



The **Královský hvozd** Marteloscope

Field guide



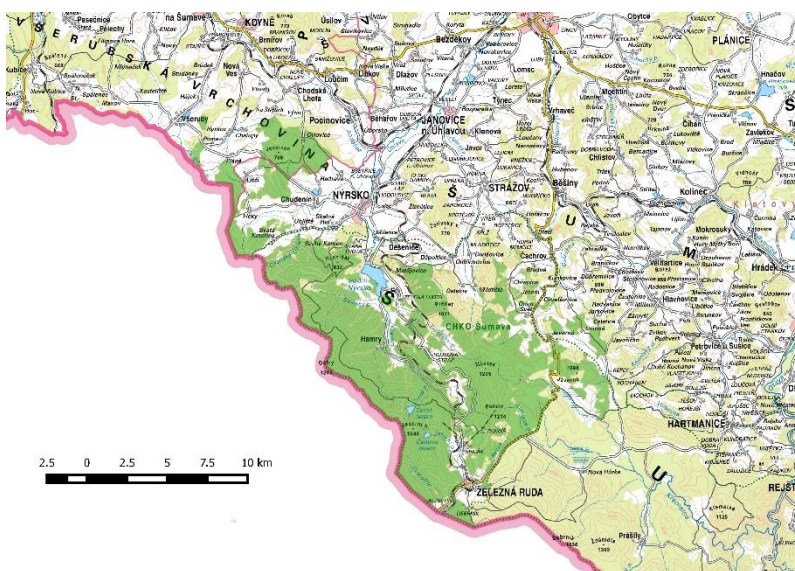
The Královský hvozd Forest Complex

Královský hvozd (Royal Deep Forest) is part of the Šumava (Bohemian Forest) border area. It is situated in the southwest of the Pilsen region in the district of Klatovy. It is divided into two forest districts – Železná Ruda and Klatovy Forest District. They are organizational units of the state enterprise Lesy ČR (Forests of the Czech Republic). Most of the forest area is regarded as “*Hercynian mixed forest*”, where the representation of spruce (*Picea abies*) in both natural and target species composition gradually increases with higher altitudes. The share of silver fir (*Abies alba*) remains rather constant while the proportion of beech (*Fagus sylvatica*) varies based on altitude and soil fertility.

Forest management builds on close to nature principles giving economic and ecological functions equal importance. Locally management decisions, may vary based on site conditions and silvicultural aims. Forests of the Královský hvozd are regenerated naturally by applying the shelterwood system. A high proportion of protection forests and special-purpose forests influence management considerably. The same applies to the ‘*Šumava Protected Landscape Area*’, which incorporates the entire territory of the Královský hvozd.

In January 2007 the hurricane Kyrill caused extensive damage to Královský hvozd. Especially affected were the spruce stands in the higher elevations.

Noteworthy is the importance of Královský hvozd as one of the most popular recreational forest areas besides that of the ‘*Šumava National Park*’ with a high number of visitors every year.



15,003 ha

Total forest area

8 m³/ha

Annual increment

320 m³/ha

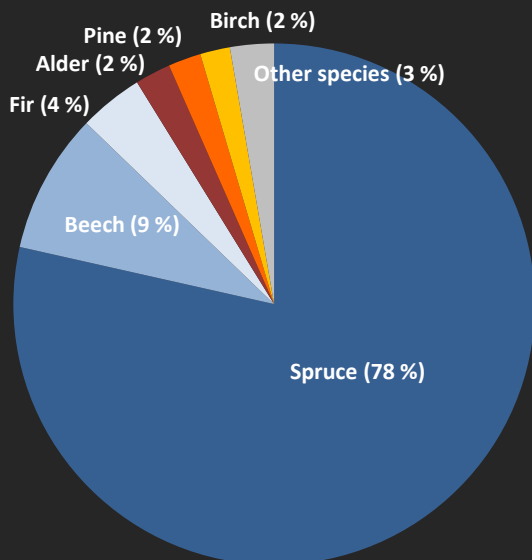
Actual average stock

14 %

Broadleaves

86 %

Conifers



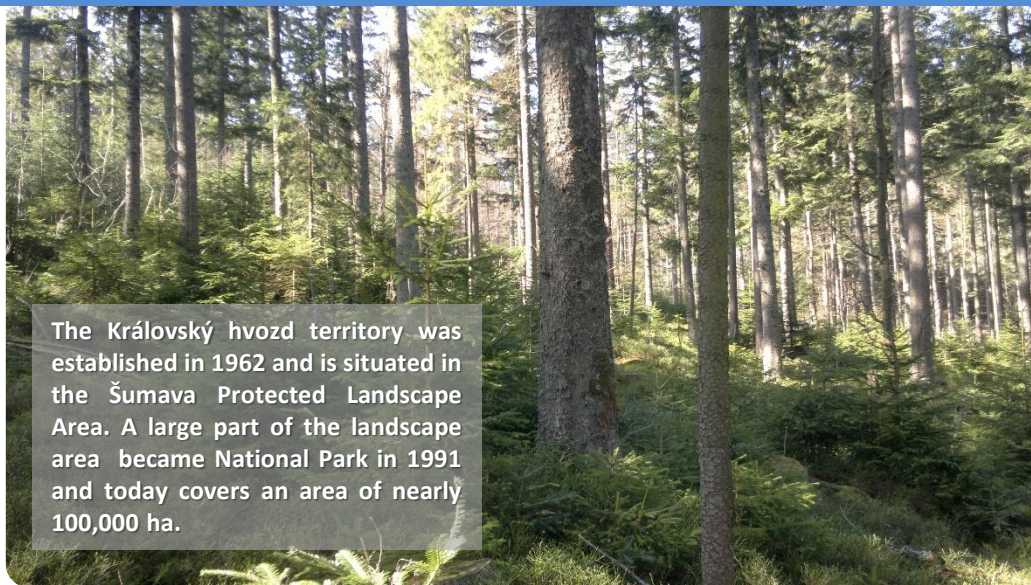
119,587 m³

is the annual increment measured over the total forest area

7.2 m³/ha

is the annual cutting-rate

Šumava Protected Landscape Area



The Královský hvozd territory was established in 1962 and is situated in the Šumava Protected Landscape Area. A large part of the landscape area became National Park in 1991 and today covers an area of nearly 100,000 ha.

Šumava Protected Landscape Area

Aim in the Šumava Protected Landscape Area (PLA), encompassing forests, agricultural land and water bodies, is the conservation and balancing of all landscape values including its characteristic landscape, typical features and natural resources.

National Nature Reserves

There are two National Nature Reserves (NNR) in the PLA. The NNR Bílá strž (White Ravine) extends across 77 ha. It is a deeply incised rocky valley of the Bílý potok Brook with numerous, rapids and a waterfall. Forests are composed mainly of herb-rich beech forests, mountain acidophilous beech stands and azonal spruce stands. Bílá strž has also been included in the Šumava Site of Community Interest.

The second NNR includes the lakes Černé jezero and Čertovo jezero and the Jezerní hora Mountain (1343 m a.s.l.).

It was legally established already in 1933 and comprises 208 ha. Bedrocks are muscovite-biotite mica schists with intercalated beds of quartzite and quartzite mica schists. The natural forest communities of mountain spruce, acidic beech and geological features such as glacier cirques, screes and boulder fields with standing oligotrophic waters of glacier lakes represent habitats of many rare and threatened plant and animal species. Populations of the lake quillwort (*Isoetes lacustris*) are critically threatened as are their habitats.

There are 205 green and blue-green algae species. Further many important moss and lichen species can be found. Of particular interest are the occurrence of the mosses *Rhabdoweisia crenulata* and the similarly rare *Plagiothecium neckeroideuma*. The fungus *Phellinus nigrolimitatus* which grows on the trunks of fallen spruce trees is found as well as *Camarops tubulina*.

More than **80 %**
of the total area have protection status of
varying types including designation overlaps

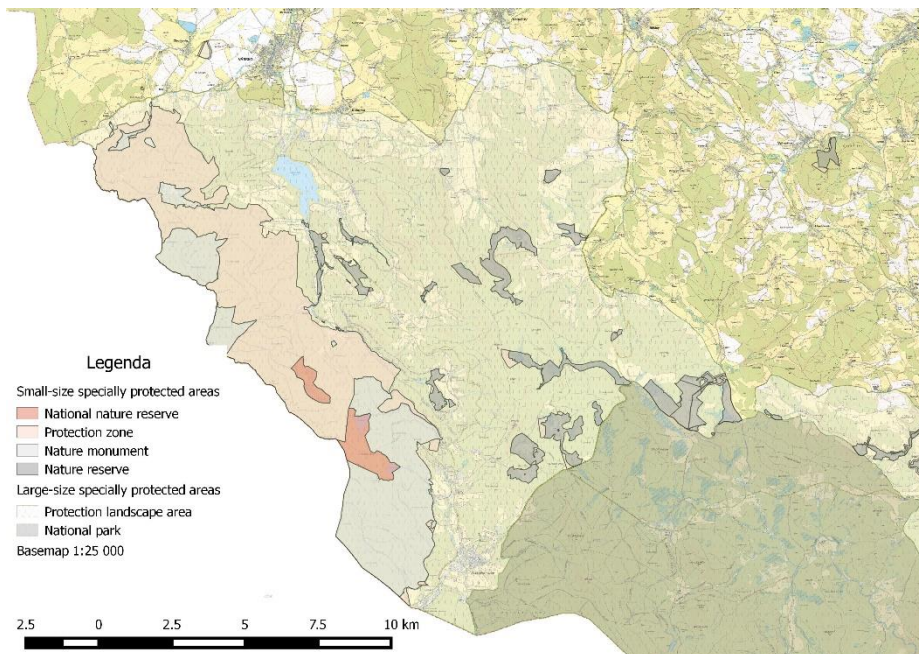
2 %
of the total forest area are
strictly protected (284 ha)

2,077 ha
are designated as natural park
'Královský hvozd'

770 ha
are gene pool reserve for beech,
fir and spruce

13,224 ha
are Sites of Community Interest
according to Natura 2000

9,037 ha
are Special Protection Areas
according to Natura 2000



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.

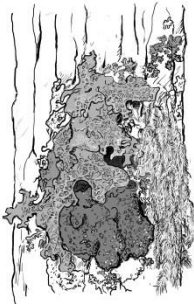
Bark loss



Crown deadwood



Epiphytic foliose and fruticose lichens



Root buttress cavities



....and biodiversity



Picoides tridactylus



Ficedula parva



Ampedus auripes



Cladonia botrytes



Rhabdoweisia crenulata



Phellinus nigrolimitatus

Site conditions

Altitude:	850 -980 m.a.s.l.
Forest ecological region:	13 - Šumava
Soil	Podzols
Site description:	Schists and gneisses
Mean annual temperature:	3.7 – 6.5 °C
Annual precipitation:	860 - 1000 mm
Natural forest community:	<i>Piceeto – Fagetum acidophilum</i>

*The most common natural forest community in the forest altitudinal vegetation zone 6 of the Hercynian mountain ranges. Occurs mainly on hillsides and upper parts of convex slopes. It is bound to acidic silicate rocks, poor in minerals, namely granites, gneisses, phyllites and mica schists. Entic Podzols represent the characteristic soil type. The tree layer is formed by *Picea abies*, *Abies alba* and *Fagus sylvatica* with the admixture *Sorbus aucuparia*. Beech occurs on the boundary of its ecological amplitude. Its representation decreases with altitude and dominance of spruce.*

*The undergrowth is poor in diversity and formed exclusively by oligotrophic species. Dominant is *Calamagrostis villosa* but also present in high cover are *Avenella flexuosa*, *Luzula sylvatica*, *Vaccinium myrtillus*, *Homogyne alpina* and *Oxalis acetosella*. Other characteristic mountain species frequently found are *Blechnum spicant*, *Lycopodium annotinum* and *Athyrium distentifolium*.*

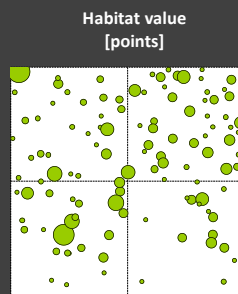
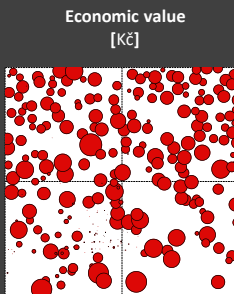
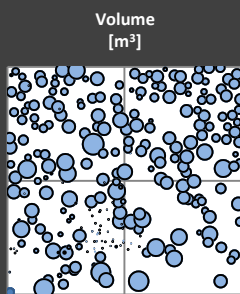
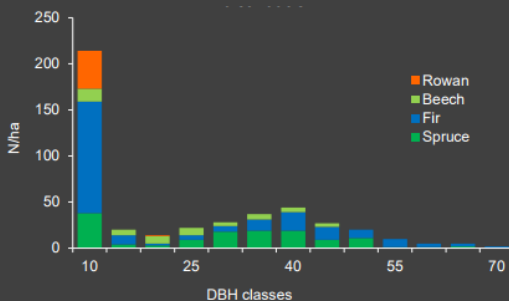


Stand characteristics

The **Královský hvozď** Marteloscope is located in a spruce dominated mountain forest mixed mainly with beech and silver fir.

Stand data

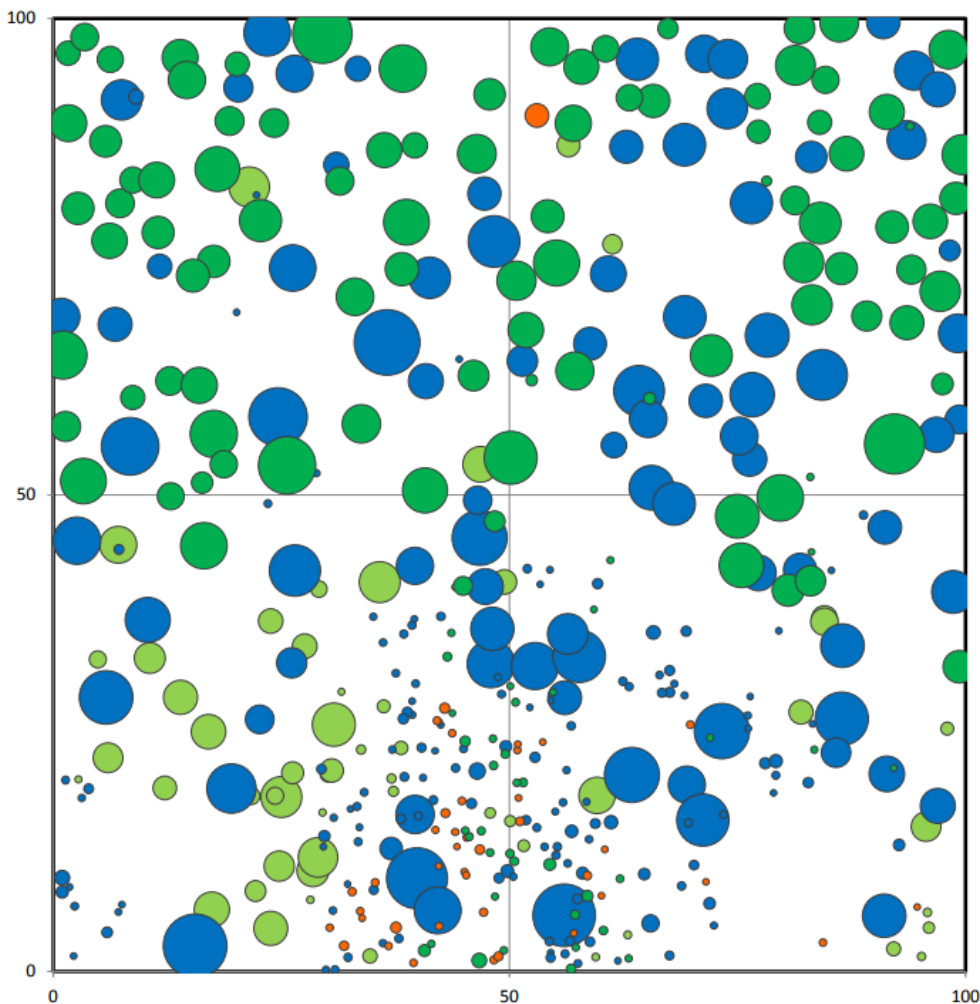
N [stems/ha]	448
BA [m ² /ha]	28.7
Volume [m ³ /ha]	329
Habitat value [points]	1,092
Economic value [Kč]	611,910.-



The **economic value (in Kč)** 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

- Rowan
- Beech
- Fir
- Spruce

DBH (cm)

- | | |
|---------------|-----------------|
| ○ 7,5 - 15,0 | ○ 65,1 - 75,0 |
| ○ 15,1 - 25,0 | ○ 75,1 - 85,0 |
| ○ 25,1 - 35,0 | ○ 85,1 - 95,0 |
| ○ 35,1 - 45,0 | ○ 95,1 - 105,0 |
| ○ 45,1 - 55,0 | ○ 105,1 - 115,0 |
| ○ 55,1 - 65,0 | |



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.



Lehnerová, L., Schuck, A., Kraus, D., 2016. The Královský hvozď Marteloscope field guide. Integrate+ Technical Paper 14. 12 p.

European Forest Institute, 2016

www.integrateplus.org