Královský hvozd & Čečiny

Demonstration sites

Field guide

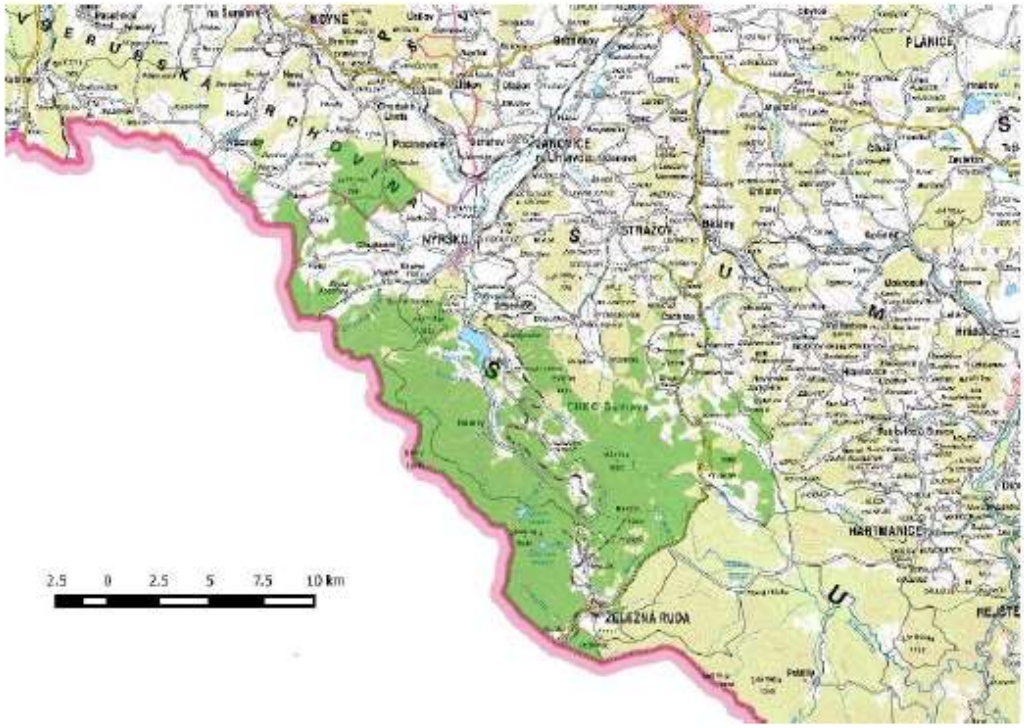
The Královský hvozd Forest Complex

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.



… in figures

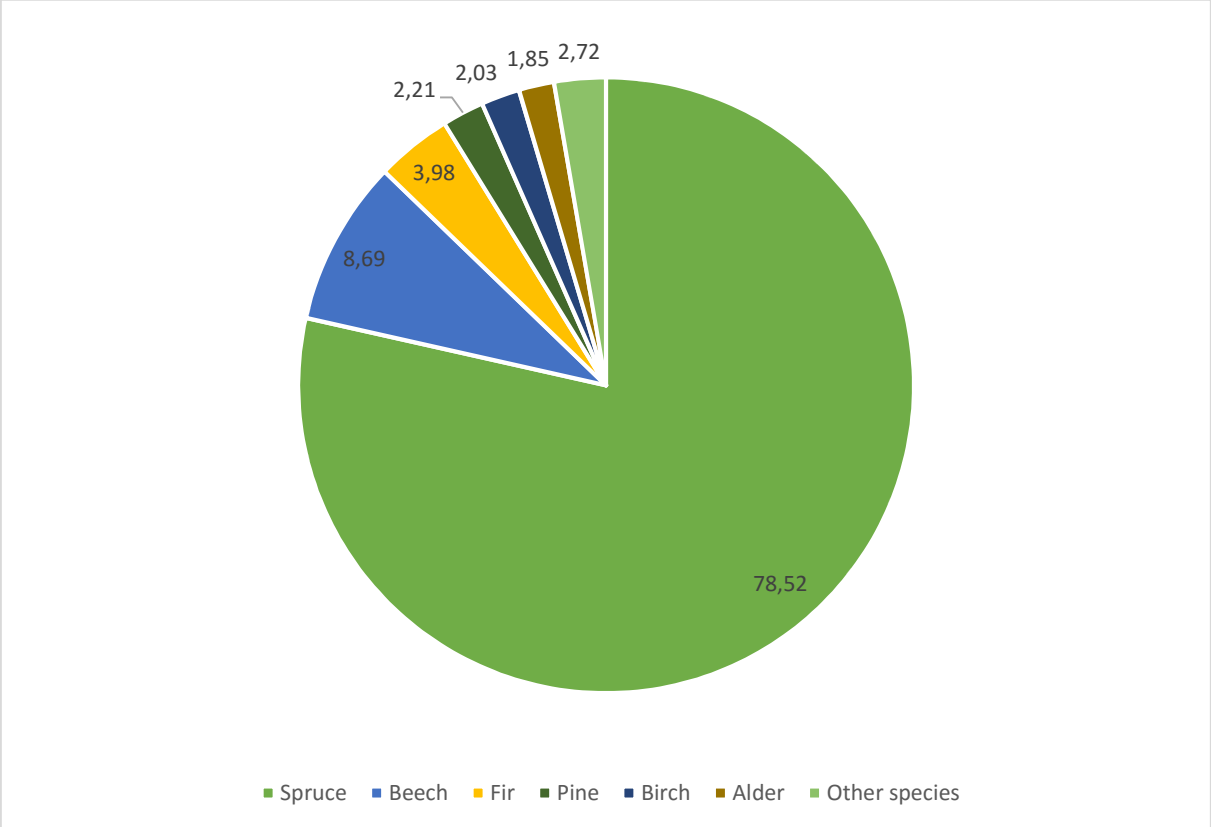
Total forest area: 15,003.04 ha

Annual increment: 7.97 $m^3.ha^{-1}$

Actual average stock: 320.19 $m^3.ha^{-1}$

Annual increment measured over total forest area:

119,587 m^3



Annual cutting-rate: 7,22 $m^3.ha^{-1}$

14 % Broadleaves and 86 % Conifers

Šumava Protected Landscape Area

The Královský hvozd territory is situated in the Šumava Protected Landscape Area, which was established already in 1962. In 1991, a large part of the PLA was transferred to a national park. The area of the Šumava PLA without the national park has a size of 99 624 ha. Its mission (subject and aim of protection) is the conservation of all values of the landscape, its appearance, typical features and natural resources, and the creation of well-balanced environment. Typical features of the landscape are particularly its surface shaping including water surfaces and watercourses, vegetation cover and wildlife, layout and use of the forest and agricultural land resources, as well as the layout and urban composition of settlements, architecture and local developments of folk character.

There are two national nature reserves (NNR) in the territory. The first of them is Bílá strž (White Ravine), in which the subject of protection is a deeply incised rocky valley of the Bílý potok Brook with numerous bed drops, rapids and a waterfall. Local native forest stands are formed mostly by herb-rich beech forests, mountain acidophilous beech stands and azonal spruce stands, types of natural sites and species for which the Šumava Site of Community Interest was decreed by another legal regulation, and which occur in this National Nature Reserve. The area of this NNR decreed in 1972 is 76.7 ha.

The other national nature reserve comprises the Černé jezero Lake and the Čertovo jezero Lake. Bedrocks are muscovite-biotite mica schists with intercalated beds of quartzite and quartzite mica schists. At the feet of amphitheatres, quaternary sediments of periglacial character and drifts have been preserved. The protected area includes the Černé jezero Lake, the Čertovo jezero Lake and the Jezerní hora Mt. (1343 m a.s.l.) situated between the two lakes. In the west, it reaches as far as to the state border. The natural forest communities of mountain spruce, acidic beech, glacier cirques, screes and boulder fields with standing oligotrophic waters of glacier lakes represent the habitats of rare and threatened plant and animal species, especially populations of the critically threatened lake quillwort (Isoetes lacustris) and its biotope. There are 205 green and blue-green algae species occurring in the locality as well as important moss and lichen species. The NNR is the only locality with the crenulate Rhabdoweisia moss (Rhabdoweisia crenulata) and the similarly rare Plagiothecium neckeroideuma, rare white wood fungus Phellinus nigrolimitatus growing on the trunks of fallen spruce trees, or shear Camarops tubulina. The area of this NNR decreed already in 1933 is 208.5 ha.

Protection in figures

86 % territory of natural protection (overlays)

2 % without forest management (reserves)

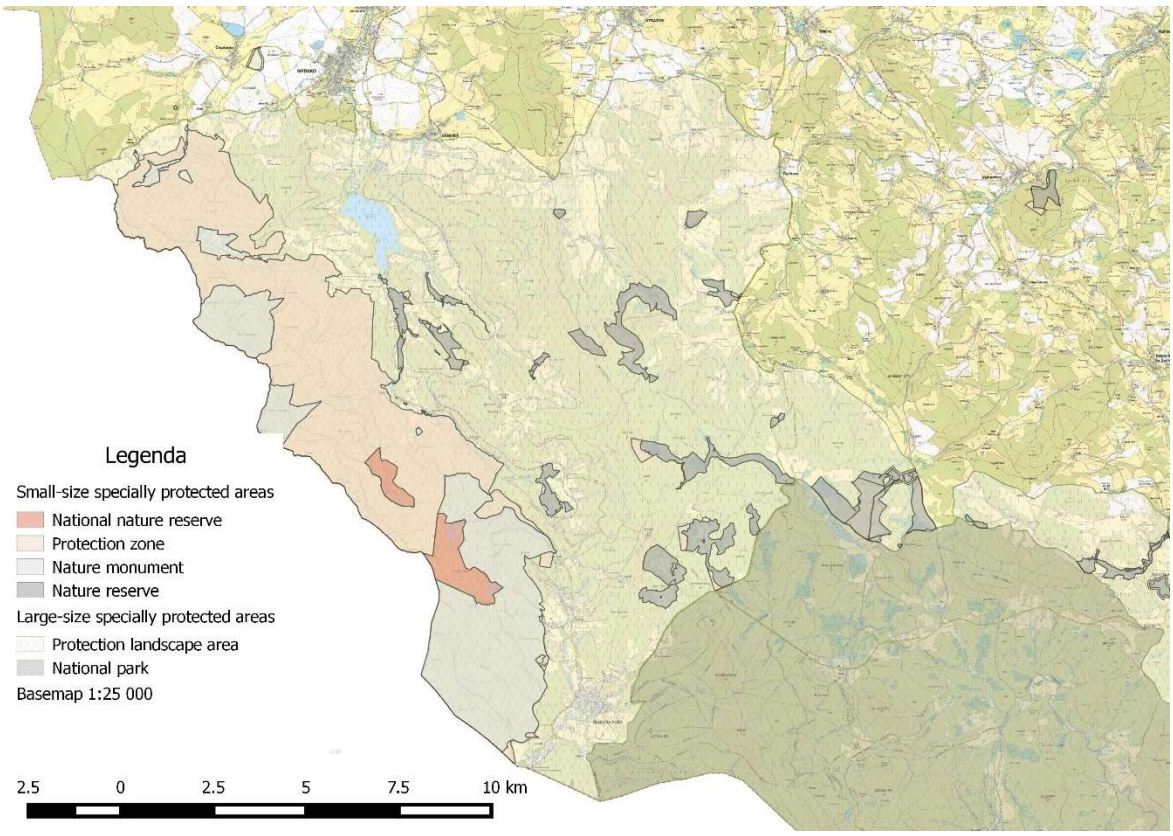
284.1 ha national natural reserves

2,076.6 ha natural park Královský hvozd

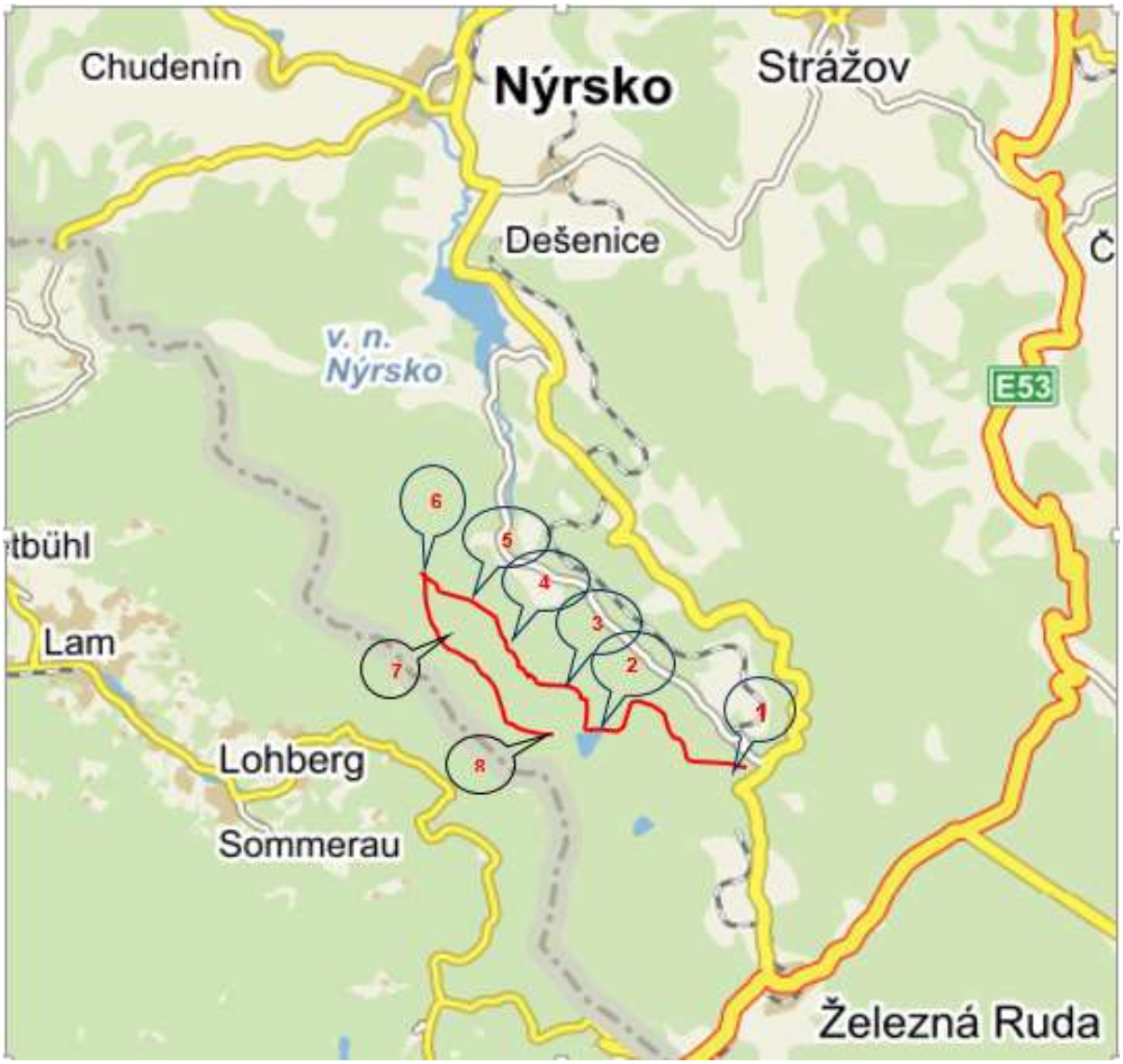
770.14 ha gene pool beech, fir and spruce

13,223.89 ha Sites of Community Importance (Natura 2000)

60 % Special Protection Area (Natura 2000) – 9,037.2 ha



Overview map – the demo site Královský hvozd



Site 1. "Špičák"

Špičák is an example of a shelterwood system for over 20 years with a focus on the growing stock and natural regeneration of the desired species composition. Originally there was only one part of the stand (1996) with a gradual natural regeneration under shelterwood. The high quality / large-diameter stand is in a phase of gradual release of the advance growth of beech, spruce and fir with an admixture of sycamore, birch, larch and rowan. It also serves as a gene pool for spruce and fir. Spruce is reduced (old trees) to support fir and beech. The cutting was conducted after the revision of the forest management plan in years 2014 and 2015 (irregularly in the stand plot, 87 m^3. ha^{-1}).
The Marteloscope of Integrate+ was placed there in 2015 (1 ha).

Suggestion:

- no removals in the upper storey of the Marteloscope
- gradual shelterwood felling in the rest of the stand (old trees of spruce),
- maintaining of condition for regeneration of fir and beech
- thinning in the younger parts of the stand with focus on the suitable species composition.
- remove only the interspersed rowan by the threat of the target tree species.

Stand information:

- Acidic Spruce-beech
- Current age: 130 / 11 / 16 years
- Area: 18.08 ha
- Altitude: 820 – 860 m a.s.l.

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Spruce	65	37	31	1.39	30 / 2	342
Fir	20	42	30	1.88	28 / 2	105
Beech	15	30	24	0.74	22 /6	39
Total						**486**

Natural regeneration of spruce-fir-beech stand (Photo taken 2014)

Site 2 – "Černé jezero" (1008 m a.s.l.)

Stand No. 1: The Lake Wall

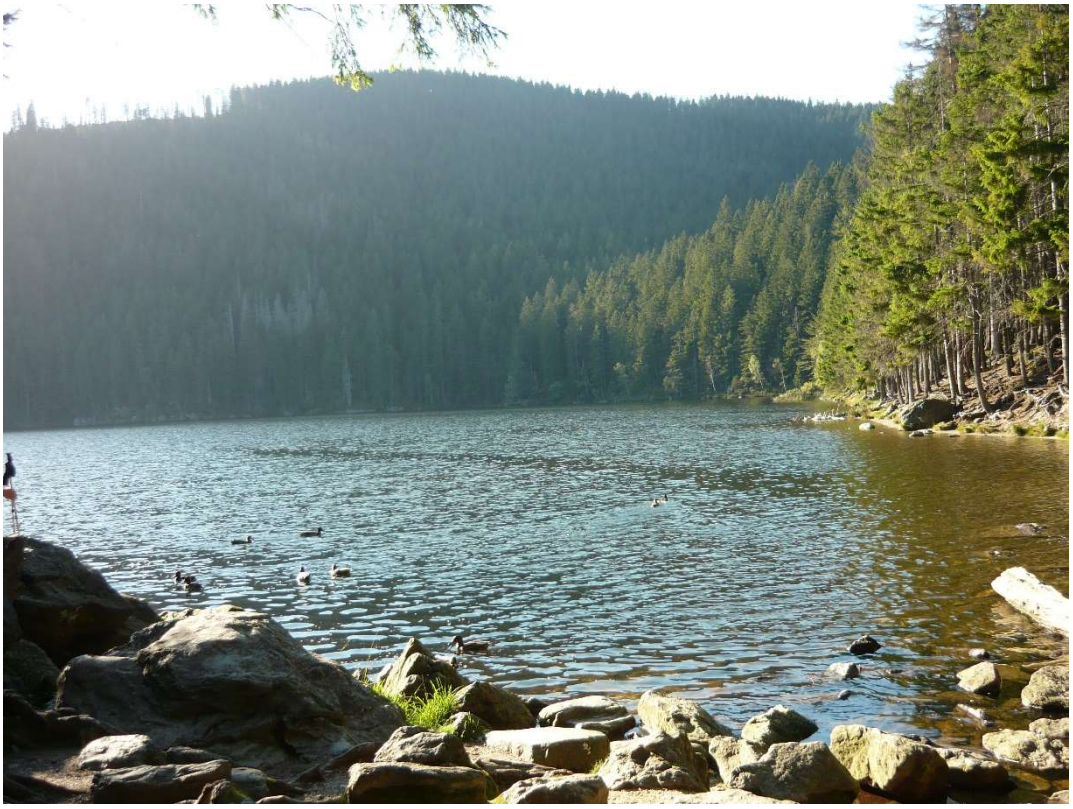
National nature reserve. The forests along the cirque stretch over 40 ha.
The cirque is non-intervention management area. The individual trees attacked by bark beetle have been killed in the nineties. The large expansion of bark beetle trees recently.

Stand information:

- Skeletal Beech-spruce
- Current age: 180 years
- Altitude: 1008 – 1326 m a.s.l.

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Spruce	100	35	24	1.05	22 / 8	314



View over the "Černé jezero" (Photo taken 2014)

Stand No. 2: The natural regeneration

It is an overmature stand with large diameters and uneven-aged undergrowth (from 19 to 35 years) of spruce, fir, beech, birch, willow and rowan. There is a release of advanced growth in agreement with Protected Landscape Area (PLA) which leads to a structured stand.

Stand information:

- From moist to stony Beech-spruce
- Current age: 168 years

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Spruce	85	43	32	2.06	30 / 3	528
Fir	10	48	32	2.79	28 / 2	65
Beech	5	46	28	2.41	26 / 2	20
Total						621

Site 3 – border between forest districts Klatovy and Železná Ruda (1108 m a.s.l.)

Stand No. 1: Forest district Železná Ruda

A shelterwood felling was realised in 2003, focused on the selection of spruce (requirement of PLA), salvage and bark beetle logging followed. The felling released the natural seeding, increased share of light use mainly spruce and rowan. Spruce dominates in natural regeneration, but fir has also fairly high share.
There is advanced growth of spruce and fir in age of 4 – 17 years, admixture of beech and rowan. The rests of the original stand meanwhile belongs to the retention trees (mainly beech).

Stand information:

- Acidic Beech-spruce
- Current age: 120 / 17 years
- Altitude: 1000 – 1080 m a.s.l.

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Spruce	52	39	29	1.56	28 / 4	320
Fir	12	38	28	1.61	28 / 2	73
Beech	36	28	26	0.80	26 / 5	132
Total						525

Stand 1: The advanced growth of spruce and fir (Photo take 2014)

Stand No. 2: Forest district Klatovy

The forest management plan from 2004 outlined: spruce monoculture with large diameter and admixture of fir and beech, irregular undergrowth of spruce (1 – 3 m height), fresh sheltrewood felling, and natural seeding of spruce, fir and beech. The felling by harvester was concentrated on the reduction of spruce. Salvage logging followed the windstorm Kyrill.
2014 – retention trees of beech (fir), group rests of the original stand (spruce, beech). Natural regeneration of spruce and rowan, fewer fir and beech in groups . Fir and beech are protected from game browsing.
Goal of site:
impacts of windstorm Kyrill on the stands, where the share of spruce was systematically reduced. Natural regeneration under (fir, beech) and within (spruce, rowan) the original stand.

Stand information:

- Acidic Beech-spruce
- Current age: 115 / 21 years
- Altitude: 1050 – 1090 m a.s.l.
- Area 0.77 ha + 0.75 ha

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Spruce	53	37	23		22	108
Beech	39	35	22		22	56
Fir	8	59	24		22	18
Total						182


Stand 2: Natural regeneration (Photo taken 2014)

Stand No. 2: Initial phase of shelterwood system

Large diameter spruce stand with admixture of fir and beech. All-over sparser natural regeneration of spruce (fir and beech) creates gradually another storey. The incidental felling only this century. Several Arolla pine (*Pinus cembra*) on the border of the stand. The stand is without a targeted regeneration, the sparse natural regenration of fir and beech established only in gaps after the incidental felling.

Stand information:

- Acidic Beech-spruce
- Current age: 137 years
- Altitude: 1090 – 1140 m a.s.l.
- Area: 4.23 ha

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Spruce	96	30	25		24	364
Fir	2	31	24		22	8
Beech	2	27	22		20	5
Total						377

Stand 2: Initial phase of shelterwood system (Photo taken 2014)

Site 4 National nature reserve „Bílá strž“

Stand No. 1: Stand nearby reserve with the forest management

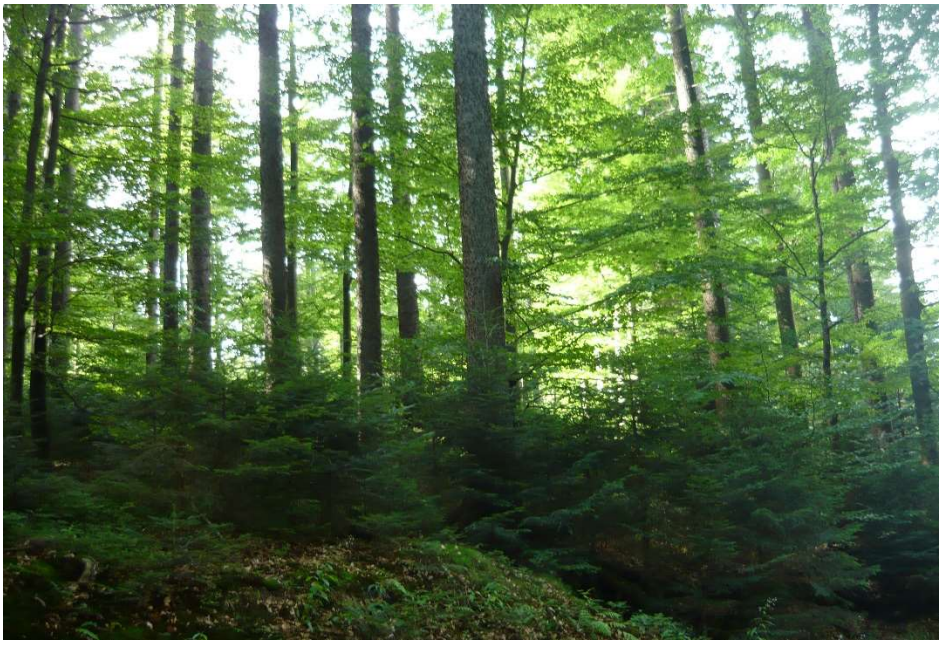
The high quality / large diameter stand is in a phase of gradual release of advanced natural regeneration of spruce, fir and beech (age 4 – 5 years). Shelterwood-strip felling was applied with the reduction of spruce and the retention of fir and beech. Spruce dominates in the area of the shelterwood-strip felling, fir in shaded parts and beech in lighter parts of the stand.
Aim of demonstration object: Using natural regeneration in a shelterwood system by creating a so-called hercynian mixture (spruce-fir-beech).
Suggestion: If we required higher composition of beech and fir in regeneration, it is preferable higher stand density to the time, when the fir and beech will be ahead enough of spruce. After that it can be reduced the stand density to support of regeneration of spruce.

Stand information:

- Acidic Spruce-beech
- Current age: 138 / 15 / 4 years
- Area: 12.96 ha
- Altitude: 960 – 1060 m a.s.l.

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	70	38	30	28	351
Beech	20	31	27	26	62
Fir	10	39	29	26	51
Total					464



Phase of gradual release of advanced natural regeneration (Photo taken 2014)

Stand No.2: National nature reserve "Bílá strž"

Without management.

Stand information:

- Stony-acidic Spruce-beech
- Current age: 142 years
- Area of stand - 16.34 ha
- Altitude: 900 – 980 m a.s.l.

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	60	40	32	30	373
Beech	25	30	28	26	92
Fir	15	44	32	30	96
Total					561

Site 5 – „horizontála" (horizontal line)

Stand No.1: Highly structured stand

Highly structured stand, low increment due to high age.
Stand structure results from management in so-called hercynian mixture (spruce-fir-beech).
Regeneration combines shelterwood system with a narrow cutting strip (cableway).

Suggestion: gradually continue with stand regeneration (combination shelterwood feeling with a narrow cutting face), preference of highly structured stand (fir and beech)

Stand information:

- Acidic Spruce-beech
- Current age: 161 / 25 years
- Area: 3.98 ha
- Altitude: 960 – 1030 m a.s.l.

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	75	39	31	28	324
Fir	12	40	30	26	70
Beech	12	30	26	24	35
Larch	1	39	30	28	4
Total					434

Stand 1: Highly structured stand, low increment due to high age. (Photo taken 2009)

Stand No.2:
Stand results from natural regeneration in the phase of established young growth in continuation of the adjacent older stand (216 A 16/3). A narrow cutting strip was used (cableway).

Stand information:

- Acidic Spruce-beech
- Current age: 13 years
- Altitude: 900 – 940 m a.s.l.

Species composition:

Species	Composition %	DBH(cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	85		2	28	
Fir	10		1	26	
Beech	5		1	24	

Stand 2: Cutting strip for cableway (Photo from 2009)

Stand No.3: Above the road

Uneven-aged stand with sparse large diameter trees in advanced regeneration. Last intervention focused on removal of spruce (requirement from PLA), and shelterwood regeneration (cableway). The regeneration of the cutting face (217 A – below the road) and the shelterwood regeneration (217 C – above the road) can be compared. Although currently beech dominates, gradual dominance of spruce in future can be assumed.

Stand information:

- Acidic Beech-spruce
- Current age: 158 / 7-23 years
- Area 10.98 ha
- Altitude 940 – 1000 m a.s.l.

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	80	36	27	26	297
Fir	15	41	27	24	59
Beech	5	37	25	24	15
Total					371

Site 6: "Stateček" (958 m a.s.l.)

Photo: View from Stateček to the Úhlava valley, ridge Prenet in background (Photo taken 2009)

Stand No. 1: Artificial regeneration

Originally a large stand of spruce with fir and some beech. Salvage felling was implemented in addition to the planning cut during the nineties. Stand originates from those management measures. The large part of the area, about 5 ha, is regenerating naturally with spruce and interspersed fir. The artificial regeneration of beech, fir and elm is implemented at higher elevation near "Stateček".

Stand information:

- Acidic spruce - beech forest
- Altitude: 900 – 958 m a.s.l.
- Age: 6 – 25 years
- Area size: 5 ha

Species composition:

Species	Composition %	DBH (cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	82 - 100	-	1 - 12	28	-
Fir	0 - 15	-	1 - 3	26	-
Beech	0 - 3	-	1	26	-

Stand 1: Artificial regeneration (Photo taken 2009)

Stand No. 2: Multi- layered forest

Stand displaying large-diameters trees of varying ages. Natural regeneration of spruce, fir and beech is implemented based on the shelterwood system. Interspersed pines occur. Fir has reached the crowns of the original stand.

Stand information:

- Acidic spruce - beech forest
- Altitude: 900 – 958 m a.s.l.
- Age: 144 / 15 years
- Area: approx. 9 ha

Species composition and volume:

Species	Composition %	DBH (cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	75	36	30	28	321
Fir	24	39	27	24	102
Beech	1	29	25	24	4
Total					427

Stand 2: Multi layered stand and logging operations (Photo taken 2009)

Stand No. 3: High structural diversity

Stand with high structural diversity and large-diameter trees. Regeneration is in an advanced state. Gene pool area for spruce and beech. A combination of shelterwood felling and 'strip cutting' (cableway) were applied for the original stand.

Stand information:

- Acidic Spruce-beech
- Altitude: 940 – 970 m a.s.l.
- Age: Older stand 149 / 67 / 25 years; younger stand 10 / 15 years
- Area approx. 10 ha

Species composition and volume

Species	Composition %	DBH (cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	80	38	31	28	351
Fir	15	40	30	28	68
Beech	5	36	27	24	22
Total					484

Stand 3: Stand displaying high structural diversity (left) and former cutting along cable lines (Photo taken 2009)

Stand No. 4

Increment (10 m^3 ha^{-1} $year^{-1}$). Trees widely spaced with a number of family trees of fir and beech. The decaying deadwood.

Stand information:

- Acidic spruce - beech
- Altitude 960 – 1020 m a.s.l.
- Current age: 60 years
- Area: 3.81 ha

Species composition and volume:

Species	Composition %	DBH (cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	100	23	22	28	391

Site 7 - from „Stateček“ to „Konečná“

Stand 1: Calamity and bark beetle cutting

In this stand salvage logging has taken place. In some parts of the stand, fir has been preserved. Beech and spruce have been planted with some fir on the clearing after salvage logging. Natural fir regeneration was favoured in areas around existing old fir trees. A similar situation can be observed in neighbouring stands where the share of fir in older stand reaches 2 % while in the young plantation 30 % are fir.

Stand information:

- Acidic Beech-spruce
- Altitude: 1160 – 1140 m a.s.l.
- Age: 139 / 6 years
- Area: approx. 5 ha

Species composition and volume:

Species	Composition %	DBH (cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	98	32	24	22	396
Beech	1	30	21	20	3
Fir	1	34	23	20	4
Total					403

Stand 1. Stand affected by bark beetle calamity (Photo taken 2009)

Stand 2: Shelterwood system in hercynian mixture

Shelterwood system in so-called '*hercynian mixture'* (spruce-fir-beech). The large-diameter stand displays high quality and increment. Individual fir and beech trees are found in the stand. Promising natural seeding and healthy regeneration can be observed.

Stand information:

- Acidic Beech-spruce
- Altitude: 960 – 1060 m a.s.l.
- Age: 145 / 22 / 6 years
- Area: 14 ha

Species composition and volume:

Species	Composition %	DBH (cm)	Mean height (m)	Yield class	Volume pro ha (m^3/ha)
Spruce	55	37	28	26	280
Beech	30	28	25	24	93
Fir	15	40	28	26	82
Total					455

Stand 2: Shelterwood system in 'hercynian mixture'
(Photo taken 2009)

Site 8: Storm affected forest at high elevations - Šumava ridge

Forest stands located on the top ridge of Šumava in proximity to the state border on Germany. The coherent spruce stand were intact practically until the end of the last century. More frequent and severe storms during the new millennium have caused increased windbreaks and windfalls. During the storm Kyrill nearly all trees were blown down leaving only a few remnants from the original stands near the road to "Konečná". The current stand is developing from: planted beech (older trees:

originating mainly from former under-planting; younger trees: in groups originating from container planting), planted spruce (older and younger trees originate from growth container planting) and recently started container planting of rowan (Sorbus). Game protection is not implemented due to the high amount of snow cover (1.5 – 2.5 m).

Stand information:

- Acidic spruce
- Altitude: 1200 - 1329 m a.s.l.
- Age: remaining older stand of 190 years (approx. 0.5 ha) and other stands aged between 5 and 20 years
- Total area: 51 ha

Species composition on calamity area:

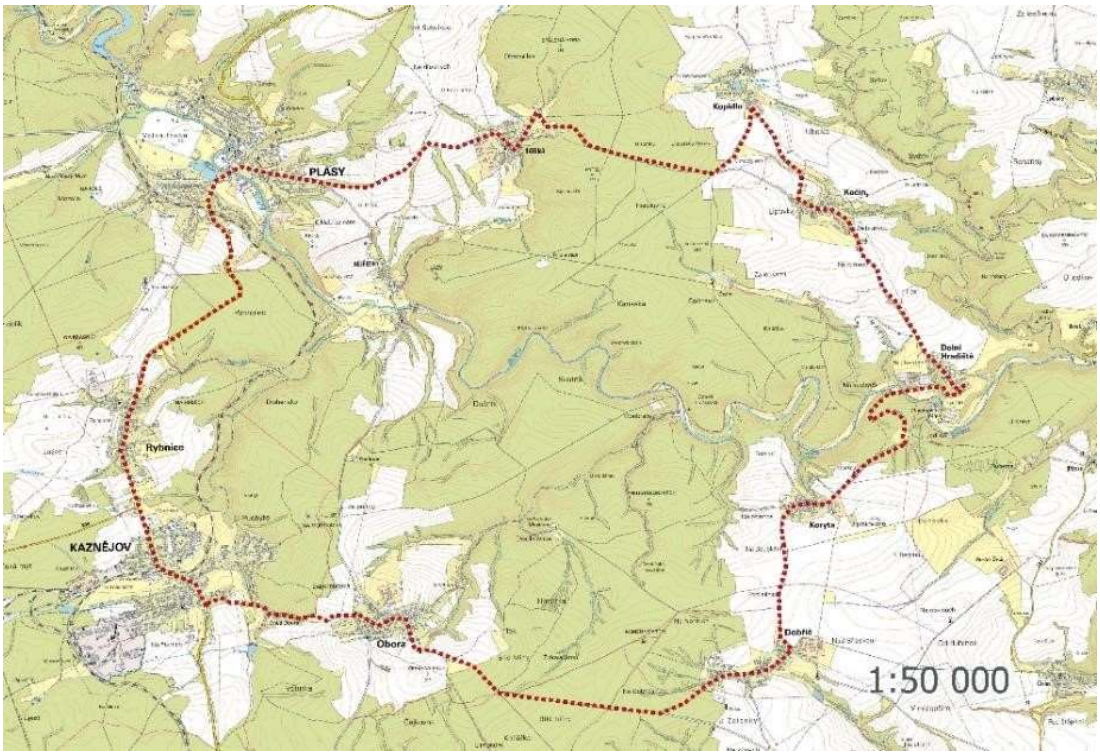
Species	Composition %	Mean height (m)	Yield class
Spruce	85 - 100	0 - 5	22 - 26
Fir	0 - 3	1	20
Beech	0 - 3	1	20
Rowan	+	1	16

Forest stand affected by windstorms, in particular Kyrill, 2007 (Photo taken 2009)

The Čečiny Forest Complex

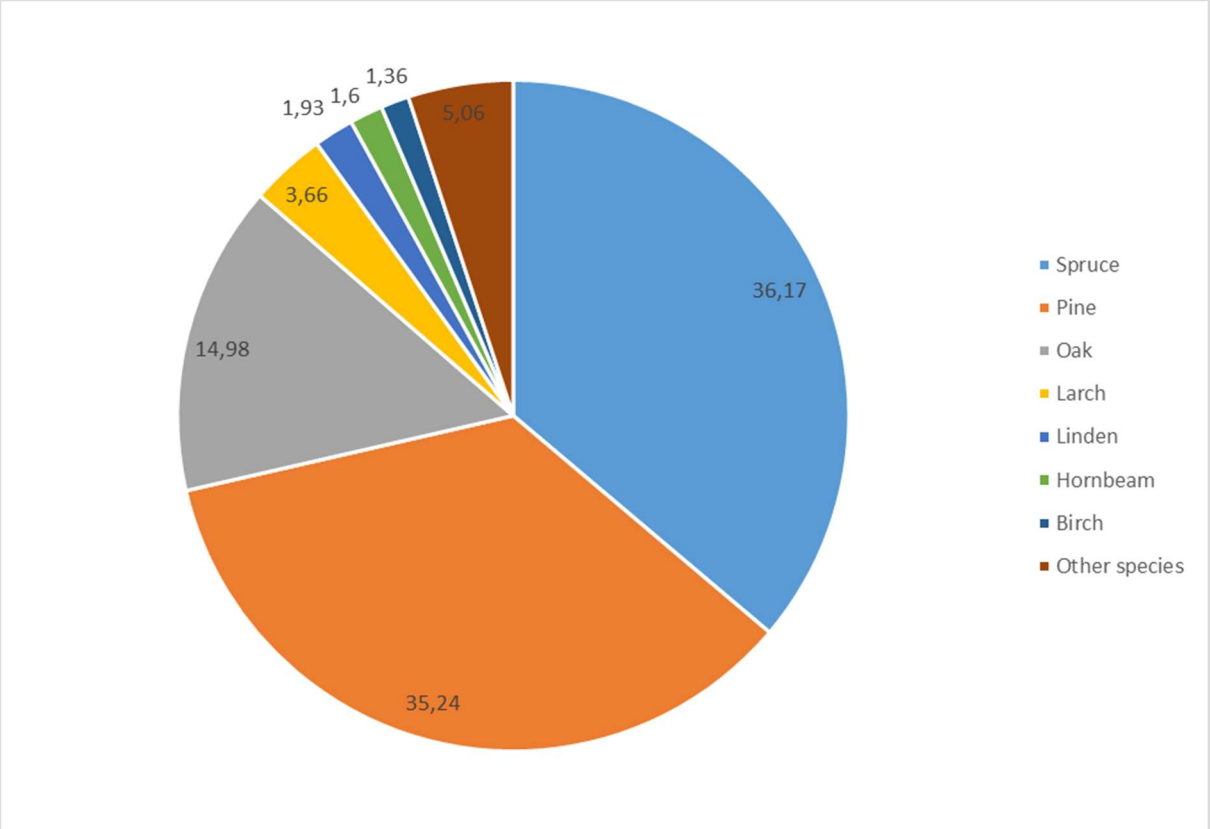
The Doubrava forest range is situated north of the regional capital Pilsen near the town of Plasy. The forest range is part of the Plasy Forest District and is managed by LČR (Forests of the Czech Republic – State Forests). The forest range extends along the river banks of the lower Střela River. It includes a gene pool area of sessile oak (approximately 413 ha), the 'Čečiny Forest Management Demonstration Object' and the Střela River Canyon' (Site of Community Interest). The total forest area comprises nearly 1600 ha.

Climate change, evolving global timber markets and increasing societal demands need to be reflected in forest management. For these purposes so called 'demonstration objects' were established which allow to compare different silvicultural systems with respect to their economic, ecological and social implications. Results from demonstration objects allow forest owners to compare silvicultural approaches and help them to select most suitable management measures that meet both their own objectives and those of society. The 'Čečiny Demonstration Object' focusses primarily on the oak management system in the Permian-carboniferous basin of the West-Bohemian Hills and includes e.g. (1) remnants of old oak stands, (2) a variation of tending approaches as research plots, (3) sites focussing on options for diversifying stand structure through natural regeneration, (4) investigating the effects of different stand structures on oak regeneration, (5) "in vitro" use of planting stock for less common tree species including cherry (Prunus avium), wild service tree (Sorbus torminalis) as well as different apple and pear species and (6) a designated oak gene pool area.



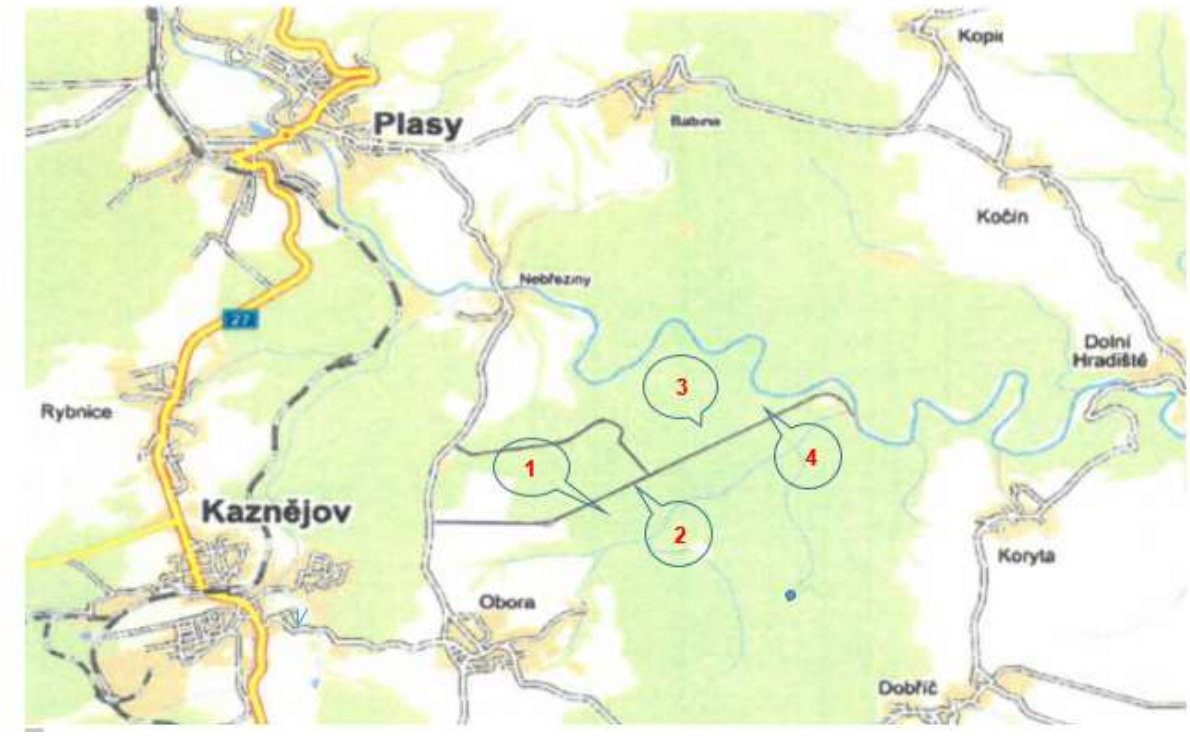
Forest complex in figures

- Total forest area: 1,594.16 ha
- Annual increment: 6.93 $m^3.ha^{-1}$
- Actual average stock: 241.4 $m^3.ha^{-1}$
- Annual increment measured over the total forest: 11,044.73 m^3



- Average annual cutting rate: 6.65 $m^3.ha^{-1}$
- 24 % Broadleaves 76 % Conifers

Overview map - the demosite Čečiny, Doubrava



Site 1: The Marteloscope

Mix high forest with a predominance of larch and sessile oak, partly a natural regeneration of sessile oak (0-2 m, 10-25 years), the gene pool of sessile oak. There is located the Marteloscope for Integrate+.

Stand information:

- Nutrient-medium Oak-beech
- Current age: 124 years
- Area 10.57 ha
- Stand density: 9

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Larch	40	32	29	1.05	28/1	190
Sessile oak	35	29	26	0.75	26/2	113
Spruce	12	27	27	0.68	26/4	57
Pine	8	35	27	1.05	26/3	32
Beech	5	37	29	1.39	28/3	20
Total						412

The stand with the Martelcoscope (Photo taken 2015)

Site 2: Gene pool of sessile oak

Stand 1: The stand after windstorm in 1999

The stand after windstorm in 1999, there have been no logging operations from the calamity time. The rotation period is 150 years. The phenotypic classification for sessile oak is A, other species B. The stand is the certified resource of the reproduction material, the selection category.
Example of stand with natural development after a wind calamity. The gene pool for sessile oak.

Stand information:

- Nutrient-medium Oak-beech
- Current age: 125 / 12 years

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Sessile oak	72	31	25	0.95	24/5	205
Larch	14	32	28	1.10	26/3	58
Pine	9	30	24	0.75	24/4	29
Spruce	5	30	26	0.87	24/6	22
Total D 12						314
Sessile oak	95				24/3	
Linden	5				28/1	
Total D 1b						

Stand 1: The stand after windstorm in 1999 (Photo taken 2015)

Stand 2: Oak stand

The gradual natural regeneration after shelterwood felling. Rotation/regeneration period – 150/40; planned felling – 486 m^3; Slope, part of the gene pool of sessile oak¨

Stand information:

- Nutrient-medium Oak-beech
- Current age: 127 / 13 / 20 years

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Sessile oak	70	35	26	1.11	24/4	208
Spruce	30	36	32	1.37	30/2	165
Total A 13						
Sessile oak	90					
Linden	5					
Hornbeam	5					
Total A 1b						
Sessile oak	100					
Total A 2						

Stand 2: Oak stand (photo taken 2015)

Site 3: Pine seed orchard and stand before regeneration

Stand 1: Pine seed orchard

Sign of seed orchard – "Doubrava č.79"
Natural forest area(NFA) 6 – Západočeská pahorkatina, altitude 385 m, year of foundation 1980, area: 6.48 ha.
Seed orchard was founded on woodland, where the stumps had been stumped out and placed under ground of seed orchard.

Number of grafts: 1191, number of clones: 86, origin of selected trees – NFA 6, selected trees belong to the regional population of west bohemian highlands pine
The average cone collection from 1991 to 2000 was 26.3 g cones, from 2000 to 2004 – 30 g cones. The maximal cone collection was 61 g cones in 2000.
The shaping is regularly controlled by the regional genetic. The plot was continuously cultivated in the past. With reaching some habitus the orchard management was turned into black fallow.

Stand 1: Pine seed orchard (Photo taken 2015)

Stand 2: The stand before regeneration

Interspersed larch and pine. The stand before stand regeneration.

Stand information:

- Compacted-acid Beech-oak
- Current age: 118 years
- Area 912D12 – 2.43 ha; area 912C12 - 1.09 ha;
- Rotation/regeneration period - 150/40
- Planned felling – 0.

Species composition and volume:

Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Sessile oak	80	33	26	0.98	26/2	264
Spruce	20	32	28	1.37	30/2	165
Total						366

Site 4:The gene pool

The gene pool. The stand with the individually represented sycamore, birch, aspen, hornbeam, pine; partly regeneration of sessile oak, linden and sycamore. The phenotypic classification for sessile oak – A, for spruce – B, for linden and larch – C.
The stand is the certified resource of the reproduction material for sessile oak and spruce, the selection category.
The comparative plot situated in south part – there are more vital growth of linden then sessile oak; the final result are "lipovky". These locality are not optimal for sessile oak, but it is still considered as alternative with using of the natural regeneration and possibility of quality assortments.
According the forest management plan is the rotation period 110 years, but the management intends to use the longer regeneration period for natural regeneration with liberation cutting and reduction of spruce.

Stand information:

Loamy Beech-oak
Current age: 105 years

Species composition and volume:

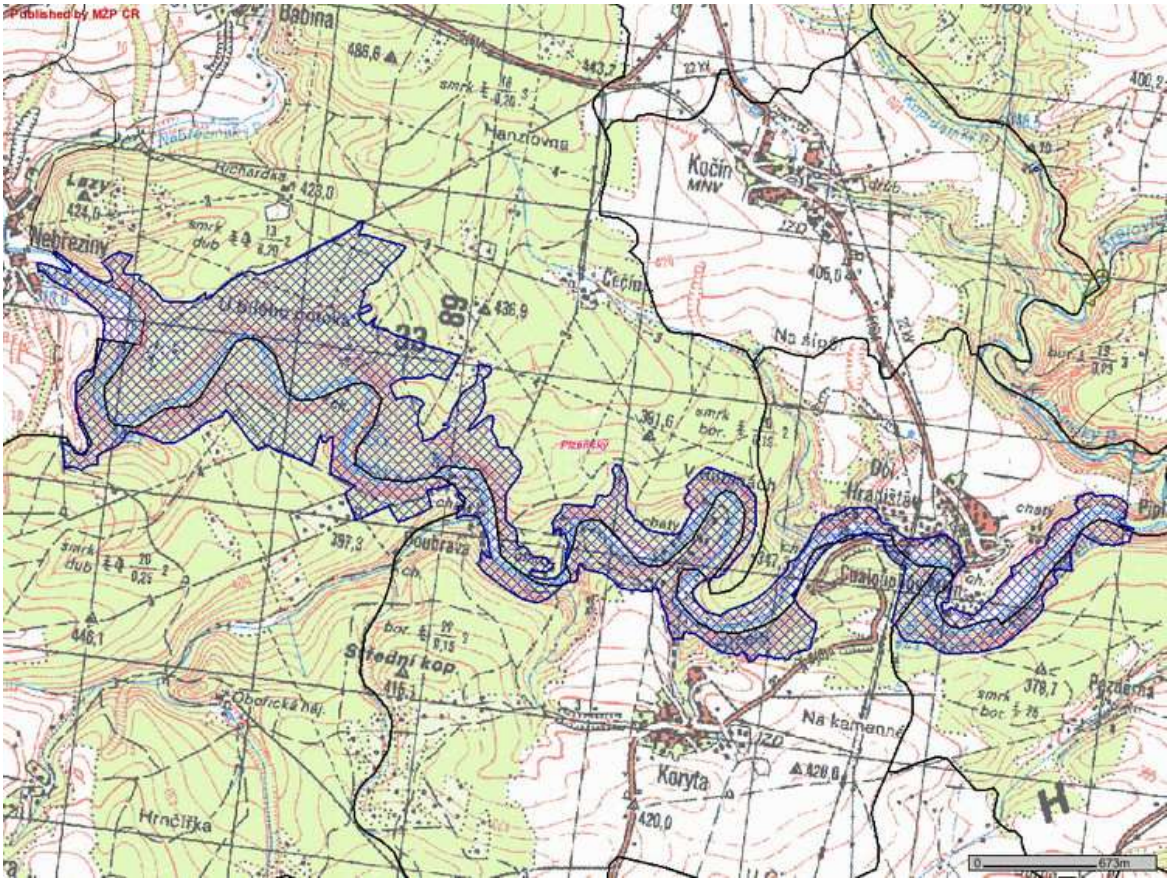
Species	Composition %	DBH(cm)	Mean height (m)	Mean tree volume (m^3)	Yield class	Volume pro ha (m^3/ha)
Spruce	54	32	29	1.10	28 / 3	275
Sessile oak	38	30	28	0.99	28 /1	131
Linden	4	29	28	0.93	28 /3	12
Larch	4	38	32	1.75	32 /1	25
Total						443

Site 4: Site of Community Interest The valley of Střela river

This is a canyon on the lower reach of the Střela River from Nebřeziny near Plasy up to Dolní Hradiště, not far from the confluence with the Berounka River. The deeply incised valley of the Střela R. is a distinctive landscape phenomenon. Thanks to the inaccessible terrain, relatively natural forest stands have been preserved there, reflecting the diversity of site conditions. Notable is the representation of scree forests with a minimum impact of human activities. Significant is also the occurrence of saxicolous habitats and a range of protected vascular plant species such as silver fir (*Abies alba*), Manchurian monkshood (*Aconitum variegatum*), mountain everlasting (*Antennaria dioica*), yellow chamomile (*Anthemis tinctoria*), spider lily (*Anthericum liliago*), rock alyssum (*Aurinia saxatilis*), mezereon (*Daphne mezereum*), bloody cranesbill (*Geranium sanguineum*), stonecrop (*Hylotelephium*

maximum), common juniper (*Juniperus communis*), bitter vetch (*Lathyrus linifolius*), martagon lily (*Lilium martagon*), navelwort (*Omphalodes scorpioides*), cowslip (*Primula veris*), or owl-head clover (*Trifolium alpestre*).

Important animal species include metallic woodborer (*Buprestis haemorrhoidalis*), longhorn beetle (*Phymatodes pusillus*) and eagle owl (*Bubo bubo*).



Map of Site of Community Interest The valley of Střela river

Hunting – Czech Republic (statistics 2014)

Total area of hunting: ..... **6,572,600 ha**

Hunting districts:

Total (pcs)	Average area (ha)
5,741	1,145

Ownership of hunting districts:

	Number	Area (ha)	Average area (ha)
Own	1,544	1,545,243	1,000
Corporate	4,207	5,027,357	1,195

Way of using hunting districts:

	Number	Area (ha)	Average area (ha)
Own-account	766	790,416	1,032
Leased	4,985	5,782,184	1,160

From the total amount of hunting districts:

	Number	Area (ha)
Game preserve	196	42,958
Pheasantry *]	293	97,130

*] Including pheasantry incorporated in other hunting districts

Number of persons with shooting licence practising hunting – 91.570

Data to the selected game species:

Game species	NSG*)	Hunting plan	Hunting	SSG**)
Red deer	12,659	15,015	18,245	22,377
Fallow deer	15,150	13,994	16,291	27,969
Mouflon	10,674	8,610	8,872	19,389
Roe-buck	281,665	137,407	97,753	283,366
Wild boar	9,562	42,717	162,150	57,186
Sika deer	1,343	7,239	12,526	9,756
Brown hare	468,008	64,887	39,561	239,239
Pheasant	483,840	544,301	477,447	188,955

*) normalized stock of game, **)spring stock of game counted to March 31st .

Game damages:

Browsing of terminal shoots on forest regeneration – 30 % of trees, bark stripping – 12 % of trees.

Presence of some other species of game:

Beaver – 5,136 pcs, moose - 18 pcs, Brown bear - 4 pcs, lynx - 278 pcs, wolf -13 pcs,
otter – 6,699 pcs, Great Cormorant 46,617 pcs, Capercaillie– 85 pcs, Black grouse – 534 pcs.

Hunting of soma other animals:

Raccoon– 493 pcs, Raccoon dog – 1,658 pcs, American mink– 659 pcs.