Facts about biodiversity

– what you should know about biodiversity and enhancing it in Nordic forests

Biodiversity is the term used to describe the variety of life on our planet in all its forms – from individual genes and bacteria to entire ecosystems like coral reefs and forests. Preserving biodiversity is of critical importance to protecting these ecosystems, which we rely on for clean air and water, food, natural resources and to mitigate climate change. In a forest ecosystem, plants, fungi, animals and microorganisms all play an important role. In Nordic forests, preserving biodiversity is an important objective for the forest industry and forest owners and an integral part of sustainable forest management.

WHAT IS BIODIVERSITY?

Biodiversity is a shortening for biological diversity meaning the variety of all living things and their interactions. It refers to the diversity within species, between species and of ecosystems, including plants, animals, bacteria, and fungi[1].

Scientists often speak of three levels of diversity: genetic, species and ecosystem diversity which cannot be separated. Each is important, interacting with and influencing others. Changes at one level can cause changes at other levels[2].

Whereas biodiversity concerns living things geological diversity refers to the natural portion of the planet that is not alive, both at the surface and in the planet's interior[3].

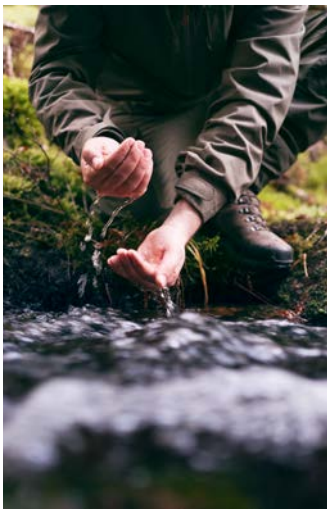
WHY IS BIODIVERSITY IMPORTANT?

Biodiversity is essential for the processes that support all life on Earth, including humans. Without a wide range of animals, plants and microorganisms, we cannot have the healthy ecosystems that we rely on to provide us with the air we breathe and the food we eat. And people also value nature of itself[4].

Biodiversity of forests underpins their ability to provide a wide range of ecosystem services that are vital for both the environment and human societies. Ecosystem services refer to the array of values derived from natural capital.

Forests provide various ecosystem services – not only wood. Such ecosystem services include for example[5]:

- clean water and fresh air
- production of wood and other raw materials
- carbon sequestration and storage
- food, such as berries and mushrooms
- pollination
- recreational experience



1) United Nations
2) McKinsey & Company
3) Unesco
4) The Royal Society
5) Ramboll, Realising the potential of a circular economy for wood-based materials, 2024

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WHAT CAUSES BIODIVERSITY LOSS?

Biodiversity loss is one of the key challenges globally together with climate change. Intense human activities are causing an accelerated extinction. One million plant and animal species are threatened with extinction, many of them within decades[6].

The main reasons for biodiversity loss are as follows[7]

- Land-use change, e.g. conversion of natural habitats into agricultural land, urban areas and infrastructure
- Climate change
- Overhunting and overfishing
- Invasive, non-native species
- Pollution
- Diseases
- Release of genetically modified organisms in nature
- Ocean acidification
- Ecosystem simplification e.g. urban areas

HOW IS BIODIVERSITY MEASURED?

Measuring biodiversity is challenging because of its complexity. Counting the number of species is the most common measure, and scientists use different methods depending on which organisms are of interest. The development of biodiversity indicators and monitoring methods is a key area in research and development, and new methods are being actively developed all the time.

The Taskforce on Nature-related Financial Disclosures (TNFD) has developed a set of disclosure recommendations and guidance that encourage and enable business and finance to assess, report and act on their nature-related dependencies, impacts, risks and opportunities.

The EU Corporate Sustainability Reporting Directive (CSRD) mandates companies to disclose information and undertakings about environmental factors, including information about biodiversity and ecosystems.

HOW IS BIODIVERSITY ENHANCED IN NORDIC FORESTS?

Commercial forests in the Nordic countries are mainly semi-natural. This means that only native tree species are used, and wood production is integrated into natural ecosystems without converting land from its natural state.

Biodiversity measures in forestry are implemented differently depending on the management approach. There are two main categories[8]:

- Land-sparing forestry, such as plantations, where biodiversity is supported by setting aside separate areas for conservation.
- Land-sharing forestry, such as semi-natural boreal forests, where biodiversity measures are integrated directly into forest management on the same land used for wood production. This approach emphasises the delivery of ecosystem services alongside wood harvesting.

In Nordic forests, industry and forest owners work to preserve biodiversity in a variety of different ways. For example, the following are common measures to enhance forest biodiversity.

- **Native tree species and mixed forests**
  Mixed forests with both coniferous and broad-leaved tree species may have better resilience against climate change. It is important to use only native tree species, as they support local biodiversity. Mixed forests containing both coniferous and broad-leaved species tend to be more diverse and may offer greater resilience to climate change.
- **Decaying wood**
  Many forest species depend on decaying wood. It is important to leave decaying trees of different ages and species, both standing and on the ground.
- **Retention trees and biodiversity stumps**
  are left on the harvesting site to decay gradually. Biodiversity stumps are made by cutting a tree's trunk at the height of two to four metres.
- **Protection thickets**
  Protection thickets are a particularly important habitat for birds.
- **Buffer zones towards waters**
  Buffer zones help to prevent nutrient and fine particle runoff into waterways, which is a cause of eutrophication. Buffer zones are also important for biodiversity.
- **Protected areas**
  Areas and sites rich with biodiversity, the so-called valuable habitats, and habitats for for several endangered species are safeguarded. In Finland 10% of the total area of forests is strictly protected
- **Restoration projects**
  Restoration aims to restore or enhance a habitat's characteristics to a more natural or diverse state. For example, herb-rich forest need nature management to maintain their biodiversity.

Many of these actions – for example, the number of retention trees or buffer zones – are specified in the requirements for forest certification schemes.

In forests each tree species is directly and indirectly linked to a significant number of other species in their various ecological roles. Wood production based on native tree species creates a high starting level for the share of the species that would naturally occur in the area.

6) UNU EHS
7) Fair planet
8) Springer Nature