

Forest characteristics and forest types - Latvia

According to the data of the Latvian National forest statistical inventory (NFI) the forests and overgrown agricultural lands, which conform to criteria of forest, occupy 3.22 million ha or 49.9 % of the territory of Latvia. The total area of the forest lands (land covered by forest, land under forest infrastructure facilities, as well as adjacent overflowing clearings, marshes and glades) are 3.49 million ha or 54.1 % of the territory of the state. In accordance with the aggregated information of Food and agriculture organization of the United Nations (FAO) Latvia is the fourth country in Europe (after the Finland, Sweden and Slovenia) with the largest proportion of land area covered by forests and other wooded lands.



In Latvia, forests are comparatively natural systems. Most of them are naturally regenerated forests however with clearly visible indications of human activities. The forests predominantly composed of trees established through planting and/or deliberate seeding make up 19 % of the total forest area (Country report of Latvia to FAO, 2010). The proportion of primary forests (forests of native tree species, in which there are no clearly visible indications of human activity and ecological processes are not significantly disturbed) is very small and they are mainly located in the strict and regulatory regime zones of Nature reserves and National parks.

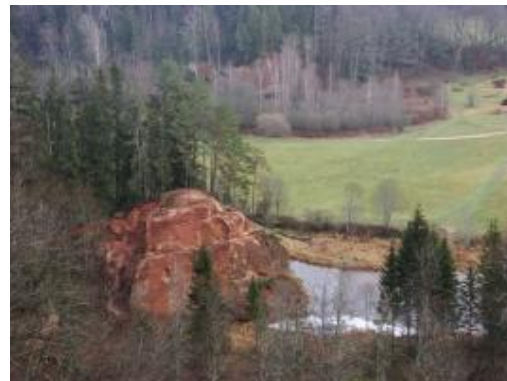
In the context of forest growing conditions approximately half (49 %) of the forests of Latvia are located on dry mineral soils. However a comparatively large proportion of forests is also on drained soils – 33 %, from which 19 % are on drained mineral soils and 14 % on drained peat soils. The forests on wet mineral soils take up 10 % of the total forest area, but forests on wet peat soils - 8 % of the total forest area. Within the framework of these five types of forest growing conditions the twenty three forest ecosystem types or forest types are divided in the Latvia, describing their inner parameters (forest stand in the maturity stage, underbrush, ground cover, soil etc.). The divided forest types reflect the production ability of site and serve as base for right forest management. For its part, within the framework of one forest type, there can be several forest stand types in dependence on the dominant tree species.

The forests of Latvia are dominated by three tree species – Scots pine, Norway spruce and birch species (silver and downy birch); together they constitute 73.8 % of the total forest area (according to the data of NFI). The proportion of pine stands is 28.9 %, but the proportion of spruce and birch stands – 17.0 % and 27.9 %. The remaining forest areas are occupied by stands of black alder (5.1 %), grey alder (9.8 %), aspen (7.7 %), ash and oak (1.5 %), and

other tree species (2 %). The coniferous stands in general occupy 46 % of the total forest area, but stands of deciduous trees – 54 %.

By the Central Europe vegetation classification system the forests of Latvia belong to five classes:

- Boreal coniferous forests. A very broad class, which includes forests on dry and wet soils.
- Dry subcontinental pine forests. Located only on the dry and sun exposed slopes and uplifts of relief, in the terraces of the valleys of large rivers.
- Pine and birch bog forests. Forests on wet peat soils or mineral soils, which flora is congenial to bogs.
- Wetland alderwoods. The most frequent habitats are: floodplains at rivers and lakes, places of groundwater outflow and the vicinities of bogs and mires where there is tendency to paludification.
- Broadleaved forests. The most frequently mixed oak, ash, elm and linden forest stands. These forests are confined to the river valleys, islands of lakes and old primary areas of broadleaved trees in Latvia.



Typical and exceptional fauna and flora species in forests - Latvia

Latvia is located in the contact zone of boreal coniferous forests and nemoral summer green deciduous forests, therefore the species, which are typical for these both forest biomes, can be also found in the forests of Latvia.

The typical representatives of the Latvian forest fauna are roe deer (exemplar number according to the data of the State Forest Service is 240 thousands), red deer (37 ths), elk (15 ths), wild boar (67 ths), beaver (89 ths), brown and mountain hare (35 ths), from large predators - lynx (1.3 ths) and wolf (0.8 ths), and also some small and medium sized predators – red fox (35 ths), pine marten (28 ths), badger (11 ths), western polecat and weasel. Most of

them are game animals (in total 17 game animals are in Latvia). Widespread species in the forests of Latvia is also racoon dog (25 ths), which was introduced into Latvia in the last century (in 1948). Another introduced species is American mink, which nowadays has won a competition with native European mink. The rare and especially protected species in the forests of Latvia are brown bear (~ 10 individuals), flying squirrel, dormouse (forest, garden, common and fat dormouse), northern birch mouse and several species of flutter-mouse. A protected species is also otter (9 ths).

From reptiles, the viviparous lizard, sand lizard, blind worm, common Northern wiper and grass snake occur in the forests of Latvia. The very rare and especially protected species are smooth snake and swamp turtle.



The diversity of bird species in the forests of Latvia is very large. From 330 wild bird species, which have been detected in Latvia, more than one hundred can be found in the forests. The rare and protected bird species in the forests of Latvia are stock dove, black stork, pygmy owl, Tengmalm's owl, middle spotted woodpecker, capercaillie, Ural owl, lesser spotted eagle. The very rare and endangered species are spotted eagle, red and black kite, eagle-owl, roller and green woodpecker.

More than 200 tree and shrub species are in the forests of Latvia, from which ~ 100 are native species, but others are foreign species. Without tree and shrub species, approximately 300 species of lichens, 298 species of mosses and 650 species of vascular plants are found in the forests of Latvia.

Main tree species are Scots pine, Norway spruce, silver birch, downy birch, black alder, grey alder, aspen, common ash and pedunculate oak. Other tree species – small-leaved lime, wych elm, fluttering elm, white willow, crack willow, Norway maple, goat willow, common hornbeam – are forming the forest stands with small area (together they constitute ~ 2 % of the total forest area). The rare and protected tree species in Latvia is common yew, which occurs mostly along the coastline. A protected species is also common hornbeam (occurs only in the state SSW part).

From introduced species, the European larch, poplars (*Populus x Canadensis*, *P. Alba*, *P. trichocarpa*), Jack pine, Weymouth pine, silver firs (*Abies alba*, *A. sibirica*), cedar pine (*Pinus sibirica*), Douglas fir, common beech occur more frequently. The total area of these species stands is very small.

The most common underbrush species are juniper, rowan, hazel, alder buckthorn, bird cherry, several species of willows, as well as fly honeysuckle (*Lonicera xylosteum*), guelder rose (*Viburnum opulus*), mountain currant (*Ribes alpinum*), and mezereon (*Daphne mezereum*). The rare and protected underbrush species are whortleberry willow (*Salix myrtilloides*), pallas honeysuckle (*Lonicera pallasii*), spindle (*Euonymus verrucosa*), wild cotoneaster (*Cotoneaster scandinavicus*), black-berried cotoneaster (*Cotoneaster niger*), dwarf birch (*Betula nana*).

Characteristic groundcover species for boreal coniferous forests are cowberry, bilberry, bog bilberry, crowberry, chickweed wintergreen (*Trientalis europaea*) etc. The unique pine forests with rare and very rare species for Latvia occur in the valley of the largest river Daugava, where the snowdrop windflower (*Anemone sylvestris*), owl-head clover (*Trifolium alpestre*), pyramidal and standing bugle (*Ajuga pyramidalis*, *Ajuga genevensis*) and vicic (*Lathyrus pisiformis*) are growing. The very rare and especially protected plant species in the pine forests are neottianthe (*Neottianthe cucullata*) and cross-leaved heath (*Erica tetralix*).



The typical species of broadleaved forests are dog's mercury (*Mercurialis perennis*), woodruff (*Galium odoratum*), yellow archangel (*Galeobdolon luteum*), ground-elder (*Aegopodium podagraria*) etc. The very rare and especially protected species are Lady's-slipper (*Cypripedium calceolus*), rattlesnake Grape-fern (*Botrychium virginianum*), Baltic Ivy (*Hedera helix*).

Forms of nature protection such as national parks and Natura 2000 sites - Latvia

In order to protect and maintain biodiversity of nature, in Latvia there are 684 specially protected natural areas approved by law or regulations of the Cabinet of Ministers. The protected areas are classified as:

- *Strict nature reserves* - territories untouched by human activities or nearly natural, in which unhindered development of natural processes shall be ensured in order to protect and study rare or typical ecosystems and parts thereof. There are 4 strict nature reserves established in Latvia – Moricsala (1912), Grīņi (1936), Krustkalni (1977) and Teiči (1982).

- *National parks* - broad areas which are characterised by outstanding nature formations of national significance, landscapes and cultural heritage landscapes untouched by human activities or nearly natural, a diversity of biotopes, abundance of cultural and historical monuments. Along with nature protection, scientific research, education and organization of leisure have an important role. There are 4 national parks in Latvia: Gauja National Park (1973), Ķemeri National Park (1997), Slītere National Park (1999) and Rāzna National Park (2007).
- *Biosphere reserves* - broad territories in which landscapes and ecosystems of international importance are located. The aim of these reserves is to ensure the preservation of natural diversity and to promote sustainable social and economic development of the territory. In 1997 North Vidzeme Biosphere Reserve was established in Latvia. It is included in the international network of biosphere reserves.
- *Nature parks* - territories that represent the natural, cultural and historical values in particular region, and are suitable for recreation, education and the instruction of society. There are 42 nature parks in Latvia, from which the most popular are Tērvetes Nature Park and Nature Park "Daugava's Circles".
- *Protected landscape areas* - territories remarkable for original and diverse landscapes and special beauty. The aim of these areas is to protect and preserve cultural environment and landscapes characteristic of Latvia in all their diversity, as well as to ensure the preservation of environment appropriate for recreation of society and tourism. There are 9 protected landscape areas in Latvia.
- *Nature reserves* – nature territories unaffected or slightly affected by human activity, which include habitats of specially protected wild plant and animal species, and protected biotopes. There are 259 nature reserves in Latvia.
- *Nature monuments* - separate, isolated natural formations: protected trees (secular trees, potential secular trees, rare trees of foreign species, specifically trees), dendrological plantings, avenues, geological and geomorphological nature monuments (detritions of rocks, secular stones, caves, springs, waterfalls), which have scientific, cultural and historical, aesthetic or ecological value. 206 geological and geomorphological nature monuments, 89 dendrological plantings and 60 avenues are protected in Latvia.

In order to ensure protection of specially protected species or habitats outside specially protected nature territories, as well as within the specially protected nature territories, if protection is not ensured by any of the functional zones, the microreserves are being established in Latvia. In microreserves similarly to specially protected natural territories certain actions that may threaten the rare species or their habitats are restricted or prohibited. Microreserves are usually smaller than specially protected areas (0.1 – 20.0 ha, for birds up to 200 ha) and the establishment procedure is less complicated and shorter as than that of specially protected areas. By the situation at the beginning of the year 2010 1949 microreserves with total area 36 694 ha are established in the forests of Latvia (according to the data of the State Forest Services).

Most of specially protected natural areas, as well as several microreserves are included in the joint net of protected areas of European importance (Natura 2000), which are established to ensure the protection of rare and protected species and biotopes. From species and biotopes, which are included in the lists of two European Union directives (Birds and Biotopes Directives), 20 species of plants, 20 species of invertebrates, 5 species of mammals, 3 species of reptiles, 11 species of fish, 70 species of birds and 60 types of habitats are found in the territory of Latvia and are protected.

The network of Natura 2000 in Latvia includes 327 territories – 4 strict nature reserves, 4 national parks, 3 nature reserve zones of North Vidzeme Biosphere Reserve, 237 nature reserves, 37 nature parks, 9 protected landscape areas, 9 nature monuments and 24 microreserves. Together they cover 793 thousands ha or 12 % of the total area of Latvia. The protection and management regimes are various – from minor restrictions in landscape areas to absolute prohibition of any management in nature reserves.



Organization of Forestry - Latvia

In Latvia, approximately half of the forests (50 %) are owned by the state, but the others are owned by the private owners and enterprises (48 %), and local governments (2 %) (According to the data of State Forest Service at the beginning of 2010). The forests under the ownership of the state are being managed by the institutions of such ministries: the Ministry of the Environmental protection and Regional development, Ministry of Defence, Ministry of Education and Science, and Ministry of Agriculture. The territories of the state forest property, where the main aim of management is nature protection – forests in the National parks and strict nature reserves, are managed by the institutions of the Ministry of Environmental protection and regional development (administrations of protected areas).

The area of such territories is 59.1 thousands ha or 2 % of the total forest area. Scientific research forests, the main aim of management of which is to ensure scientific research continuity, are managed by the Forest Research Station (institution of the State Forest Service, which, for its part, is supervised by the Ministry of Agriculture). The area of such territories is 28.9 thousands ha or 1 % of the total forest area. For its part, the state forest property, the main aim of management of which is to ensure the implementation of commercial interests, is managed by the Joint Stock Company “Latvijas Valsts Meži” (“Latvian State Forests” or LVM). The stockholder is the Ministry of Agriculture. LVM ensures management and administration over 1.62 million ha of land including 1.4 million ha of forests (47 % of the total forest area). LVM performs forest management over the whole rotation cycle, including

the sales of timber. The institutions of the Ministry of Education and Science, as well as institutions of the Ministry of Defence are managing comparatively small areas of forests under the ownership of the state.



From local governments the largest forest owner is Riga city council, to which ~ 63 thousands ha of forests belong, which are managed by the limited company “Rīgas Meži” (Riga forests). Sustainable development in the forest sector is guaranteed by the Forest Law and subordinate regulations of the Cabinet of Ministers, which define norms related to the duties of forest owners when they manage their properties. The Forest Law also determine that natural persons have the right of access and free movement in a state or a local government forest, if normative acts do not limit it. Access and free movement of natural persons in other forests may be restricted by the owner or the lawful possessor of the forest.