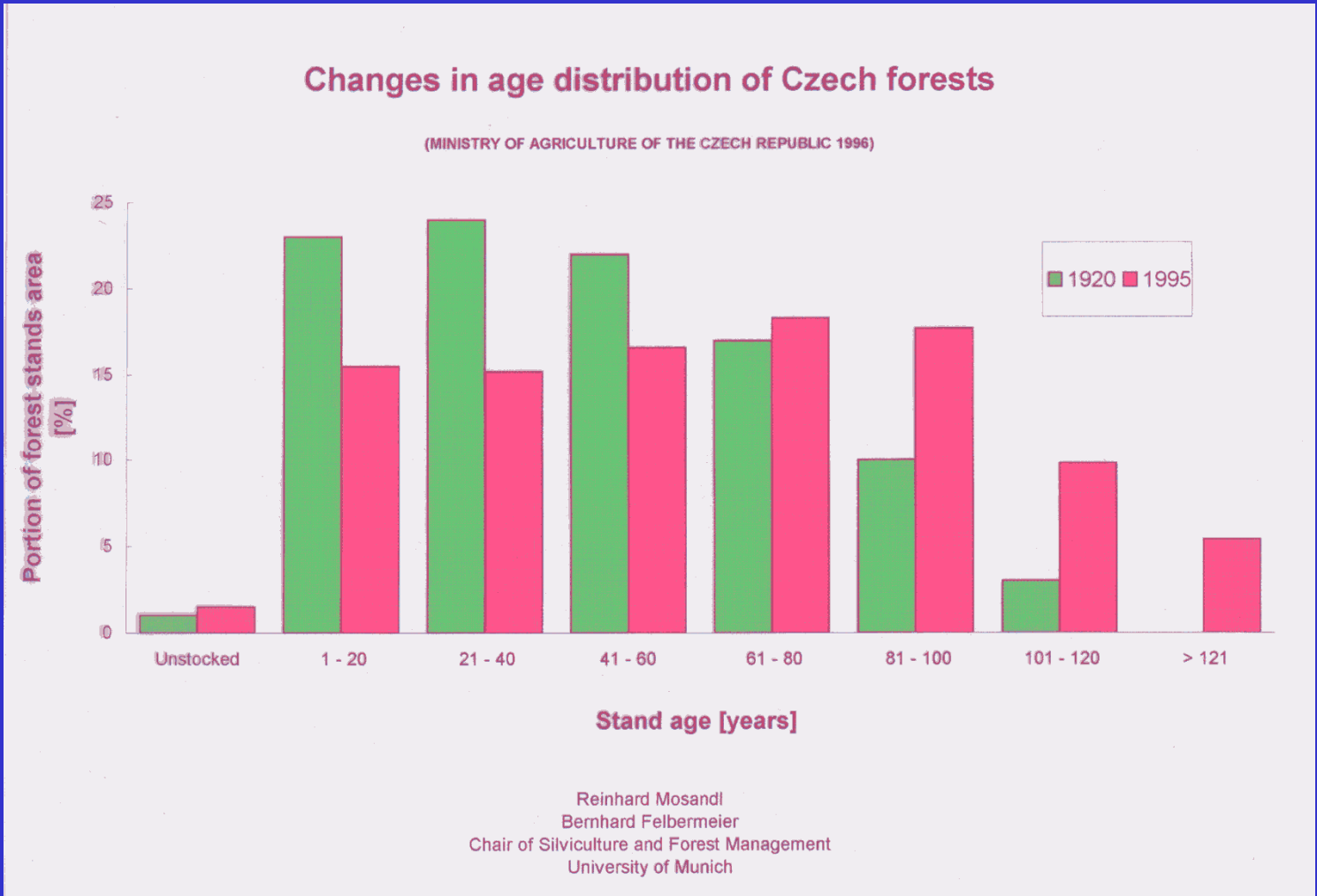


From KÖSTLER et al. 1968 / after KÖSTLER 1956

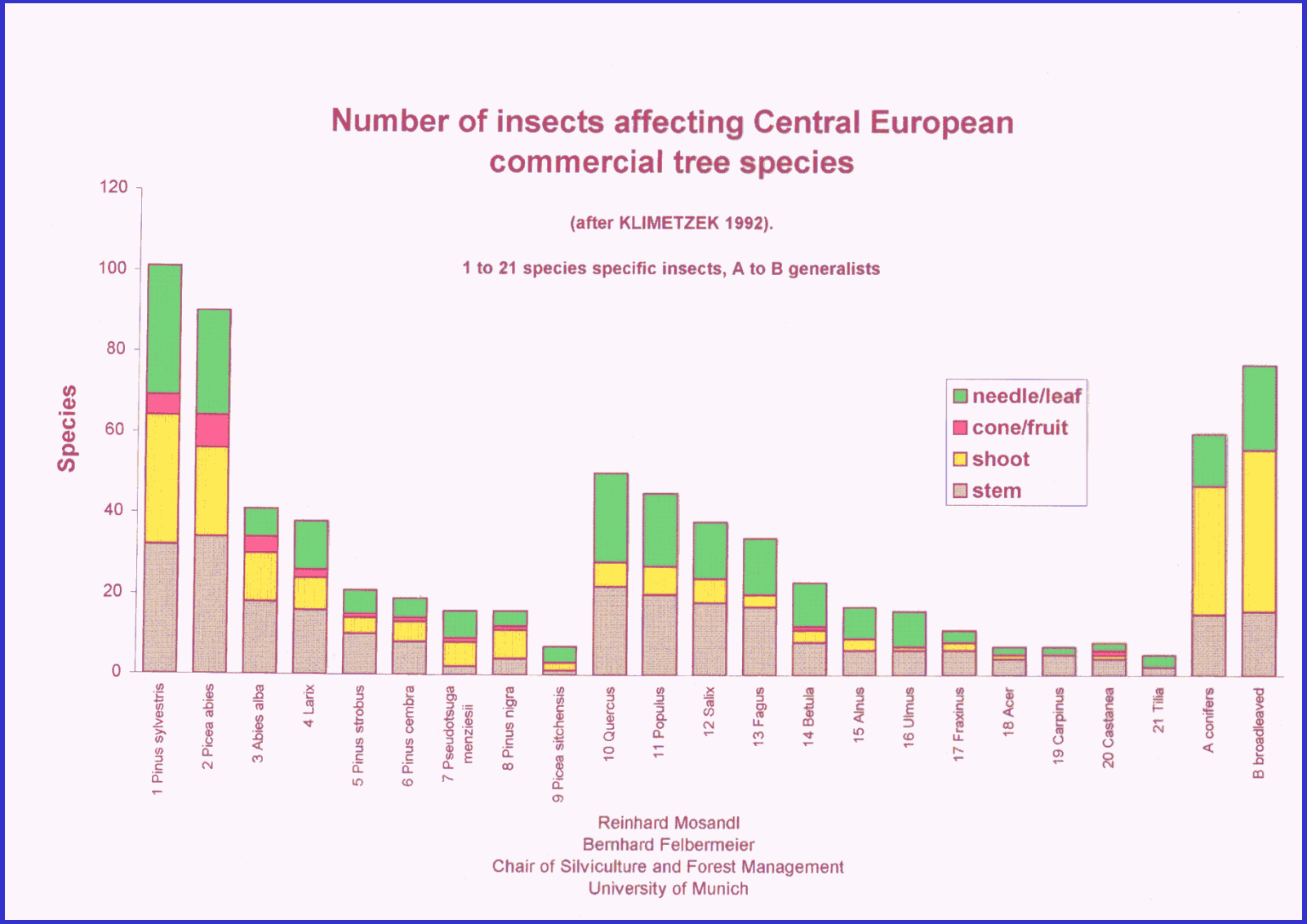
Windthrow of Sitka spruce in Ireland



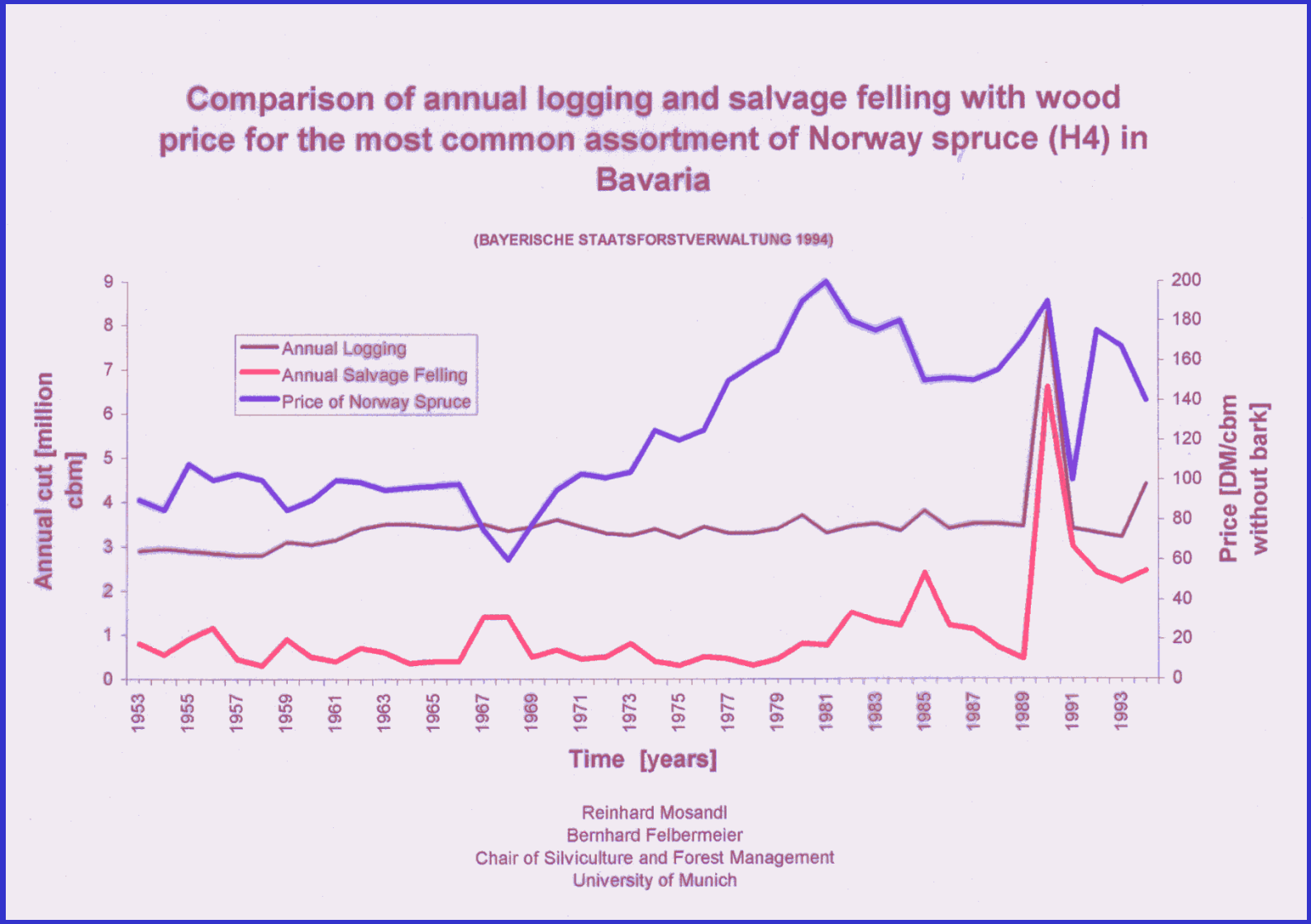
Age distribution



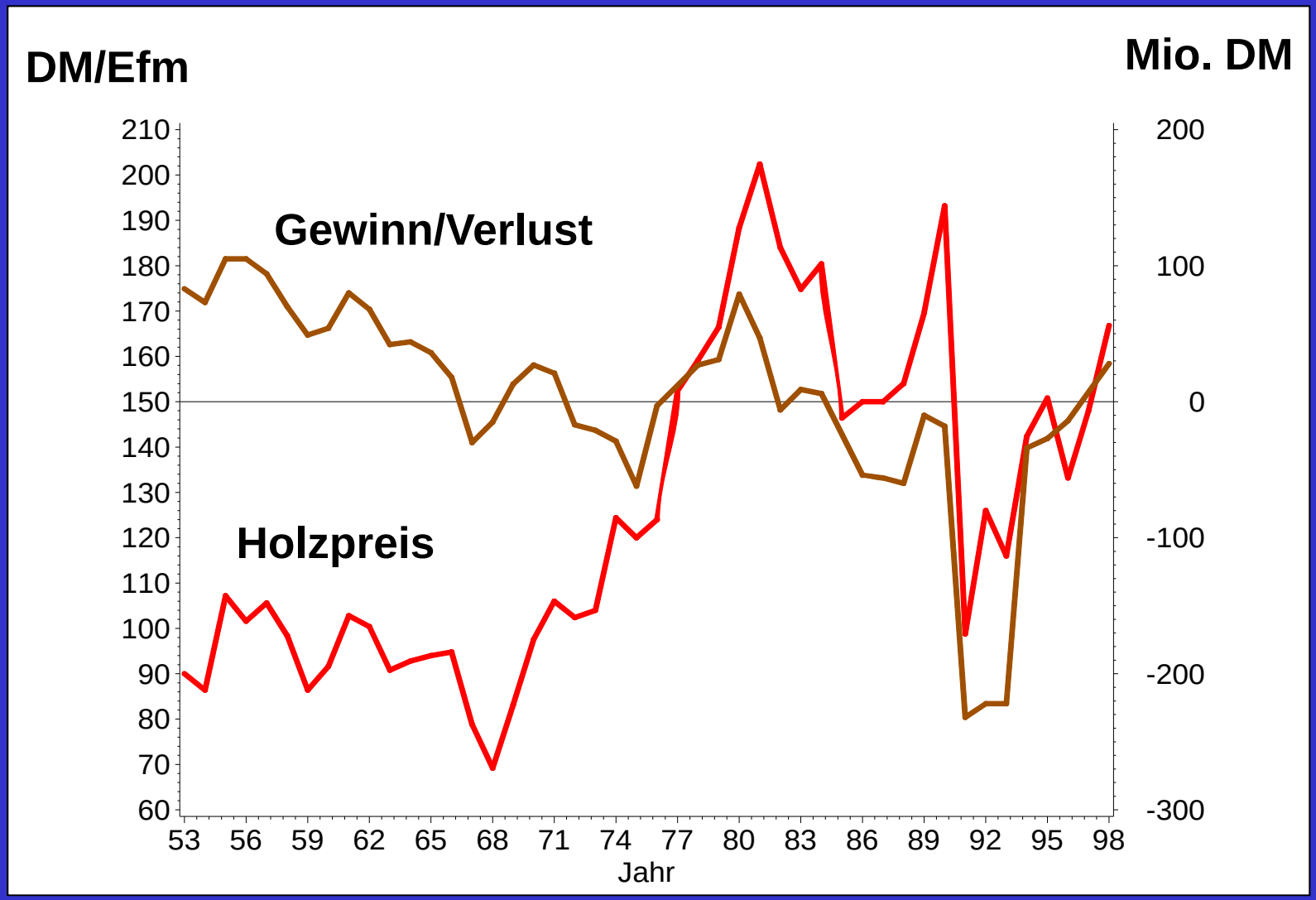
Insects


Number of insects affecting Central European commercial tree species
(after KLIMETZEK 1992).
1 to 21 species specific insects, A to B generalists
Species
120
100
80
60
40
20
0
needle/leaf
cone/fruit
shoot
stem
1 Pinus sylvestris
2 Picea abies
3 Abies alba
4 Larix
5 Pinus strobus
6 Pinus cembra
7 Pseudotsuga menziesii
8 Pinus nigra
9 Picea sitchensis
10 Quercus
11 Populus
12 Salix
13 Fagus
14 Betula
15 Alnus
16 Ulmus
17 Fraxinus
18 Acer
19 Carpinus
20 Castanea
21 Tilia
A conifers
B broadleaved
Reinhard Mosandl
Bernhard Felbermeier
Chair of Silviculture and Forest Management
University of Munich

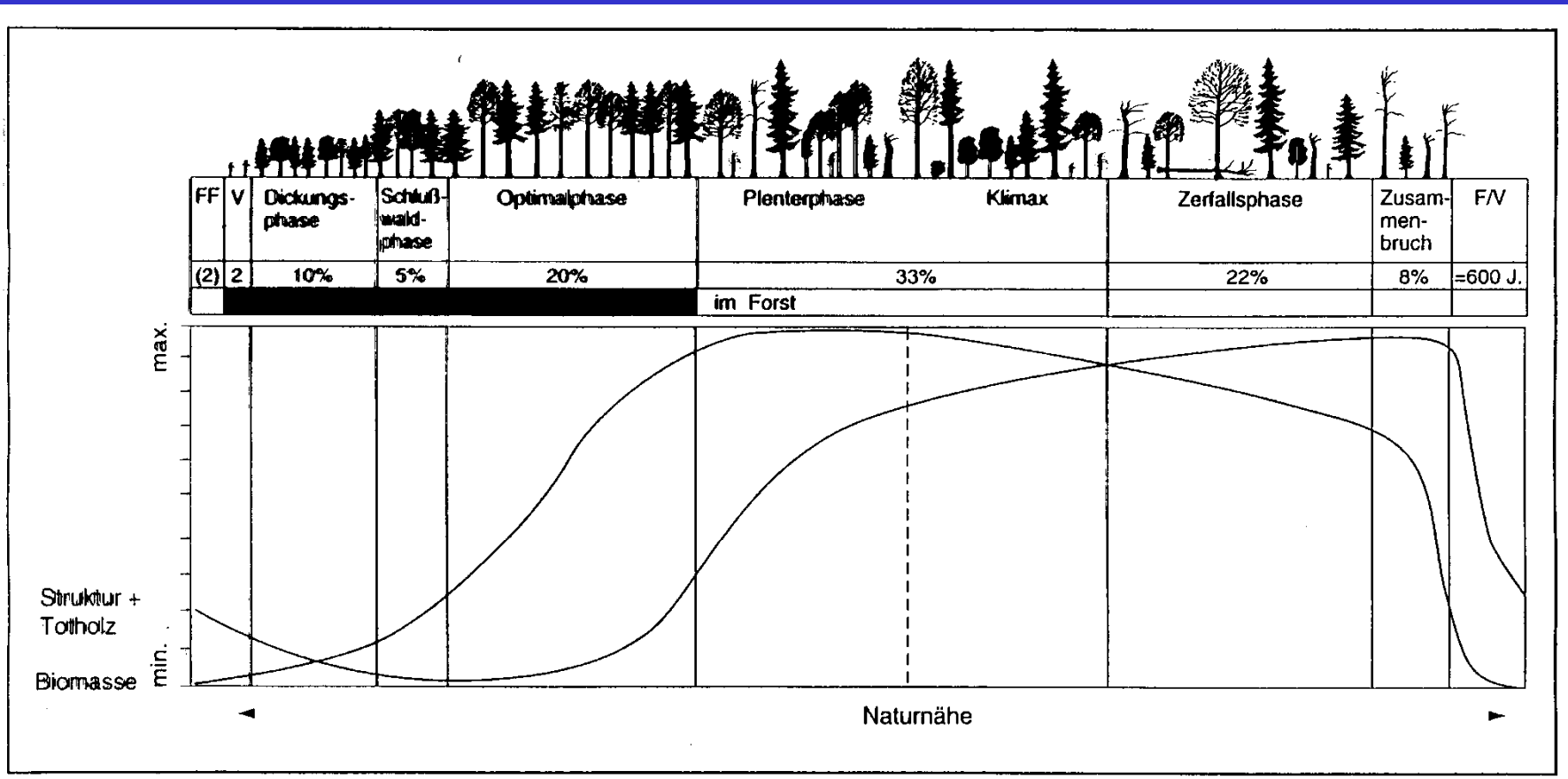
Logging, felling and price



Development of timber price of spruce (red) and loss and win (brown) in Bavarian State Forests



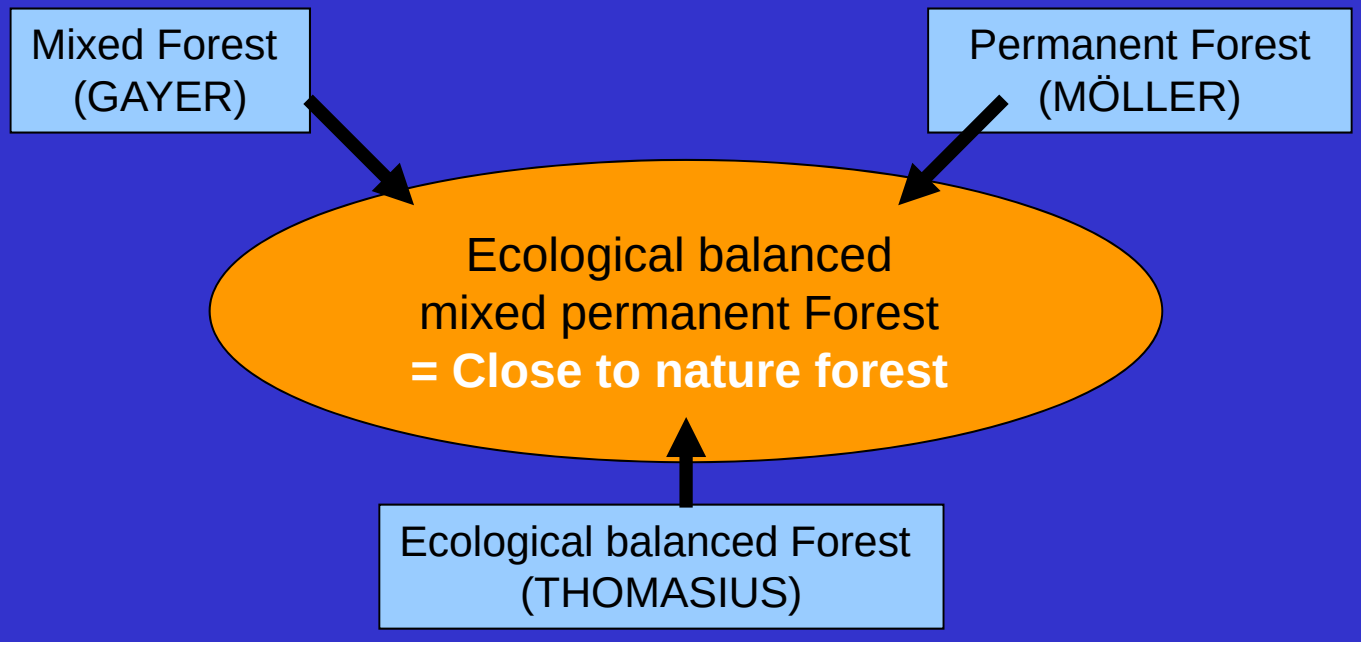
Development phases in a natural forest



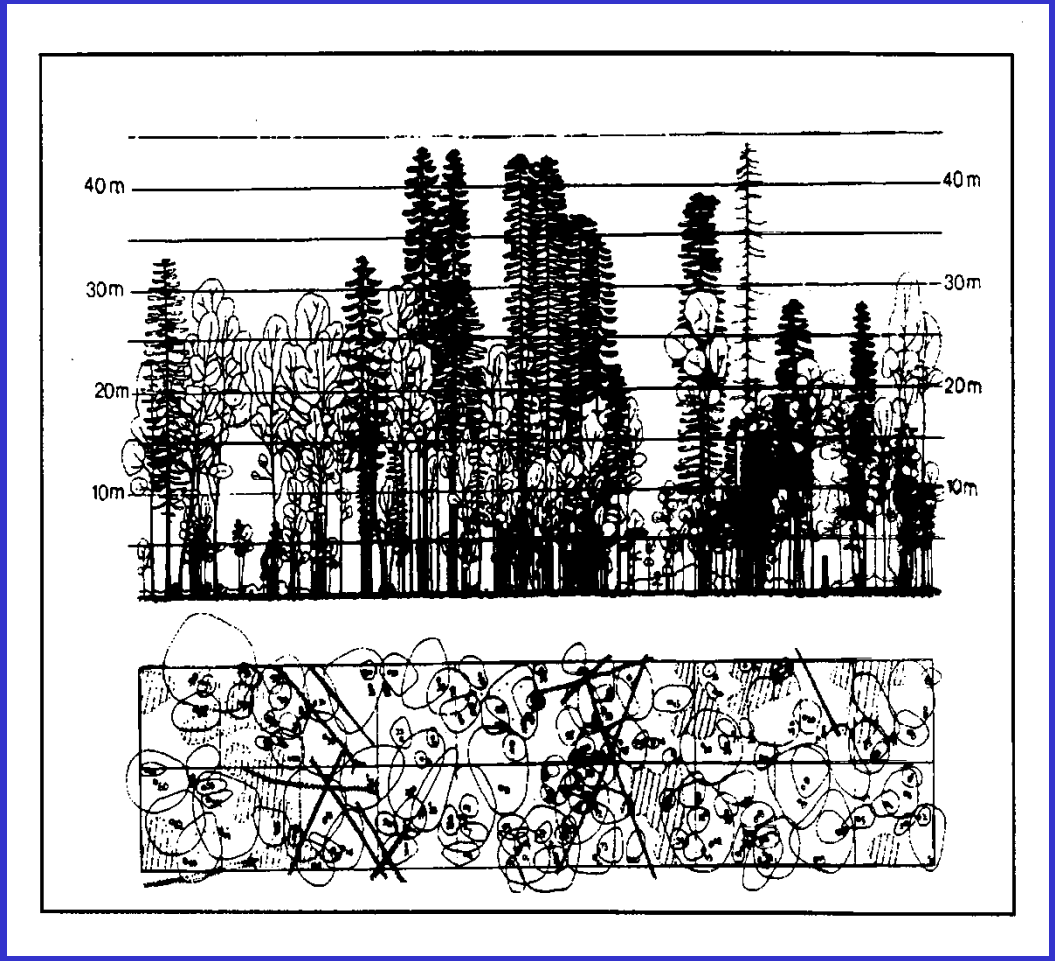
The new objective of Forestry:

The „close to nature“- forest

1. Requirements and characteristics of the new forest
    1. Lower susceptility for damages
    2. Better economic performance
    3. Improved suitability for multipurpose forestry
2. Appearance of the new forest



Pristine forest in Austria



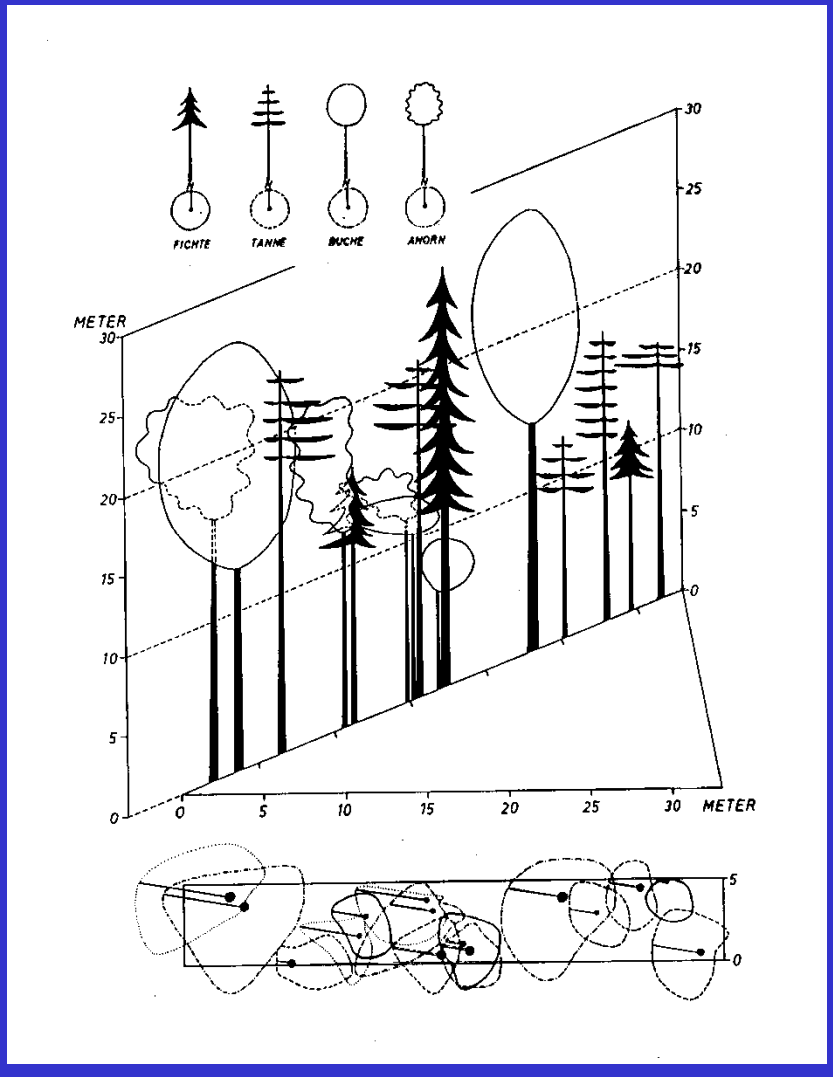
Natural forest during regeneration phase

Rothwald,
Lunz am See, Austria

From: WALTER und BRECKLE 1991

Pristine forest
of beech and yew
in Iran

Mixed mountain forest in Bavaria



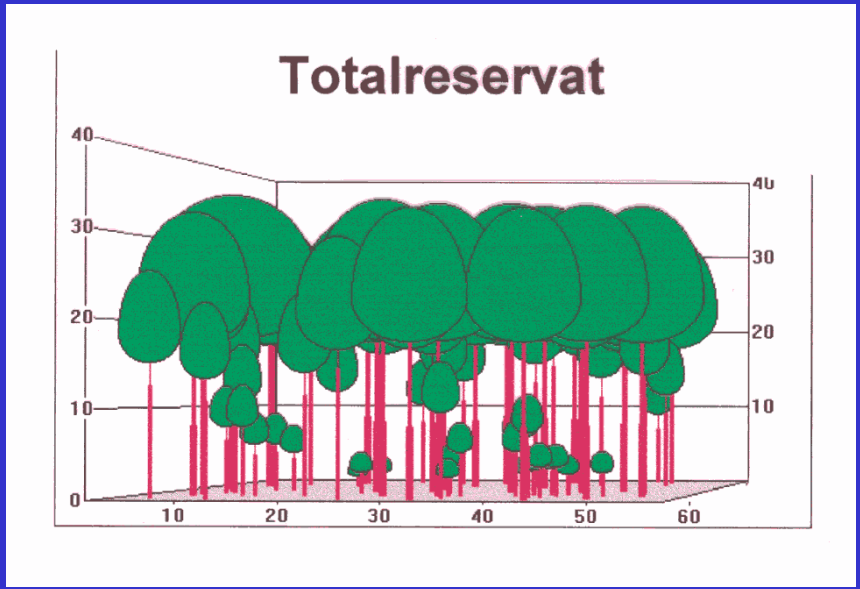
Ein naturnah aufgebauter Bergmischwaldbestand in den Chiemgauer Kalkalpen

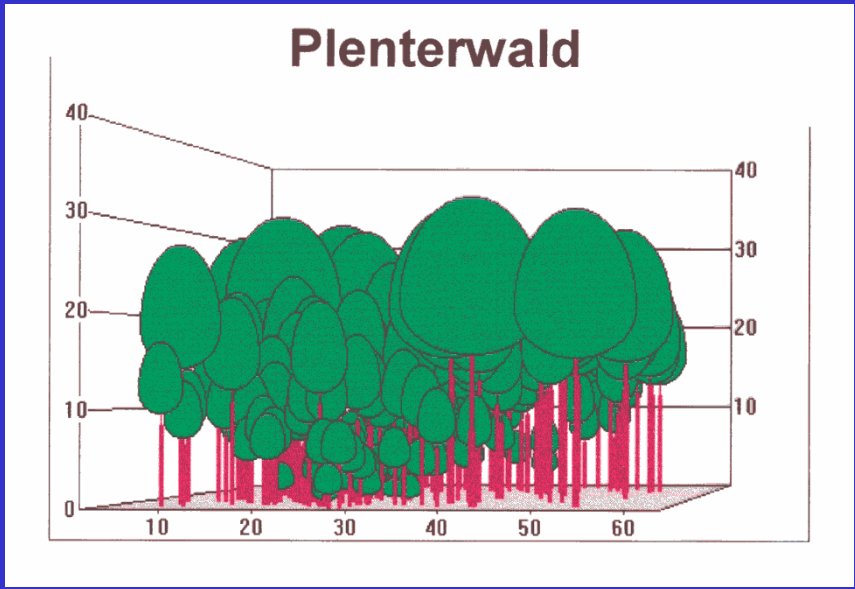
Aus: MOSANDL 1991

Permanent Forest in Keula/Germany

Left: without silvicultural treatment

right: with group selection cutting





Plot size : 50m * 50m

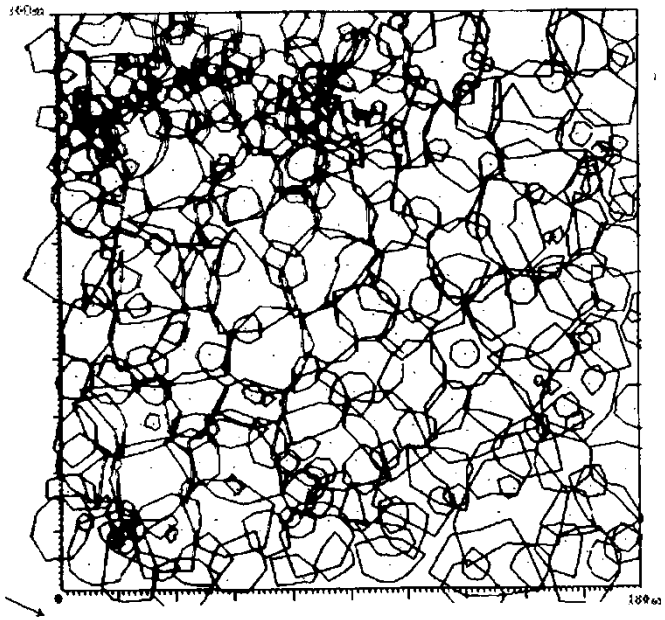
Beech forests in Keula

Without sivicultural treatment

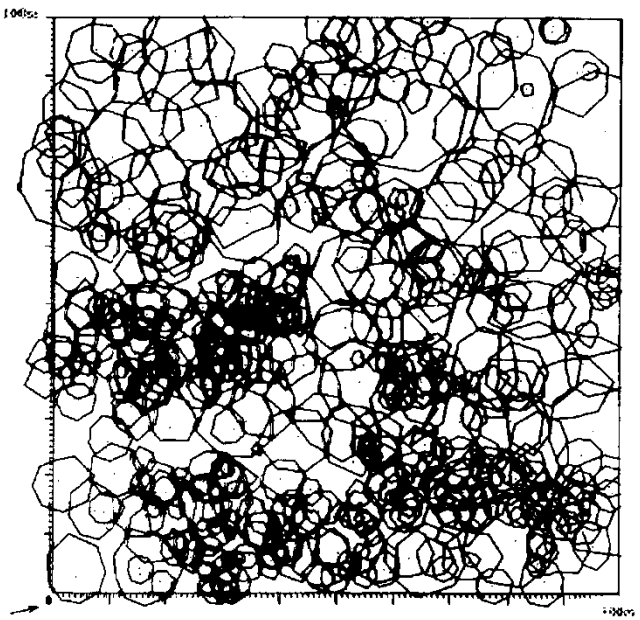
Group selection cutting

Crown maps Keulaer Plenterwald

(Aufnahme im Winterhalbjahr 1994/95)

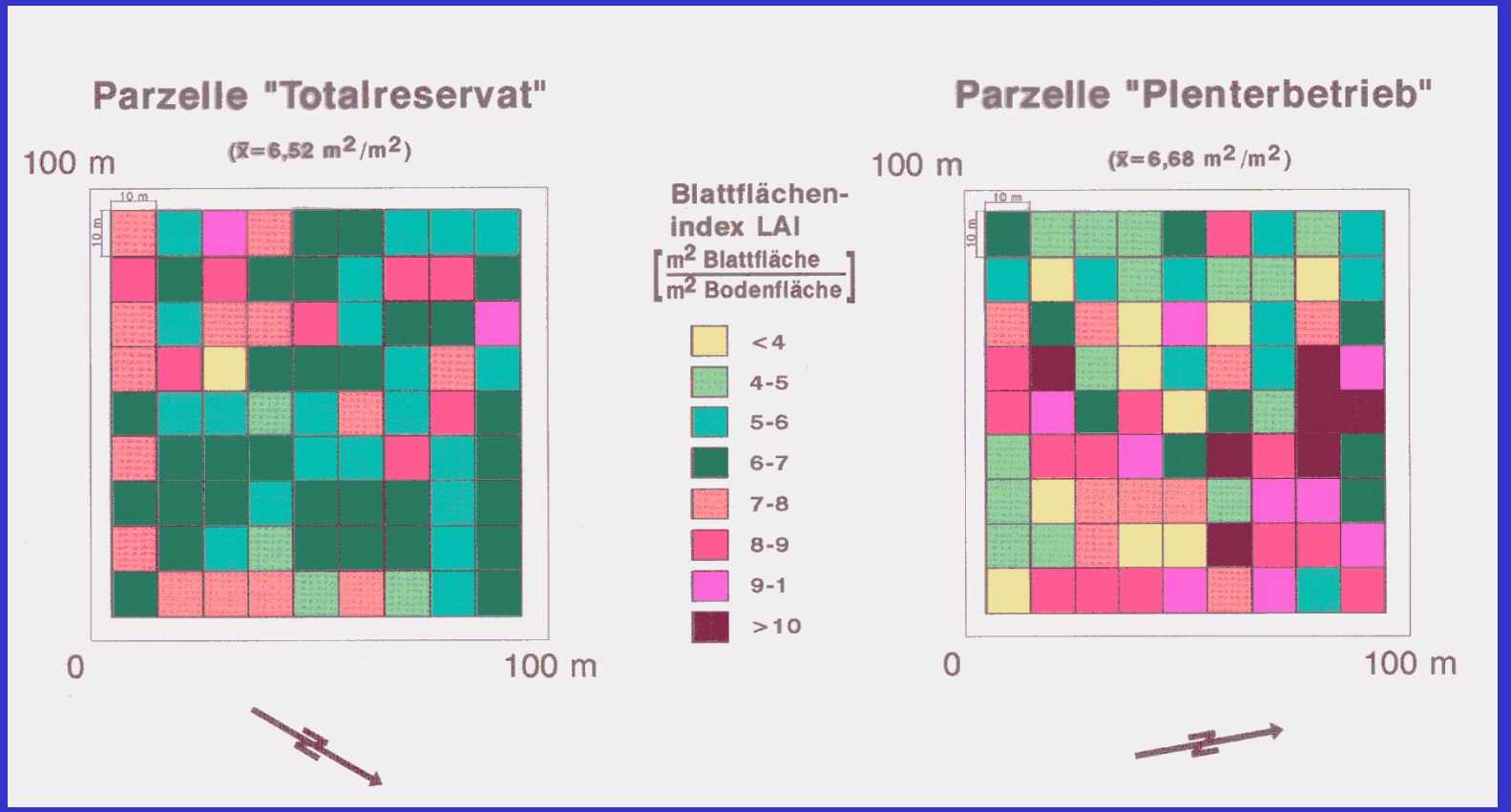


Totalreservats-Parzelle

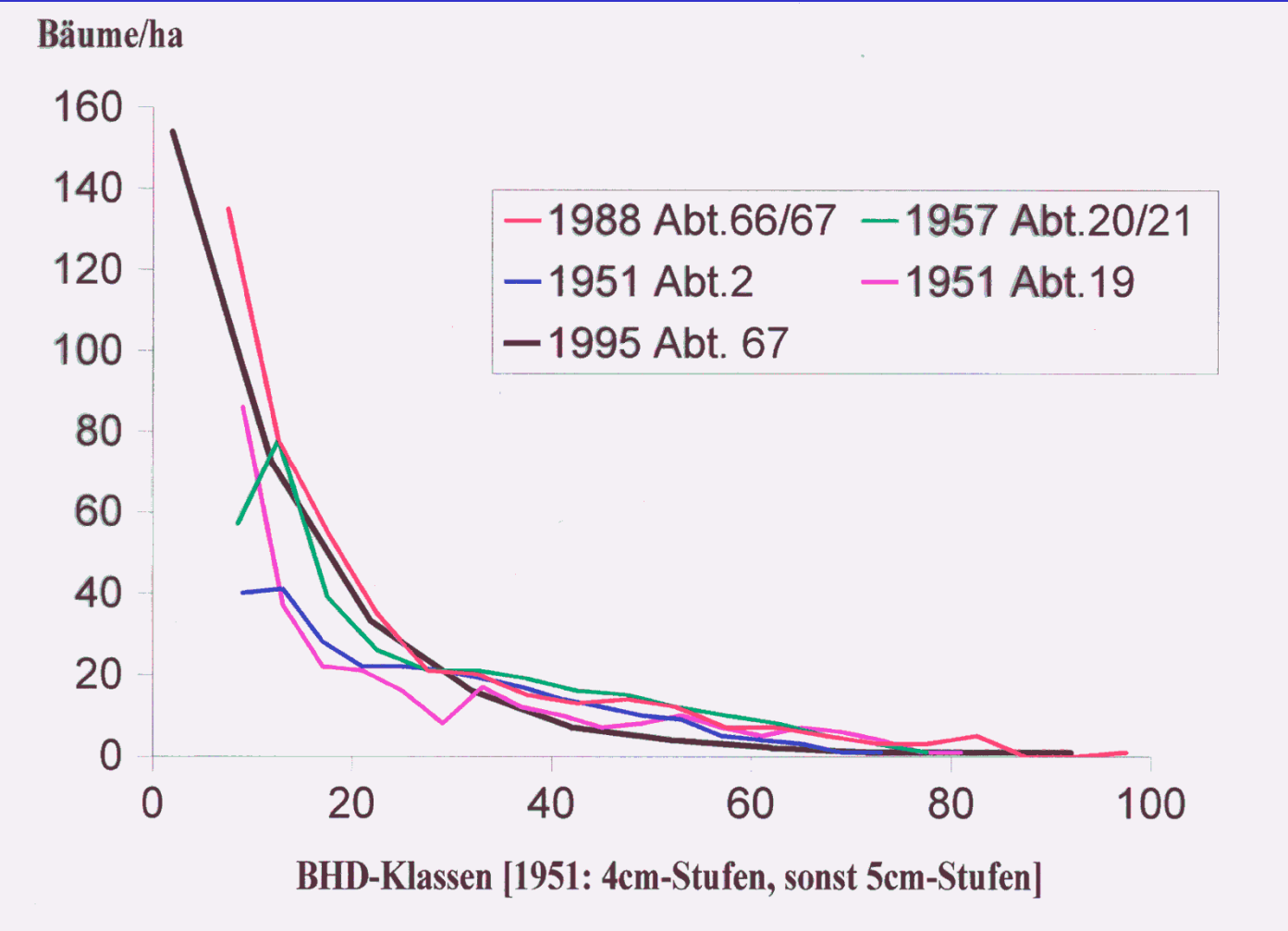


Plenterwald-Parzelle

Leaf area index in beech forests in Keula /Germany



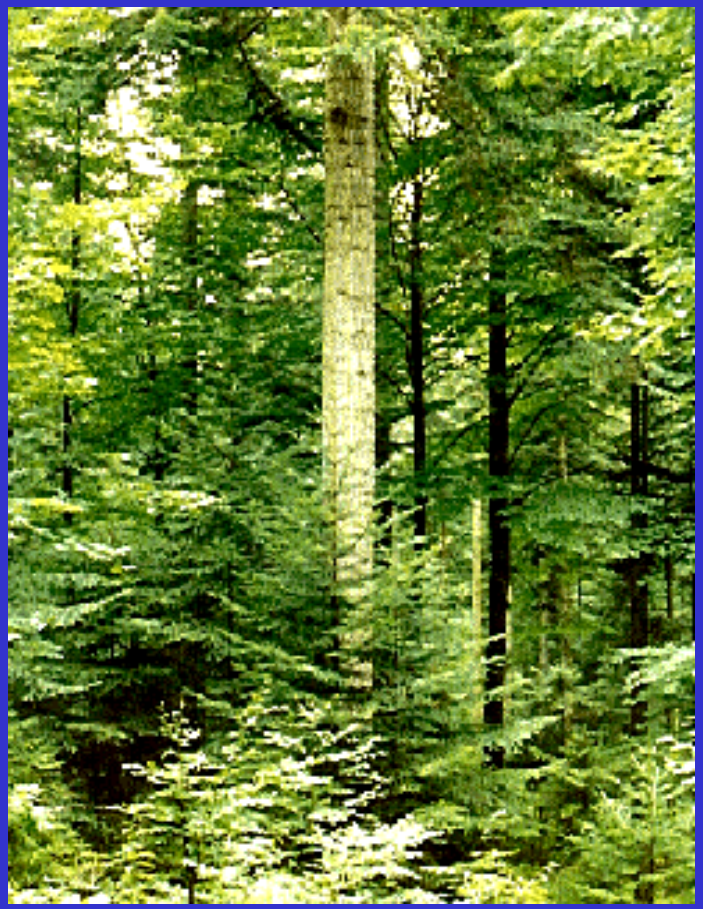
Diameter distribution in a group selection forest in Keula/Germany



Mixed group selection forest in Iran

The old and the new concept

Age class forest

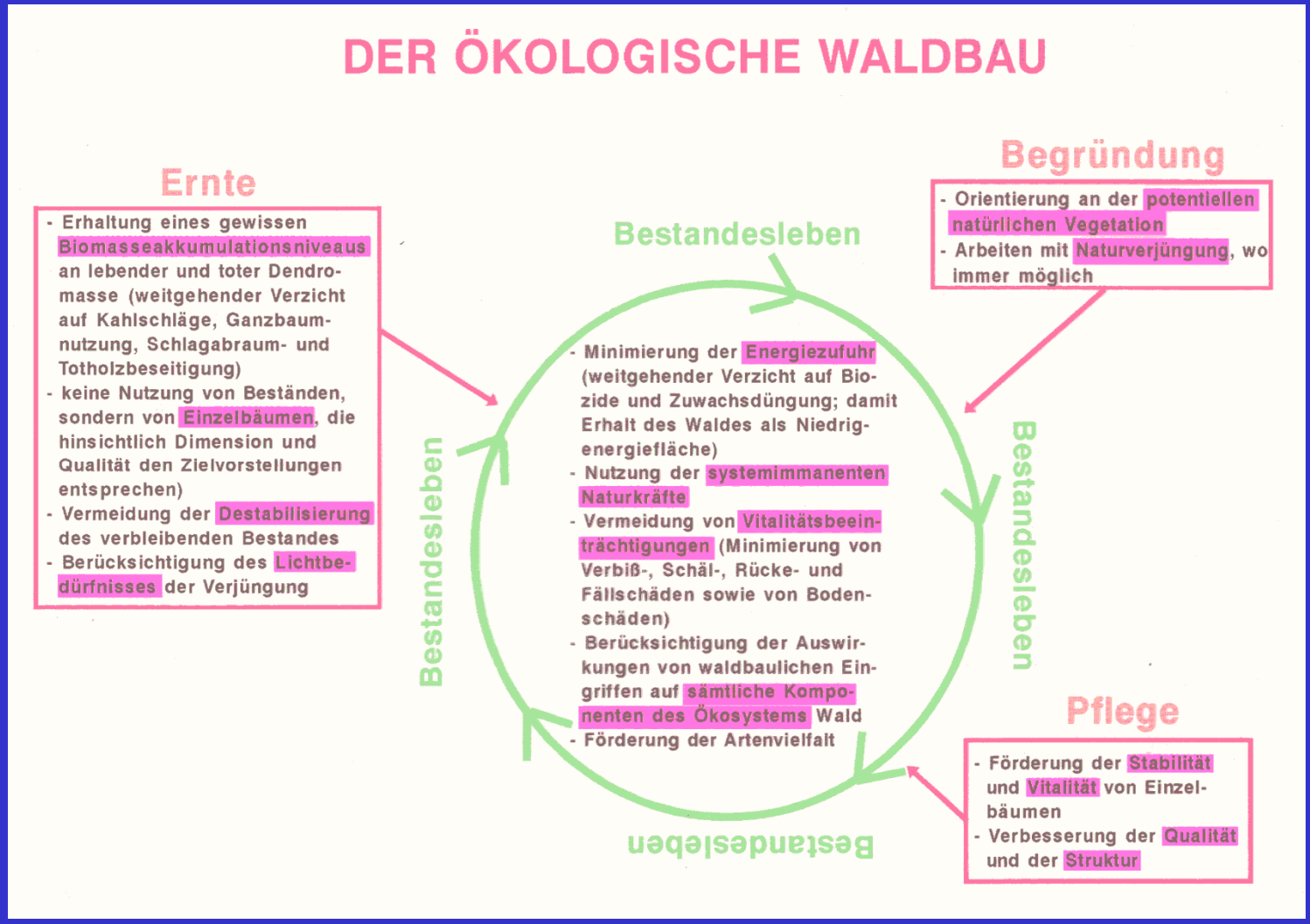


Close to nature forest

Difference : Close-to-nature and age class forest

Kennzeichen	Naturnaher Wald	Altersklassenwald
Driving force	Nature	Man
Principle	Use of natural power	Dominate nature
Species composition	Determined by site conditions	Determined by economic objectives
Energy balance	balanced	not balanced
Matter flow	Minimize input and output of matter	Not limited input and output of matter
Stability	High	Low
Elasticity	High	Low
Usage	Single tree (selection forest)	Forest stand (age-class forest)
Sustainability	Forest stand	Enterprise units

Ecological Silviculture



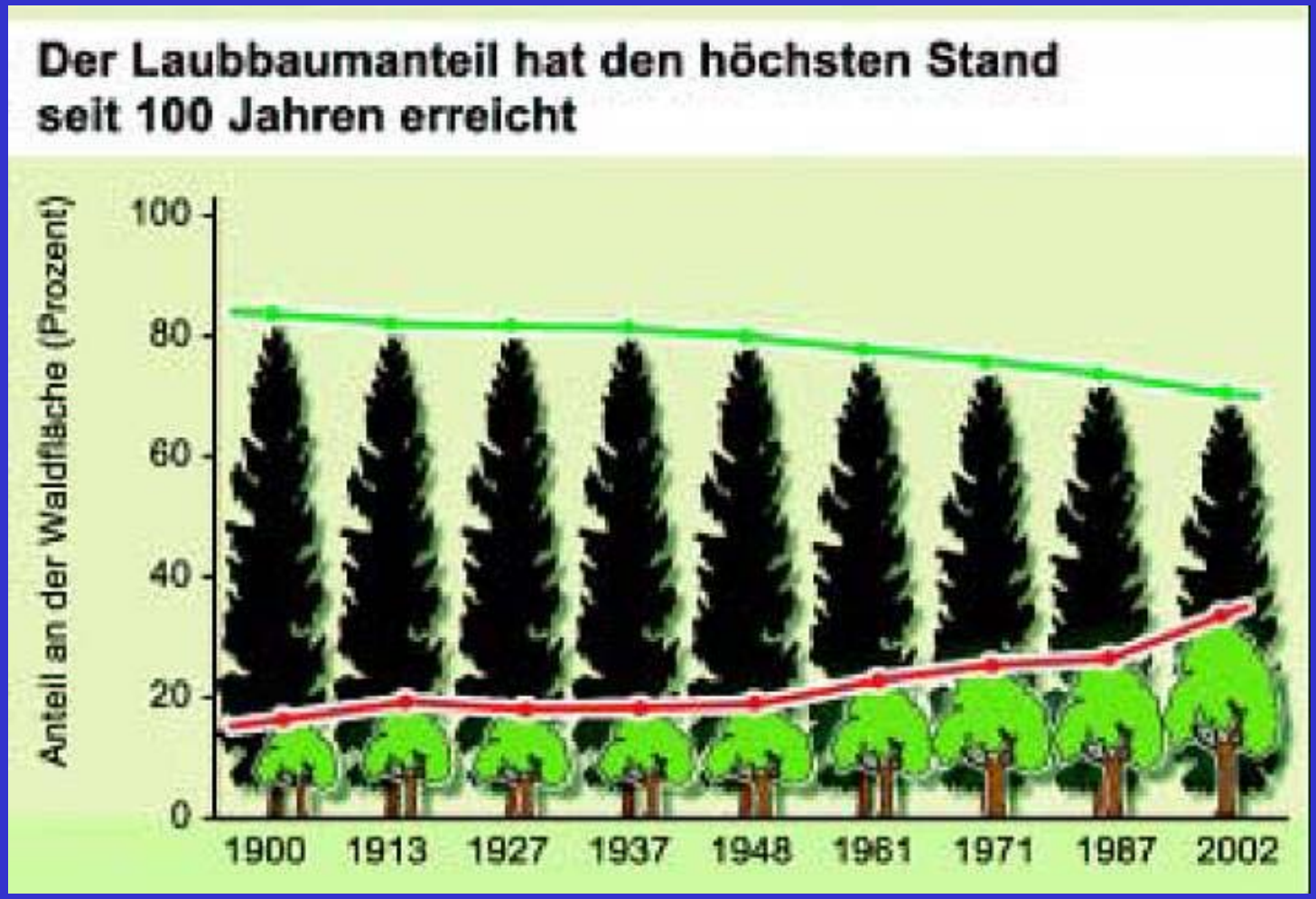
Objectives for close to nature forests

Objectives	Target	Minimum requirements - Proposals for implementation on stand level
1. High resistance	1. Site adaption (ecologically balanced)	Orientation to Potential Natural Vegetation (PNV): • Tree species of PNV > 50% • Non PNV domestic tree species < 50% • Non domestic tree species < 30%
	2. Mixed	• Mixture of 2 tree species (minimum) • Minimum proportion of each tree species 10% of basal area
	3. Permanent	Achievement of a permanent forest by: • keep biomass (living and dead biomass above ground) of 20 Vfm/ha at minimum (or 5% of maximum growing stock) • create structure by active silvicultural treatment (i.e. selection, crown thinning, second tree layers)
2. High economic performance	4. Low costs & high values	• Usage of natural powers (natural regeneration, birds, succession) • Improvement of stand values (i.e. pruning) • Reduction von damages by game, harvesting and environmental impact (i.e. pollution)
3. Multipurpose forest	5. Diversity	• Reduction of harvesting intensity (compensation i.e. by funds) to improve diversity (ie. keep old trees for ecological or esthetic puposes)

Result: Close to nature forests

Evaluation of the progress towards the new objective

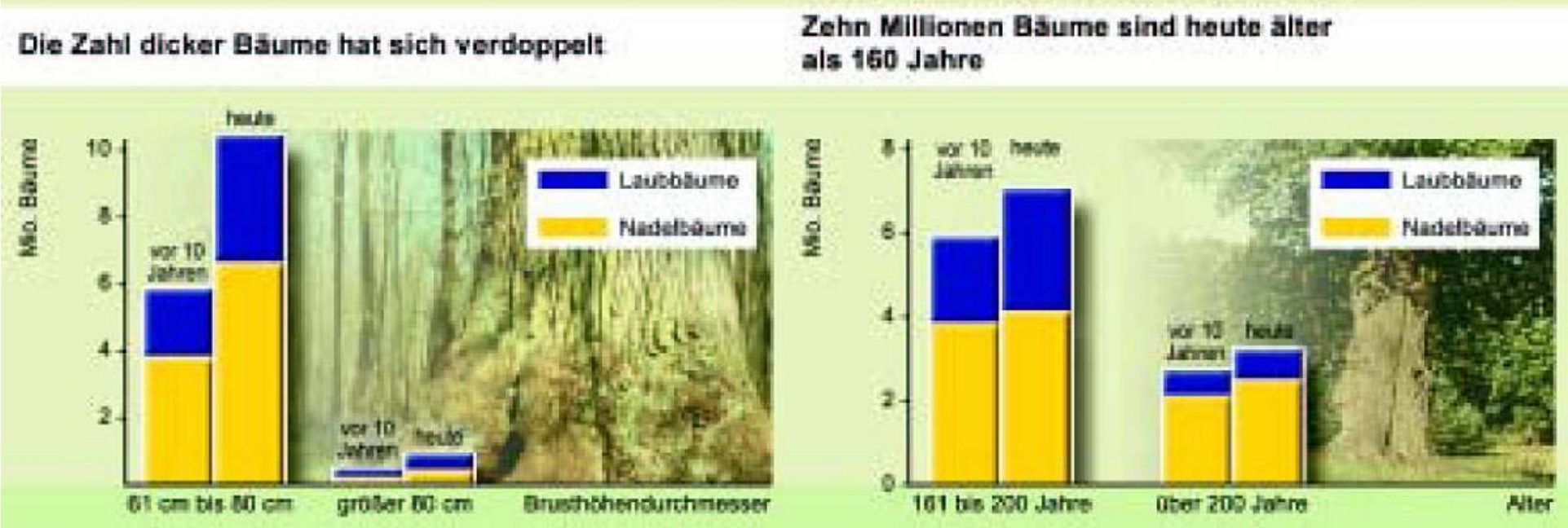
Proportion of broadleaves in Bavarian Forests



Evaluation of the progress towards the new objective

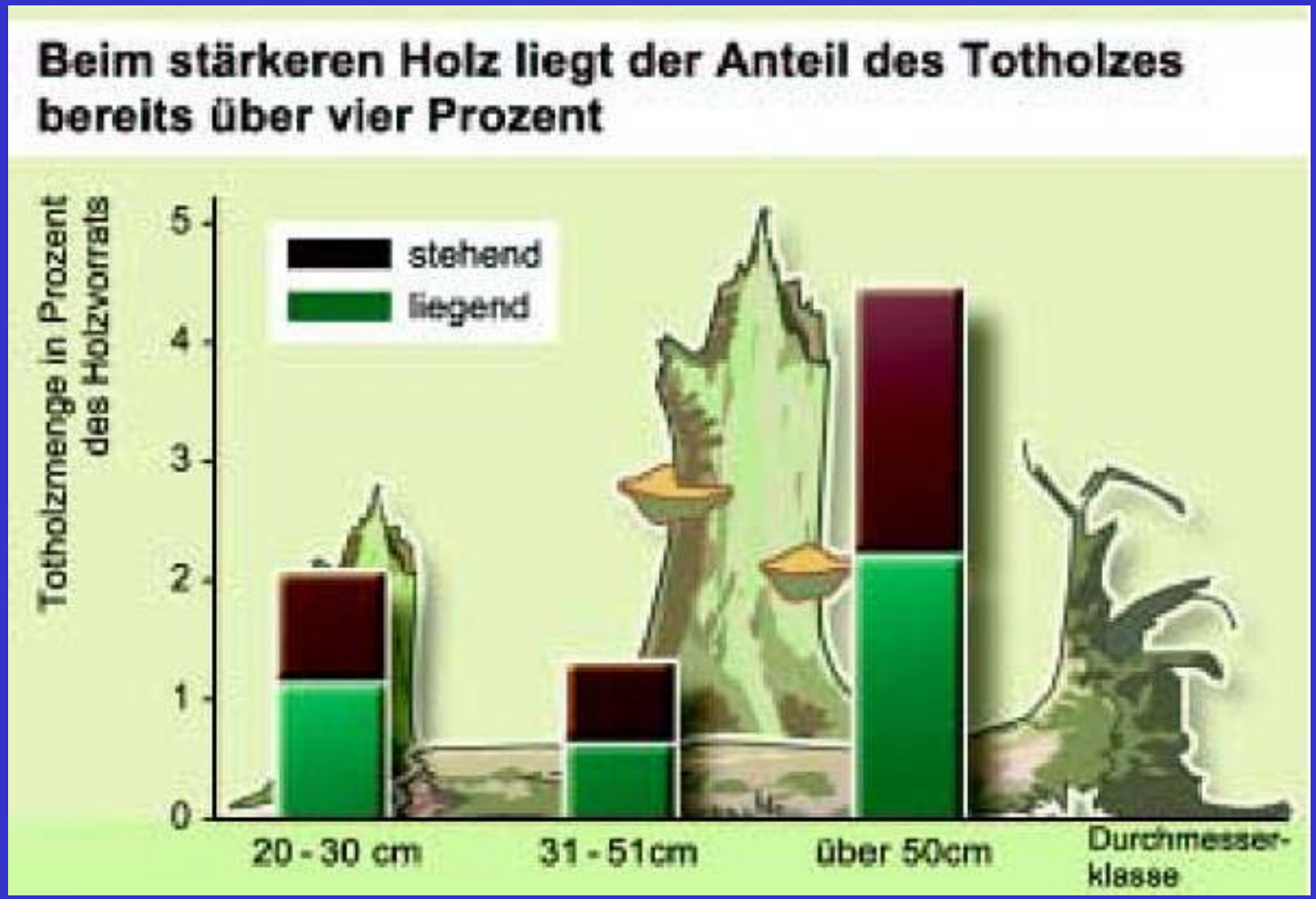
Number of big trees

Number of old trees



Evaluation of the progress towards the new objective

Dead wood in Bavarian Forests

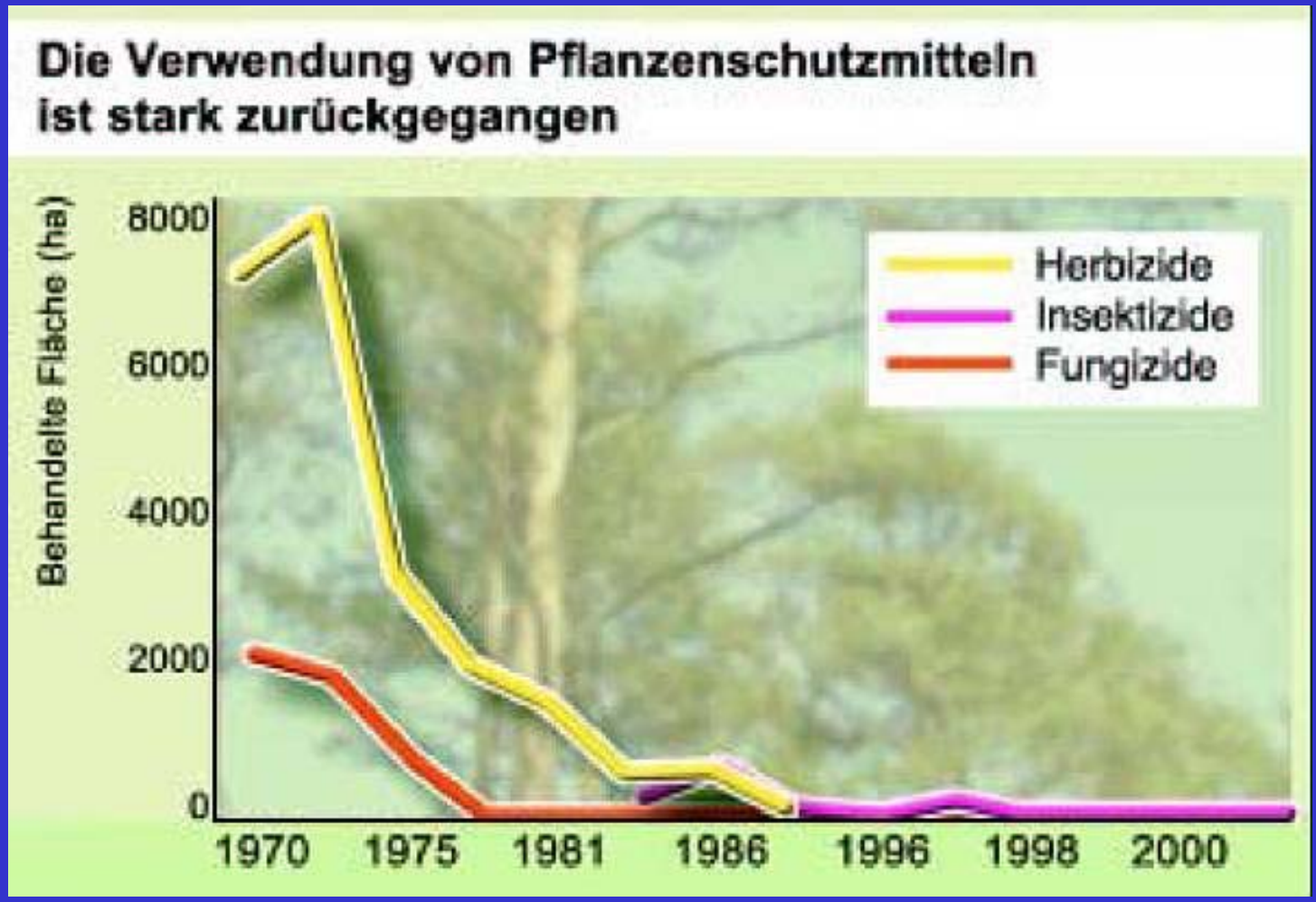


Evaluation of the progress towards the new objective

Game management in Bavarian Forests

Evaluation of the progress towards the new objective

Use of chemicals in Bavarian Forests



Prerequisites for an ecological silviculture in the future

1) Clear objectives

2) Qualified staff and appropriate management units

3) Improved economic situation

4) Reduction of forest stress factors

5) Ecological based education and research


Thank you for your attention!