

## Introduction – Czech Republic

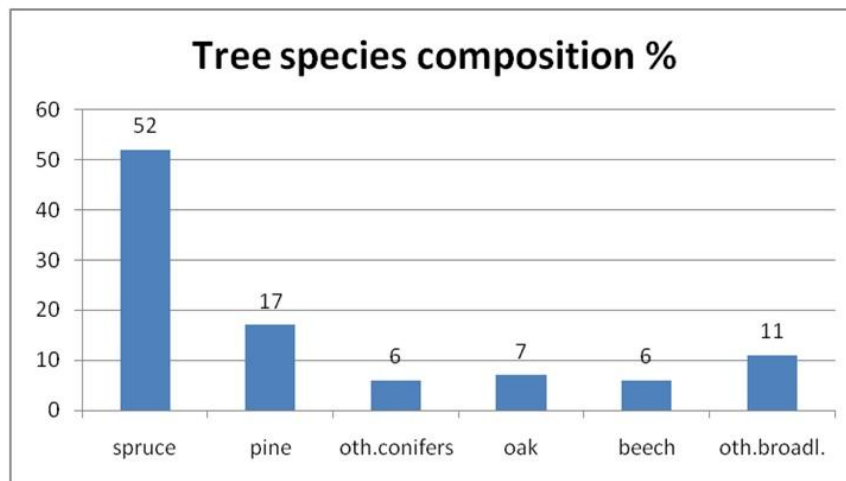
Nowadays forest area in the Czech Republic is nearly 2.6 million ha, what **represents 34 % share of forests**. On the end of 18th century it was 25.0 % and in 1910 that share was 30.0 %, what means that that forest coverage is steadily increasing.

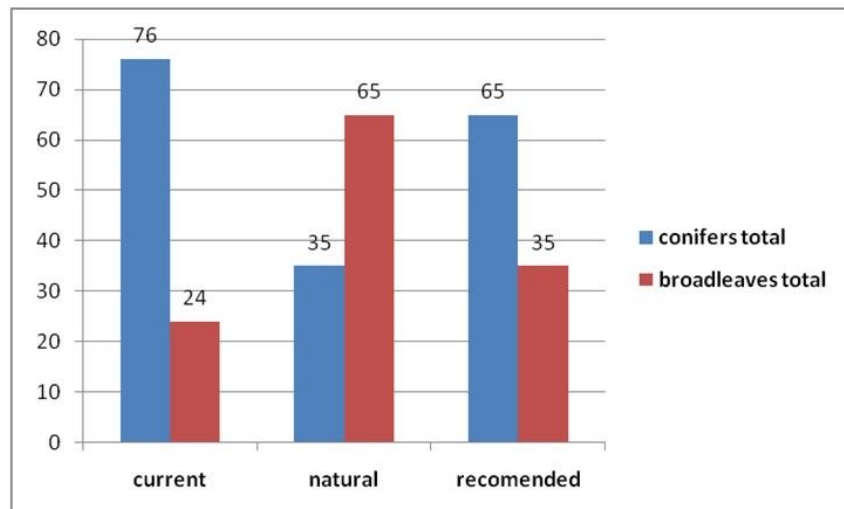
The Czech Republic belongs to the smaller European countries (79 thousands km<sup>2</sup>; 10 mil. inhabitants) nevertheless it has a great variety of natural riches including quite diverse and rich forest biocenosis. Diversity of sites together with a geographical position of the country, which is situated on the crossroads of several phytogeographical areas, resulted in the creation of a wide range of plant associations including naturally predominant forests.

## Forest characteristics and forest types - Czech Republic

### Forest changes in the past

Forests in the Czech Republic were considerably changed in the process of colonisation and later on during the technical revolution. Their status was significantly change just by human impact. Because of increasing of timber consumption there was a need to protect forest by special laws. **Theresian Forest Orders (1754)** gave the first direction to responsible management assuring sustainable yield. The species and spatial composition of Czech forests was altered in the past in effort to increase timber production and to satisfy the demand for the most frequently required tree species (spruce, pine). Coniferous species now dominate in forest stands structure.





**Current share** – according to 31.2009 statistic data

**Coniferous** 76 %

**Broadleaves** 24 %

**Natural share** – state before colonization (several thousands years ago);

**Recommended share** – scientifically based sustainable compromise between demand of community, economical benefit and ecological necessity.

### Forest typology

Forest typology is a basis for differentiated silviculture according to the natural conditions. As regards of vertical zones, basic characteristics of forest stands can be distributed as follows (generalized):

Forest altitude zone	Elevation above sea level	Average annual temperature	Annual precipitation	
Prevailing species / Unit	m	°C	mm	
pine	<b>Non-zonal</b>			
oak, pine	< 400	> 8,0	< 600	<b>lowlands, uplands</b>
spruce, beech, oak, pine	400-550	6,5-7,5	650-700	<b>uplands - highlands</b>
spruce, beech, fire,	550-1000	4,0-6,5	700-1000	<b>highlands</b>
spruce	1000-1350	2,5-4,0	1200-1500	<b>mountains</b>
dwarf pine	> 1350	< 2,5	> 1500	

## Main tree species and appropriate conditions for cultivating in the Czech Republic

In general, on **fertile sites**, especially on limestone and basalt are **not suitable for conifers** - they often suffer with decay.

### **Spruce** (*Picea abies*)

- 1050 m above sea level - **climax mountain spruce stands**
- 400 – 1050 m above sea level recommended cultivate mixed stands with soil improving species, especially with beech, fir, larch, **prefers acidic sites**
- 600 -900 m above sea level wood production optimum

### **Pine** (*Pinus sylvestris*)

- up to 500 m above sea level, **suitable on sandy acidic sites**

### **Beech** (*Fagus silvatica*)

- up to 1050 m above sea level, **prefers fertile sites**
- **550 -900 m above sea level wood production optimum**

### **Pedunculate oak** (*Quercus robur*)

- in **riparian forests and on stands enriched with water**

### **Sessile oak** (*Quercus petraea*)

- uplands **up to 550 m above sea level**, usually **accompanying** with hornbeam, linden, pine.

### **Other tree species in Czech forests:**

**Conifers:** fir, larch, introduced Douglas fir

**Broadleaves:** ash, maple, hornbeam, birch, aspen, linden, alder, poplar, willow

The most important commercial timber tree species in the Czech Republic are Norway spruce, Scots pine, European beech, Sessile oak.

**The most valuable wood is so called resonance wood for musical instruments**

**construction.** The source of this material comes from quality Norway spruce stands from mountainous areas with the slow increment.

### **Exceptional and rare forest types in the Czech Republic:**

**Flood plain** forests, which are not too numerous, as well as **riparian** and accompanying stand of **watercourses** represents another landscape-forming components. Also their importance is immensurable. In their stands can be found: **willows, black alder, ash, oaks, poplars, sycamore, Norway maple, elms. These sites are not suitable for conifers. Dwarf pine stands** – in the highest altitudes only (for example in the Krkonoše national park).

## **Forest damage, meaningful factors of Czech forests jeopardy**

### **(1) Industrial emissions**

Since the mid of 20<sup>th</sup> century till the end of 80ties and synergic effect of pollution and extreme climate factors has a special impact among the numerous negative factors as they represent the first, starting agent in relation to biological pests. Particularly forests in northwest Bohemia and later the whole mountain ridge forest on northern Czech border were damaged through the industrial air pollution (electric power plants) using low quality brown coal and other heavy pollution) and the acid atmospheric deposition. Soil depositions are evoking persisting stress. Therefore this episode represents the most serious damage of the Czech forests up to data.

The worst current problem represents oxides of nitrogen (NO<sub>x</sub>) from vehicle engines.

## (2) Other abiotic factors

Refer to non-living elements of the environment: rocks, soil, water, fire, wind, snow and frost. The most serious are just **windstorms** in last years – e.g. **Kyrill 2007** (there were nearly 11 mill. m<sup>3</sup> trees fallen – increment in CZ is 16 mill. m<sup>3</sup>).

## (3) Biotic factors – forest pests

Forest pests usually attack weaker trees under regular conditions (a reason can be weather conditions, air pollutions, long dry periods and their combinations). Insect pests represent the worst problem in the Czech Republic in last years. The most significant species include bark beetles mainly spruce **bark beetle** (*Ips typographus*), nun moth, and tortrix.



*Spruce bark beetle (VULHM archive)*

*Forest damage caused by Spruce bark beetle (Stanislav Jansky)*

## Problems caused by hoofed game

Particularly red deer, sika deer, mouflons, which are overpopulated in many localities, inhibits enhancement of the ecological stability of forests stands. Then fungi usually attack stands damaged by game and the timber is destroyed by fungal decay. **Dear barking and browsing damages can be count as the most serious biotic damage of forests in the Czech Republic in the last century.**

## Forest Protection Service of Forest Research Institute – help for forest owners

It provides monitoring of harmful, mainly biotic factors occurrence and damage caused by them all over the country. Advisory services to all forest owners are provided for all forest users free of charge.

# Typical and exceptional fauna and flora species in forests - Czech Republic

The species and spatial composition of Czech forests was altered in the past in effort to increase timber production and to satisfy the demand for the most frequently required tree species, which resulted in the today's greater share of coniferous (76 %) than broadleaved (24 %) species.

Forests represent natural communities with a great species diversity. Even the poorest forest is home to thousands of animal species. This means that forests house an enormous number of animals. These are adapted to lives both on the surface and inside tree trunks, in tree blossoms, fruit or in treetops.

## Typical fauna of the Czech forests

The most common animals in Czech forest are red deer, roe deer, wild boar, sika deer, fallow deer, mouflons, wild boar, fox, brown hare, and pheasant.



*Red deer* ([www.mezistromy.cz](http://www.mezistromy.cz))



*roe deer* ([www.mezistromy.cz](http://www.mezistromy.cz))



*Sika deer* ([www.mezistromy.cz](http://www.mezistromy.cz))



*wild boar* ([www.mezistromy.cz](http://www.mezistromy.cz))



*hare (www.mezistromy.cz)*

### Exceptional fauna in the Czech forests

We can for example mention:



capercaillie = wood grouse (*Tetrao urogallus L.*) – ([www.mezistromy.cz](http://www.mezistromy.cz))

black grouse = heathcock (*Lyrurus tetrix L.*) - ([www.mezistromy.cz](http://www.mezistromy.cz))

These two bird species we can observe in National park Šumava:



wolf (*Canis lupus L.*) – ([www.mezistromy.cz](http://www.mezistromy.cz))

brown bear (*Ursus arctos L.*) - ([www.mezistromy.cz](http://www.mezistromy.cz))

Wolf and bear are protected species with priority consideration in Natura 2000 SPA Beskydy Mts. in the North East part of the Czech Republic near Slovakian borders.

### Typical flora in the Czech forests

#### (1) Acidic sites



Pine stand with blueberry (*Vaccinium myrtillus L.*) – (UHUL Plzeň archive)  
blueberry (*Vaccinium myrtillus L.*) – (www.mezistromy)

#### (2) Fertile sites



woodruff (*Galium odoratum*) – (www.mezistromy.cz)

## Forms of nature protection such as national parks and Natura 2000 sites - Czech Republic

A part of the forests occur in special protected areas, demarcated in accordance with the provisions of Act No. 114/1992 Coll. Total area of forests in existing special protected areas (SPA) of various levels of protection are approx. 750 thousand ha, which represents approx. **28.4 % of total forest area** in the Czech Republic. Forests represent a fundamental potential of biological diversity in the Czech Republic and contain the most preserved constituents of our nature.

## National Parks (NP)

NPs are protected areas with the highest priority protection level. The state administration is responsible for the environment in these areas.

NP name	Basic characteristic	Year of creation	Area
Krkonoše NP KRNAP	The highest mountains, glacial phenomena (corries, moraines), important mountains geobiocenosis with a lot of endemits; important damages by air-pollution; in highest expositions are dwarf pine stands.	1963 (1991)	36 200 ha
NP Podyjí	Dyje river canyon with important geobiocenosis; important archaeological localities.	1991	6 300 ha
NP Šumava	National Park Sumava on the border with the Federal Republic of Germany and National park Bavarian Forest. Old mountains with glacial lakes, continuously forested, with peat bogs, lynx reintroduced in 1980ties; protection of ecosystems and landscape nature of montane forest, important damages by windbreaks and bark beetle outbreaks.	1991	68 500 ha
NP České Švýcarsko	Sandstone hilly country on the Labe river right bank in Děčín region; rock formations and ample original forest ecosystems.	1999	7 900 ha

## Natura 2000

In the Czech Republic were declared 1087 special areas of conservation (SAC) **up to data** - together **9 %** area of the Czech Republic and 41 Special Protection Areas for birds (SPAs) - **10 %** area of the Czech Republic.

### Natura 2000 protected species with priority consideration in the Czech Republic:

#### Mammals

Wolf (*Canis lupus L.*)

Brown bear (*Ursus arctos L.*)

#### Crustaceans

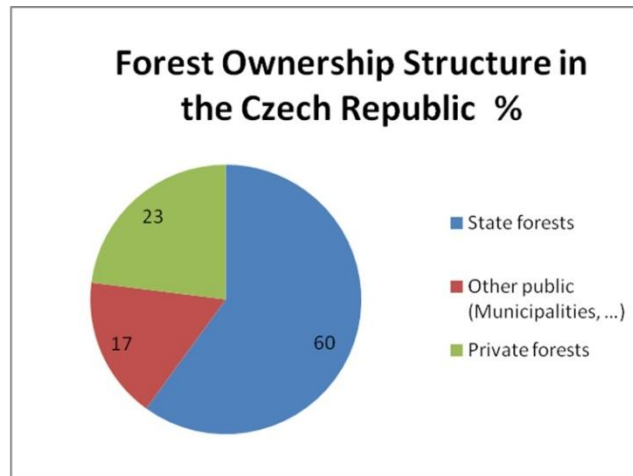
Crawfish (*Austropotamobius torrentinum L.*) – (Lenka Janoušková)

Crustacean of smaller watercourses can be found.



**Beetles** *Osmoderma eremita L.* – lives in rotten rests of wood in old trees holes, especially in landscape alleys (oaks) and river accompanying trees (willows) but also in old oaks in forests.

# Organization of Forestry - Czech Republic



Restitution of Church property has not been completed yet (6.5 %)

**State forests: 60 %**

**Private forests: 23 %**

**Municipalities: 17 %**

**Forests of the Czech Republic, State Enterprise (LCR, s. p.)** manages most of the state forests (**51%** of the whole). LCR s.p., in accordance with decision of the Czech Government, **intend to realize** all forestry activities (cutting, planting, silviculture, road maintenance, ... ) on long term contract basis with big forestry entrepreneurs only (total outsourcing) in this time.

The important **non-state** forest owners have established a voluntary professional organisation - the **Association of Municipal and Private Forest Owners in the Czech Republic (SVOL)** just after restitution law approval. This is very important and respected partner of Ministry of Agriculture, Ministry of Environment and other partners in development of forestry policy documents in the Czech Republic. SVOL organises expert seminars for its members and excursion, disseminates regularly expert forest information and organize common wood-sale.

According the Forest Act (289/1995 Coll.) all Czech forests are **commonly accessible (everybody have the right to enter into the forest, namely at one's own risk)**; although limitations can involve some sensitive areas, like forest nurseries, game enclosures, research areas, habitation sites of animals, water springs and of course forested specially protected areas (SPAs). Limitation can be also periodic (e.g. in the time of long-term drought due to possibility of fire, in the time of forest operations etc.).

To have **Forest management plan (FMP)** is an obligation for all forest owners with forest property over 50 ha. Small forest owners can receive Forest management guidelines free of charge, on other way they manage in accordance with the Forest Act. **FMP is of a service on a forest owner**, it is an instruction what it is necessary to carry out in which stand (afforestation, tending, felling) – it is elaborated for the 10 years period.