Rare tree species in Central Europe

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Curriculum

Introduction to rare tree species
- Importance
- Distribution
- Botanical characteristics

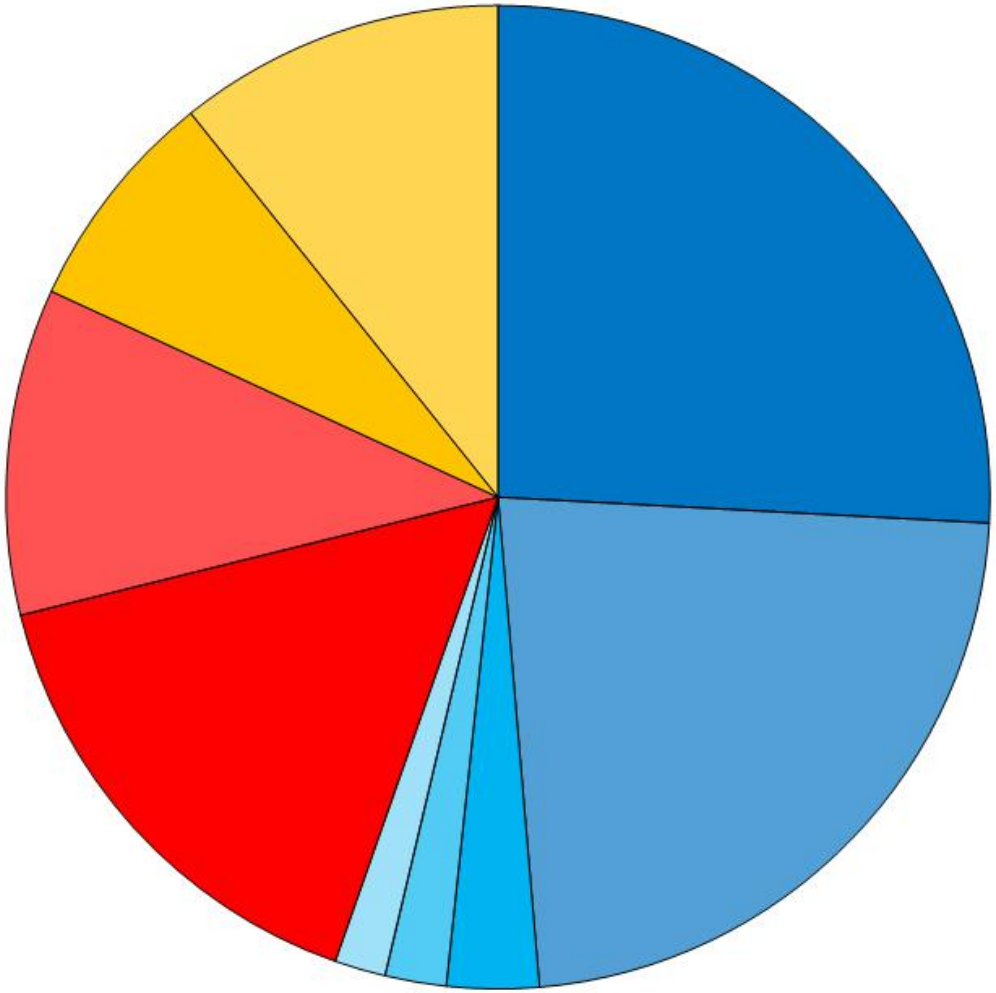
Introduction to field exercise
- Site description
- Your tasks

Fieldwork

Presentation and discussion of results

Finale talk “How the abandonment of traditional forest management systems influences the occurrence of a rare tree species”

Tree species distribution in Germany



- *Picea abies*
- *Pinus sylvestris*
- *Larix decidua*
- *Pseudotsuga menziesii*
- *Abies alba*
- *Fagus sylvatica*
- *Quercus sp.*
- Other hardwoods
- Noble hardwoods

(BWI[3])

Interest in rare tree species

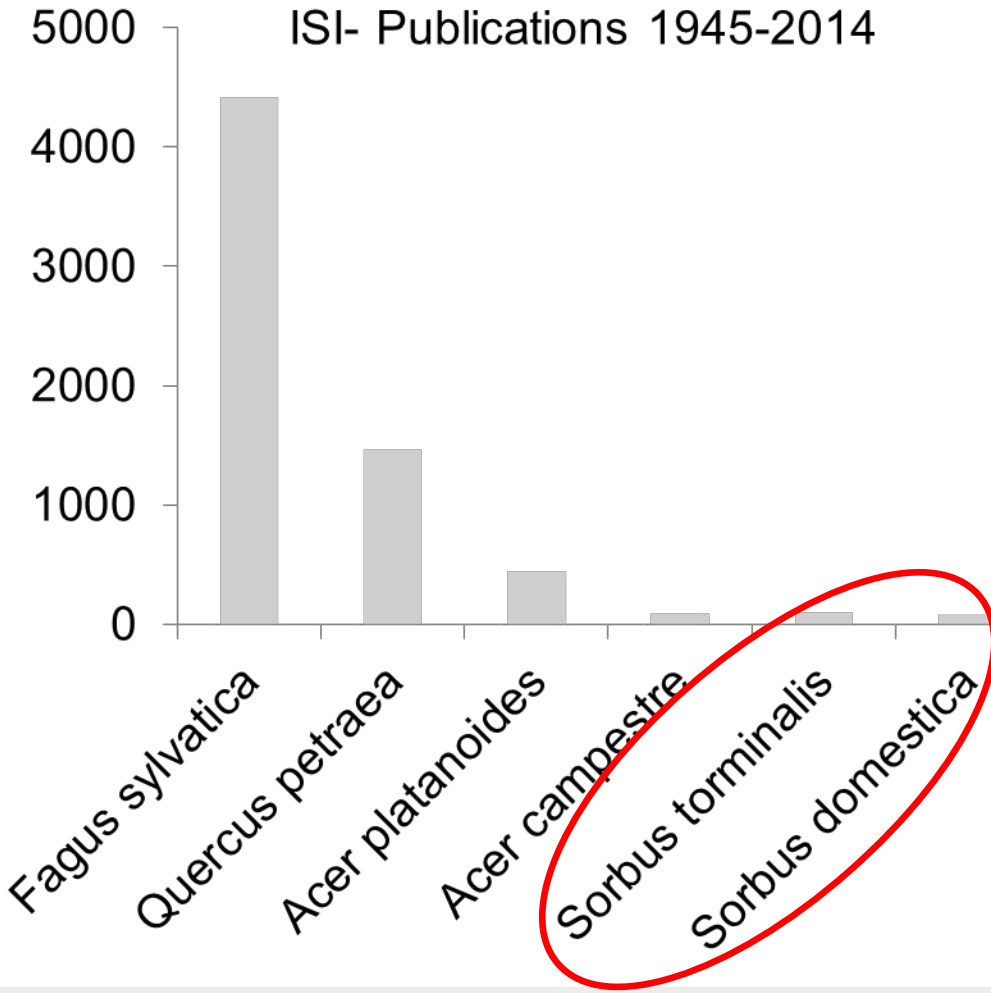
- Environmental: biodiversity
- Silvicultural: increasing options for mixed species forests, drought tolerant species
- Economical: highly valuable timber for unique furniture + use of fruits
- Aesthetics, cultural: flowers and autumn leaves

Rare tree species in Europe

Percentage of forest component across Europe:

Acer campestre	0.04 %
Acer platanoides	0.34 %
Sorbus torminalis	0.02 %
Sorbus domestica	0.01 %

(Hemery 2008)



Reasons for rarity

– low competitiveness

– poor sexual reproduction

– little silvicultural promotion

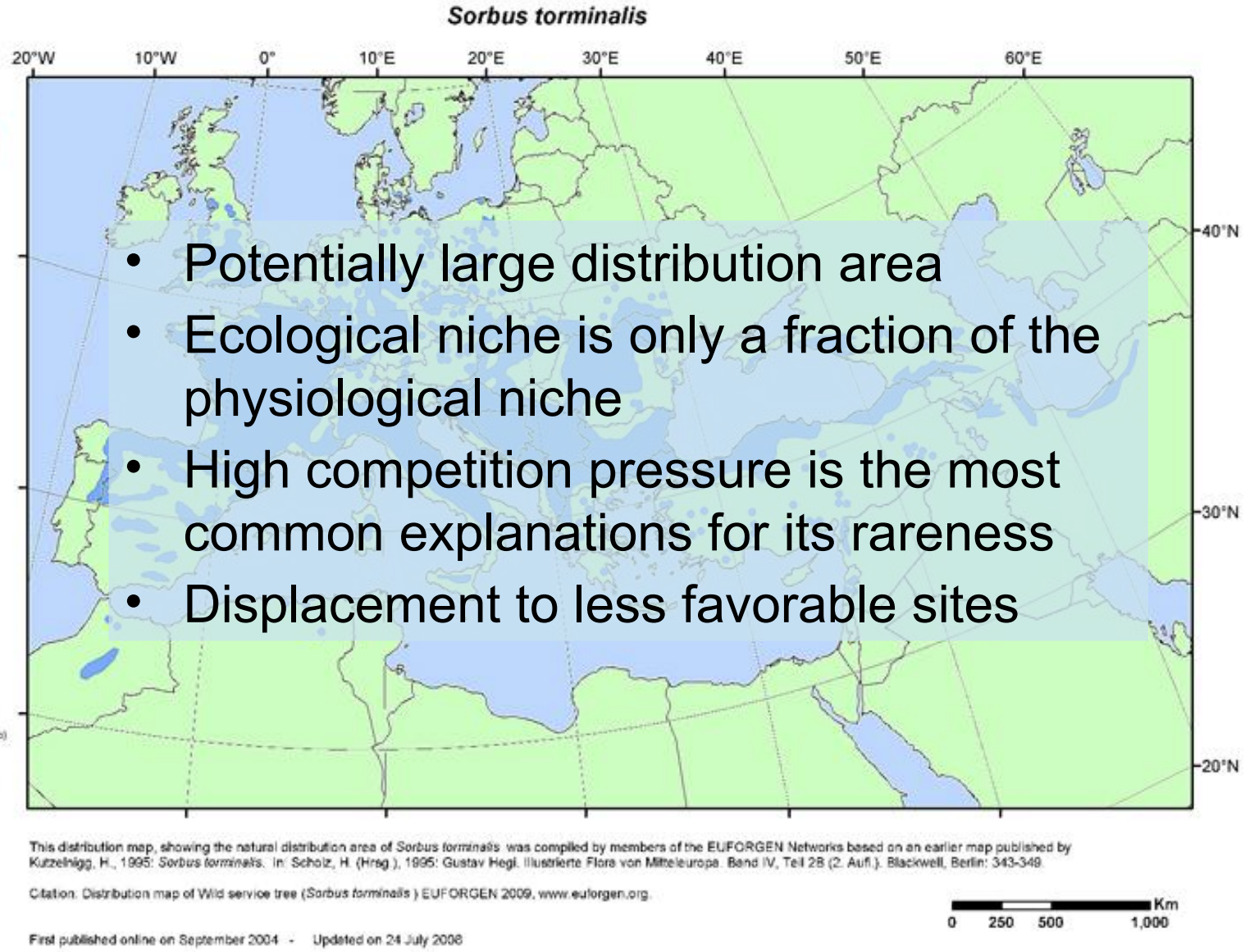
– conversion + transformation of oak coppice forests

–knowledge gaps of local foresters

–browsing

–light ecology/continuous cover forestry

–suppression of natural disturbances

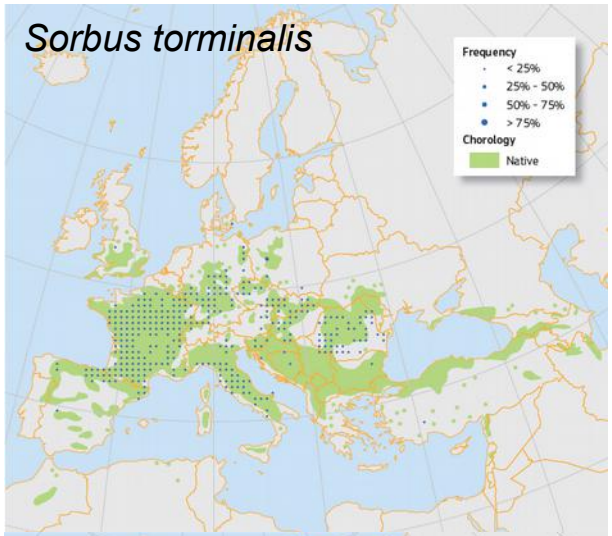


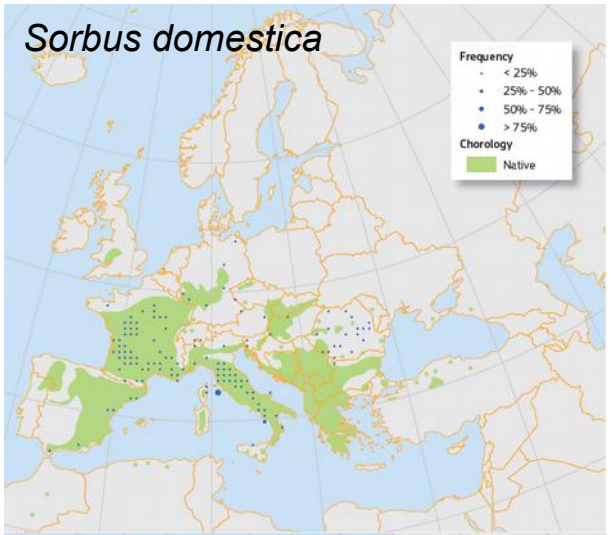
- Potentially large distribution area
- Ecological niche is only a fraction of the physiological niche
- High competition pressure is the most common explanations for its rareness
- Displacement to less favorable sites

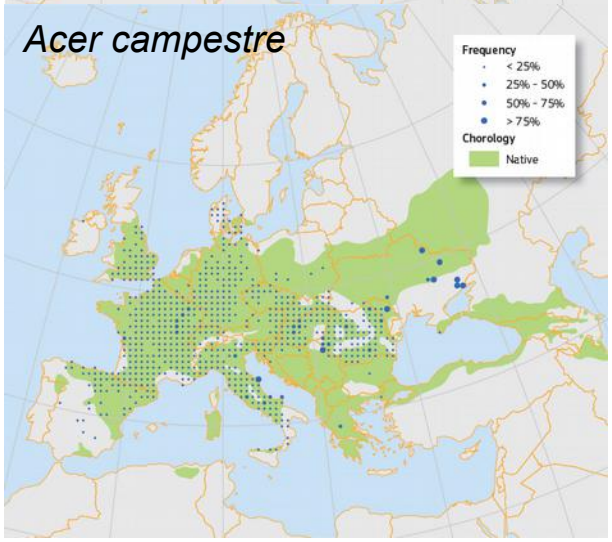
Botanical / morphological characteristics

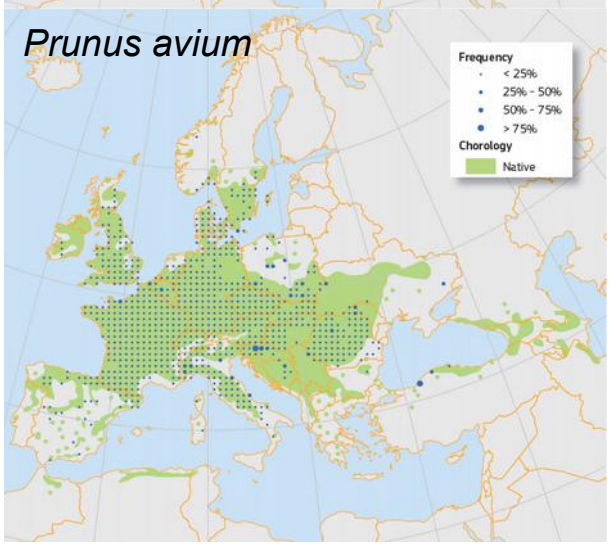
- Descriptions of four rare broadleaved tree species
- Typical species of coppice forests
- *Sorbus torminalis* (Wild service tree)
- *Sorbus domestica* (Service tree)
- *Acer campestre* (Field maple)
- *Prunus avium* (Wild cherry)

Natural species distributions in Europe









Sorbus sp.

– A genus of about 100 - 200 species of trees and shrubs

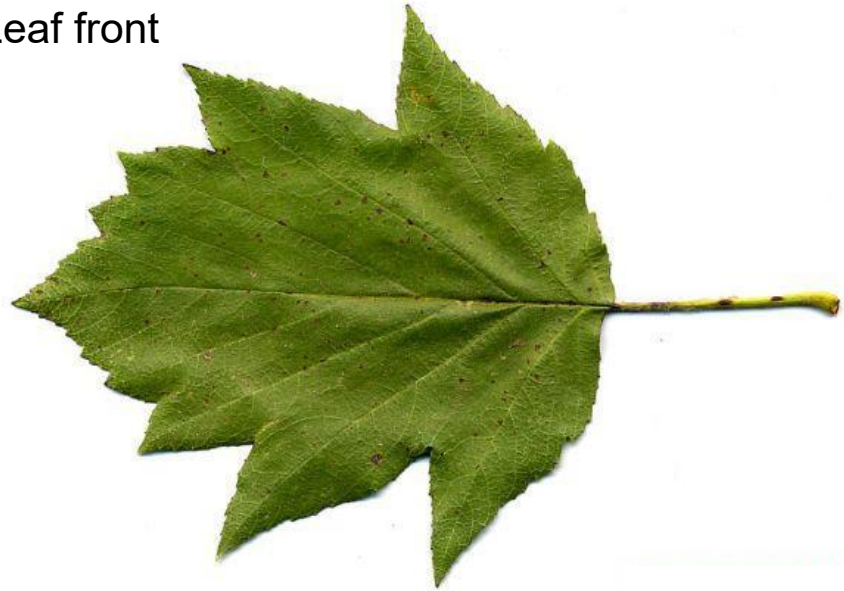
– Family: Rosacea

– Subfamily: Maleae

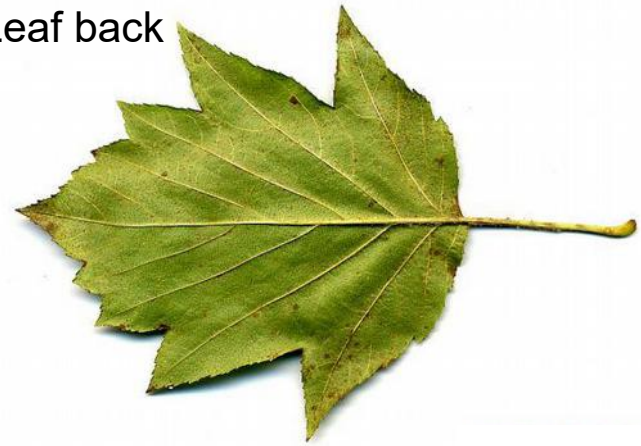
– Most commonly known are *Sorbus aucuparia* (Rowan), *S. aria* (Whitebeam), *S. torminalis* (Wild service tree) , and *S. domestica* (Service tree)

Sorbus torminalis

Leaf front



Leaf back



Terminal bud

Sorbus torminalis

Sorbus torminalis


Bark young tree


Bark mature tree

Sorbus torminalis

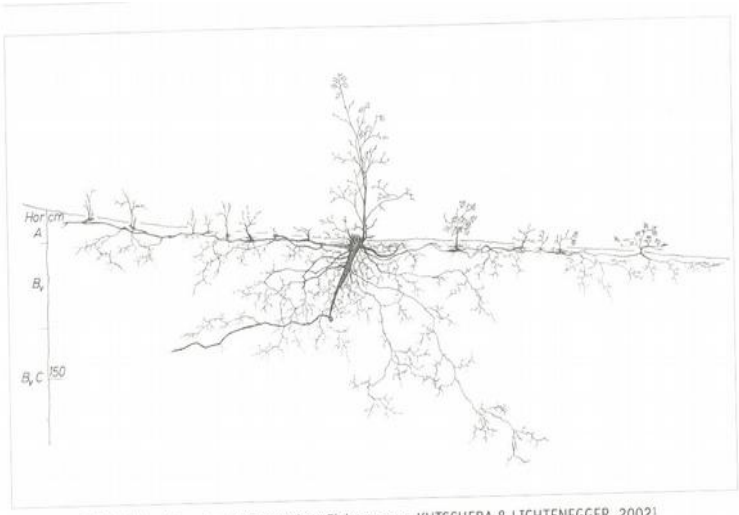
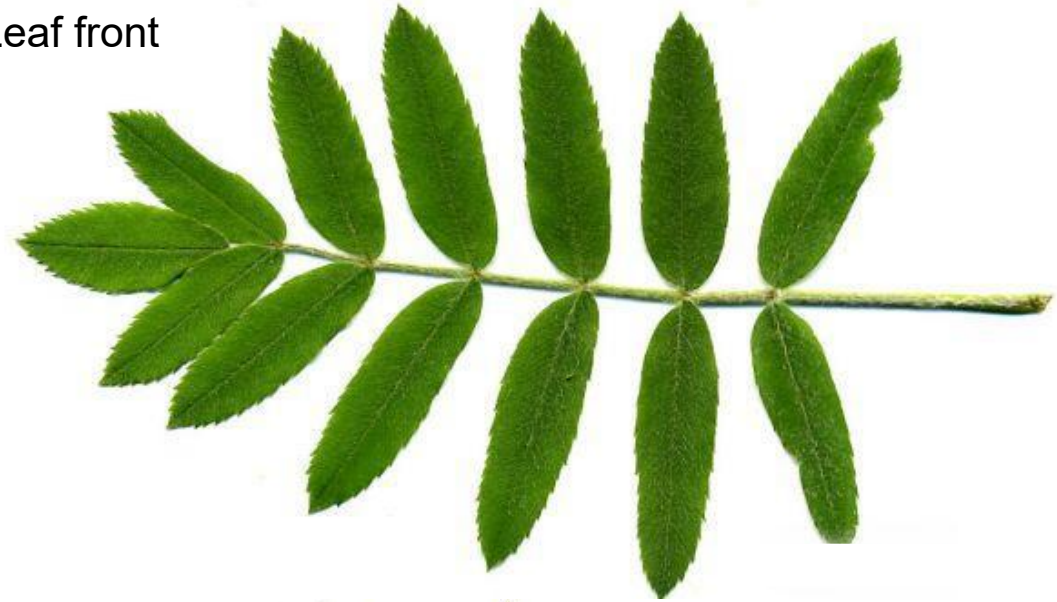


Abb. 1.2: Beispiel der Wurzelbrutbildung einer Elsbeere, aus KUTSCHERA & LICHTENEGGER, 2002[1]

Vegetative regeneration is typical for *Sorbus* species

Sorbus domestica

Leaf front

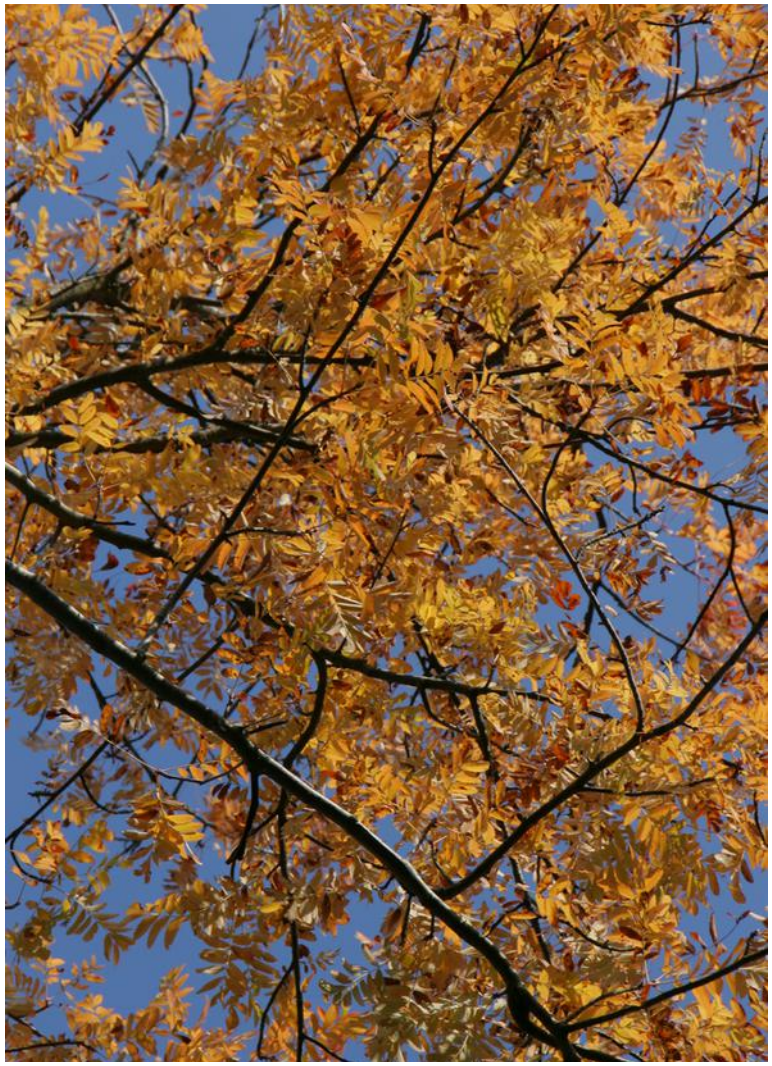


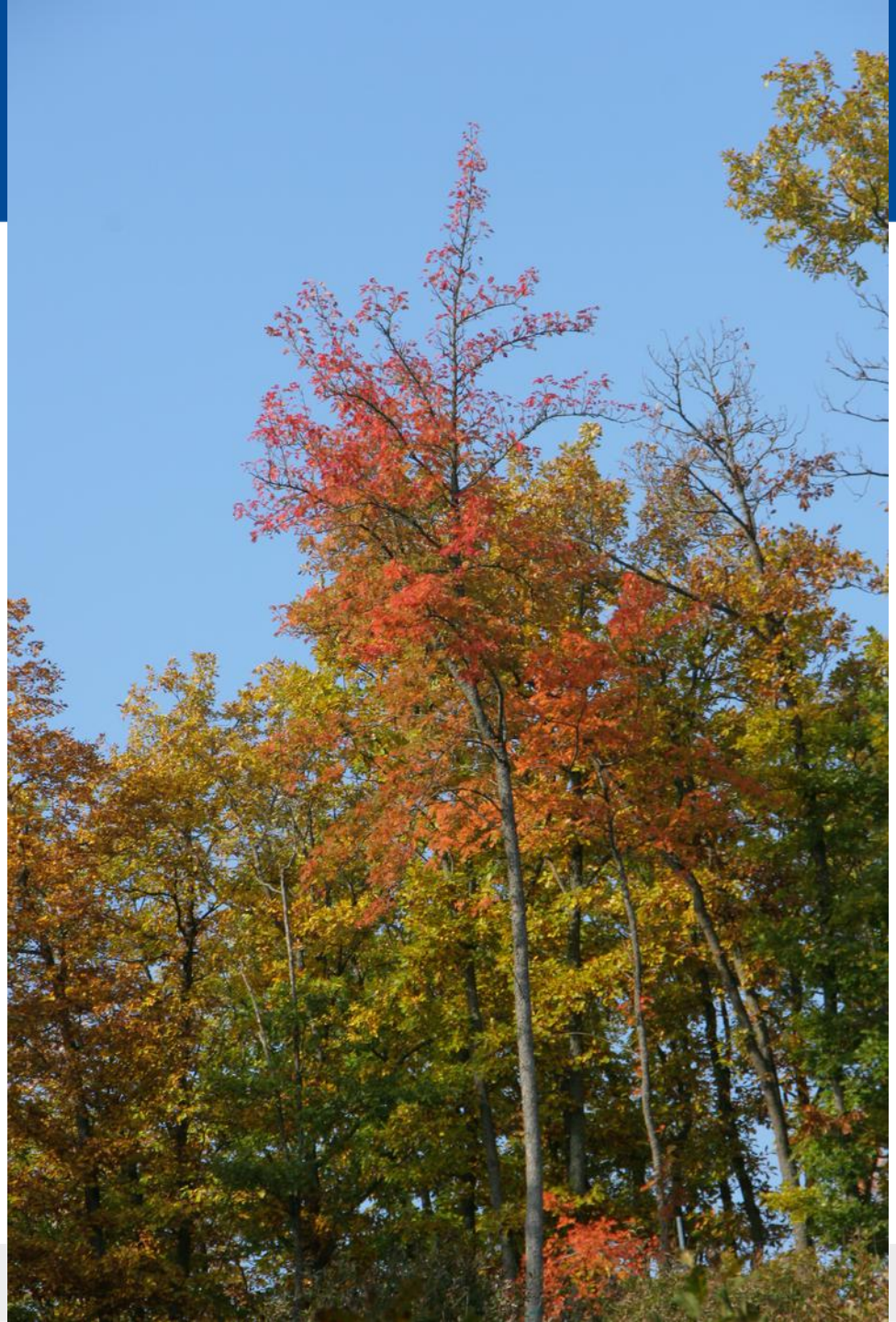
Leaf back

Terminal bud

Sorbus domestica

Sorbus domestica





Acer sp.

– A genus of approximately 120 species of trees and shrubs

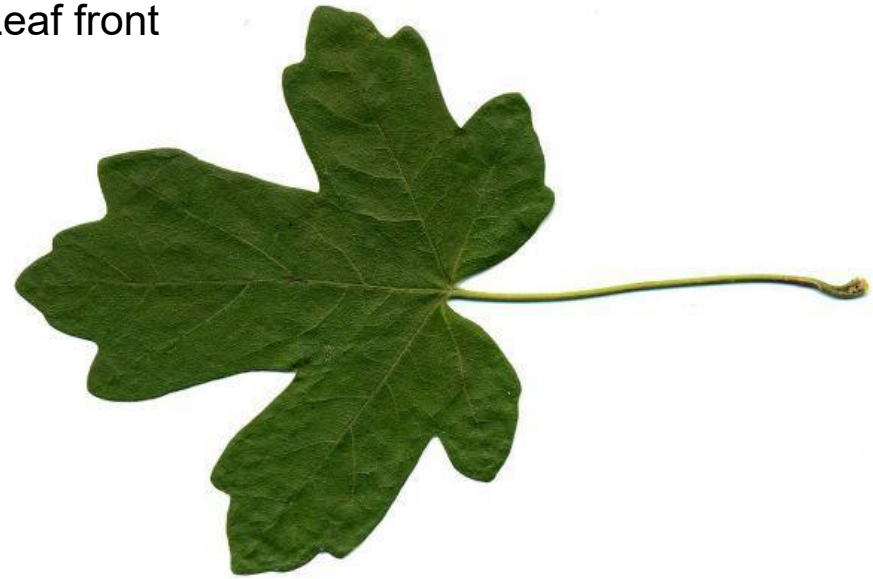
– Family: Sapindaceae (soapberries)

– Subfamiliy: Hippocastanoideae

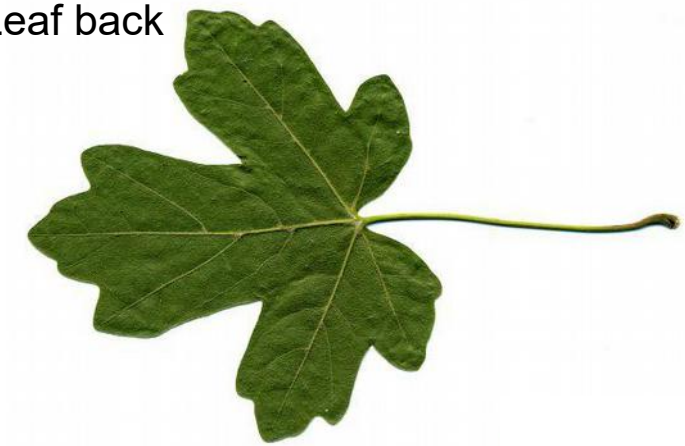
– Most commonly known are *Acer pseudoplatanus* (Sycamore), *A. platanoides* (Norway maple), *A. campestre* (Field maple), *A. saccharum* (Sugar maple), and *A. monspessulanum* (Montpellier maple)

Acer campestre

Leaf front



Leaf back



Terminal bud

Acer campestre

Flower

Fruits

Acer campestre

Saplings show temporal cork bars

Prunus sp.

– A genus of about 430 species of trees and shrubs

– Family: Rosacea

– Subfamily: Amygdaloideae

– Most commonly known are the cultivated fruit species like plums, cherries, peaches, nectarines, apricots, and almonds

Prunus avium

Leaf front

Leaf back

Lateral bud

Prunus avium

Fruits

Prunus avium

Bark mature tree

The exercise

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Study area

Aged coppice forests in RLP:

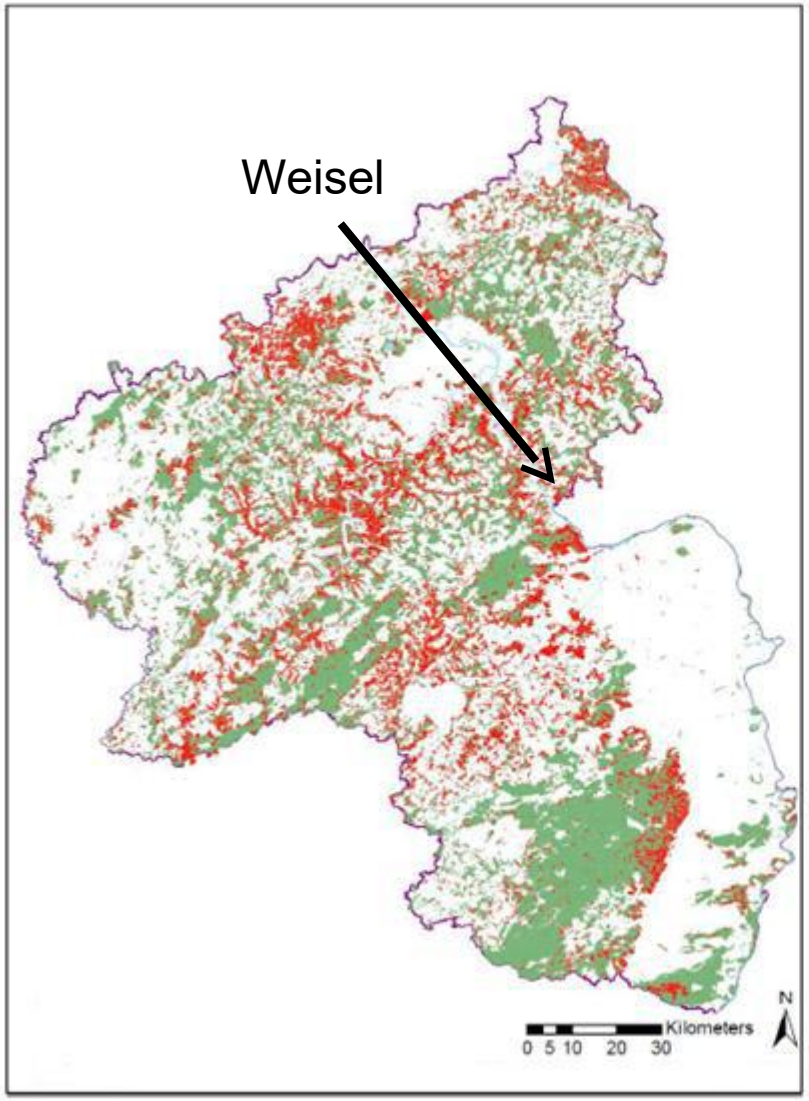
- ca. 160.000 ha (20% total forest area)

Selection criteria:

- 80-90 years old
- oak, hornbeam
- not to steep
- three different treatments

Site conditions:

- average precipitation Vp = 360 mm
- average temperature Vp = 14,4 ºC
- exposition: south / south west
- nutrients: rich

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Schenkelbach
Rhein
Schenkelbach
Schenkelbach
9
Kauber Werth
Rhein
9
42
RHEINLAND-PFA
HESSEN

Your tasks (today)

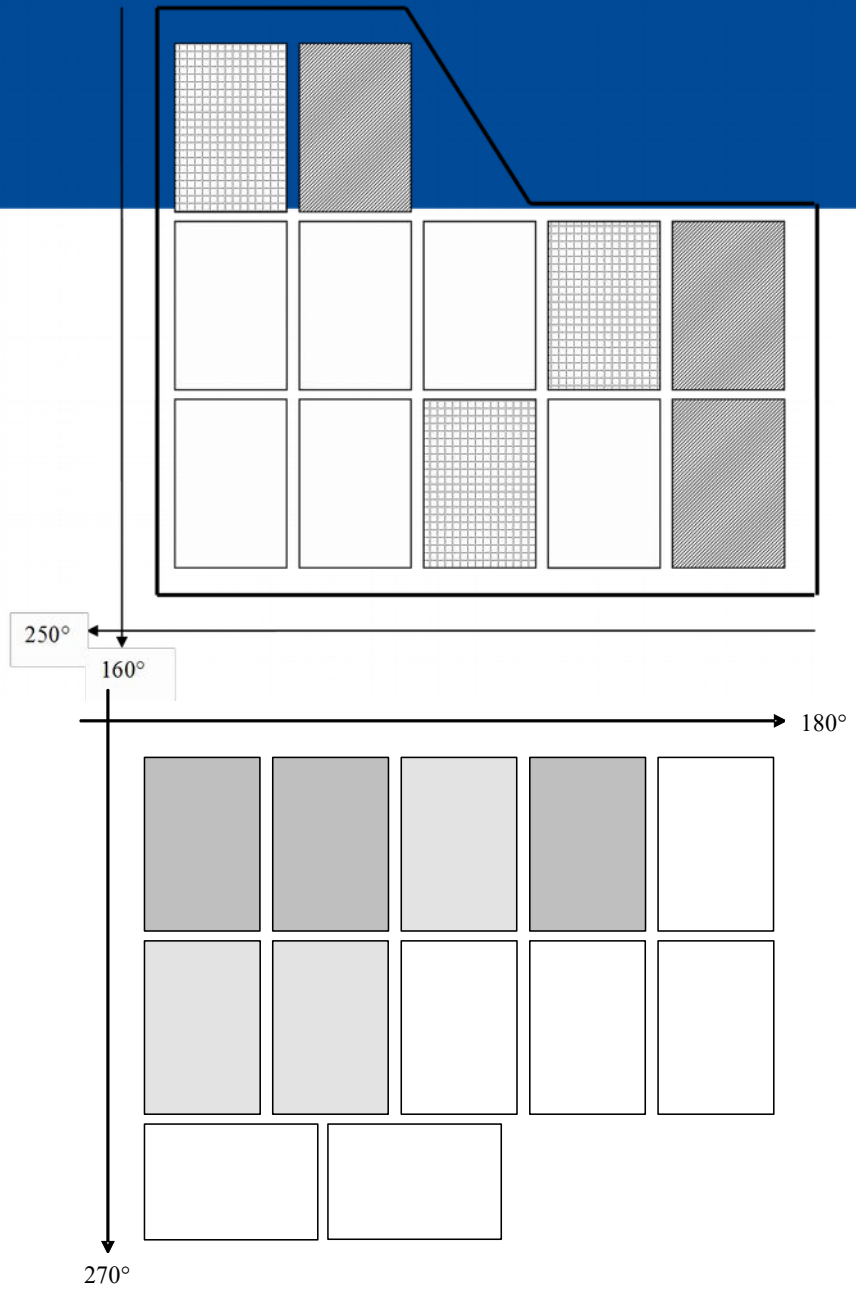
Group 1 & 2 “Coppiced stands”

Establish sampling plots and record
- presence,
- total height,
- origin and
- vitality of rare tree species and the nearest three competitors

Group 3 & 4 „aged coppice stands“

- apply measurements above
- pay additional attention on regeneration


RHEINLAND-PFALZ
HESSEN
RHEINLAND-PFALZ
HESSEN


250°
160°
180°
270°

Your tasks (tomorrow)

Prepare flip charts for discussion of results

Pay detailed attention to:
- Frequency (N/ha) in relation to height (class)
- Height of rare tree species in relation to competitors
- Frequency (percentage) in relation to vitality

Derive silviciultural recommendations for future stand management focussing on the conservation of rare tree species and noble hardwoods.

Questions?

Your results please!

Albert-Ludwigs-Universität Freiburg

21st July 2016

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