

# Biodiversity

2021  2030

## Tornator's Biodiversity Program 2021–2030

The goal of the Biodiversity Programme 2021–2030 is to safeguard and increase the biodiversity of forests by introducing new measures, increasing the amount of active nature management, the protection of valuable areas and continuing with the effective stakeholder cooperation, as well as monitoring the biodiversity effects of the measures. Measures under the Biodiversity Program not only improve the status of endangered forest species and habitats, but also promote ecosystem services and water protection, game management and mitigation of climate change.

Finnish nature has become less diverse in recent decades, but there are many possibilities to reverse this trend. As a company, we are prepared to take significant steps towards even more sustainable forestry, because we stand alongside forests and forestry. The company's FSC® certification, granted in 2014, bears testimony to our ambitious work to strengthen biodiversity. Now, Tornator wants to strengthen its efforts for biodiversity by establishing a Biodiversity Program for 2021–2030, since the preservation of biodiversity and healthy forests are the prerequisite for the sustainable use of forests.

The Biodiversity Program briefly presents the nature management of commercial forests, various biodiversity projects and protection, which, according to research and general understanding, are preconditions for ecologically sustainable forestry. It is essential for the effectiveness of the Biodiversity Program that measures are taken in all key sectors that affect the development of biodiversity (nature management, restoration, protection) and habitat types (mires, forests, water courses). Our active cooperation with stakeholders supports and enhances all of the above themes.

### Goals of Tornator's Biodiversity Program 2021–2030:

- ✓ We will restore 3,000 hectares of mire habitats
- ✓ We will take 200 active measures to improve forest and aquatic habitats
- ✓ We will protect 5,000 hectares of valuable natural sites
- ✓ We will introduce protective thickets for forest species in forest management practices
- ✓ We ensure the continuity of deadwood in our forests
- ✓ During the program period, we will develop the peatland forestry towards more environmentally friendly by continuous cover forestry and the use of rotary tiller like peat soil preparation machine
- ✓ During the program period, we will update our forest management guidelines to increase the amount of mixed stands
- ✓ We will use biodiversity indicators to monitor the condition of forest nature

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## Why is it important to preserve biodiversity?

Biodiversity refers to the spectrum of life: it covers the number of species, the diversity of their genome, and the diversity of ecosystems. All ecosystem services provided by forests, including wood as raw material, harvested products, game, clean drinking water, flood control, pollination, recreation values and health benefits, are based on biodiversity. The biodiversity also helps to develop new treatments and medicinal substances.

The two most significant global environmental threats are the loss of biodiversity, and climate change. Biodiversity plays a crucial role in mitigating climate change and adapting to the changes caused by it. The biodiversity of healthy ecosystems is a resilient buffer that promotes coping with climate change, both in natural ecosystems and in society.

In Finland, forests play a major role in biodiversity, as forests are, by area, a large habitat type, and provide the most important habitat for endangered species. According to the latest assessment of threatened species (2019), almost a third (31 per cent) of all endangered species or 833 species, live primarily in forests. Because the number of forest species is high, the number of endangered forest species is high as well. The share of endangered species has increased from previous assessments, but there are, however, relatively fewer endangered species living in forests than in other habitats. The trend of more forest species becoming endangered has eased but has not yet stopped. Most of the endangered forest species are fungi, lichens and insects. The most common reasons for endangerment of forest species include forest regeneration and management measures, the decline of old-growth forests and large trees, and the reduction of decayed wood.

According to the latest results of the assessment of threatened habitat types in Finland, published in 2018, almost one half of the country's habitats are threatened. According to the assessment, all heath forest habitat types were classified as either endangered or near threatened. Forest habitat types in southern Finland were assessed as more endangered than those in northern Finland. Nature management of commercial forests and conservation areas, as well as the restoration of habitats, can improve the condition of particularly herb-rich forests, deciduous forests, esker forests and species dependent on decayed wood.

Both Tornator and the Government of Finland are committed to the Convention on Biological Diversity and the UN Sustainable Development Goals, including the protection of terrestrial ecosystems, climate action and ensuring clean water and sanitation. The protection of biodiversity is one of the key themes of the new EU Forest Strategy, published in 2021.

## Measures

### Theme 1 – Nature management of commercial forests

#### The importance of nature management of commercial forests in terms of biodiversity

Nature management of commercial forests plays a key role in securing the viability of forest species populations. Valuable conservation areas, concentrated in the northern parts of Finland, are surrounded by commercial forests. Different habitats are not sufficiently represented in the conservation areas, and key biotopes excluded from forest management are often small-scale. Ecologically sustainably managed commercial forests provide living space as well as spreading routes suitable for species between the conservation areas.

Nature management of commercial forests is also the most far-reaching tool in terms of the development of biodiversity. At Tornator, it includes methods, used every year over several tens of thousands of hectares, to ensure meeting the goals related to biodiversity.

Safeguarding biodiversity in forest management requires:

- that areas, where forest management would result in significant deterioration or loss of biodiversity values, are identified and excluded from forestry measures, and
- that operations in forest management areas are carried out in ways that increase and preserve biodiversity.

The main objectives of nature management in commercial forests include safeguarding habitats that are important for the diversity of species, and securing structural features such as large, decayed or burnt trees, as well as protective thickets. Promoting mixed stands, diversifying forest structure and water protection measures in forestry are another important part of the whole. Research results indicate that nature management measures used in commercial forests in Finland are steps in the right direction, and have positive impacts on biodiversity.

#### Measures in Tornator's Biodiversity Program 2021–2030 to improve nature management of commercial forests:

- ✓ We will introduce protective thickets for forest species in forest management practices
- ✓ We ensure the continuity of deadwood in our forests
- ✓ During the program period, we will develop the peatland forestry towards more environmentally friendly by continuous coverage forestry and the use of rotary tiller like peat soil preparation machine
- ✓ During the program period, we will update our forest management guidelines to increase the amount of mixed stands

#### Protective thickets

Protective thickets are small-scale groups of brush and trees of varying sizes, left untouched in forest management. They add structural diversity to the forest and provide shelter, food and nesting sites for forest species. Many game species, including wildfowl and hares in particular, benefit from protective thickets. A good protective thicket is composed of several tree species and trees of different sizes, as well as plenty of undergrowth and dwarf shrubs.

In forest management operations, Tornator will introduce the practice of leaving protective thickets the size of 10–100 m<sup>2</sup> in addition to groups of retention trees. Based on natural conditions, 1 to 3 thickets will be left for each hectare. Under suitable conditions, larger groups of cultivated trees or

wet depressions, not worth regenerating, can be left untouched. About 50,000 thickets are created each year.

### **Deadwood**

Deadwood is the most significant resource that increases the biodiversity of forests, as deadwood is the precondition of life for one quarter of all our forest species, that is, some 4,000 to 5,000 species. The species dependent on deadwood include many fungi, lichens, mosses and insects in particular. In addition to the volume of deadwood, the quality and continuous availability of deadwood are key factors for the species dependent on deadwood. On average, the volume of deadwood is lower in commercial forests than in natural forests, but the volume of deadwood in commercial forests can be increased through nature management measures.

Tornator increases the volume of decayed wood in its forests by leaving dead and live retention trees standing, by demarcating protection zones, by prescribed burning of suitable sites, and by making artificial snags. In addition, clusters of decayed wood are formed in valuable habitats and conservation areas. With these measures, we will create the preconditions for a multiple volume of decayed wood, in comparison with conventional forest management practices.

### **Mixed stands**

Above all, mixed stands improve forest biodiversity by increasing the number of species and individuals in the forest. Broadleaved trees in particular increase the diversity of ground vegetation: the number of species of fungi, polypores, moss and lichens. The FSC forest certificate of Tornator's forests requires that the share of broadleaved trees must be 10 %. Mixed stands also enhance landscape value, reduce the risks of damage caused by climate change, and promote game management in commercial forests.

Tornator's aim is to update silvicultural chains during the program period in order to increase mixed stands. In addition, Tornator participates in the development of forest management regimes for mixed stands in the SEKAVA project of Natural Resources Institute Finland (Luke). Mixed stands can involve cultivation of broadleaved trees among conifers or, for example, the cultivation of pine and spruce in the same forest stand. In Tornator's conifer-dominated forests, the goal is to maintain the share of broadleaved trees in particular.

### **Peatland forestry: continuous cover forestry and soil preparation with Neva 111.2 rotary tiller**

On peatlands, continuous cover forestry can eliminate the need for forest ditch repairing, provided that enough trees are left in the tree stand after felling to evaporate water. This reduces the load of solids and nutrients on water courses resulting from ditch repairing and helps to maintain the carbon stored in the peatlands. In addition, for many forest species, such as bilberries and several edible fungi, the varying tree stand, and the shading provided by continuous cover canopy layer are among the most important features of the habitat. Tornator's aim is to establish continuous cover forest management as part of the company's forest management guidelines during the program period. The identification of sites suitable for continuous forestry in forest resource and remote sensing data is promoted.

The destruction of deadwood can be significantly reduced by choosing a soil preparation method that breaks the ground less intensely. Moreover, light soil preparation reduces the risk of strain on the water courses caused by site preparation and has a lower impact on ground vegetation. Soil preparation that is as light as possible is important to protect the berry harvests that are vital for recreational use and for many game species. Light soil preparation also saves the coverage and

species variety of mosses, lichens and vascular plants growing on the deadwood on the ground. Tornator is the only operator in Finland that uses environmentally friendly soil preparation with the Neva 111.2 rotary tiller in forest regeneration. This method is considered to be one of the lightest soil preparation methods available.

#### **Other commercial forest nature management measures in Tornator's forests:**

Tornator joined the FSC forest certification scheme in 2014, and even before the goals set in the Biodiversity Program, Tornator's nature management of commercial forests has been progressive. Today, Tornator is Finland's largest FSC-certified forest owner, owning 31 % of the FSC-certified forests in Finland. The requirements set by FSC certification on nature management in commercial forests are considerably stricter than the standards specified by law, and the PEFC forest certification standard. By virtue of the FSC certification, the following efficient commercial forest nature management measures are already in use in Tornator's forests:

- More than 6 times higher retention tree volume in comparison with PEFC-certified forests due to large-dimensioned (d<sub>1.3</sub> > 20 cm) retention trees
- Saving of dead trees (at least 20/ ha) in forest management and protection of forests with abundant deadwood
- Water course buffer zones of 10–30 metres left untouched and excluded from forest management
- Preservation of a minimum share of 10 % of broadleaved trees in thinning and tending of seedling stand
- Restrictions during the nesting season of birds and identification and protection of capercaillie courtship sites during felling
- Prescribed burning requirement of 3 % of the area of suitable regeneration fellings, making Tornator one of Finland's most significant implementers of prescribed burning
- Preservation of ecotones and hydrological balance in virgin mires

In addition to the certification requirements, since 2017, Tornator has complied with the Finnish Forest Industries Federation's programme to increase deadwood by making two artificial snags per hectare during thinning. About 20,000 artificial snags are made in Tornator's forests every year.

## **Theme 2 – Active habitat management**

### **Key nature management projects and their significance for biodiversity**

Habitat management supports habitats whose natural values have declined, for example due to human activity, as a result of habitats becoming overgrown, due to fewer natural disturbances such as less forest fires, or the spreading of invasive species. The aim of active measures is to promote the restoration of habitats towards their natural state and to restore the natural species to the site, thus increasing the biodiversity of forests. Habitat remediation and restoration are key tools for safeguarding biodiversity and improving the status of endangered species and habitats. Key sites for habitat management and restoration include mires, wooded habitats and water course restoration sites.

#### **Measures in Tornator's Biodiversity Program 2021–2030 to improve the condition of forest and aquatic habitats:**

- ✓ We will restore 3,000 hectares of mire habitats
- ✓ We will take 200 active measures to improve forest and aquatic habitats
- ✓ improvement measures

**Mire restoration**

More than one half of mire habitat types in Finland are endangered. In addition, 120 endangered species, such as willow grouse and ruff, live primarily in mires. Forest drainage is the most significant cause of mires becoming endangered: more than one half of the total area of mires in Finland has been drained for the purposes of silviculture. No new drainage is performed, but the process of mire species becoming endangered will continue, as the draining effect of the ditches is ongoing, the tree stands and shrubs of previously open mires will become denser, and the food plants of species that favour open mires will become fewer.

Restoration of drained mires involves damming or blocking ditches to raise the water surface in the mire to its original level. In addition to blocking ditches, trees grown after drainage must be removed. Mire restoration and restoration of water in dried mires is important for safeguarding not only biodiversity, but also the ecosystem services the mires provide. Amongst other benefits, mires sequester and store carbon, balance out the impact of flooding, filter and purify water, and provide berries and game. At the same time, many measures taken to improve the condition of mire ecosystems also promote the condition of the nearby waterway. This is also beneficial for the recreational use of lakes, for example.

**Management of forest habitats**

Forest habitat management supports habitats whose natural values have deteriorated due to habitats becoming overgrown, or human activity. Such habitats may include herb-rich forests, sunlit habitats, burnt areas, areas taken over by invasive species, genetic reserve forests, and sites where certain specific species occur. More than half of the endangered species in forests live primarily in herb-rich forests, sunlit eskers and burnt areas, which means approximately 5 % of the total area of forests. Therefore, management measures focused on these habitats can effectively help a significant share of endangered forest species.

To achieve the best possible outcome, habitat management measures are always carefully planned specifically for each site. For example, there are many types of herb-rich forests: careful felling for nature management purposes can be performed on fresh herb-rich forest in order to promote the dominance of broadleaved trees on the site, while the demanding herb-rich forest vegetation of dry herb-rich forests require light, and therefore the tree stand can be treated quite intensively to maintain sufficient openness. The species of sunlit eskers, such as wild thyme and catsfoot, benefit from the removal of shading trees and the exposure of mineral soil and may recover fairly quickly as a result of the management measures. The living conditions of species dependent on burnt wood can be increased and maintained through prescribed burning of regeneration areas and retention tree stands.

**Water course restoration sites**

Flowing-water bodies have been cleared for example for the purposes of timber floating and drainage of land for forestry. In addition, for example culverts along breeding routes have weakened the spawning conditions of migratory fish. As consequence, migratory fish in Finland have become endangered. The removal of barriers to migration from flowing-water habitats, and the restoration of small waters and brooks, improve the quality of aquatic habitats.

Tornator has several significant flowing water restoration projects underway in collaboration with stakeholders, for the purpose of improving the condition of flowing-water habitats and the spawning conditions of endangered migratory fish. In addition to the restoration of flowing waters, key aquatic habitat restoration projects include wetlands that help reduce the eutrophication of water courses, and the restoration of springs to improve the state of valuable habitats and endangered species.



### Theme 3 – Conservation

In order to ensure the biodiversity of species and habitats, we do not only have to ensure the nature management of commercial forests but also protect valuable habitats excluded from forestry and habitats home to endangered species. Protected forests and mires include national parks, strict nature reserves, private conservation areas and areas protected to preserve biodiversity in commercial forests. The network of conservation areas must comprise a variety of different habitats and natural habitat types. The conservation areas must also be sufficient to meet the needs of various species so that they can find shelter and food, and be able to reproduce and, if necessary, spread to new habitats.

**Measures in Tornator's Biodiversity Program 2021–2030 for conservation:**

- ✓ We will protect 5,000 hectares of valuable natural sites

#### **Establishment of nature conservation areas**

Conservation areas are established to protect endangered or rare species, biotic communities or ecosystems. The conservation areas protect not only the diversity of species and habitats, but also ensure the preservation of the national landscape, cultural heritage and recreational and hiking areas for all citizens. In the beginning of the program period, Tornator owns about 200 private conservation areas in Finland, totalling more than 12,000 hectares of protected areas. Tornator wants to develop the network of conservation areas in Finland and our aim is to increase the number of conservation areas owned by the company by 50 per cent. We also protect key biotopes and other valuable habitats.

#### **Protection of key biotopes**

Key biotopes refer to sites that are important for rare animal and plant species and biodiversity. Key biotopes are often small-scale, but their significance for species diversity is considerable. Key biotope sites differ from the usual forest landscape, for example in terms of water economy, nutrient efficiency and topography, and are suitable for species that have adapted to those specific conditions. The forest, water and nature conservation legislation and forest certificates that guide Tornator's operations protect important key biotopes of forest and mire ecosystems, such as virgin mires, fresh herb-rich forests, steep cliffs and forests with an abundance of deadwood. Key biotopes are identified and marked in Tornator's system, and the required restrictions on their use are established.

### Theme 4 – Biodiversity indicators

#### **Challenges of measuring biodiversity**

Measuring the benefits gained by nature management, habitat improvement and conservation to biodiversity is challenging, because biodiversity covers multiple levels and manifestations. Furthermore, changes in habitats and species are slow. The best-known indicator of biodiversity is the number of species. However, measuring the number of species reliably and comprehensively is laborious and expensive, so in many cases, indicators to directly indicate the status of endangered species or habitats are not available for an individual forest owner. Therefore, the development of the natural state and the impacts of actions for nature must be monitored by indirect indicators through the development of structural features of forests indicating biodiversity, and protection, as well as the implementation of other active biodiversity measures.

The most widely used biodiversity indicators include the volumes of deadwood and large aspens, consideration for natural sites in felling, the share of broadleaved trees of the total forest stand, the share of alternative regeneration methods, and the number of nature management projects.

Even though Tornator is forced to measure biodiversity on its land indirectly, the success of the nationwide official assessment of threatened species can be promoted by reporting species observations, reported to the company, to the environmental administration's systems. The official assessment of threatened species serves as the reference material for species protection measures, including the requirements of environmental legislation and forest certification. Tornator investigates the occurrence of species including in wind power planning, research projects, and planning of stands marked for harvesting, for example in habitats of the flying squirrel. In addition, stakeholders provide Tornator with species observations based on notifications of forest use and public FSC conservation maps.

**Biodiversity indicators of Tornator's Biodiversity Program 2021–2030 for monitoring the performance of the Biodiversity Program:**

NATURE MANAGEMENT OF COMMERCIAL FORESTS		
Indicator	Target	KPI
Biodiversity taken into consideration in forestry measures	The adverse effects on the environment in the measures are minimised and biodiversity is supported through nature management measures in accordance with the certifications	Overall score of nature management quality (TAPIO Silva Oy)
Tree species	Increase the amount of broadleaved trees and aspens	The share of broadleaved trees of the total volume of tree stand + aspen (National Forest Inventory NFI and forest resources and remote sensing data)
Deadwood	The volume of deadwood is increased various ways, including leaving alive retention trees, dead trees and artificial snags.	NFI and quality assessment of nature management
Forest structure	Increase structural variation in forests	Volume of felling in continuous cover forestry

NATURE MANAGEMENT PROJECTS		
Indicator	Target	KPI
Mire restoration	Maintain and increase the habitats of protected species and water protection	Area of mire restoration measures
Active habitat management	Management measures to preserve the species typical of the site (non-mire habitats)	Number of forest and aquatic environment management projects

CONSERVATION		
Indicator	Target	KPI
Nature conservation areas	Development of the conservation area network	Development of the number of conservation areas (ha)
Valuable habitats	Protection of valuable habitats	Development of the number of habitats (pcs)


### **Development of indicators and KPIs**

An important goal of the Biodiversity Program is to develop biodiversity indicators. Tornator participates Stora Enso's and Sveriges lantbruksuniversitet's project "*Development of Evidence-based Key Performance Indicators (KPI's) for biodiversity 2020–2025*". The long-term goal of the project is to develop a pioneering, scientifically leading method for the comprehensive measurement of biodiversity and the impact of nature management and protection measures in forests. In the first phase of the project (2020–2022), preliminary biodiversity KPIs will be selected for use in Stora Enso's corporate responsibility work. Between 2021 and 2022, measurements will be made in Tornator's forests as part of a study on the effectiveness of retention trees in conserving biodiversity.

### **Research**

Tornator and the University of Eastern Finland have tentatively planned to apply for a joint doctoral researcher to focus on increasing and measuring the functional biodiversity of mires on restored mires. The measurable properties are related to vegetation, water quality, game, berry harvests and carbon sequestration.

In addition, during the program period, Tornator will commission theses for example on structural features that support biodiversity in Tornator's forests based on NFI data and on the effects of prescribed burning on lichens of burnt sites.

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