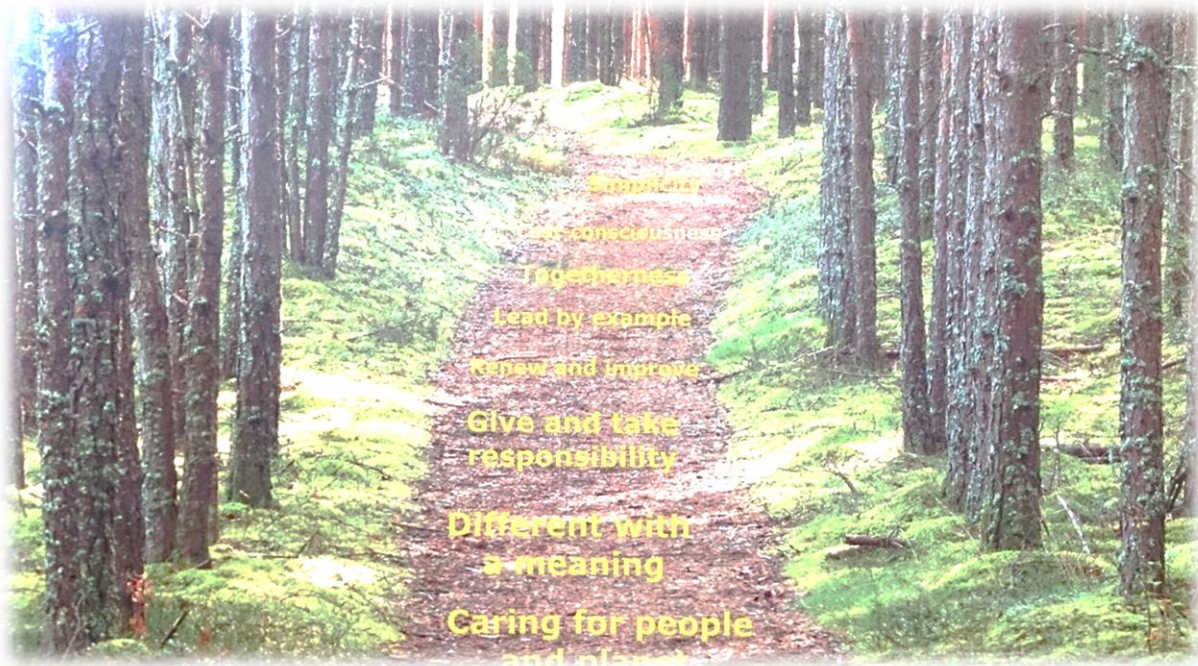


Ingka Investments Estonia OÜ



Forest Management Plan

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Introduction

The Forest Management Plan (hereinafter – FMP) of Ingka Investments Estonia OÜ (hereinafter - Ingka) contains the results of the forest management planning process, including forest management objectives, resource assessment, planned and implemented activities, as well as references to Ingka internal regulations. The mission of the Ingka Investments Estonia is to support Ingka Group in its desire to use resources in a sustainable manner. Ingka Investments Estonia OÜ manages and owns forestland of 19 571 hectares in the entire inland territory of Estonia.

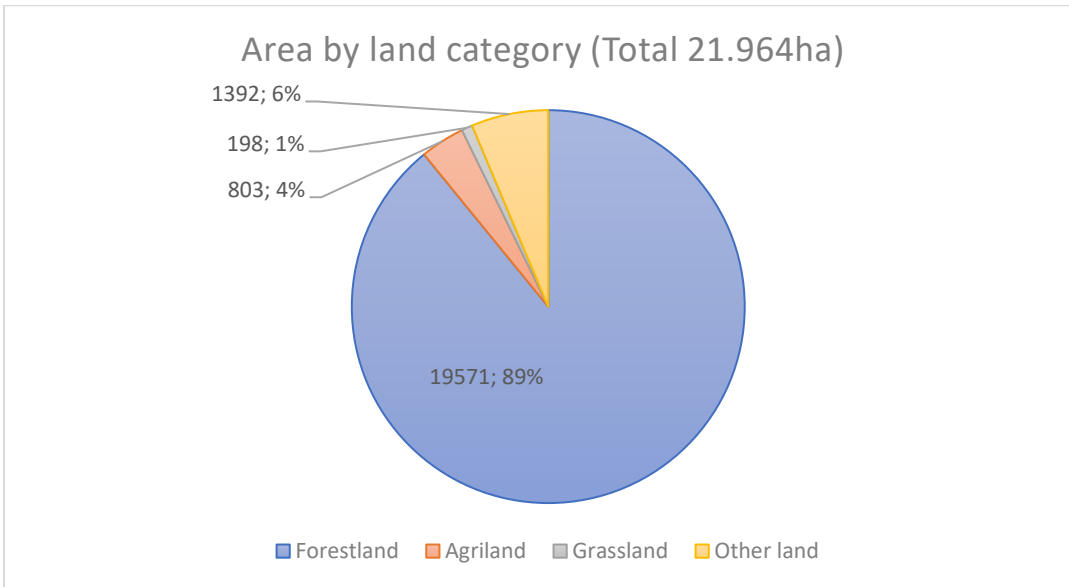
The FMP summary is publicly available on the Ingka Investments Estonia webpage www.ingka-investments.ee. It is communicated with public interest groups at least once every 5 years or whenever significant changes in forest management practices have occurred. The management plan is updated at least once a year. The FMP summary ensures that the requirements of the legislation of the Republic of Estonia as well as forest management standards are met. During the development of the FMP, the compliance of the SCS Global Services Temporary Forest Management Standard (V2.1, March 2016) with the national legislation was evaluated, and no conflict situations were found. Re-evaluation will be carried out with each update of the FMP.

By endorsing this document, the Ingka undertakes to comply with FSC® (FSC-C138271) principles and criteria, as well as all binding legislative requirements of the Republic of Estonia; the company also requires this commitment from all external service providers. The Forest Operation Manager is responsible for the contents of this FMP. Should you have any questions or comments regarding this FMP, please send them to the e-mail: ingka.investments.ee@ingka.com.

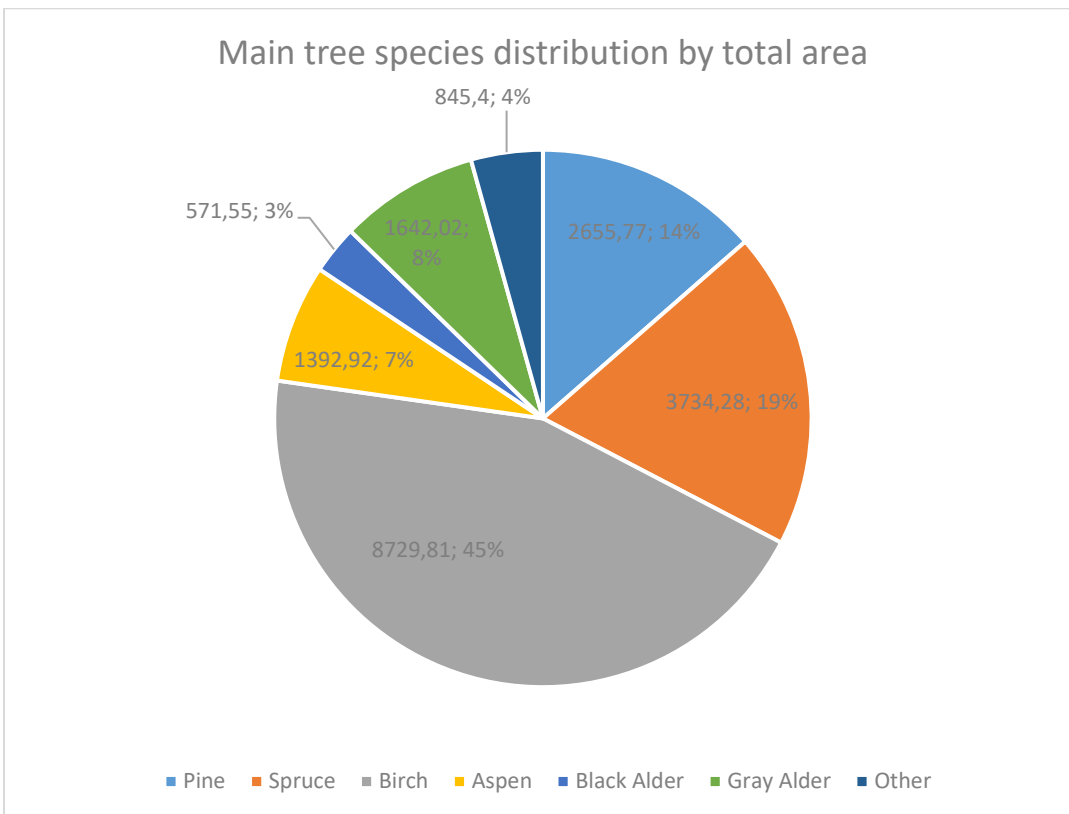
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a) Forest stand description

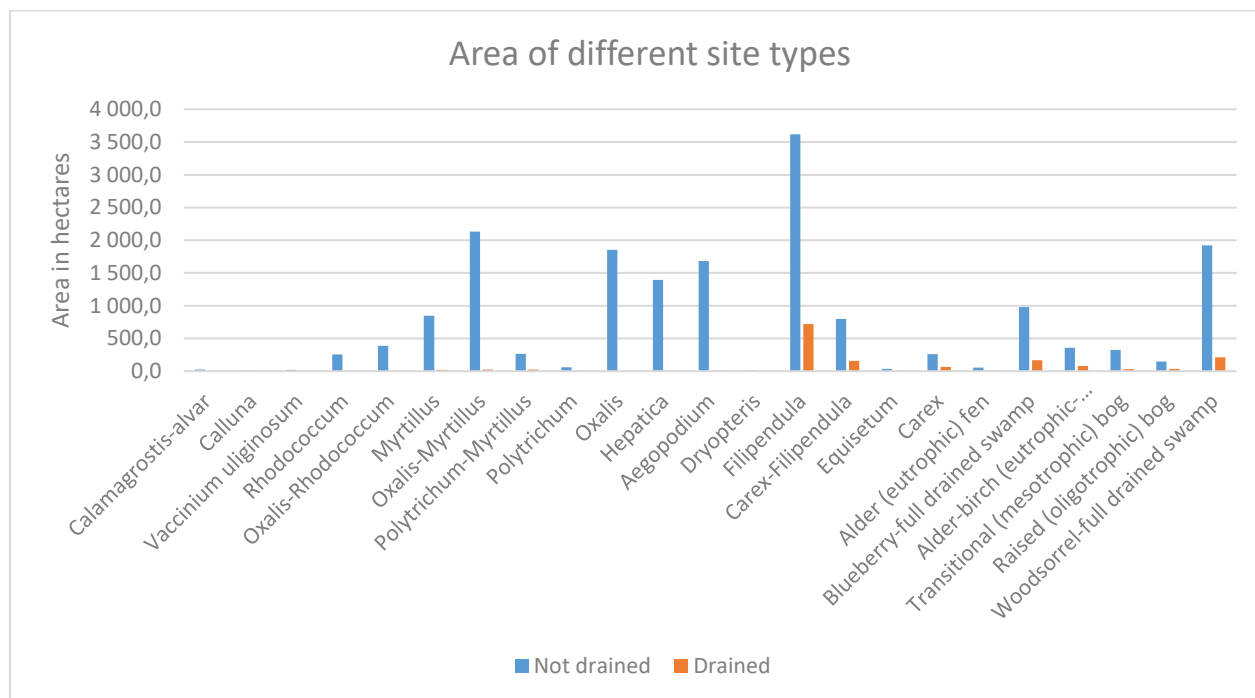
Distribution of territory by category of land (ha) as seen in the figure below:



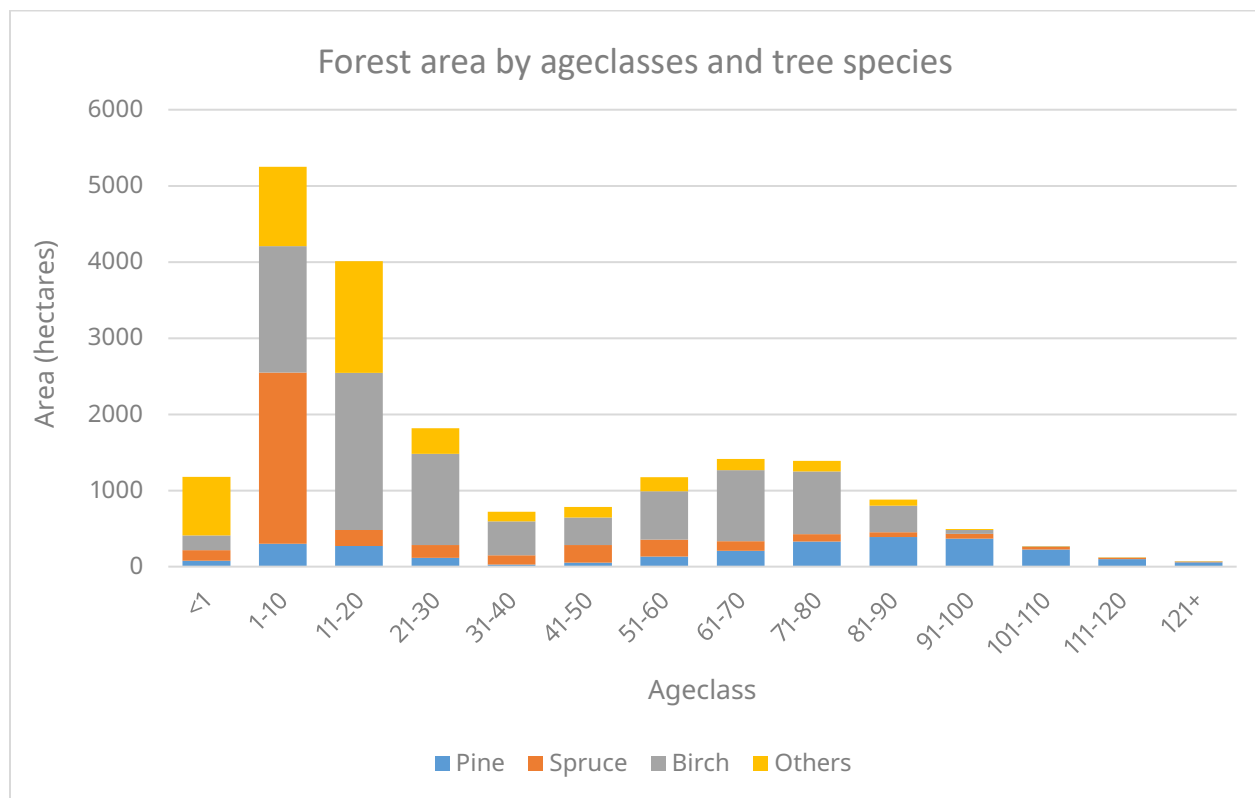
Distribution of territory by main tree species (ha) as seen in the figure below:



Distribution of forestland by site types and drained area:



Age class distribution:



Distribution of territory by site quality (ha) as seen in the table below:

Ia	I	II	III	IV	V	Va
1265,6	6683,1	7164,2	3000,2	966,9	323,8	138,3

At present, no invasive species are found in managed forest areas. The only likely invasive species, hogweed *Heracleum sosnovskyi*, is monitored and eliminated under management of Environmental Board. More information about hogweed, how to recognize it and map layer can be found on Environmental board webpage (<https://keskkonnaamet.ee/voorliigid>).

Also 2.7 hectare of introduced species are planted in the forest area. Small, 0.2 hectare of Fir plantation can be found in Koeru parish (31401:002:0184) and 1.98 hectare of Larix plantation can be found in Audru parish (15905:001:0286), Türi parish (27101:004:0292) and Peipsiääre parish (86102:001:0653). Small Populus Alba plantation is found in Mets-Kaasmaru (52801:007:0074) property for 0,6 hectares. Those areas are purchased in early period of forming the forestland portfolio. Forest manager is not planning to plant new introduced species which are not allowed grow by legislation.

The manager is not responsible for planning transformation of forest land for plantations or non-forest lands, but if he plans to do this, then it:

- a) will affect a very limited part of the managed forest;
- b) will not take place in high conservation value forests;
- c) will provide clear, substantial, safe, and additional environmental benefits in the long term for the entire managed area as a whole.

b) Nature conservation areas

In the managed area, it is continuously ensured that no less than 10% of the total forest area is allocated to the primary objective – nature protection.

Ingka classifies and protects the following areas:

Identified value	Short description	Area, ha
HCV Category 1	Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.	261,2

HCV Category 2	Landscape-level ecosystems and mosaics. Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.	-
HCV Category 3	Ecosystems and habitats. Rare, threatened or endangered ecosystems, habitats or refugia.	37,0
HCV Category 4	Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.	694,1
HCV Category 5	Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or Indigenous Peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or Indigenous Peoples.	3,6
HCV Category 6	Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous Peoples, identified through engagement with these local communities or Indigenous Peoples.	9,3
	Total HCVF	1005,2

Conservation zone	Areas that are designated and managed primarily to safeguard species, habitats, ecosystems, natural features or other site-specific values because of their natural environmental or cultural values, or for purposes of monitoring, evaluation or research, not necessarily excluding other management activities.	0.2
Protection Areas		920,0
Connectivity areas	A measure of how connected or spatially continuous a corridor, network, or matrix is. The fewer gaps, the higher the connectivity. Related to the structural connectivity concept; functional or behavioural connectivity refers to how connected an area is for a process, such as an animal moving through different types of landscape elements.	-
	Total rare or threatened species	920,2

Representative sample area	Portions of the Management Unit delineated for the purpose	According to HCVF register: forests on peat soils	372,1
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	of conserving or restoring viable examples of an ecosystem that would naturally occur in that geographical region.	According to HCVF register: forests on wet mineral soils	13,3
		According to HCVF register: forests on mineral soils	5,7
Total Representative sample area			391,0
Total Conservation Area Network			2316,4

In high value forest areas, only activities permitted by national and/or forest management standards are carried out. In areas that do not correspond to the classification of high value forests, but are included among the 10% of the protected areas, no clear cutting will be planned if possible and reasonable (a complete list of protected areas, by cadastral, is available in conservation area register).

c) Principles of high value forest management

High value forests	Legislation of the Republic of Estonia or internal company policy governing management	Sources of documentation - desktop research using the best available information
HCV1	<ol style="list-style-type: none"> 1. Nature Conservation Act 2. Forest Act 3. The protection procedure of a protected area, species protection site or individual protected natural object 4. IKEA Forest management strategy 	National networks of protected areas designed for the protection of biodiversity (species). Large scale PA will not be included here entirely; Concentrations of species in critical moments of their existence: breeding, feeding, etc.
HCV2	NA	
HCV3	<ol style="list-style-type: none"> 1. Forest act 	http://www.globalforestwatch.org/ Check the correspondence between EU priority habitats and the national habitat classification available in stand registers for a rapid assessment. For example, Alvar forest and registered key habitats
HCV4	<ol style="list-style-type: none"> 1. Nature Conservation Act 2. Forest Act 3. Water Act 4. Forest management guideline Ingka Baltic 	Include stands with forest dbh 1.3 whose main function assigned is watershed protection or soil erosion control.
HCV5	NA	
HCV6	<ol style="list-style-type: none"> 1. Heritage Conservation Act 2. Forest management guideline Ingka Baltic 	Obvious cultural values are usually well-known and are belonging to the government (central or regional) or to

the local community/municipality. To be checked - desktop research.

In order to ensure the preservation of high value forest properties, each of the high value forest categories in nature is subject to their effectiveness evaluation indicators, which are corresponding to the identified high-quality attribute or purpose. As a result of annual monitoring, data on the development of a high-grade feature (species composition, distribution, phytosanitary status, etc.) and deviations from the target are obtained.

Provisions for protecting water resources (e.g., stream courses and adjoining riparian areas, wetlands, seeps and springs) found within the defined forest area, especially forest management on bank, shore, etc. restriction belt will be carried out according to FSC standard and Nature conservation act. Final felling will be done as shelterwood cutting where possible. When-ever not possible, then clear cut area should not be bigger than 1 ha. Driving through rivers and creeks is usually forbidden. According to the law:

1. It is not allowed to cut any trees 10 m from the water, except damage, dead or trees and pushes fallen or about to be fallen into the water.
2. It is forbidden to store any residues in the water.

Continuous forest or bush cover is maintained on a stripe of 10 m along the river banks.

Surveillance and discover of new HCVF is and will be done in accordance with Ingka procedures and monitoring system.

d) Natural forest habitats

In order to identify the potential presence of Woodland Key Habitats (WKHs) in the managed area, evaluation of potential rare habitat is carried out during the fieldwork at least before every logging operation. If during the planning of forestry work, when studying databases and maps of regional or national protected parameters or receiving comments from interested parties (forestry workers, environmental organizations, etc.), reasonable information has been obtained that the forest property meets the WKH, the forest manager notifies the Environmental Board about potential WKH and takes responsibility to save area from any operations, before expert evaluation. WKH in new purchased properties will be evaluated by experts and if no indicators appear, the forest manager will make a proposal to Environmental Board to erase object from WHK register. Training for co-workers will be carried out regularly to identify WKH indicators.

Endangered species, their habitats and protective areas

Restriction type	Area, ha
Species permanent habitat protective belt, prohibited management	137,8
<i>Species permanent habitat restriction belt, limited management buffer zone</i>	240,7

Full list of identified endangered species is available in forest management software and National Forest Registry.

In order to raise the awareness of co-workers regarding the possibilities of identifying large bird nests (black stork, black kite, serpent eagle, etc.), trainings will be carried out.

e) Forest ecological functions

Regulatory functions	Habitat ensuring functions	Productive functions
CO ₂ capture and O ₂ production within the process of photosynthesis	Living and breeding location for animal species	Ensuring and improving the growth and quality of timber and non-timber resources
Ensuring air quality	Preservation of biodiversity	Expansion of ecosystem productivity (natural stabilization)
Ensuring water quality	Balanced species numbers ratio	Ensuring the sustainability (non-diffusion) of ecosystem (forest stand) productivity
Ensuring water volume	Recovery of optimal food chains and ecological niches	Maintaining the quality of soil by ensuring the prerequisite for increased forest productivity
Protection against erosion	Ensuring suitable natural conditions for the development of coastal and inland water ecosystems	Ensuring suitable conditions for the conservation of fish resources

f) Objects with heritage and/or archaeological value

The forest manager shall ensure that objects with heritage and/or archaeological value are protected by coordinating activities with the National Heritage Board or protected voluntarily if considered important by third party. The following objects are considered:

- Places of burial
- Former homes
- Ornamental tree plantations and alleys

- Individual old trees
- Individual tapped trees, etc.

Next to that, many former homes are on the properties. Ruins will be left as they are or cleaned carefully, if needed.

g) Non-timber forest resources

The forest manager is aware of the value of non-timber forest resources (products and services).

The forest manager has identified such non-timber resources in his forest properties:

Resource	Location	Production volumes
Forest berries and mushrooms	All forest properties	Not produced commercially
Game animals	All properties, especially territories where hunting rights lease agreements have been concluded	Limits are set by local board and Environmental board
Recreation	All forest properties where available	Areas will be selected

h) Description of fauna

The Ingka Forest Manager has representatives of fauna typical of the territory of Estonia, such as beavers, stags, wild boars, elks, roe deer, etc. Annual information is gathered on the number of game (limited and unlimited) species such as beavers, stags, wild boars, elks and roe deer by Environmental Agency.

Taking into account the size of the forest property and location, as well as the distribution area of forest animal populations, it is not possible to determine the exact number of species and their density in a given property, therefore the data provided by the Environmental Agency on changes in the population of fauna at national level is used.

i) Beaver flooding

At present, the forest manager has identified long-term beaver flooding in forest properties on natural watercourses with the total area of 12.2 ha, the manager is aware that leastways a partial protection must be ensured.

j) **Phytosanitary condition**

Phytosanitary condition of Ingka forest is good. No forest pests or insects attack have been recorded. Forest manager is monitoring forest regular bases and keep gathering information about possible pests from Environmental Agency.

k) **Description of adjoining land**

Ingka Forest properties are located throughout Estonia, thus this chapter provides a general description of the territory of Estonia.

Territorial placement

Estonia lies on the eastern shores of the Baltic Sea immediately across the Gulf of Finland from Finland on the level northwestern part of the rising East European platform between 57.3° and 59.5° N and 21.5° and 28.1° E. Average elevation reaches only 50 meters and the country's highest point is the Suur Munamägi in the southeast at 318 meters. There is 3,794 kilometers of coastline marked by numerous bays, straits, and inlets. Estonia is covered by about 23 000 km² of forest. Agriculture land amounts to about 12 000 km² and bogs cover about 2140 km². There are more than 1,400 natural and artificial lakes in Estonia. The largest of them, Lake Peipus (3,555 km²), forms much of the border between Estonia and Russia. Located in central Estonia, Võrtsjärv is the second-largest lake (270 km²). The Narva and Emajõgi are among the most important of the country's many rivers.

Climatic conditions

Estonia lies in the northern part of the temperate climate zone and in the transition zone between maritime and continental climate. Because Estonia (and all of Northern Europe) is continuously warmed by maritime air influenced by the heat content of the northern Atlantic Ocean, it has a milder climate despite its northern latitude. The Baltic Sea causes differences between the climate of coastal and inland areas. Estonia has four seasons of near-equal length. Average temperatures range from 16.3 °C on the Baltic islands to 18.1 °C inland in July, the warmest month, and from -3.5 °C on the Baltic islands to -7.6 °C inland in February, the coldest month.

Forests

Estonia is a country rich in forest – over a half (50.6%) of land is covered with forest. The area and reserve of our forests has increased significantly during the last half-century. In Estonia, forest grows on approximately 2.3 mln hectares, of which approximately 75%, that is, 1.6 mln hectares is manageable forest. Most common tree species are pine, birch and spruce.

Animal kingdom

Estonia's sparse population and large areas of forest have allowed stocks of European lynx, wild boar, brown bears, and moose to survive, among other animals. Estonia is thought to have a wolf population of around 200, which is considered slightly above the optimum range of 100 to 200. Estonian birdlife is characterized by rare seabirds like the Steller's eider (*Polysticta stelleri*), lesser white-fronted goose (*Anser erythropus*) and black-tailed godwit (*Limosa limosa*), wetland birds like the great snipe (*Gallinago media*), dry open country birds like the corn crake (*Crex crex*) and European roller (*Coracias garrulus*) and large birds of prey like the greater spotted eagle (*Aquila clanga*). Estonia has five national parks, including Lahemaa National Park on the northern coast as the largest. Soomaa National Park, between Pärnu and Viljandi, is known for its wetlands. Reserves such as Käina Bay Bird Reserve and Matsalu National Park (a wetland of international importance under the Ramsar Convention) are also popular with locals and tourists and support a wide variety of birdlife. The largest bear populations can be found in north east Estonia in the counties of Ida and Lääne Viru. The numbers of bears, lynx and wolves suffered during the Soviet Occupation as the animals were persecuted heavily. After they were given protection the numbers of the larger carnivores peaked in the early 1990s but they have since fallen slightly from those highs due to increased hunting pressure. In 2008, Estonia was home to approximately 620 brown bears, 760 lynx, and 135 wolves. As of early 2010, large ungulates included 48,040 roe deer (down from 63,000 in 2009), 11,741 European elk, 2,831 red deer, and 22,642 wild boars.

2. Forest management objectives

This chapter defines long-term management objectives and the methods of achieving them in the economic, environmental and social management area. The company's goals are set by the Board.

a) Company's long-term goals

Economic

1. Optimizing the value of long-term assets in accordance with all applicable laws, regulations and ToE standard (Terms of Engagement in Forest Operations).
2. Carrying out forest management activities in accordance with the annual budget and in line with priority investments in forestry, ditching and road maintenance, thus improving the productivity of commercial forests in the long run.
3. Directing the wood products derived from the Ingka Forest Management in the IKEA supply chain, if it adds value to the Ingka Group.

Environmental
1. Forests must be managed in an environmentally responsible manner and certified in accordance with the Forest Stewardship Council (FSC) principles and criteria.
Social
1. Forests must be managed in a socially responsible manner and certified in accordance with the Forest Stewardship Council (FSC) principles and criteria.

b) Techniques for reaching long-term goals

Techniques for reaching economic goals
1. To purchase additional forest land, assessing their ability to achieve the above economic goals. 2. To carry out reasonable forest care, including tending of young forest stands and growing stocks. 3. Other actions contributing to the achievement of the above goals.
Techniques for reaching environmental goals
1. To purchase additional forest land, assessing their ability to achieve the above environmental goals. 2. To balance the volume of wood harvesting with actual wood growth in the forest. 3. Other actions contributing to the achievement of the above goals.
Techniques for reaching social goals
1. To purchase additional forest land, assessing their ability to achieve the above social goals. 2. To balance the volume of wood harvesting with actual wood growth in the forest, thus ensuring sustainable forest management practices and a socially important factor such as regular employment. 3. Other actions contributing to the achievement of the above goals.

c) Wood sales

Wood for delivery will be sold as stumpage or as assortments. The forest manager shall provide full insight into gross log incomes, transportation costs, harvesting costs, and other costs, so that Ingka can follow the whole harvest/wood sales chain. Ingka accounting stipulates revenues are recognized at the moment of issuing the invoice.

The Forest manager shall optimize wood sales revenues through finding the best buyer, maximize the amount of valuable assortments, chose the right timing for sales. The Forest manager is flexible in time with 30% of the planned sales volume to sell it under best possible market situation. Thus the sales volume for a year could maximally vary between 70-130% of the budgeted volume, but maybe further constrained by legal frame works or FSC.

- The forest manager shall sell the respective assortments trying to get best possible price per assortment and maximizing the volume of the most valuable assortments, veneer logs and saw logs, i.e. maximize total value according to [Assortment Production Guideline](#).
- The forest manager shall sell wood when the market is beneficial. Determination of when the market is beneficial shall be done on reliable market information, demonstrated to

Ingka. In absence of reliable official market information, other sources of information shall be searched, also non-domestic sources could be used.

All the taxes are paid in accordance with the relevant laws.

d) Timber product description

Assortment EE	Assortment EN	Product Level 1	Product Level 2	Species
Männipost	Pine post	W1 Rough Wood	W1.1 Round wood (logs)	Pinus Sylvestris / Pine
Männi majapalk	Pine houselog	W1 Rough Wood	W1.1 Round wood (logs)	Pinus Sylvestris / Pine
Männipalk	Pine sawlog	W1 Rough Wood	W1.1 Round wood (logs)	Pinus Sylvestris / Pine
Männilatt	Pine fence post	W1 Rough Wood	W1.1 Round wood (logs)	Pinus Sylvestris / Pine
Männipalk sorditu	Pine defected log	W1 Rough Wood	W1.1 Round wood (logs)	Pinus Sylvestris / Pine
Männipaberipuit	Pine pulpwood	W1 Rough Wood	W1.1 Round wood (logs)	Pinus Sylvestris / Pine
Männiküttepuuit	Pine firewood	W1 Rough Wood	W1.2 Fuel wood	Pinus Sylvestris / Pine
Kuusepalk	Spruce sawlog	W1 Rough Wood	W1.1 Round wood (logs)	Picea abies / Spruce
Kuusepost	Spruce post	W1 Rough Wood	W1.1 Round wood (logs)	Picea abies / Spruce
Kuuselatt	Spruce fence post	W1 Rough Wood	W1.1 Round wood (logs)	Picea abies / Spruce
Kuuse majapalk	Spruce houselog	W1 Rough Wood	W1.1 Round wood (logs)	Picea abies / Spruce
Kuusepalk sorditu	Spruce defected log	W1 Rough Wood	W1.1 Round wood (logs)	Picea abies / Spruce
Kuusepaberipuit	Spruce pulpwood	W1 Rough Wood	W1.1 Round wood (logs)	Picea abies / Spruce
Kuuseküttepuuit	Spruce firewood	W1 Rough Wood	W1.2 Fuel wood	Picea abies / Spruce
Kasepakk	Birch veneer	W1 Rough Wood	W1.1 Round wood (logs)	Betula pendula / Birch
Kasepalk	Birch sawlog	W1 Rough Wood	W1.1 Round wood (logs)	Betula pendula / Birch
Kasepalk sorditu	Birch defected log	W1 Rough Wood	W1.1 Round wood (logs)	Betula pendula / Birch
Kasepaberipuit	Birch pulpwood	W1 Rough Wood	W1.1 Round wood (logs)	Betula pendula / Birch
Kaseküttepuuit	Birch firewood	W1 Rough Wood	W1.2 Fuel wood	Betula pendula / Birch
Sanglepalk	Black alders pallet	W1 Rough Wood	W1.1 Round wood (logs)	Alnus glutinosa / Black alder
Hall-lepapalk	Gray alder pallet	W1 Rough Wood	W1.1 Round wood (logs)	Alnus incana / Grey alder
Okaspuuküttepuuit	Conifer Firewood	W1 Rough Wood	W1.2 Fuel wood	Pinus Sylvestris / Pine, Picea abies / Spruce
Muu okaspuupalk	Other conifer sawlog	W1 Rough Wood	W1.1 Round wood (logs)	Pinus Sylvestris / Pine, Picea abies / Spruce
Haavapalk	Aspen pallet	W1 Rough Wood	W1.1 Round wood (logs)	Populus tremula / Aspen
Haavapaberipuit	Aspen pulpwood	W1 Rough Wood	W1.1 Round wood (logs)	Populus tremula / Aspen
Muu lehtpuupalk	Other hardwood pallet	W1 Rough Wood	W1.1 Round wood (logs)	Alnus incana / Grey alder, Alnus glutinosa / Black alder, Acer platanoides / Maple, Fraxinus Excelsior / Ash, Quercus robur / Oak, Populus Tremula / Aspen
Küttepuuit	Firewood	W1 Rough Wood	W1.2 Fuel wood	Alnus incana / Grey alder, Alnus glutinosa / Black alder, Acer platanoides / Maple, Fraxinus Excelsior / Ash, Quercus robur / Oak, Populus Tremula / Aspen, Betula Pendula / Birch, Tilia Cordata / Linden.
Lehisepalk	Larch sawlog	W1 Rough Wood	W1.1 Round wood (logs)	Larix / Larch
Saarepalk	Ash sawlog	W1 Rough Wood	W1.1 Round wood (logs)	Fraxinus excelsior / Ash
Raiejäätmed	Logging residues	W3 Wood in chips or particles	W3.1 Wood chips	Pinus Sylvestris / Pine, Picea abies / Spruce, Alnus incana / Grey alder, Alnus glutinosa / Black alder, Acer platanoides / Maple, Fraxinus Excelsior / Ash, Quercus robur / Oak, Populus Tremula / Aspen, Betula Pendula / Birch, Tilia Cordata / Linden.
Okaspuu paberipuit	Conifer pulpwood	W1 Rough Wood	W1.1 Round wood (logs)	Pinus Sylvestris / Pine, Picea abies / Spruce
Võsa metsamaalt	Biofuel chips from forestland	W3 Wood in chips or particles	W3.1 Wood chips	Pinus Sylvestris / Pine, Picea abies / Spruce, Alnus incana / Grey alder, Alnus glutinosa / Black alder, Acer platanoides / Maple, Fraxinus Excelsior / Ash, Quercus robur / Oak, Populus Tremula / Aspen, Betula Pendula / Birch, Tilia Cordata / Linden.

3. Description of the forest management system

Forest manager has implemented procedures for work flow according to intercompany Forest management guideline for maintenance and logging operation together with fieldwork forms and work specifications for co-workers and service providers.

Outsourcing is used for forestry activities such as silviculture, maintenance, harvesting and transportation. In order to ensure that outsourcing providers are informed about certification and other requirements, trainings are organized and contractors are also provided with electronic copies of the binding certification standards.

In the production of timber, the method of clear cutting is mostly used for regeneration cutting. In compliance with the requirements of Nature Conservation, the forest manager does not perform clear cutting (maintaining the growing tree density on the ground floor of the forest stand not less than 0.4) in green belts (in the contact (transition) zone) around swamps and river.

In stands where oaks, lindens, maples, fluttering elms, elms and hornbeams are dominant, the restoration of forest stands of these species is ensured at least to the extent that the proportion of species in question was before the start of the regeneration cutting.

If this does not create a real threat of diseases and pests in surrounding stands and/or threats to occupational safety, such locations and trees are not subject to forestry activities in the area under management:

- specific areas of deadfalls and wind broken trees where large trees have grown;
- burnt stands older than 30 years, in groups or separately — surviving trees, as well as trees lost in groups;
- crab-apples and junipers.

a) Management of wet forests

The management of wet forests meets the following requirements:

- The preservation of advance growth is promoted in wet spruce forests (swamp forest, mixed forest on wet peat soil, wet rich deciduous forest, wet spruce forest and reeds) and at least partial regeneration under the mother stand crown carpet;
- In wet deciduous tree and spruce forests (swamp forest, mixed forest on wet peat soil, wet rich deciduous forest, wet spruce forest, as well as mixed swamp forest with reeds where spruce or black alder is dominant), regeneration of growing tree species is to be promoted.

b) Forest maintenance and regeneration

The main task of forest regeneration is growing a productive and qualitative forest that meets the forestry requirements, restoring the forest by sowing or planting, or promoting natural regeneration, if it occurs with tree species corresponding to the given growth conditions. Only certified forest reproductive material is used for artificial reforestation within the Ingka.

The maintenance of young forest stands is carried out with the aim of promoting the development of tree species best suited for particular forest-growing conditions. It should also be mentioned that maintenance increases the future forest productivity and the value of retainable trees, depending on the genetic characteristics of the plants or seeds. Proper selection of plants greatly influences the growth of stock and the quality of trunks. Properly cultivating young forest stands for retainable trees will significantly increase the growth space and reduce the duration of the forest cultivation cycle.

Thinning of growing stock should be started when forest stand trees from the moment of young forest stands merging begin to run out of resources for growth – water, nutrients and light. During the thinning process, part of the stand is periodically cut out.

In unmixed stands, thinning of growing stock regulates density and improves stand quality, but in mixed stands – forms a forest stand with the desirable species composition and quality.

The intensity of thinning depends on the forest stand's composition, age, growing stock, biological characteristics of the main species, forest stand, type of growth conditions and forest stand management forestry objective, as well as on the ability of the forest stand to continue producing wood in such volume that at the moment of main cutting, the growing stock would be close to the possible maximum amount.

Ingka forest manager in Estonia follows the Forest Management Guidelines in the Baltic States.

a) Logging equipment and technology

In order to reduce the impact of logging on the soil and growing trees, as well as to increase the majority of the assortment to be obtained and their quality, Ingka uses suitable technology. The technical requirements for timber harvesting and delivery technology are determined individually, evaluating the conditions and distance of timber delivery in order to minimize the negative impact of logging equipment on the soil. Mostly, harvesters and forwarders are used for any logging activity.

b) Labour protection

Each company engaged in Ingka forest work must have a labour protection system set up that is in compliance with the Occupational Health and Safety Act and must observe the bound safe work requirements.

The inspection of these requirements is performed by forest manager during the day-to-day logging operations, as well as during the Ingka internal audit. The forest manager provides guidelines and annual training for co-workers and service providers on current issues in labour protection.

4. Grounds for the choice of annual forest harvesting and species selection

An annual allowable cutting (AAC) volume is balanced with wood growth, thereby ensuring a solid timber flow and sustainable forest management. AAC of forest products, either by area or volume, is established by a combination of empirical data and published literature, based on conservative, growth and yield estimates to ensure that the rate of harvest does not exceed the calculated rates of long-term growth.

For long term optimization and ensuring long-term sustainability, Iptim (by Simosol OY) software is used to create optimised harvest and maintenance plans based on Ingka data, models, regimes, products and objectives.

The planning of harvesting is carried out in a way that during operations included in the regular forest management process (regeneration cutting and commercial thinning) does not exceed the average permissible cutting volume for a 120-year period. The annual cutting volume can be increased to the extent of the growing stock accumulation during the previous period. The planned cutting volumes do not include damages caused by natural disasters (deadfalls, snow showers, etc.) and the increase in cutting volumes related to liquidation of consequences.

Regeneration method and species selection will be done according to Ingka Group Forest management guideline:

Dry	Pine Natural regeneration (Planting/sowing)	Pine Natural regeneration (Planting/sowing)	Pine Natural regeneration (Planting/sowing)	Pine/Birch/Spruce Natural regeneration	--
Mesic	Pine/Birch Natural regeneration	Pine/Birch Natural regeneration	Birch/Pine/Spruce Natural regeneration	Birch Natural reg (Planting*) Spruce Planting*	Birch Natural reg (Planting*) Spruce Planting*
Moist	--	Birch/Pine Natural regeneration	Birch/Spruce Natural regeneration	Birch/Spruce (Black Alder) Natural regeneration	Birch/Spruce Black Alder/Ash Natural regeneration
Wet	--	Birch/Pine Natural regeneration	Birch/Black Alder Natural regeneration	Black Alder/Birch Natural regeneration	Black Alder/ Ash/Birch Natural regeneration
	Poor	Weak	Medium	Fertile	Rich
	Liechen	Lingonberry/ Heather (Vaccinioso Callunoso Sphangnosa)	Blueberry (Myrtillosa Sphangnosa)	Low Herb (Oxalis) Grass	High Herb (Aegopodiosa Mercurialiosa Filipendulosa)

5. Forest growth dynamics and monitoring

To assess the activities carried out, forest growth dynamics, flora and fauna changes, an annual monitoring is provided. Monitoring is performed by the Forest Operation Manager.

a) Timber growing stock and production

	BY 2018	BY 2019	BY 2020	BY 2021	BY 2022	BY 2023
Total wood growing stock (m3)	600 786	1 203 982	1 736 532	1 694 254	1 712 640	1 681 012
Timber production volumes (m3)	24 615	50 481	64 918	80 608	91 940	92 062
Long term AAC	28 978	59 467	85 737	89 639	95 350	95 350

b) Forest dynamics, flora and fauna composition changes

	BY 2018	BY 2019	BY 2020	BY 2021	BY 2022	BY 2023
Natural and artificial reforestation (seedlings)						
Pine	24600		38 000	51 350	55 500	160 000
Spruce	475400	698 090	732 600	761 225	636 075	584 990
Birch			70 000	123 300	177 350	70 400
Aspen					2 900	
Black Alder						3800
Total	500000	698 090	840 600	935 875	871 825	819 190

c) Forest health status

Damaged forest stands (ha)	2018	2019	2020	2021	2022	2023
Removed cutting certification due to abiotic and biotic conditions (sanitation cutting)				3,1 ha	5,2 ha	12,3 ha
Replenishment of young forest stands (P; E; B)				31 ha	51 ha	88 ha

Repellents used (ha)	BY 2018	BY 2019	BY 2020	2021	2022	2023
Trico	44	88	262,7	174,75	109	23,54
Plantskydd			26			
Cervacol			28,3	15,7	0	1

d) Environmental impact

Environmental impact is assessed before, during and after logging operations and during maintenance activities if risks appear.

Questioner and it's report is available in Forest Information system.

e) High conservation value forest: identification, management and monitoring

HCV monitoring plan for FSC certified forests owned by Ingka Investments Estonia OÜ

Objectives:

The overall aim of HCV monitoring and management is to maintain and, where possible, enhance significant and critical environmental and social values as part of responsible forest management.

In order to reach that, monitoring shall:

- track the evolution of the identified critical values and their response to the applied management measures;
- validate the existence of identified values or any significant changes affecting their existence or conservation status;

A. Description and location of each HCV present: info about the significant or critical nature of the HCV at the appropriate scale.

B. Establishment of baseline data: what is the situation at hand when an entity makes the assessment?

C. HCV management objectives and targets: can be derived from the HCV definitions. The organization must transform management objectives (e.g., preserve rare wetland habitat), into specific and measurable management targets (X ha of wetland are in a healthy state).

D. Assessment of threats to HCVs: the organization must conduct a threat assessment for the HCVs identified (can be done by externals) <http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme>.

E. Consultation with stakeholders and experts: stakeholder engagement and consultation of external specialists, especially when the scale and intensity of production activities or external threats to HCVs are high;

F. Development and implementation of effective management strategies: that maintain and/or enhance the HCVs identified.

G. Development and implementation of a monitoring plan: to evaluate the effectiveness of management strategies and prescriptions, and must be tied directly to management objectives.

H. Adaptive management strategies, based on monitoring results to ensure effective HCV conservation. The management plan needs to clearly lay out a process for using the results of monitoring to change management as needed.

Development and implementation of the monitoring plan

An HCV may be declining, or a management strategy may be ineffective because of a number of reasons, including:

- Practical barriers to management implementation;
- Poor implementation of management strategies;
- New or changing threats/conditions;

These challenges can make it difficult to distinguish between a decline in an HCV due to weak implementation of management strategies, vs. a change due to (well implemented but) ineffective management strategies. Therefore, it is essential to monitor:

1. The implementation of management plans (operational monitoring)
2. Whether HCVs are being maintained by current management plans (strategic/effectiveness monitoring), and
3. Threats to HCVs (threat monitoring - aims to assess any changes in threats to HCVs).

The first monitoring category covers all management prescriptions (e.g. SOPs) across the management unit and it's being implemented at different compartment levels within the FME (E.g. monitoring of SOPs relating to road construction, harvesting operations, waste management and maintenance of HCV area boundaries). Relevant information for HCV network are transferred towards FSC responsible for their consideration and follow up.

The strategic and threats monitoring are subject of this plan.

Strategic/effectiveness monitoring

- Aims to assess whether HCVs are being maintained by current management plans;
- The schedule of strategic monitoring will depend in part on the vulnerability of the value being monitored and the cost of monitoring.

f) **Illegal forestry**

Forest manager shall register all violations of forestry laws, regulations or administrative provisions. Reasons for the violation of law shall be established and the forest manager shall implement relevant preventive and corrective actions:

- Having detected illegal activities (such as illegal tree cutting, construction and other unauthorized activities), forest manager immediately inform the competent state and/or local authorities and document the relevant event.
- Having detected violations of forestry laws, regulations or administrative provisions inside the company (sub-contractors incl.), corrective and preventive measures will be carried out according to "[Ingka Baltic Conflict Resolution Procedure](#)".

In order to avoid violation of boundaries of the felling area, if, as a result of the cutting, the basal area of the forest stand or its part will be reduced below the minimum basal area, except in the case of forming 0.2 hectare and smaller openings during the selective cutting, the felling area is marked so that the boundaries of the felling area are clearly visible, clear boundaries are considered to be:

- a forest stand up to 20 years of age;
- a clearing;
- non forest land;
- a boundary track;
- forest infrastructure objects;
- a colored, ribbed or visor-stamped border of felling area.

g) Social influence

Social Impact Assessment will be regularly done by analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions and any social change processes invoked by those interventions. Before or during forest logging and thinning operations forest managers are performing Social Impact Assessment by filling questionnaire in Forest Information System.

Main risks and their control measures:

Related issues	What can happen	Existing control measures
Health and safety	Injuries to workers and locals	High standard for service providers
Infrastructure	Can damage	Avoid using soft roads during rain period
Neighbours	Conflict	Notification and negotiations, agreement for land use
Local labour	Give work and income to locals	Prefer local labour
Local economy	Sell timber to local sawmills and firewood producers	Prefer local buyer
Promotion of local social and environmental values	Fix up local sightseeing or recreation objects	
Children education	Allow local school children and other people to participate in planting days where it is safe	
Change landscape	Large clear-cut areas in populated areas	Notification and negotiations

All forest properties owned by managers provide free access to berry and mushroom picking, as well as other types of recreation that is not contrary to existing legislation or certification requirements. Restrictions on access to forests can only be made if required by safety requirements (forestry works are underway) or in other situations, where there is a threat to society or the environment.

The forest manager hears out the local community (including the owners of neighbouring land) and other interested parties regarding the forest management and plan that has taken place. The forest manager establishes and updates the list of interested parties annually, see Annex 3.

Any interested party is invited to submit their suggestions, questions and comments by sending them to the e-mail: contact@ingka-investments.ee, thus continuously improving the manager's performance in forest management and ensuring social responsibility.

Comments received (both external and internal) are evaluated, and within a month from the moment of receipt, the respondent is provided an answer (action) to the comments made, FMP is

included in the response if necessary. The process is governed by the internal [Ingka Baltic Conflict Resolution Procedure](#).

Fair compensation or reasonable mitigation shall be provided to local people, communities or adjacent landowners for substantiated damage or loss of income caused by the FM.

People employed as a result of performing economic activity (number):

Year	Staff employees		Outsourcing	
	Men	Women	Men	Women
2018	5		30	
2019	5		50	
2020	6		56	
2021	6	1	71	3
2022	7	1	76	5
2023	8	1	76	4

Accidents occurred (number):

Year	Staff employees		Outsourcing	
	Serious	Fatal	Serious	Fatal
2015	0	0	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	0	0	0	0
2019	0	0	0	0
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0

6. Environmental protection measures

The forest manager is aware that inadequate logging can result in significant damage to the environment, therefore before the start of disturbing activities in forest plots, environmental impact assessments are carried out and their progress is documented in the Evaluation form before any harvesting action and TOE (Terms of engagement) audits are done during and after harvestings. Data will be recorded in the company database or Forest Information System. Both main cutting and growing stock thinning is considered to be disturbing activity. Planned forest management activities are modified taking into account the results of the environmental impact assessment (by applying the most appropriate development techniques, machinery, development time, adjusting the delivery and export paths, etc.).

To ensure environmental protection requirements, the forest manager organizes training for co-workers and service providers annually. Written guidelines are also developed that are binding on different types of activities (preserving natural values in felling areas, soil and water protection,

operation of infrastructure objects, etc.). The Ingka internal regulatory documents are listed in *Annex 2*.

a) **Retainable trees and forest structures**

The principles for choosing retainable trees and forest structure are regulated by the Ingka "Ingka Investments Forest Management Guidelines and environmental pollution reduction requirements".

b) **Seasonal protection measures**

To reduce the negative impact of economic activity on bird nesting in the forest, in forests with high natural density of breeding birds and diversity of species:

- logging intensity is reduced from April 1 to July 31, all large-scale final felling's and guillotine cuttings are reduced in deciduous forests, thinning's are allowed throughout the period. During this period, we carry out felling's in properties that are unlikely to be nesting areas for birds (stands with conifers and low-fertility habitat types);
- As the logging intensity is high during cold period in February March and due to limitation of transport, significant amount of the timber will be delivered and sold during the nesting period.

c) **Fire safety**

Fire safety in the forest and obligations of landowners in forest areas in the Republic of Estonia is regulated by Fire Safety Act.

A landowner shall be obliged:

- 1) to set up tracks and firebreaks in forest areas and to maintain them, except in the protected areas specified on the basis of the Nature Conservation Act, if so provided by subsection (2) of this section;
- 2) to prepare and mark existing smoking and campfire sites and parking lots for means of transport;
- 3) to mark existing water points, keep the access roads open for vehicles and ensure other technical conditions required for fire extinguishing;
- 4) in the case of high fire-risk and based on the orders of the Rescue Board to place notices on the prohibition of campfires in visible places.

The requirements for setting up tracks and firebreaks and requirements for tracks and firebreaks shall be established by a regulation of the minister responsible for the area.

Likewise, during everyday logging operations, it is controlled that all technical units working in the woods are equipped with operational fire extinguishers. The forest manager undertakes control over the implementation of these rules, training for the requirements is provided. ✓

7. Identification and protection of rare, threatened and endangered species

The existing inventory data is used as the basis for identifying rare, threatened and endangered species; in accordance with national legislation, inventory data is updated at least every 10 years, as well as with the acquisition of a new forest property, if necessary. Similarly, in order to ensure the protection of rare, threatened and endangered species, the Forest manager shall, before commencement of economic activity, take field visits.

The protection of identified rare, threatened, and endangered species and habitats is based on the principles of high value forest management that are developed in accordance with the legislation and Certification Standards.

8. Annexes

Annex 1: List of binding international agreements and laws and regulations;

Annex 2: List of binding documents used for the management planning of Ingka internal and other forests;

Annex 3: List of endangered species.

Annex 1: List of binding international agreements, laws, regulations and ILO

Following list presents all available laws and regulations what are relevant in forestry. Latest update of the list is available on Ministry of Environment homepage: <https://envir.ee/elusloodus-looduskaitse/metsandus/metsandusvaldkonna-oigusaktid>.

All applicable laws and regulations are published on government webpage: www.riigiteataja.ee.

- Metsaseadus;
- Metsa majandamise eeskiri;
- Metsa korraldamise juhend;
- Metsateatise esitatavate andmete loetelu ning metsateatise esitamise, menetlemise ja registreerimise kord ning tähtajad;
- Eriveo tingimused ning eriveo teostamise ja erilubade väljaandmise kord ning tee omanikule tekitatud kulutuste hüvitamise, eriloa menetlustasu ja eritasu määrad;
- Riigimetsas kasvava metsa raieõiguse ja metsamaterjali müügi kord;
- Metsakorraldaja katsetöödele ja eksamitele esitatavad nõuded, katsetööde ja eksamite korraldamise ja tulemuste hindamise kord ning ekspertkomisjoni moodustamine ja töökord;
- Metsamaterjali veoeskiri, metsamaterjali üleandmise-vastuvõtmise akti, müüdüd või ostetud raieõiguse või metsamaterjali kohta Maksu- ja Tolliametile esitatava teatise ja veoselehe vorm;
- Metsakorraldustööde tehniliste vahendite kohta esitatavad nõuded;
- Eestis metsa kultiveerimisel kasutada lubatud kultiveerimismaterjali algmaterjali päritolupiirkonnad;
- Metsa uuendamisel kasutada lubatud kultiveerimismaterjali algmaterjali päritolu, kultiveerimismaterjali tarnimise ja turustamise nõuded;
- Puidu mõõtmise ja mahu määramise meetodid, mõõtmistäpsusele ning mõõtmistulemuste dokumenteerimisele esitatavad nõuded;
- Vääriselupaiga klassifikaator ja valiku juhend kaitseks lepingu sõlmimine ja kasutusõiguse tasu arvutamise täpsustatud alused;
- Suure, keskmise ja väikese metsade tuleohuga maakondade jaotus;
- Metsatee seisundi kohta esitatavad nõuded;
- Erastataval maal asuva metsa maksumuse määramise korra kinnitamine;
- Õigusvastaselt võõrandatud maal hooldusraie tegemise ja piirisihtide raiumise korra kinnitamine muutmise;
- Jahiseadus;
- Muinsuskaitseadus;
- Maaparandusseadus;
- Teeseadus;

- Keskkonnaseadustiku üldosa seadus;
- Töötervishoiu ja tööohutuse seadus;
- Töölepinguseadus;
- Võlaõigusseadus;
- Asjaõigusseadus;
- Tulumaksuseadus;
- Maksukorralduse seadus;
- Looduskaitse seadus;

Applicable environmental conventions, agreements and ILO conventions ratified by Estonia are available on public webpage <https://eur-lex.europa.eu/homepage.html?locale=et>

Annex 2: List of intercompany documents

Document number	Name of document
1	Forest Management Plan
2	Ingka Investments forest management guidelines and environmental pollution reduction requirements
3	Juhised töövõtjale
4	Valgustusraie tööjuhised
5	Ingka Baltic Conflict Resolution Procedure
6	Forest standard operating procedures
7	Ümarpuidusortimendid ja optimaalne järkamine
8	ToE
9	Ingka Baltic sales strategy
10	Andmesisestuse reeglid FIS-is
11	Töökorralduse reeglid

Annex 3: list of endangered species

The database of endangered species can be found in following websites:

1. <https://www.riigiteataja.ee/akt/118062014020?leiaKehtiv>;
2. <https://www.riigiteataja.ee/akt/104072014022?leiaKehtiv>