# The Steinkreuz Marteloscope

## Field guide

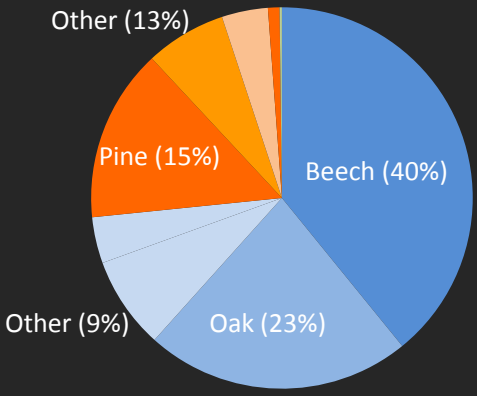
BAYERISCHE STAATSFORSTEN
Nachhaltig Wirtschaften.

# Ebrach in figures

**16,500 ha**
Total forest area

**8.5 m³/ha**
Annual increment

**370 m³/ha**
Actual average stock




**140,000 m³**
is the **annual increment** measured over the total forest

**100,000 m³**
is the annual cutting-rate

**25,000 m³**
is the fuelwood production per year

**20,000 m³**
are annual losses due to biodiversity measures

**72 %**
Broadleaves

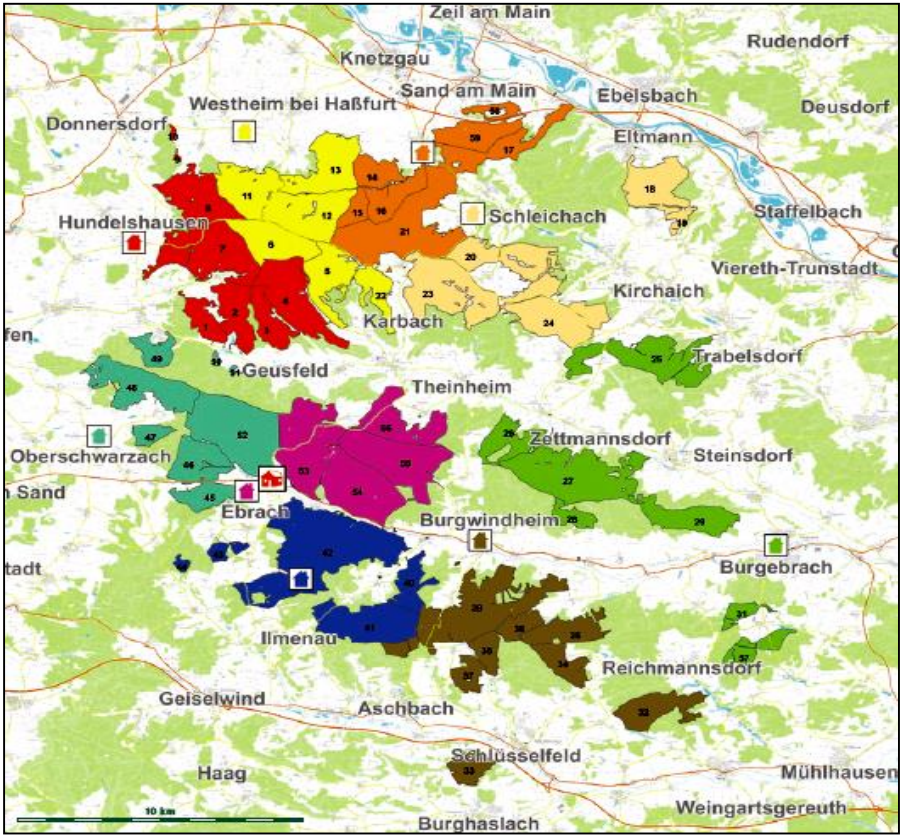
**28 %**
Conifers

**Around 480**
different species of saproxylic beetles

# Ebrach State Forest Enterprise

Ebrach State Forest Entreprise (BaySF) manages an area of around 16,500 ha of state forest in the Steigerwald region, located between Würzburg and Nürnberg in North-Western Bavaria.

The forests are composed of ca. 72 % broadleaved species (Beech ca. 40 %, Oak ca. 23 %) and 28 % coniferous species (pine being the dominant species with around 15 %). The actual average stock is ca. 370 $m^3$ /ha and the annual cutting rate amounts to approximately 100,000 $m^3$. Around 80 % of deciduous timber is marketed in the region to more than 60 sawmills. Almost 25,000 $m^3$ of sold fuelwood make Ebrach one of the largest producers in Germany.



# Biodiversity concept

**The Steigerwald region is considered as one of the most important beech forests in Germany in terms of the conservation of forest dwelling species. Biodiversity conservation of these species is central to Ebrach State Forest Enterprise. Special emphasis is given to the high number of occurring saproxylic beetles, a key indicator species group for the region.**

**Conservation despite utilization** – The management approach implemented in Ebrach is often coined "conservation despite utilization". It can be described as an integrative approach which strives to ensure biodiversity conservation and timber production over the whole productive forest area. To ensure diversity of forest dwelling species, structural diversity and the supply of living and dead wood is crucial.

The centerpiece of Ebrach's concept is a carefully selected and cross-linked system of set-aside and extensively managed forest areas.

Stands with a high ecological value fall under set-aside forest, which contains different categories (see figures right). They can serve as the basic safeguarding of biodiversity and as donor areas for temporal colonization of habitat structures in adjacent productive forest stands.

Additionally, they link dispersed habitats. The concept therefore is often called and known as stepping stone concept.

Another important element of the enterprise's approach is an extensification of management. This is mainly realized in old stands or younger stands with a high number of remnant old trees. This leads to a systematic build-up of habitat trees and deadwood .

All other stands are managed according to legal requirements regarding nature and species conservation. For example, it is already taken care during pre-commercial thinnings to ensure the persistence of sufficient future habitat trees.

# Biodiversity concept in figures

**6,000 ha**
**Extensification of forest management**

**430 ha**
**Total area of 6 strict reserves**

**700 ha**
**210 stepping stone areas**

**63 ha**
**Forest edges**

**96 ha**
**Wet forest biotopes**

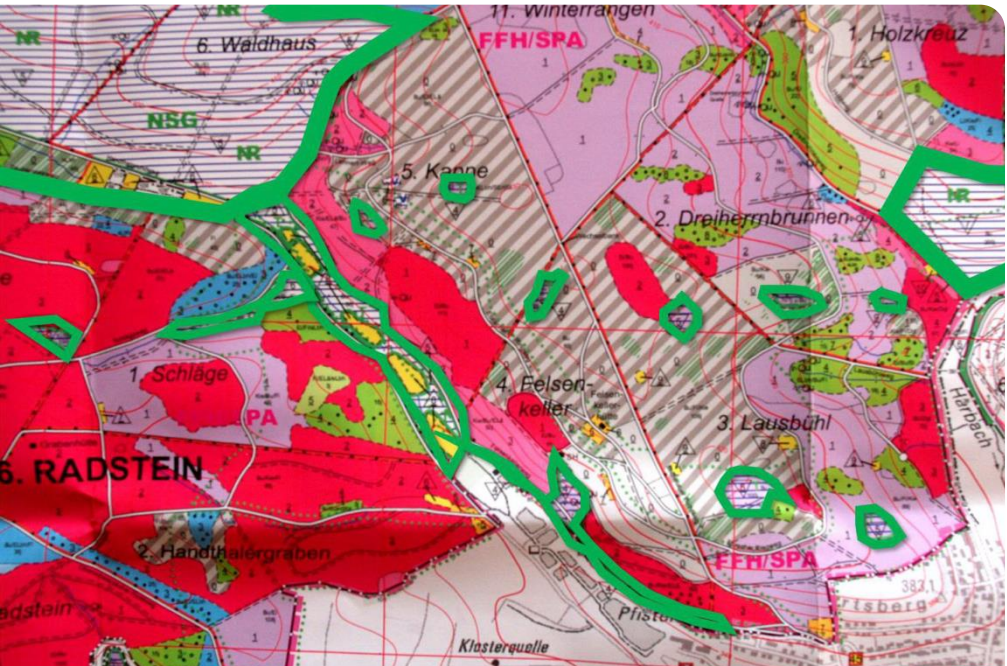
**7 %**
**Set-aside forest areas**

**10 /ha**
Target for habitat trees

Target for deadwood

**20 m³/ha**
in stands older than 100 years

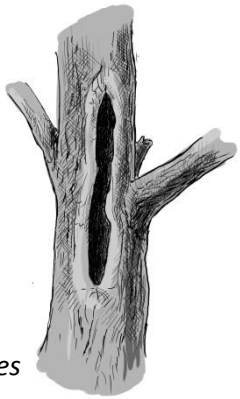
**40 m³/ha**
in stands older than 140 years



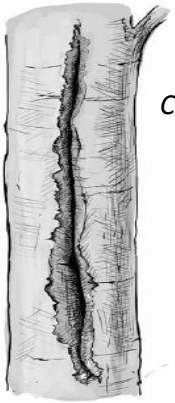
# Habitat structures

*Large quantities of deadwood and a high density of old microhabitat-bearing trees are characteristic elements of natural forests, especially of the old-growth phases. These phases are often absent or rare in managed forests, even in forests under close-to-nature management. Also in selective harvests and thinnings, 'defective' trees referring to these old-growth phases (hollow, dead and languishing trees) are often removed. Yet, an important share of forest biodiversity is strictly or primarily dependent on these elements for their survival, especially 'saproxylic' species, that is species depending on deadwood.*

*Most species dependent of old-growth-elements and phases have become threatened. Conservation of biodiversity in commercial forest stands is mainly a question of retention of such microhabitat structures.*

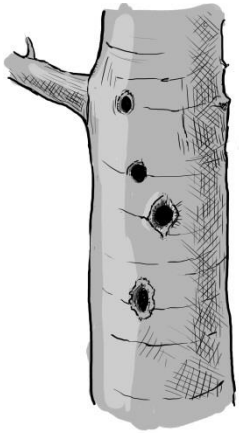


*Large mould cavities*



*Cracks and scars*

*Conks of polypores*



*Woodpecker cavities*

# ….and biodiversity

*Dendrocopos medius*

*Ficedula albicollis*

*Fomes fomentarius*

*Osmoderma eremita*

*Bolitophagus reticulatus*

*Hericium coralloides*

# Site conditions

| | |
|---|---|
| **Altitude:** | **340 m.a.l.** |
| **Forest ecological region:** | **Franken Keuper and Alb foothills, Steigerwald** |
| **Soil:** | **Pseudogley-Brown earth** |
| **Site description:** | **Mesic moist silt above clay, carbonate in lower soil** |
| **Mean annual temperature:** | **7.5° C** |
| **Annual precipitation:** | **800 mm** |
| **Natural forest community:** | ***Luzulo-Fagetum*** |

*Luzulo-Fagetum beech forests occur mostly in continental areas, on acid and nutrient-poor soils. The optimal distribution of Luzulo-Fagetum beech forests occurs in continental rainfall-rich regions. This distribution is limited by soil conditions with the lack of oxygen during the growing period being due to soil wetness or instability.*

*The forest canopy is dominated by Fagus sylvatica (beech) with Quercus petraea (sessile oak). The understory of this forest type is sparse and floral diversity rather poor.*

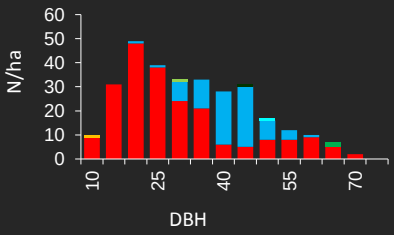
***Species:** Luzula sylvatica, Carex brizoides, Athyrium filix-femina, Dryopteris carthusiana*

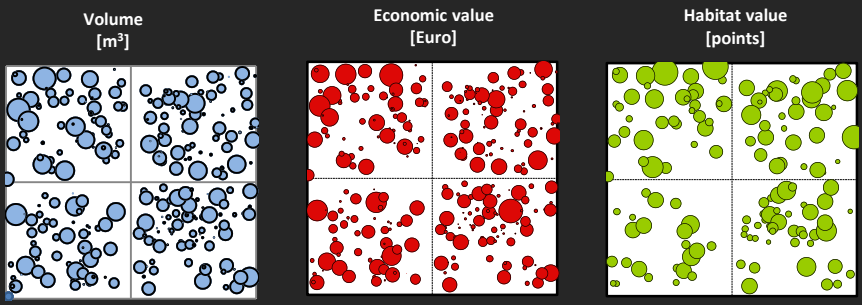
# Stand characteristics

The Steinkreuz Marteloscope is located in a multi-layered stand of mainly beech and oak of about 100 years.

## Stand data

| | |
|---|---|
| N [stems/ha ] | 303 |
| BA [m²/ha] | 30.06 |
| Volume [m³/ha] | 327.2 |
| Habitat value [points] | 3,803 |
| Economic value [Euros] | 30,774.- |

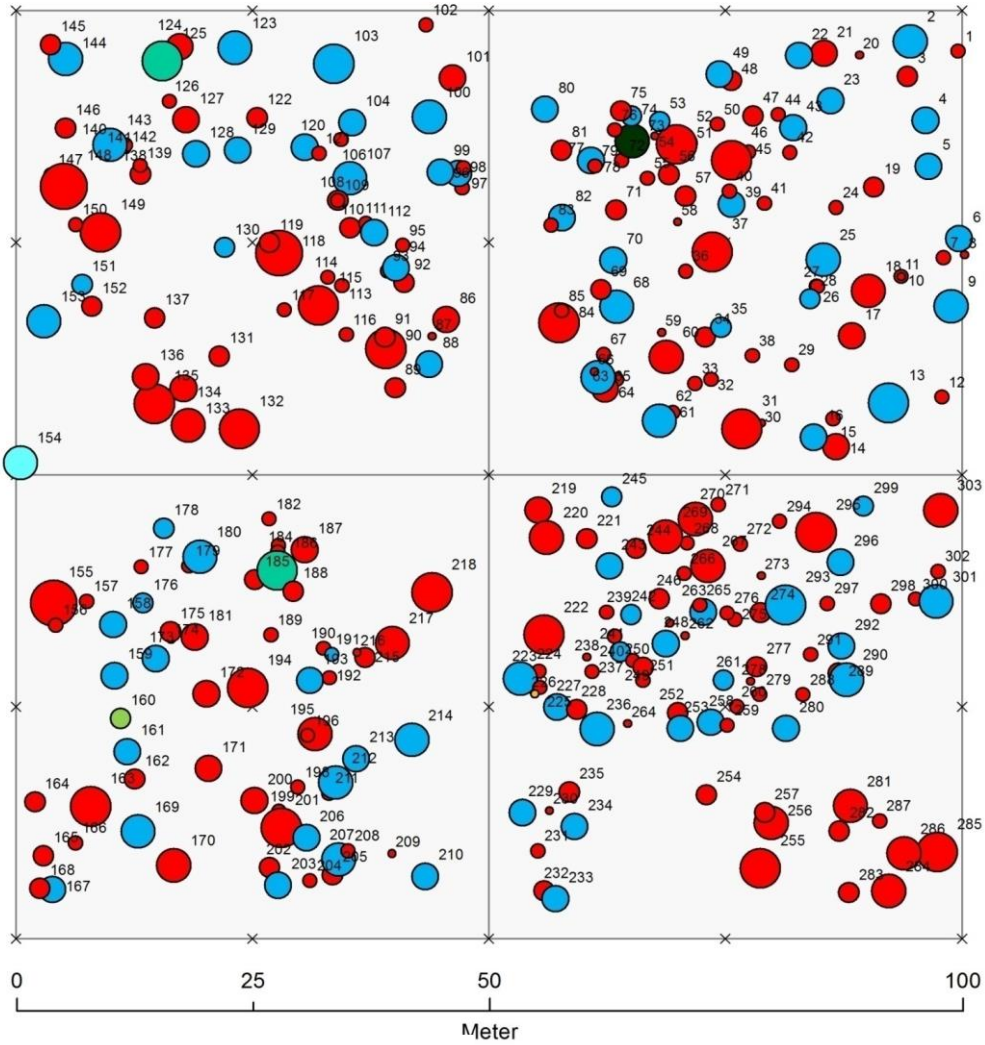



The **economic value (in €)** is estimated for each tree based on volume, stem quality and corresponding local timber price lists.

The **habitat value (in points)** is assessed for each tree based on tree microhabitats, taking into account rarity of each habitat and duration for it to develop.

The evaluation of the habitat value is based on a comprehensive catalogue of tree microhabitats. It comprises 23 saproxylic and epixylic features such as cavities, large dead branches, cracks and loose bark, epiphytes, sap runs, or trunk rot characteristics. Tree microhabitats are of prime importance for specialized and often endangered forest species of flora and fauna.




**Tree species**

- Beech
- Oak
- Hornbeam
- Birch
- Larch
- Pine
- Spruce

**DBH (cm)**

- 8,9 - 15,0
- 15,1 - 25,0
- 25,1 - 35,0
- 35,1 - 45,0
- 45,1 - 55,0
- 55,1 - 65,0
- 65,1 - 75,0

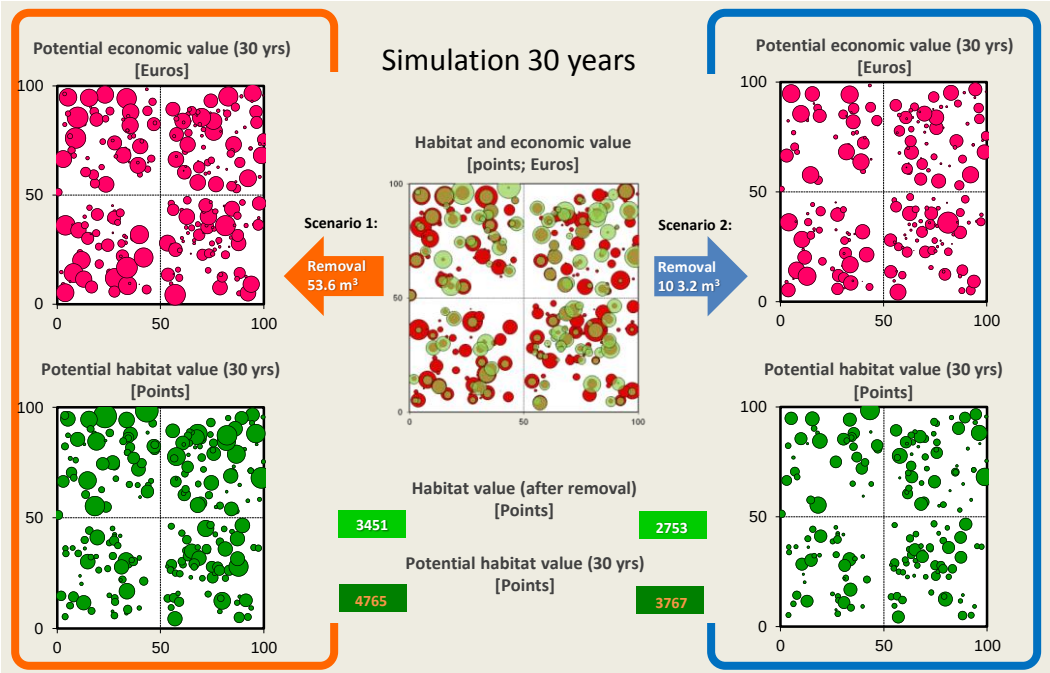
N

# Example of interventions

A simulation of virtual tree selection exercises in the Marteloscope with two different management approaches shows that a careful removal of competitor trees is able to ensure the maintenance of the ecological potential of the stand (Scenario 1). A drastic reduction of badly formed trees will finally reduce most biodiversity relevant structures even if habitat trees are selected before harvesting (Scenario 2).

**Scenario 1:** - Selection of 36 future crop trees and 24 habitat trees, harvesting of 28 competitors
- Monetary value of trees selected for cutting approx. 4,488 €

**Scenario 2:** - Focal cut on badly formed stems, retention of habitat trees, harvesting of 74 trees
- Monetary value of trees selected for cutting approx. 8,068 €



Integrate+ is a demonstration project funded by the German Federal Ministry of Food and Agriculture (BMEL) to establish a European network of demonstration sites for the integration of biodiversity conservation into forest management.

The Integrate+ project runs from December 2013 to December 2016 and builds on a partner network from research and practice with a focus on implementation of integrative management and enhancing transnational exchange of experiences.

Kraus, D., Schuck, A., Mergner, U., 2015. The Steinkreuz Marteloscope field guide. Integrate+ Technical Paper No. 2. 12 p.

European Forest Institute, 2015

www.integrateplus.org