ANNUAL REPORT 2020

RMK ANNUAL REPORT 2020

TABLE OF CONTENTS

10 FACTS ABOUT RMK

45%
of Estonia's forests are maintained by RMK.

30%
of RMK's forests are strictly protected.

30
offices are maintained by RMK across Estonia. Its headquarters is located in Sagadi.

6500
people were employed in RMK's forests during the year. Of those, 695 are full-time employees at RMK, with the rest employed by partner companies or working as seasonal workers.

6
important tasks performed by RMK are growing forests, preserving natural values, carrying out nature protection works, earning a profit for the state through the management of the forest, offering opportunities for moving around in nature, and promoting awareness of nature.

23 million
forest plants were planted in RMK's forest

2.9 million
visits were made to RMK's recreational and protected areas.

1%
of RMK's forest land is clear-cut each year. All clear-cut areas are reforested.

0 €
is the cost of everyman's right – camping along RMK's trails, spending the night in forest cabins, or sleeping in a tent within recreation areas.

4
certificates prove that RMK adheres to high standards in its activities. These are the sustainable forestry certificates FSC® (FSC-C022757) and PEFC, and the environmental and quality management certificates ISO 14001 and ISO 9001.

REPORT TO THE OWNER

Aigar Kallas
Chairman of the Management Board of RMK

Six years ago, the supervisory board of RMK agreed on six goals of the Estonia's state forest management. The aim of these goals was to increase the value of the forest that belongs to us all and ensure the environmental, social, and economic balance of forest benefits. Now, the period of 2015–2020 in RMK's Development Plan has come to an end and it is time to take stock of progress. How did we do?

- We increased the productivity of state forest area by growing 4.8 million m^3 of timber in 2020, instead of the planned 4.7 million m^3. The area and reserves of the state forest are increasing.
- We harvested on average 3.8 million m^3 of timber per year, thereby securing the stability of the timber market and providing jobs to thousands of Estonians. Every year the forest gives timber assortment with increasingly better quality.
- In 2020, we had 2.9 million visitors on our protected and recreational areas, whereas we had surpassed the target number long before the coronavirus brought Estonians into the woods. More and more Estonians are finding their way into the forest.
- We restored endangered or low-quality habitats on more than 15,000 hectares, which is half as much as we initially thought would be feasible. Degraded nature gets back its face.
- We earned nearly 400 million euros in profit, which is over 100 million euros more than set as target. State forest management brings home the bacon.
- We were consistently among the ten most valued employers in Estonia and paid our employees competitive wages. People are taken care of.

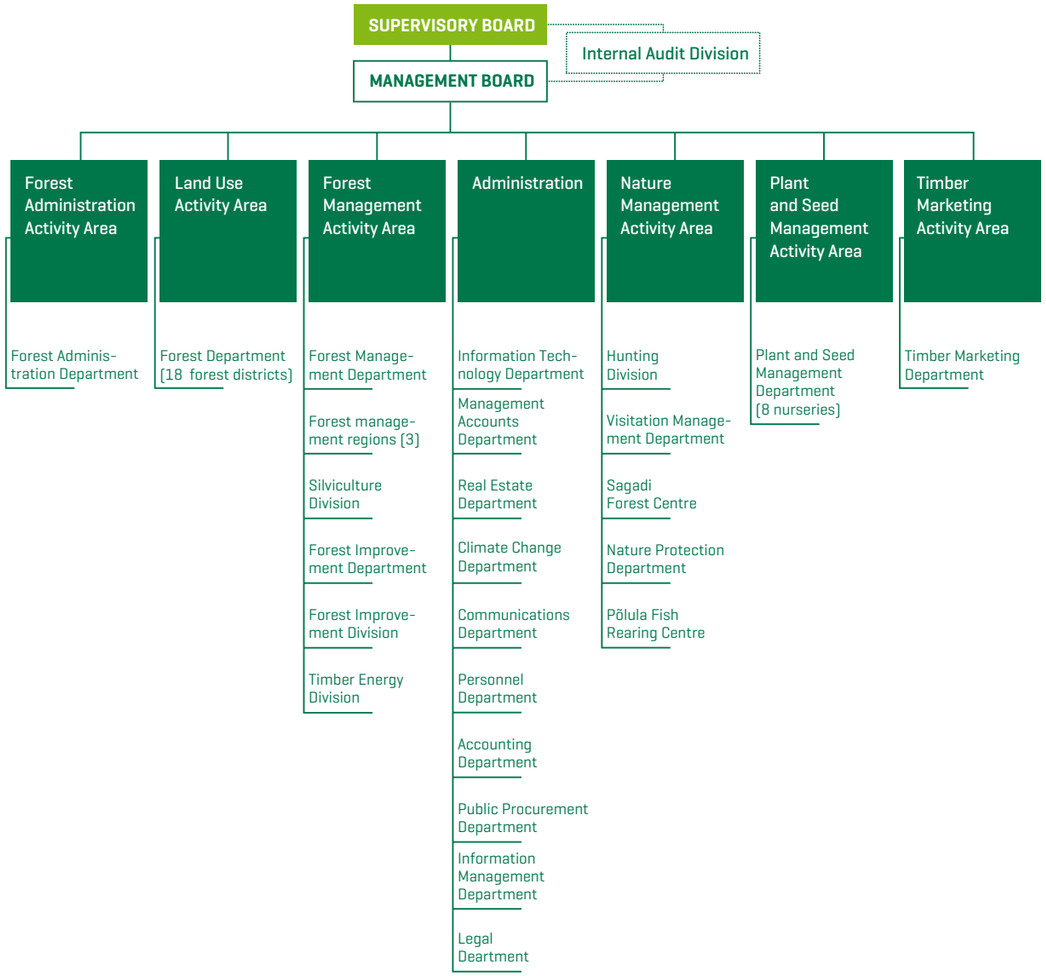
The goals we set before our owner, that is the people of Estonia, were met – the value of state forest increased. RMK's supervisory board extended the previous strategy for another two years until a new state development plan of forest is adopted. All goals remained the same, only the target figures to be reached are new. Another goal was added to the previous six – how successful we are in involving people who consider state forest their home forest and considering their wishes in forest management. You can find a detailed overview of all these indicators – fulfilment of previous as well as the set future goals – from the yearbook.

The employees of RMK and of our partner companies can be found from the pages of the yearbook. These and thousands of other people, working daily in the state forest, are the ones who with their hard work keep and grow the biggest wealth of Estonia – the forest. And the forest, in turn, maintains our living environment and ensures coping with the climate change. Thank you, climate heroes!

ABOUT THE ORGANISATION

State land managed by RMK ... of which forest land	1,426,713 ha 1,041,058 ha
Full-time employees	695
Turnover	EUR 187.5 million
Operating profit	EUR 82.4 million
Dividends and income tax paid into state budget	EUR 80.7 million
Land tax	EUR 4.7 million

STRUCTURE

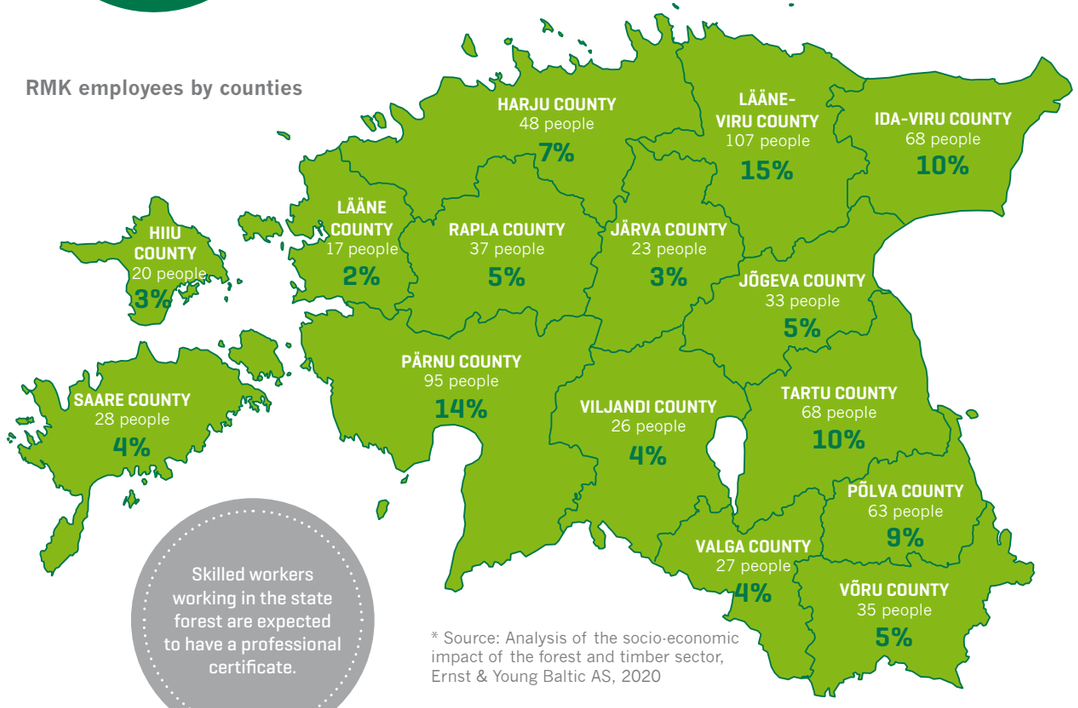


STAFF

The forestry and the timber industry provide jobs for **28,000** people in Estonia.

Considering indirect and incidental impact, the forest pays the bills of **59,000** people in Estonia.

RMK employees by counties



Skilled workers working in the state forest are expected to have a professional certificate.

* Source: Analysis of the socio-economic impact of the forest and timber sector, Ernst & Young Baltic AS, 2020

RMK outsources most of the works to be performed. In free competition, the service prices increased in the period of 2015–2020. RMK managed to keep its general administrative expenses on the same level.

2015

The RMK Development Plan 2015–2020 formulated as an objective to **remain among the ten most valued Estonian employers and to pay competitive salary to all of its employees**.

RMK has managed to do it. It has remained in the top 10 of Estonia's most preferred employers (Kantar Emor study) and paid its employees salary which is above the market's upper quartile (Fontes compensation study). This means that 75% of people employed in this area in Estonia earn less than in RMK. The same goals shall remain valid also for 2021 and 2022.

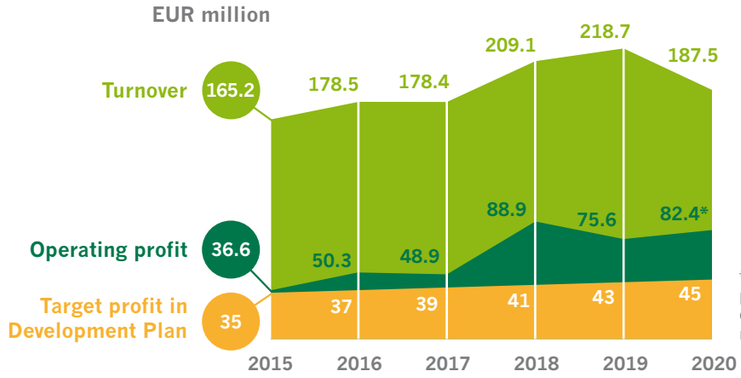
The timber sold by RMK in 2020 generated 700 million euros of added value for the Estonian economy. Tax revenue received from the timber sold by RMK to the state budget was 380 million euros. The calculations are based on the analysis of Ernst & Young Baltic AS titled 'Analysis of the socio-economic impact of the forest and timber sector' (2020) and the economic impact assessment of the forestry sector (2020) prepared by OÜ Finantsmaailm.

CONTRIBUTION TO THE ECONOMY

RMK's economic indicators (EUR million)	2015	2016	2017	2018	2019	2020
Turnover	165.2	178.5	178.4	209.1	218.7	**187.5**
Operating profit	36.6	50.3	48.9	88.9	75.6	**82.4**
Dividends and income tax paid into state budget	18.3	24.5	28.1	26.9	51.4	**80.7**
Land tax	4.6	4.7	4.8	4.9	4.9	**4.7**
Labour taxes	6	6.1	6.9	6.6	7.1	**7.2**

The **profit targets** of the RMK Development Plan 2015–2020 were met with a good margin. While initially, it was planned to earn 240 million euros in profit over six years, the overall result was by 100 million euros more, plus the sales proceeds of the Tootsi wind farm registered immovable.

2020



* Includes the sales proceeds of 42.9 million euros of the Tootsi windpark registered immovable

COOPERATION PROJECTS

RMK participates in activities which help people better understand the nature and move around within, to value wood as a building material and honour the traditions of foresters.

The special project in 2020 was the cooperation in organising the first round of the World Rally Championship in Estonia. RMK allowed the WRC Rally Estonia stages to be held on its forest roads and performed works to increase safety. Also, RMK increased the awareness of the spectators, to ensure that the rules of conduct in the forest are clear.

Forestry and timber use

- In Viljandi County, Kolga-Jaani Rural Municipality, the **Lalsi Church** was restored by MTÜ Vanaajamaja in cooperation with the local community and the Estonian Apostolic Orthodox Church. RMK helped by contributing the timber for the wooden structures.
- The non-profit association Estonian Woodhouse Association held a professional **contest for the builders of handicraft log houses** in Suuremõisa, Hiiumaa, with RMK providing the necessary timber.
- Under the aegis of the non-profit association Estonian Forest Society and supported by RMK, the traditional **logger sports series xCUT Cup competitions** were held. As the Tartu Maamess was cancelled, the first competition was the Salla Cup in June and the second -TOP 10 during the family forest day in Tallinn, in August. The Estonian Logging Championships were held in the Luua Forestry School in September.
- The non-profit association **Emajõe Lodjaselts** built the floors of a new Emajõe barge complex in Tartu using the oak blocks obtained from RMK.
- **Forestalia**, the joint choir of foresters, continued its series of joint singing events with support from RMK.
- A total of 60 **substitute homes** throughout Estonia received a free Christmas tree from RMK.
- RMK supported the stage set of the **play 'Estonian funeral'** at SA Vene Teater with timber.
- Woodspot OÜ launched a novel **web environment for purchase and sale of timber**, in order to step up the market of local timber. RMK supports the development of content of the portal.
- With the help of RMK, the winner of **Lotte Village invention competition** was able to realise the idea of the invention 'Save our planet', issuing tree seeds. In the future, anyone interested will get an envelope from Lotte Village with tree seeds and an instruction on how and where to sow the seeds.

Healthy living and visiting nature

- As due to the corona pandemic, public events were prohibited for long time, RMK started with the **Estonian orienteering events** only at the end of June. A total of 235 orienteering days took place in which 5,375 enthusiasts made more than 37,823 starts.

Environmental and nature conservation

- Over 40 photographers once again participated in the **Bloodless Hunt**, the winner was the photo of a pygmy owl, taken by Aare Udras. The best photos were exhibited for a short period also in the Forest House. All other exhibitions planned in the Forest House had to be cancelled due to the pandemic.
- RMK supplied firewood to the non-profit association **Estonian Union for Child Welfare camps** at Remniku and organised nature study programmes for campers.
- RMK cooperated with the civic education programme **Minu Riik (My Country)**. In the course of that, more than 400 students of 9th grade from Estonian- and Russian-language schools were welcomed at and introduced to the activities of the Forest House.

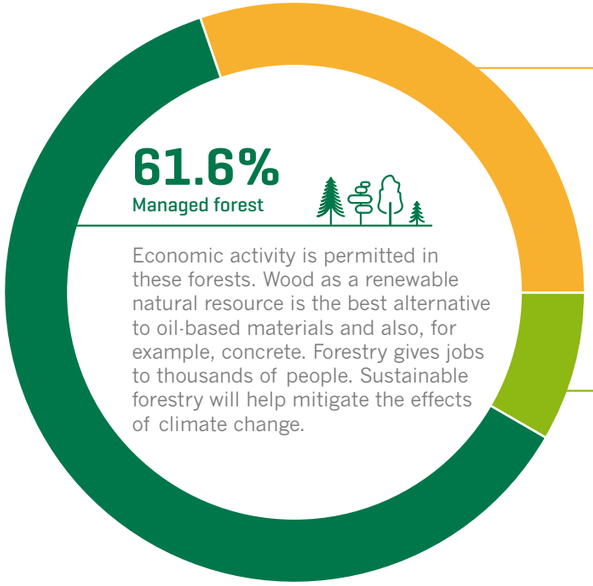
During the Bloodless Hunt photo competition, RMK gave a special prize to Jarek Jõepera, whose camera caught a roe deer, smelling something.

FOREST MANAGEMENT

State forest surplus	195 million m³
Renewed forest area	11,800 ha
New forest plants	23 million
Cleaning	43,300 ha
Thinning	8,300 ha
Regeneration cutting	11,400 ha
Timber sold	4 million m³
Revenue from the sale of timber	184.2 million

OVERVIEW OF FORESTS

Division of the RMK forests (%)	2016	2017	2018	2019	2020
Strictly protected forests	19.0	25.3	28.6	29.1	**30.2**
Forests with economic limitations	19.8	11.0	7.6	7.1	**8.2**
Managed forests	61.2	63.7	63.8	63.8	**61.6**



61.6%
Managed forest

Economic activity is permitted in these forests. Wood as a renewable natural resource is the best alternative to oil-based materials and also, for example, concrete. Forestry gives jobs to thousands of people. Sustainable forestry will help mitigate the effects of climate change.

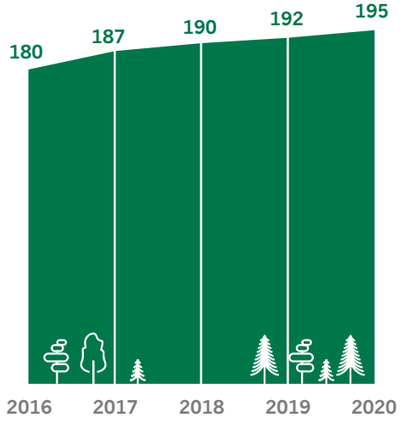
30.2%
Strictly protected forest

RMK does not manage forests in these areas, but activities may be necessary for conservation purposes. Nature reserves, dedicated protection zones for permanent habitats and protected areas, precious habitats and Natura 2000 habitats overlapping with restricted zones and storage areas are under strict protection.

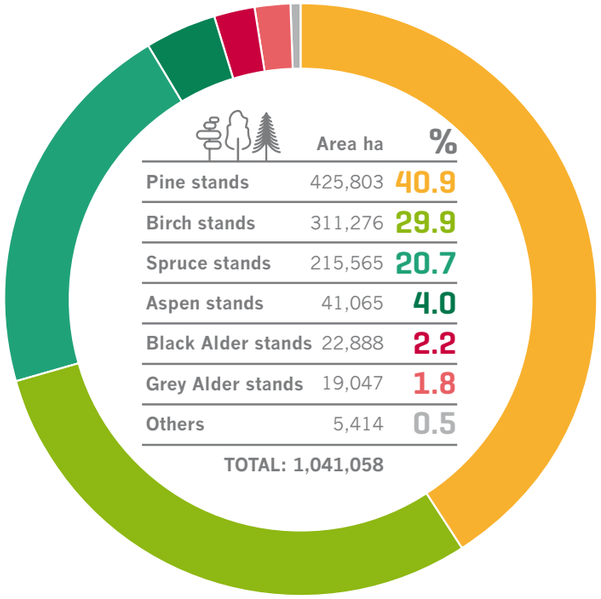
8.2%
Forest with economic limitations

Economic activity is permitted in these forests, but additional restrictions apply. Such areas include for example restricted zones and preserves outside the Natura habitat.

RMK forest surplus (million m³)



RMK forest area by main tree species

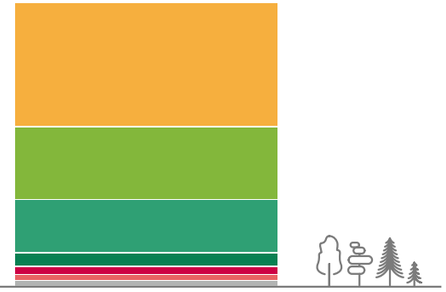


	Area ha	%
Pine stands	425,803	40.9
Birch stands	311,276	29.9
Spruce stands	215,565	20.7
Aspen stands	41,065	4.0
Black Alder stands	22,888	2.2
Grey Alder stands	19,047	1.8
Others	5,414	0.5

TOTAL: 1,041,058

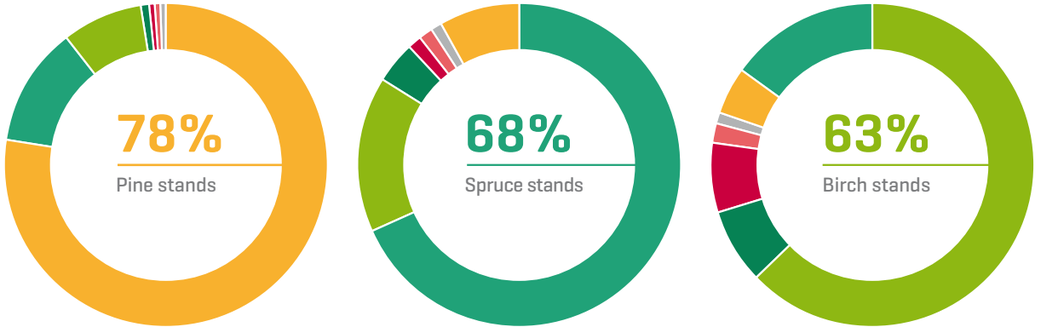
RMK forest surplus by main tree species

	Surplus m³	m³/ha	%
Pine stands	88,526,000	208	45.5
Birch stands	51,681,000	166	26.6
Spruce stands	37,384,000	173	19.2
Aspen stands	8,329,000	203	4.3
Black Alder stands	4,650,000	203	2.4
Grey Alder stands	3,023,000	159	1.6
Others	960,000	177	0.5

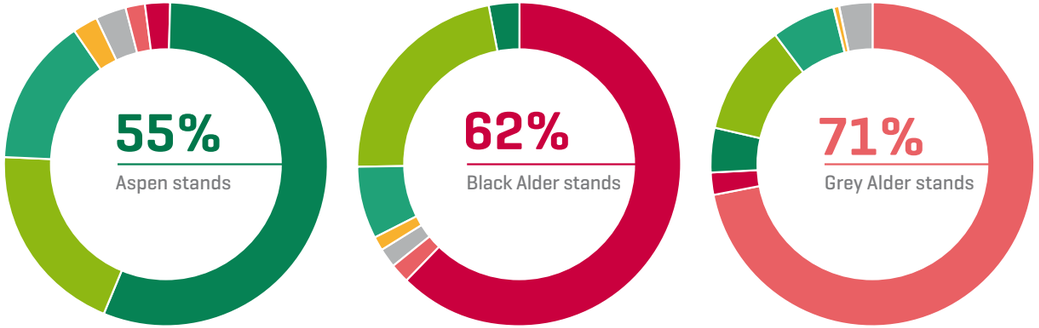


TOTAL: 194,553,000 m³

Distribution of the surplus of stands by main tree species



Pine Spruce Birch Aspen Black Alder Grey Alder Others



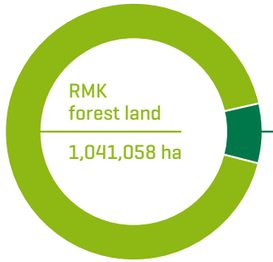
It's not just pine trees growing in pine stands, birches in birch stands and spruces in spruce stands.

Pine stands have the largest share of the main tree species, thanks to the good ability of pine to grow in very dry and very wet growing areas where other tree species have difficulties. The species composition is much more diverse in spruce, birch, aspen and alder stands.

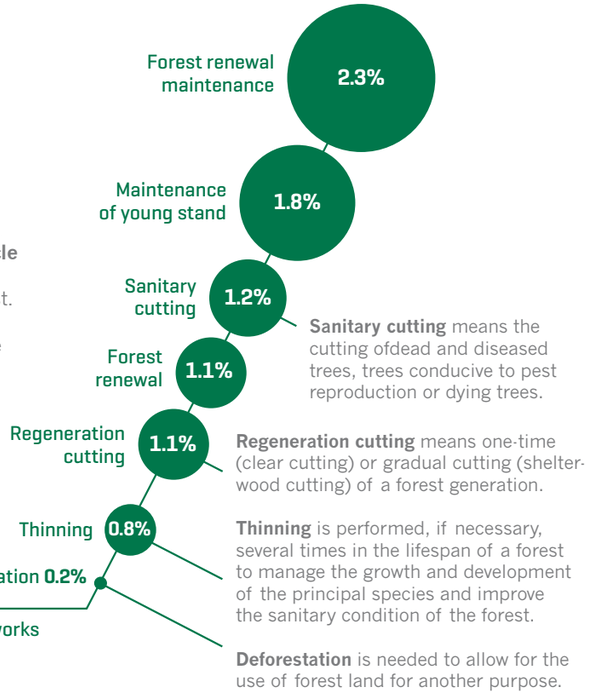
FORESTRY WORKS

Forestry works' map

An overview of the works performed in the RMK forest can be obtained from the forestry works' map. The map shows the **activities concerning the life cycle of forest** – establishment of a new forest generation, cultivation, maintenance and cutting of mature forest. For each forest stand, one can see its area, main tree species, age and recent work. Also, it is possible to see what kind of works are planned for the current year. The map can be viewed **on the website and in the app of RMK**.



8.5%
RMK area of forestry works



Sanitary cutting means the cutting ofdead and diseased trees, trees conducive to pest reproduction or dying trees.

Regeneration cutting means one-time (clear cutting) or gradual cutting (shelterwood cutting) of a forest generation.

Thinning is performed, if necessary, several times in the lifespan of a forest to manage the growth and development of the principal species and improve the sanitary condition of the forest.

Deforestation is needed to allow for the use of forest land for another purpose.

Cutting (ha)	2016	2017	2018	2019	2020
Regeneration cutting	11,920	10,866	11,227	11,394	**11,383**
... of which clear cutting	11,799	10,797	11,083	11,195	**11,226**
... of which shelterwood cutting	120	69	144	199	**157**
Thinning	9,079	9,944	8,478	8,812	**8,319**
Sanitary cutting	6,017	3,980	3,906	7,810	**12,043**
Deforestation*	869	725	1,605	1,335	**2,027**
Design cutting	332	149	72	245	**730**

* The area of deforestation also includes the roads and trenches of RMK which were cleaned of the trees and brushwood that had grown there. Out of the deforestation performed in 2020 (on 2,027 hectares), the maintenance works of the land improvement systems amounted to 1,580 hectares.

Fight against spruce bark beetles

At the time, when the entire Estonia was struggling with the corona virus, the foresters tackled another sturdy enemy – the spruce bark beetle. This tiny beetle had managed to strongly reproduce due to the last two drought summers and warm winters and damage large amounts of forest. At the end of May, RMK established **the damages caused by the bark beetle on 2,900 hectares of commercial spruce forests**.

To identify the population and time when the bark beetles migrate, 25 bark beetle **migration monitoring sites** and **trap trees** were set up, to immediately eliminate their colonies as soon as they wake up from hibernation and settle under the bark of the trees. The bark beetle started to migrate later than usual, at the end of May. The previously cut trees and trap trees settled by bark beetles were then immediately removed from the forest, to prevent reproduction and further spread to healthy and undamaged forest.

During one month and a half, RMK carried out **beetle control on 947 hectares of extensively damaged areas**. RMK has adhered to the felling-free season since 2002 and will do it also in the future, however to get the damaged areas under control, it is necessary to fight the bark beetle during the felling-free time. This must also be done in the future, if necessary. RMK has never before carried out such a large volume of bark beetle control activities. All the works were performed in accordance with legislation and standards and the control workplan was coordinated with the bark beetle expert, entomologist Heino Õunap.

During the identification of the extent of control, RMK also mapped new storm damages on 1,625 hectares, many of which were caused by the late-winter storm of 2020. Accordingly, at the year-end **the volume of sanitary cutting had almost doubled compared to the previous years**.

RMK's Development Plan 2015–2020 aimed to **increase the productivity of state forest area by growing 4.7 million m³ of timber per year**. Better-growing trees store more carbon available in the atmosphere and help to mitigate the effects of global warming.

The fact that the **forest area owned by RMK earlier increased,** contributed to the achievement of the goal: more forest area was transferred to the state ownership, land excluded from agricultural use and former areas under quarries were afforested. As both sources of the productivity increase have practically been exhausted, then in the future, this goal will be supported the most by implementing correct and timely forest management techniques.

Increase of forest area (million m³)

	2015	2016	2017	2018	2019	2020	2021*	2022*
Target	4.2	4.3	4.4	4.5	4.6	**4.7**	4.8	4.8
Actual	4.4	4.6	4.8	4.8	4.8	**4.8**		

* forecast

Two-thirds of the productivity of state forest area arises from managed forests and one-third from protected forests – in the latter, the forest has been left for natural renewal and RMK does not contribute to the increase of productivity with its activity there.

Heightened public interest

In 2020, **public discussions were held for 67 state forest areas**, where the heightened interest of local inhabitants towards the planned economic activity could be expected. At engagement meetings, which due to the corona virus were held electronically, the planned works were introduced and their need justified, an overview was given of the plans of planting new forest and the proposals and the wishes of local inhabitants were listened to.

Starting from 2017, which is the year from which RMK organises engagement meetings on the areas with heightened public interest (HPI areas), such meetings have been held in 149 regions. In most of the cases, an agreement was reached with local inhabitants before starting the cutting works. Upon need, additional conditions were agreed for that or concessions made in initial plans. Negotiations are still ongoing in places where no agreement was reached and RMK will not cut the forests before arriving at a compromise.

The forest areas of heightened public interest for the local communities and inhabitants are agreed upon with the **local authority during the preparation of the comprehensive plan**. In addition, local communities or inhabitants can make proposals to RMK for including forest areas in the areas of heightened public interest if they use these areas for their everyday activities and needs.

HPI areas are identified and **forestry work plans prepared for these areas for up to ten years**. RMK also discloses the plans on its website. The areas agreed upon with the local community or inhabitants are marked on the RMK forestry work maps. As at the end of 2020, **130 HPI areas on a total of 18,000 hectares** have been marked on the RMK forestry works' map. The map displays the boundaries of the agreed HPI areas, however the method, time and extent of forest management are still under discussion in some places.

At the beginning of 2021, RMK updated the **local community involvement** instruction, considering the recommendations given by the Chancellor of Justice and involvement consultants. In addition to a timeframe, the instruction helps to understand what kind of proposals can RMK consider with and in which matters should RMK contact the legislator. Also, the instruction describes the procedure of processing the received proposals and when the involvement into the forestry works' plan of a specific area is considered ended.

By extending the previous development plan to 2021 and 2022, RMK added to it a seventh strategic goal – involvement of local inhabitants in the forest management planning. On HPI areas, RMK **aims at reaching in all cases an agreement with the local inhabitants** on the preconditions of the **work before starting the forestry works**.

Involvement of local inhabitants in the forest management planning

	2017	2018	2019	2020	2021*	2022*
Number of meetings	3	53	82	**75**	100	100
Number of agreements	3	53	80	**72**		

* forecast, minimum

Forest renewal	2016	2017	2018	2019	2020
Mineralization of the land for planting (ha)	6,403	7,918	7,924	8,358	**8,812**
Mineralization of the land to aid natural renewal (ha)	1,419	1,686	1,604	1,867	**575**
Forest sowing (ha)	272	311	335	207	**173**
Forest planting (ha)	6,443	7,140	7,177	7,477	**8,353**
Aiding natural renewal with planting or sowing (ha)	261	434	705	856	**618**
Leaving for natural renewal (ha)	1,455	2,021	1,680	1,662	**2,037**
Contribution to the forest renewal (ha)	3,597	2,940	2,959	3,890	**3,250**
Plants planted (million)	20.2	21.2	21.3	22.1	**23**
... out of which pot plants (%)	42	52	52	52	**51**

Cleaning (ha)	2016	2017	2018	2019	2020
Maintenance of young stand	19,366	19,072	18,462	18,527	**18,988**
Forest renewal maintenance	23,966	24,607	23,201	24,618	**24,342**
TOTAL	**43,332**	**43,679**	**41,663**	**43,145**	**43,330**

Planting and sowing by tree species (ha)	2016	2017	2018	2019	2020
Pine	3,101	2,925	3,241	3,318	**3,431**
Spruce	3,015	4,046	4,267	4,204	**4,687**
Birch	809	469	683	977	**976**

Silviculture

RMK **renewed forest on 11,756 hectares**, which is 1.1% of RMK's forest land. Among this, RMK afforested 458 hectares of areas, where the forest had not grown before (low-value grasslands, bushes, quarries).

A record of 23 million trees were planted: 10.5 million pines, 9.8 million spruces, 2.5 million birches and alders, and nearly 150,000 oaks. All forest plants were grown in RMK's nurseries.

Besides planting, forest is renewed also by sowing or **leaving the area for natural renewal**. About one-fifth of clear-cut areas were left for natural renewal, where due to the soil and humidity, the natural renewal of broad-leaved trees is successful.

Besides RMK's logging workers, **1,700 people from partner-companies** also joined the forest planting. For that, RMK has signed four-year framework contracts with 120 companies.

For the third year, **machine planting** was also used, which takes care of both soil preparation and planting in one take. As a result of the state of emergency established due to the corona virus, the planting days aimed at the public were cancelled.

The peak of the forest renewal works is autumn. **During the forest renewal**, small trees are helped to grow out of the grass, **maintenance of young stand** or cleaning is used to improve the growth conditions of young trees. Maintenance of young stand is carried out in quite an even volume throughout the year, less during planting period. Altogether, RMK renewed forest on 43,330 hectares, which is 4.2% of RMK's forest land.

RMK provided **EUR 19 million** for forest planting and maintenance of the young stand.

PLANT CULTIVATION

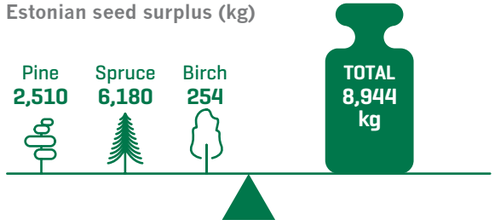
Growing forestry plants (million)	2016	2017	2018	2019	2020
Pine	11.8	10.8	10.2	10.6	**10.6**
Spruce	9.1	10.7	9.6	9.2	**10.5**
Birch	1.9	1.2	1.6	2.4	**2.7**
Other (black alder, oak)			0.1	0.1	**0.1**
TOTAL	**22.8**	**22.7**	**21.5**	**22.3**	**23.9**

Plant cultivation

From eight RMK plant nurseries, 23 million forest plants were delivered to the state forest. In addition, 0.9 million forest plants were sold to private forest owners at an auction. Average sales price was 22 cents for a plant.

A **unique conifer handling machine** was purchased for the Marana nursery, covering the plants with fine sand and water-based viscous adhesive, protecting them thereby against damage by weevils. In the future, RMK plans to use this method to treat at least 4.5 pine plants, to be planted to clear cut areas endangered by weevils.

Estonian seed surplus (kg)



Besides weevils, young trees are endangered also by cloven-hoofed game. This is why RMK sprays pine and spruce plants with natural solution containing sheep fat, which discourages wild animals from eating the young trees. Spraying works were carried out on 4,700 hectares.

Seed surplus

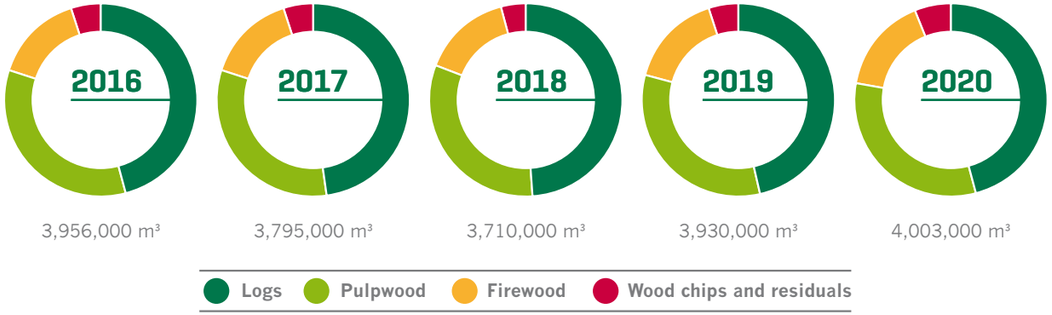
RMK used 1,001 kg of forest tree seeds, i.e. for EUR 270,000, from which 81 kg was spent on forest sowing and 232 kg on RMK nursery sowing. Forest tree seeds were sold for 688 kg at an average price of EUR 265 per kg.

RMK collected 2,335 kg of new spruce seeds, 454 kg of pine seeds and 32 kg of birch seeds. **The seed surplus of forest trees was 8,944 kg as at the year-end**, from which spruce seeds made 6,180 kg, pine seeds 2,510 kg and white birch seeds 254 kg. The spruce seed surplus will cover Estonia's forestry needs for 12 years, pine seeds for 6 years and birch seeds for 4 years.

TIMBER MARKETING

Sale of timber (m³)	2016	2017	2018	2019	2020
Logs	1,819,000	1,798,000	1,795,000	1,845,000	**1,845,000**
	46%	48%	49%	47%	**46%**
Pulpwood	1,352,000	1,213,000	1,200,000	1,285,000	**1,259,000**
	34%	32%	32%	33%	**32%**
Firewood	602,000	579,000	565,000	611,000	**644,000**
	15%	15%	15%	15%	**16%**
Wood chips and residuals	183,000	205,000	150,000	189,000	**255,000**
	5%	5%	4%	5%	**6%**
TOTAL	**3,956,000**	**3,795,000**	**3,710,000**	**3,930,000**	**4,003,000**

RMK sold **4 million cubic metres of timber**, 3.9 million of which was harvested in 2020. Logs made up 46% of the sales volume, pulpwood 32%, fuelwood 16% and wood chips 6%. **Sales proceeds of timber amounted to EUR 184.2 million**, being by 30.4 million less compared to the year before. The decline was caused by 16% drop in the average price of round wood compared to 2019. **Prices decreased in all groups of goods**: 22% for pulpwood, 14% for logs and 7% for firewood.



RMK sold 84% of timber under long-term contracts and 16% using other methods of sale. **RMK's strategy for timber marketing favours companies who process the wood on site** and export products with higher added value.

The **timber market remained volatile** throughout the year – while at some point there was very good demand for the assortment, the next minute, it was unexpectedly poor. In the Baltics, the price of assortment of conifers was in particular influenced by the low price and high supply of timber harvested from the areas damaged by the bark beetle in Central Europe.

The structure of the assortment of the local market was influenced also by the cutting carried out in Estonian spruce stands due to the damages caused by bark beetles. Therefore, the demand for fresh pine log, birch log and birch pulpwood increased in the second half-year, while the price of spruce assortment continued to decline.

Thanks to the general price depreciation of pulpwood, the capacity of the sawmills of small logs and pole processing to compete with the buyers of pulpwood recovered.

Despite the growing supply of timber on the market, suitable for renewable energy production, RMK managed to **sell more wood chips than planned**. The sale was in particular on the account of previously accumulated stocks.

The cutting rights to growing trees were sold to private persons for the purpose of storing firewood, to the lessees of semi-natural biotic communities for maintenance works and for infrastructure projects and clearing of peatlands. Altogether, RMK sold cutting rights for 18,600 cubic metres.

Biggest clients by the amount purchased	m³	% of total sales
Horizon Tselluloosi ja Paberi AS	210,000	5%
Stora Enso Eesti AS	205,000	5%
Estonian Cell AS	202,000	5%
Toftan AS	196,000	5%
Graanul Invest AS	189,000	5%
Metsä Forest Eesti AS	180,000	4%
Vara Saeveski OÜ	149,000	4%
Warmeston OÜ	143,000	4%
BillerudKorsnäs Estonia OÜ	123,000	3%
Osula Graanul OÜ	117,000	3%
TOTAL	1,714,000	43%

In 2015–2020, **RMK harvested and sold at an average of 3.8 million m³ of timber per year**. As the accounting cutting area established by the Minister of the Environment will be stable for the next five years, the cutting and selling volume will remain within the same range also in 2021 and 2022.

RMK carries out cutting works also for the other owners of state land, such as the Transport Administration, the Defence Forces. RMK sells the timber harvested in the above manner likewise to the timber harvested from its own land.

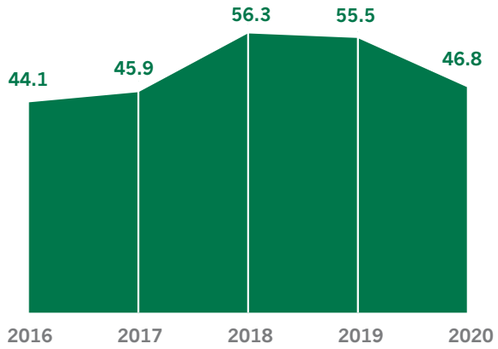
Harvesting and sale of timber (million m³)

	2015	2016	2017	2018	2019	2020	2021*	2022*
Target	3.5	3.6	3.7	3.8	3.9	**4.0**	3.8	3.8
Actual	3.6	4.0	3.8	3.7	3.9	**4.0**		

* forecast

Two-thirds of the timber sold by RMK are harvested by regeneration cutting. During the thinning, an average of 0.5 million m³ of timber is harvested per year. Timber is obtained also from sanitary cutting and deforestation. Energy wood is obtained by cleaning the ditches and routes and, from the trunks, branches and treetops left on the cutting areas.

Average price of the sold timber (EUR/m³)



FOREST IMPROVEMENT

Forest improvement indicators	2016	2017	2018	2019	2020
Forest roads built, reconstructed and renewed (km)	361	348	316	328	**221**
Reconstructed and renewed drainage systems (ha)	13,200	22,600	25,700	19,600	**18,700**
Investment into forest roads and drainage systems (million euros)	23.5	23	23.5	25.9	**21.1**

Maintained forest roads

During the year, RMK reconstructed 221 km of existing forest roads and built new roads. **RMK lands contain 9255 km of forest roads**, belonging to RMK, to which about 2000 kilometres of roads located on other owners' lands, but used, and therefore also maintained by RMK, are added.

Properly maintained forest roads simplify forestry and nature conservation works, making it easier to move around in nature and put out fires. There are 79 fire waterpoints in RMK forests, the use of which is enjoyed also for example by amphibians and dragonflies.

Almost half of RMK's forest land has been drained. **No more drainage systems will be built**; however, the existing ones do need maintenance and reconstruction. Draining increases the increment of RMK forests by 700,000 cubic metres every year and properly maintained drainage systems reduce the damage to soil during forest management.

Making use of oil shale ash

A pilot project was launched to use **oil shale ash for the reinforcement of forest roads** when building them. This way we can save and reduce the use of gravel and artificial materials such as geotextiles and geogrids. The TTK University of Applied Sciences has been involved in the experiment.

Suitability of oil shale ash for the reinforcement of roads was tested on two road sections in Pärnu County (altogether on 1.8 km). The road-bearing capacity and condition of the road improved, however not yet to the necessary level. The experience gained served as a good basis for investigating the next test sections, for developing the construction solutions and finally, also for preparing the principles of stabilising roads with oil shale ash.

Roads have never before been built this way in Estonia. Yet, RMK has already used the limestone material and crushed stone produced from it when mining the oil shale, instead of gravel and limestone, to reduce its environmental footprint.

WASTE COLLECTION

Waste collection in RMK forests	2016	2017	2018	2019	2020
Amount (kg)	247,000	281,800	290,200	250,000	**250,000**
Expenses (EUR)	53,000	92,000	100,000	98,000	**120,000**

RMK cleaned up **250 tonnes of waste** from the forest; the collected quantity of waste was the same also a year before. This work was performed by RMK's partners Ragn-Sells and Eesti Keskkonnateenused, at a cost of EUR 120,000.

Two-thirds of this amount comes from Ida-Viru County and Harju County. Mostly, household and construction waste, furniture, but also glass, metal, and hazardous waste are all dumped in the forest.

RMK gives the plastic waste, collected from the forest and sorted, a new life by installing **signs made of waste to mark the state forest** and the RMK long hiking trail. Collecting the waste from the forest is necessary not only because the waste taken to nature hurts the eyes, but because it is a threat to the environment and the forest residents.

FOREST FIRES

Forest fires in RMK forests	2016	2017	2018	2019	2020
Number (pcs)	9	1	45	8	**5**
Area (ha)	97	4	269	39	**11**
Average fire (ha)	11	4	6	5	**2**

HUNTING

Hunting in RMK land	2016	2017	2018	2019	2020
RMK average price for using hunting land (EUR/ha)	2.9	3.8	2.3	3.4	**2.1**
Income from hunting (EUR)	246,000	250,000	178,000	207,000	**152,000**

RMK earned EUR 152,000 from hunting, most of which from public auctions of hunting permits. Due to the effects of the corona virus, the revenue decreased about one-fourth compared to the year before.

On average, RMK was paid EUR 2.11 per hectare for hunting. RMK shared EUR 12,000 of the revenue from public auctions with land owners who permit hunting on their private lands.

RMK manages the Kilingi-Nõmme, Kuressaare and Väätsa hunting areas. On such areas where RMK itself is not administering the hunting activities, RMK has concluded agreements for the use of state land for hunting with 325 hunting district users. Among other things, the contract also states when hunters have to compensate for any damage caused to forests by game.

RMK issued a claim for damages to eight hunting associations for damage caused by game animals. This concerns altogether 8.5 hectares, where RMK has to renew the area or supplement its forest renewal. The total amount of claim for damages is slightly above EUR 2,000.

The main wild animal damages the young stands is the elk (92% of cases), while almost half of the damages originate from Tartu, Jõgeva and Lääne-Viru Counties. Damages caused by red deer have been identified only in Hiiumaa. Tartu and Valga County account for nearly 70% of the material damages caused by roe deer.

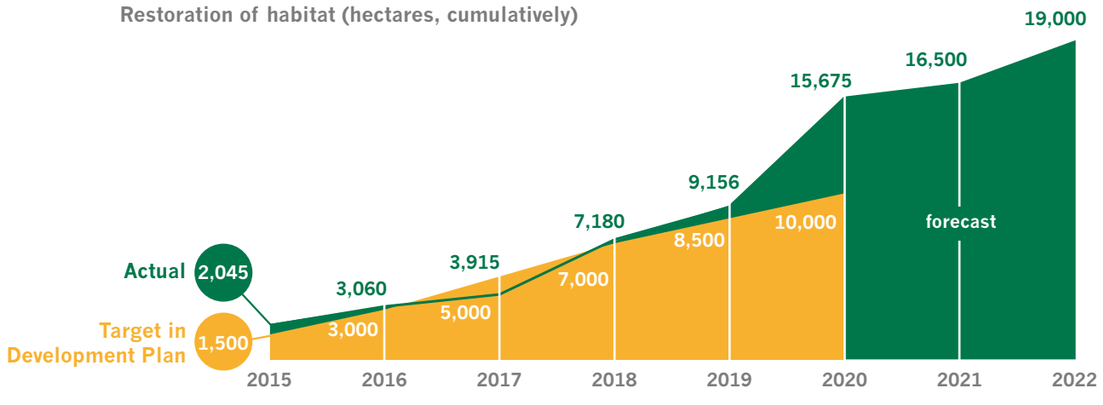
NATURE PROTECTION

Protected species	495
Sites with protected species	40,777
Total area of key biotypes	25,787 ha
Semi-natural biotic communities, rented	24,513 ha
Cost of nature protection works	EUR 4.9 million

NATURE PROTECTION WORKS

The RMK Development Plan **aimed to restore endangered or low-quality habitats on 10,000 hectares by the year of 2020**.

Owing to better than estimated external funding and good cooperation with partners, the total area target, set for the development plan period, was exceeded by more than 5,500 hectares. In restoring the bog habitats, RMK managed to exceed also the target set in the state nature conservation plan for the year 2020.



Cost of protection works (EUR)	2016	2017	2018	2019	2020
TOTAL	**2,730,000**	**4,050,000**	**5,580,000**	**6,640,000**	**4,910,000**
...incl. government grants received (state budget, UCITS)	1,230,000	2,510,000	3,100,000	3,420,000	**2,310,000**

RMK is the largest performer of nature protection works in Estonia. Under RMK's initiative, 267 works were performed in 2020, aimed at the preservation or improvement of the condition of nature protection values. The largest in terms of area was the bog restoration, followed by restoration of semi-natural communities. As a new area, RMK was tasked **to improve the condition of watercourses and remove obstacles from the migration roads of fish**. The cost of nature protection works was EUR 4.9 million.

Nature protection works are necessary as some species need a living environment that is untouched by human activities, the others, however, prefer to live in communities that have emerged as a result of long-term less-intensive human activity. Closing the trenches in bogs helps to restore the primary bog ecosystems serving as a habitat for species shy of humans; whereas restoration of wooded meadows creates preconditions for permanent less-intensive agriculture, which provides suitable conditions for the development of Europe's most species-rich communities.

Habitat restoration works (ha)	2016	2017	2018	2019	2020
Bog community restoration	72	291	2,778	1,422	**5,982**
Semi-natural community restoration	1,007	388	505	554	**522**
Other community restoration	69	47	0	0	**0**
TOTAL	**1,148**	**726**	**3,283**	**1,976**	**6,504**

Bog habitats

In 2020, several previously started extensive restoration works of bog habitats were completed. **Together with its partners, RMK restored more than 6,000 hectares of bog habitats**, the largest of them, an area of 1,022 hectares, in the Tolkuse bog in Pärnu County.

Bog restoration works were completed also in Laukasoo, Ohelpalu, Sirtsi and Tudusoo bogs. Also, a hiking trail, introducing the restoration of bogs, was built in the latter with the support of LIFE-project.

Bogs are **important ecosystems that ensure our water supply and quality**, which serve as a habitat for several rare plant and animal species in Europe, such as orchids, grouse and golden eagle. Bogs also play an important role in terms of climate, as these ecosystems store large amounts of carbon. Bogs that comprise just 3% of the planet's mainland store 20% of the entire carbon, found in the soil of the planet.

However, **cut-over peatlands**, covering 9,000 hectares of Estonia, **do not store carbon**. These are extremely flammable dry areas with no vegetation, which emit a lot of carbon compounds and thus accelerate global warming. In order to ensure natural restoration processes on the former peatlands, RMK in cooperation with the University of Tartu, tested **sowing of the sphagnum components with a machine** on the Maima peatland in Pärnu County. To test the success of different methodologies, the Maima cut-over peatland was divided into 15 areas: on 12 areas, various restoration methods are being tested and 3 areas are left as 'control areas', where no restoration works are carried out. This way it is possible to obtain information which will serve as a basis for future more informed decisions in the restoration of bogs.

In Estonia, the restoration of bogs began ten years ago and over this time, bogs and bog forests covering more than the area of the island of Vormsi, have been changed to have more life. Under RMK's initiative, former cut-over peatlands have been restored on nearly 1,000 hectares.

Semi-natural communities

Lands rented out for maintenance of semi-natural biotic communities (ha)	2016	2017	2018	2019	2020
	22,462	23,355	23,962	24,304	**24,513**

Semi-natural communities are areas characteristic of the Estonian landscape over the last centuries, that have been used as pastures and meadows, where moderate human intervention is required to preserve their biodiversity. To preserve the semi-natural communities, RMK gives the meadows and pastures on the land in its possession to **local entrepreneurs for management**. As at the end of 2020, 24,513 hectares of land have been leased out.

In order to make meadows serviceable per year, RMK restored 522 hectares of meadows and pastures in 2020. The largest restoration works of semi-natural communities were carried out in Pärnu County (189 ha) and Saaremaa (175 ha); however, more than 100 ha of heritage communities were restored also in Harju and Lääne County. In total, there are **semi-natural communities on the land of RMK on about 33,700 hectares**.

While most of the meadows and pastures are in rural areas, there are still some meadows also in the cities. For example, under the initiative of the Tallinn City Government, cattle were brought to maintain the meadows on the Kõrkja holm in the old valley of the River Pirita in Tallinn.

To improve the maintenance conditions of semi-natural communities on a total of 1,157 hectares, three roads, nine crossings and one log yard were established. The access conditions improved the most in Matsalu National Park.

Work for the protection of species

Specific works were performed **for the benefit of 25 rare and endangered species** on a total of 94 hectares. The bodies of water where the great crested newt, natterjack and spadefoot toad spawn were improved at 15 sites all over Estonia. Orchids were created better growth conditions at six growth sites; in the form of more extensive works in Lääne-Viru County at the Varangu and Läpi orchids growth sites.

For the first time, the growth conditions of protected plants were improved in the Anne conservation area, in Tartu, where the seeds of meadow vegetation were collected and sown on a prepared wasteland.

Parks and landscape views

Maintenance and restoration works were carried out on 36 hectares. Views to River Pirita, the Käsmu Bay and River Emajõgi were opened up as well as in the Varbola Stronghold and around several hiking trails and lakes.

Maintenance and restoration works were carried out in 14 parks. More extensive activities were carried out in Oru Park, where trees, dangerous to visitors, were cut, stumps milled, grass mowed and the park area cleaned of household waste.

PROTECTED SPECIES

In Estonia, **568 plant, fungi, lichen and animal species have been taken under protection**. Of them, 495 are registered on RMK land. Of these, 54 belong to the most strictly protected 1st category, 234 to the 2nd category and 207 to the 3rd category.

Over the year, the number of protected species on the RMK land increased by one – this is the **smew** (*Mergellus albellus)*, belonging to the duck family and entered under the 2nd category.

In addition to the number of species, the situation of the protected species is described more substantially by the number of protected species' habitats. **The number of habitats of protected species on RMK's lands is 40,777**; within a year, this number increased by 2,591. A habitat is understood in the case of one specimen of a species or, in the case of species growing in groups, as the site of the group, in the case of birds, the nest area, etc.

Improved situation of natterjack

The population of natterjack is increasing, supported greatly by RMK, **who has restored the habitats that are suitable to amphibians**.

Natterjack is a small toad with a yellow line on the back, who prefers open ground as a habitat and needs shallow waterbodies of temporary nature for spawning. Several surveys performed by the Estonian Environmental Agency indicate that the natterjack has been saved from extinction in Estonia. The 'spring concert' of the natterjack in the Veskijärve nature conservation limited management zone at the Suursoo landscape protection in Lääne Viru County in the spring of 2020 was especially pleasing. Even 117 male natterjacks were counted there; this number has not been counted anywhere in Estonia during the last couple of decades. Restoration works of habitats were carried out in Veskijärve also in 2020.

According to Riin Rannap, an expert of amphibians, both, the cleaning of spawning water bodies from tall vegetation as well as extensive opening of the dune areas have been the cause of the success. For that, RMK has cut the former dune areas afforested with cultural tree stands. RMK plans to keep the dune areas open also in the future, to ensure the preservation of the population of natterjack. For example, restoration of the previously afforested dune habitats will continue in the Vilsandi Natural Park in Saaremaa. The works began already in 2013 and will continue also in 2021.

Protection strategies of the flying squirrel and capercaillie

RMK developed and approved the protection strategies of the flying squirrel and capercaillie until the year 2030. The protection strategies describe the risk factors arising from the activity of RMK and formulate mitigation measures.

The purpose of the strategy in case of a flying squirrel is to ensure a more suitable abundance network for the animal throughout the distribution area of the flying squirrel in RMK's forest. Starting from 2013, RMK has **ensured the existence of distribution corridors for the flying squirrel and established key sites** and contributed actively into monitoring. In 2020, the RMK employees **found new traces of flying squirrel's activity in nine forest stands**. Initial protection was applied in the areas.

The flying squirrel is a small nocturnal rodent, belonging in the 1st category of protection, who covers long distances by gliding from tree to tree. Out of the habitats of the flying squirrel, 80% are on the land of RMK. The purpose of the natural protection plan of the flying squirrel is to record at least 60 settled habitats per year. As a result of the monitoring performed in 2020, **we are aware of 75 settled habitats of the flying squirrel**.

The purpose of the protection strategy of the capercaillie is to plan the activities of RMK in a way to ensure stable or increased population of capercaillie in the core zones of the lands in the possession of RMK. RMK has established a ban on clear cutting on the lekking sites of the capercaillie, located outside the protection areas. RMK's employees participated in the annual capercaillie monitoring, in the course of which also new lekking sites have been found. In 2020, **the RMK's employees monitored the capercaillie on 80 monitoring sites**.

Capercaillie is a breeding bird, belonging into the 2nd protection class, common in the mainland of Estonia, who lives mainly in older pinewoods. Out of the habitats of the capercaillie, 90% are on the land of RMK. The purpose of the national protection plan of capercaillie is to achieve a favourable condition for the population (size of the lekking population being 1,500–2,400 male capercaillies). At the moment, the size of the lekking population is estimated at **1,300–1,600 male capercaillie**s.

BIODIVERSITY IN MANAGED FORESTS

Maintaining biodiversity is important in all forests – those that are strictly protected, those having economic restrictions, as well as managed forests. In order to preserve the biodiversity of the Estonian forests, RMK has taken on several obligations, some of which are even stricter than the law provides for.

- **Cutting is ceased** from 15 April until 15 June.
- In the reconstruction of the drainage systems, care is taken not to damage the **wet forests** with a natural water regime.
- **Buffer zones** are maintained near natural bodies of water to reduce possible erosion.
- In the case of clear cutting, more **old trees and down wood** are preserved than required by the Forest Act.

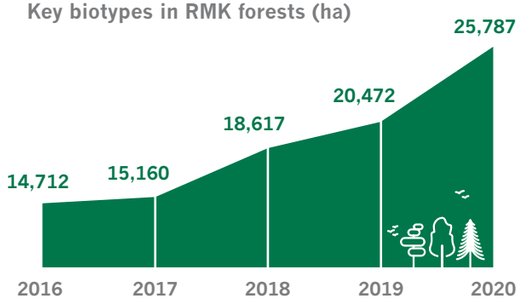
KEY BIOTYPES

On RMK land, 25,787 hectares of key biotype have been selected and **this area increased by 5,315 hectares in a year**. Over the last ten years, the area of key biotypes in RMK's forest has grown two and a half times.

In 2019, RMK decided to carry out inventory of key biotypes in a mature forest on ca 55,000 hectares, making ca 1/3 of the total area of managed mature forests, corresponding to the criteria of regeneration cutting. No cutting is carried out in these forests before the inventory is completed. As at 2020, inventory has been undertaken on 28,613 hectares of the selected areas, out of which 3,242 hectares have been declared and registered as key biotypes.

Key biotypes are suitable habitats for rare and endangered species where structures of natural forests have been preserved: for example, very old trees, big lying and dead or burnt trees. Key biotypes strictly fall under protected forest, which compose more than 300,000 ha, or 30% of RMK's forests. The share of strictly protected forests is growing year by year.

Key biotypes in RMK forests (ha)



PROTECTED AREAS

RMK **bought 29 registered immovable properties with nature protection restrictions from private owners**. The acquired land, with total area of 264 hectares, cost EUR 2.9 million.

RMK was assigned to start buying land with high natural value for the state in 2018; previously this was done by the Land Board. Over the two and a half years, 88 registered immovable properties for EUR 6.5 million have been bought. RMK will obtain the required funds by selling land that is not necessary for the fulfilment of its main assignments.

Protected areas in RMK forests (ha)

Special mgmt. zone of the protected area	199,151
Limited mgmt. zone of the protected area	70,246
Limited mgmt. zone of Species protection site	29,656
Special mgmt. zone of Species protection site	24,787
Special conservation area	19,004
Strict nature reserve of a protected area	562
Protected area without protection rules	3,316
Single object in nature	124

The zones of the protected areas may partly overlap.

PÕLULA FISH FARM

Fish populated to rivers from Põlula

Year	Species	Larva	One-summer-old	One-year-old	Two-summers-old	Two-years-old	Total
2016	Salmon		86,157	44,755	5,393	36,796	173,101
2017	Salmon		54,682	60,851	21,186	42,795	179,514
2018	Salmon	75,000	118,355	79,497	9,256	32,767	314,875
2019	Salmon	47,370	164,375	73,862	12,739	28,648	326,994
2020	**Salmon**	**21,994**	**187,008**	**69,193**		**16,099**	**294,294**
2016	Whitefish		33,810				33,810
2017	Whitefish		6,885				6,885
2018	Whitefish		43,774				43,774
2019	Whitefish		30,374				30,374
2020	**Whitefish**		**12,020**				**12,020**
2019	Sturgeon		4,820				4,820
2020	**Sturgeon**		**1,944**	**1,143**			**3,087**
2020	**Sea trout**		**6,000**				**6,000**

In spring and autumn, 294,000 salmon, 12,000 whitefish, 3,000 sturgeon and 6000 trout were released into the rivers from the Põlula Fish Farm. Young salmon were released into the rivers of Valgejõgi, Loobu, Purtse and Pärnu, whitefish into the river of Narva and trout into the river of Kohtla.

In late-winter, the construction works of the **quarantine building of fish** and the related infrastructure were completed. The building was immediately taken into use in connection with the experimental farming of the freshwater pearl mussel. In autumn, the roe taken from the natural breeding whitefish and salmon of Lake Peipus and the Pärnu and Kunda rivers were taken to the quarantine building for breeding. With the completion of the quarantine building, the risks of introducing dangerous fish diseases into the hatchery have been notably reduced.

A relevant laboratory was furnished **for the experimental works of freshwater pearl mussel farming**.

The young freshwater pearl mussel is kept and grown in a thermostat at an even temperature. They must be constantly maintained, measured and counted, fresh water and food added. By the end of the year, the thermostat held 600 young mussels, half of which were already one millimetre long. These are planned to be released into the river in spring 2021.

Cooperation was launched with the Peipsi Alamvesikonna Kalurite Liit and the University of Tartu Estonian Marine Institute, to collect and breed the roe of the Peipus whitefish, grow young fish and release them into the Lake Peipus to restore their population. At the year-end, about 700,000 Peipus whitefish were breeding in the quarantine building. **Experiments with the farming of Atlantic sturgeon and crayfish** continued as well.

Juvenile grow-out possibilities of whitefish and sturgeon in the cages installed in the ponds were expanded.

VISITING NATURE AND NATURE AWARENESS

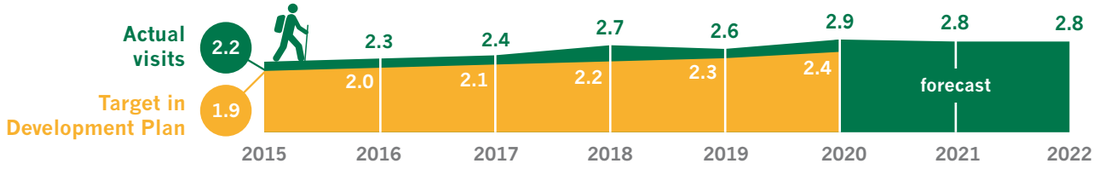
Visits to RMK's recreational areas and protected areas	2.9 million
Visitors at the information desks	67,000
Visitors to Elistvere Animal Park	79,400
Visitors to Sagadi Forest Museum	18,400
Participants in nature education programmes	39,500
Expenditures on visitation infrastructure and promoting nature awareness	EUR 8.4 million

VISITING NATURE

The number **of visits to the protection and recreation areas**, set as a goal in the RMK Development Plan, **increased notably** and this already before the year of the corona pandemic, which caused special impetus to Estonians to visit the nature.

When developing the visitation infrastructure, three indicators are followed – the number of visits, the satisfaction of visitors and the stress tolerance of the nature. If one of these three starts to suffer for any reason, a new activity will be launched in addition to the ordinary maintenance and cleaning works, e.g. updating of the infrastructure or developing alternative visitation places for the visitors.

Visits to RMK's recreational areas and protected areas (million)



2 + 2 brought masses to the forest

During the exceptional corona-year, the number of visits to the RMK's recreation and protection areas was 2.9 million. This is **300,000 times more than the year before**. Nearly 12% of Estonians are permanent clients of RMK's visitation infrastructure, visiting the nature 12 or more times a year. The attempt of RMK to spread the people due to the requirements of the emergency situation, which caused many to discover new visiting objects, was fruitful. Out of the inhabitants 43% visited such recreation or protection areas or hiking routes of RMK where they had never been before. **The share of those moving around in the nature together with their family increased** – while in 2015, for example, 50% of people took their family to the nature, then in 2020, this figure was 67%.

Based on the study conducted in 2020 by Turu-uuringute AS, **97% of people considered the possibilities of a nature holiday offered by RMK as necessary**. During a similar study in 2012, 85% gave the same answer.

3,100 km of nature trails

59 campsites

27 forest cabins

738 fireplaces, including **328** covered fireplaces

20 forest houses

3 cross-country areas

RMK long hiking trail:

820 km Peraküla-Aegviidu-Ähijärve

615 km Penijõe-Aegviidu-Kauksi

372 km Oandu-Aegviidu-Ikla

RMK Visitor Centres

The most popular protected areas:

- Lahemaa National Park (169,100 visits)
- Soomaa National Park (96,100 visits)
- Matsalu National Park (52,000 visits)

The most visited recreational areas:

- The recreation area near Tallinn (including Keila-Joa Park, 355,500 visits)
- The Northern Shore of Lake Peipus Recreation Area (including Oru Park, 307,500 visits)
- The Nõva Recreation Area (261,200 visits)

Support to labour market

While many lost their jobs due to the corona virus, RMK, instead, created new jobs. Due to a higher rate of visitation, more repair and maintenance works had to be done, for which **23 seasonal jobs were created throughout Estonia**.

In addition, RMK increased the design and construction works for visiting infrastructure planned for the year, offering the construction sector **additional employment for EUR 540,000**. According to the estimates, at least 70 more people will got a job this way.

Construction works were finalised on 22 sites,the most visited of which are, for example, the Venemäe viewing tower, Teringi and Nigula educational trail, Karula National Park, Meiuste and Kaleste campsites. The ruins of the Meremõisa Manor were conserved and the stairs and fish fountain of the Oru Park, pavilion at the Selisoo campfire site, Kauksi stairs and dune and the stairs of Sangaste forest park were repaired. The forest houses at Praali, Värska, Ilumetsa, Kõrvejärve and Luige were renovated.

NATURE AWARENESS

Nature programmes and number of participants	2016	2017	2018	2019	2020
Nature programmes organised	2,766	2,667	2,594	2,380	**3,036**
Participants in programmes	52,800	52,000	51,600	49,400	**39,500**

Nature education programmes were carried out for 39,500 people at RMK visitor centres, nature houses and the Sagadi Forest Centre. The programmes included both, guided tours as well as programmes passed on one's own, whereas besides children and young people, things to discover were offered also to adults. For example, several visitor centres have developed **backpack programmes**, where the person gets instructions, worksheets and tools from the visitor centre and can take the route independently or in a group.

RMK offers independent nature study also via interactive games. RMK has nearly 40 **interactive games** created for a specific route and the range is being expanded. It is possible to take **interactive quizzes** on RMK's homepage without leaving your home – these are dedicated for example to nature conservation, animals, trees or birds.

RMK's waste game, which can be played on the webpage of loodusegakoos.ee, tests your knowledge. A player must decide in which trash can what kind of waste to place. Sorting 25 waste elements can be practiced on two levels of complexity.

The number of people participating in the nature awareness activities organised by RMK was 241,000. Information desks provided advice on 67,000 occasions.

RMK's interactive **forest quiz** was taken by a record number of schoolchildren – 10,435 students from 241 schools. Also, a competition 'Forest postcard of Estonian schoolchildren' was held.

Anniversary year of nature conservation

On the occasion of the 110th anniversary of Estonian nature conservation, RMK organised an enchanting event '**Toila Valge ÖÖ**' ('White Night of Toila') in August, opened a new hiking trail in Lahemaa and made geocaching possible in national parks.

During two nights, the big event 'Toila Valge ÖÖ' filled the Oru Park with more than 30 light installations, artists and buzzing of outdoor cafes. Insofar as the year of 2020 had been announced to be the year of Estonian folktales, the visitors were surprised by traditional as well as fictional stories.

A 5.6 km long trail of forest stories, dedicated to forest stories and nature conservation was opened at the end of the summer between the Sagadi Manor and the Oandu visitor centre. One can find 18 'storybooks' on the journey, rich in fantasy, with a possibility to read or listen to a fairy tale using the QR code. Wild fairies, ghosts, a water wraith and serpent king, talking animals and birds, a money pit and fern blossom – on the trail you will learn what people have said about them.

Geocaching teaches you new things in a more adventurous way. Now you can play it in all six Estonian national parks. Geocaching is a is a treasure hunting game, played in the fresh air that guides you to discover stories and facts related to national parks.

SAGADI FOREST CENTRE

Number of visitors to the Sagadi Forest Centre	2016	2017	2018	2019	2020
Visitors at Forest Museum	32,800	31,400	34,600	41,900	**18,400**
Accommodation clients	9,100	7,100	8,200	9,700	**5,700**

RMK's Sagadi Forest Centre was visited **34,200 times during the year**. Although the number of foreign visitors dropped to nearly zero, the number of domestic visitors slightly increased. Despite the difficulties, the Sagadi Forest Centre continued its work. All traditional events, such as the tree days, museum nights, family events of the Nature School, mushroom exhibition and dinner of wild flavours of Lahemaa still took place.

The restrictions imposed due to the corona virus forced the forest centre to a nearly two-month standstill in spring, yet, there were still new exciting outputs at that time. For example, the visitors could participate in several new interactive games and a park trip of the Nature School. In the spring, the **garden of Sagadi Manor** got a completely new content and form to the delight of all those interested in plants.

The forest museum offered to the visitors a permanent exhibition 'Mets toidab' ('The Forest Feeds') and a history-oriented review exhibition '100 sammu metsateel' ('100 Steps on a Forest Road'). From June to September, it was possible to visit the travelling exhibition of the Tartu National History Museum 'Maailm seljakotis' ('World in a Backpack') in the attic of the manor.

ELISTVERE ANIMAL PARK

Over the year, 79,400 people visited Elistvere Animal Park, **being by 18,000 more than a year before**.

The big event of the year was when a **young wolf** was brought to Elistvere from the Riga Zoo, named Koroonius as a result of a name contest. There are about 200 wolves living in Estonian nature; the Elistvere Animal Park is the only place in Estonia where one can explore our national animal.

The animal park also became a home for a tiny fox puppy, who for now has grown into a young fox lady, named Roosi. At the yearend, we celebrated the 23rd birthday of the bear Karoliina, who is one of the first inhabitants of the animal park. The activities of the **bear and lynx of Elistvere can be monitored online in YouTube**.

The animal park was open to the visitors all the year round, however several traditional events were cancelled due to the corona restrictions. In summer, when the situation was less onerous, the animal park used the magic of the longest summer nights and was open until midnight on five days in June. The visitors like this event very much.

NATURE CAMERAS

RMK's nature cameras were set up in seven locations for observation. **Saunja bay camera** was installed in the Silma Nature Reserve for the first time. Most often people could see in front of the camera grey herons and great egrets; sometimes also raccoon dogs and fox were seen strolling on the seashore. The camera offered beautiful sound background:
on early spring mornings and evenings, one could hear the communication of greater white-fronted goose, greylag goose and bean goose, staying on the bay; often a pair of common cranes emitted trumpeting calls on a nearby coastal meadow.

A bark beetle camera at Ussimäe, went live with a beetle, provoking resentment. In the coolest spring of the last 60 years, the common spruce bark beetle began its devastating activity later than usual, at the end of May. A bark beetle finds a suitable tree with the help of extremely good sense of smell from a distance of up to a kilometre and chews itself into the bark of a spruce in minutes.

A carnivore camera on a small cutting area near the Maarjapeakse bog in Southern Pärnu County gave hope to mediate the activities of carnivores. Despite the signs found in the nature, it was not possible to see wolves, but still the bears, foxes and raccoons. Once, a bear handled his bear stuff in front of the camera for a longer time, clinging to the stump before midnight and – intended and done – pushed the block off the stump. Another time, our familiar bear was accompanied by a fox, who seemed to be so interested in the doings of the large animal that intruded behind the back of the bear without realising the danger.
A deer camera in Saaremaa told us that the warm winter had not misled the animals – they began shedding antlers still at the usual time, in the second half of February. However, already on January 15, a deer bull with only one four-branched antler on its head could be seen. Still, it was not a record-early shedding of antlers, but the animal was deprived of his crown on a village road of Piirimetsa, just a few kilometres from the feeding site, where the poor fellow ran into the same off-road vehicle that had brought him silage, hay, carrots and apples for food. The collision knocked off the head the left horn, which had five branches.

The fish camera of Lake Võrtsjärve was placed to the flooded area of the northern shore, to see the pike migrating to spawn. Someone was constantly on the move on the fish camera – fish, frogs and many different aquatic invertebrates. A shoal of roaches circuited in front of the camera in the beginning of April for three weeks, as if a picture came from the aquarium. Once a pike sat under the shoal for a long time, both ignored each other.

The microphone of the fish camera picked up sounds above the waterline. One day a kingfisher came to sing and catch a fish right under the microphone.

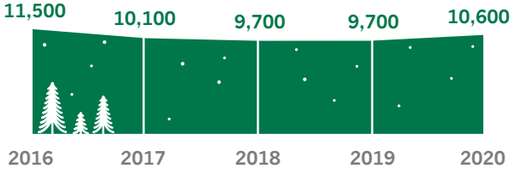
A fish camera near the mouth of the Keila river showed a big male salmon with deformed jaws on September 17, when the first 'spies' arrived at the spawning site. The rainy weather often made the water hopelessly muddy, but in brighter moments you could see the perch, common rudd and vimba breams. Once, four ides swam upstream, a trout took a place in front of the rock every day, a river lamprey swam directly onto the camera post and sucked on it for a while.

The badger camera followed the life of city badgers who had built their home on the territory of the Tallinn Zoo. Due to the warm winter, the badger family did not stay in the hibernation; they were most active at night.

CHRISTMAS TREES

10,600 Christmas trees were brought home from the state forest, which is the second-best result starting from 2008, when RMK began to sell the trees. For RMK, this is not a way to earn income, but a possibility to invite people to the nature also in winter and keep alive an old tradition. RMK gave Christmas trees to 60 substitute homes and to several social institutions.

Christmas trees from RMK forest



HERITAGE CULTURE

Heritage culture database, prepared under RMK's initiative, **consolidates information on 39,158 sites**. Out of these, 6,985 are wholly or partly located on the land owned by RMK.

During the year, emphasis was placed on supplementing the sites in the heritage culture database with additional information and improving their location accuracy, which was made for a total of 836 cases. A comparison with the data of memorials and graves in the Estonian topographic database was completed and thereby the topographic database was supplemented with 363 sites. Information concerning the location of cultural heritage sites was exchanged with the project 'Sünnipaik' ('Birthplace') of the Estonian National Museum, led by Peeter Volkonski. It was a big IT-leap that the Land Board transferred the application of heritage culture to a new map environment.

RESEARCH

Applied research projects supported including active	19 4
2008–2020 budget for applied research	EUR 2.6 million
Forestry scholarships	5
Scholarship spending in a year	EUR 33,000

APPLIED RESEARCH

RMK began its targeted financing of research in 2008. During this time, funding decisions have been made for 19 applied research projects and EUR 2.6 million paid out.

In 2020, **two new applied research projects were selected to be supported**. In addition, there are another two ongoing projects funded in 2018.

RMK Research Council

- Jaan Liira, Senior Research Fellow in Plant Ecology at the University of Tartu
- Ahto Kangur, Professor, Head of the Chair of Forest Management and Forest Ecology at the Estonian University of Life Sciences
- Kalev Jõgiste, Professor of the Chair of the Forest Biology at the Estonian University of Life Sciences
- Kalev Sepp, Professor, Head of the Chair of the Landscape Management and Nature Conservation at the Estonian University of Life Sciences
- Krista Lõhmus, Professor Emeritus, Senior Research Fellow of Applied Ecology, Chair of Ecophysiology at the University of Tartu
- Ülo Mander, Chair of Physical Geography and Landscape Ecology, Professor of Physical Geography and Landscape Ecology at the University of Tartu
- Aigar Kallas, Chairman of the Management Board of RMK
- Kristjan Tõnisson, Member of the Management Board of RMK

Ongoing science projects

Impact of selective felling on the carbon balance of the forest eco-systems and economic aspects

Duration: 2020–2022

Project Manager: Veiko Uri from the Estonian University of Life Sciences

Project's main executives: Mats Varik, Mai Kukumägi, Jürgen Aosaar, Kristiina Aun, Mikko Buht, Marek Uri, Kaido Soosaar, Alisa Krasnova

RMK funding: EUR 204,000

A lot of discussions are going on about alternative management methods to clear cutting, such as more extensive use of shelterwood felling and selective felling. At the same time, there has been very little relevant research carried out in Estonia. However, Estonia's state forest management must be research-based.

The project will **investigate the development of forest eco-system and the carbon balance after selective and clear cutting**. The production of stands, including the storage of carbon in them is being assessed, the forest reserves, structure and the condition of trees is being described. Based on this, the further development and increment of the stands in the long-term is predicted. Empirical information on the quantity and quality of the timber cut in the first stage of selective cutting is obtained, which in turn serves as basis to the initial economic assessments of such cutting method.

The applied research, commenced in autumn 2020, began with the **establishment of test areas**; for that selective cutting was carried out in the selected areas in Tartu and Põlva County. A total of five test areas will be established, three of which will be pine stands and two mixed forest stands.

The project will be carried out in cooperation between the University of Tartu and the Estonian University of Life Sciences.

Factors determining the protection capacity and growth of common spruce in pure and mixed stands: impact of climate change and growth site

Duration: 2021–2023

Project Manager: Priit Kupper from the University of Tartu

Project's main executives: Arvo Tullus, Katrin Rosenvald, Gristin Rohula-Okunev, Pille Mänd

RMK funding: EUR 195,219

The spruce is ecologically and economically one of the most important tree species in Estonia, as well as in the entire Central and Northern European region. At the same time, the ecophysiology models show that spruce is less able to adapt to climate change than the other important tree species in the region and that the vegetation range models predict a shift of the spruce area in a northern direction.

The project examines:

- **what does the protection ability of the spruce depend on** (resin flow and concentration of phenolic compounds) and how do the growth, physiological indicators and conditions of the growth site influence this
- what are the **effects of intraspecific and interspecific competition** on the growth and protection ability of the spruce in mixed stands with different proportion of spruce
- how does the growth and adaptability of the spruce depend on the estimated elevation of precipitation, degree of soil moisture and air humidity on the FAHM climate manipulated experimental site in pure spruce and mixed birch and spruce stands
- what is the reaction of spruce growth to weather conditions based on a dendroclimatologcal analysis during the last ca 50 years, depending on the type of growth site and composition of stand

In 2020, preparations were made to start the project. The **first suitable experimental areas** were found, were in 2021, the necessary measuring will be performed concerning the growth, protection ability and physiological indicators of spruce. A total of 15 suitable experimental areas will be found from five different types of growth sites.

Increasing the purpose of protected forest fragments

Duration: 2018–2021

Project Manager: Kadri Runnel from the University of Tartu

Project's main executives: Anneli Palo, Piret Lõhmus, Raul Rosenvald, Indrek Tammekänd

RMK funding: EUR 152,517

A considerable proportion of Estonia's protected forests are small fragments of less than 15 hectares surrounded by commercial forest. Such forest fragments are important because they provide a habitat for many scattered endangered species. At the same time, they do not form a self-regulating natural whole and are threatened by external impacts, which is why the natural values there are also at risk.

The project will examine **whether the preservation of natural values in protected forest fragments depends on how the forests surrounding them are managed**.

The core of the project is extensive fieldwork and the year 2020 was literally filled with such work. By late autumn, the species inventory and the seven-month experiment, catching fungi spores from the air in the areas under investigation, were completed. The purpose was to get an understanding on whether the patterns of the occurrence of species are connected with the environmental characteristics or distribution. For the moment, the collected data is beginning to take a shape: identification of the material (lichens and tinder fungi) collected during the species inventory is in its final stage and we are expecting the results of sequencing of spore samples from Oslo. In spring and summer 2021, the data analyses and summaries will be undertaken.

The project will be carried out in cooperation between the University of Tartu and the Estonian University of Life Sciences.

Biocontrol efficiency and the use of antagonistic fungi to control *Heterobasidion annosum* in the spruce stands and the infestation of different plant types in fertile nursery types

Duration: 2019–2021

Project Manager: Tiia Drenkhan from the Estonian University of Life Sciences

Project's main executives: Kadri Põldmaa, Tiit Maaten, Kalev Adamson, Leho Tedersoo, Rein Drenkhan

RMK funding: EUR 194,213

The growth of common spruce stands in fertile types of nurseries is inhibited by the widespread presence of root rot. The use of the *Phlebiopsis gigantea* based bio-preparation, Rotstop®, helps to mitigate the damage caused by *Heterobasidion annosum*.

The project analyses the efficacy of the preparation and the effects of the treatment on the biota, as well as studies of other antagonistic fungal species and their effects on *Heterobasidion annosum*.

Testing areas with different plant types were established for the analysis of root rot infestations of young trees. By the end of 2020, a total of 3,040 tree samples had been collected from the common spruce stands (38 areas) before and 12 months after the thinning and treatment of the stumps with Rotstop®. The existence of *Phlebiopsis gigantea* has been analysed from 39% of the samples. The results indicate that before the treatment of the stumps, *Phlebiopsis gigantea* occurred in 0.5%; 12 months after the treatment, in 27% of stumps.

The efficiency of treatment of stumps with a harvester after 12 months was analysed. The average proportion of *Phlebiopsis gigantea* in 200 stumps treated with Rotstop® was 29.5% (in the same stumps, the *Heterobasidion annosum* amounted to 11%) and in 200 not treated stumps, the proportion of *Phlebiopsis gigantea* was 10% (that of *Heterobasidion annosum*, 8%).

Parasites were isolated from fruiting bodies of the *Heterobasidion annosum* collected from spruce, pine and juniper to the purified cultures, and parasite-free fruiting bodies were placed in a humidity chamber. Most of the fruiting bodies in the humidity chamber developed *Sphaerostilbella broomeana*. Laboratory experiments identify the efficiency of the parasite as an inhibitor of the *Heterobasidion annosum* growth.

The tree samples collected from the stumps in the experimental areas were analysed (altogether 830 samples); the existence of *Heterobasidion annosum* was identified in a total of 73 stumps. The results revealed uneven occurrence of the pathogen across the experimental areas. The analysis of roots of planted forest plants shows the proportion of their infection with *Heterobasidion annosum* two years after planting.

The project will be carried out in cooperation between the Estonian University of Life Sciences and the University of Tartu.

SCHOLARSHIPS

Endel Laas Scholarship

- for doctoral students at the Estonian University of Life Sciences
- EUR 4,800 per year
- Recipients in 2020: Laura Peedosaar, Mikko Buht

Heino Teder Scholarship

- for Master's students at the Estonian University of Life Sciences
- EUR 3,200
- Recipients in 2020: Airiin Vaasa, Laura Pihlak

Toomas Ehrpaisi Scholarship

- for students of Luua Forestry School
- EUR 1,917
- Recipient in 2020: Hendrik Akkatus

Academic forestry education in Estonia celebrated its 100th anniversary in 2020. The need to educate forestry scientists rose in Estonia after the land reform of 1919, when 80% of forests were transferred into the state ownership. Yet, there was a shortage of specialists who could have protected and managed this wealth. Thus, on 15 August 1920, the chair of forestry and geodesy was established in the University of Tartu. For today, more than 4,000 forestry specialists have been educated in Tartu, able to keep and manage the forests in a smart way.

FINANCIAL SUMMARY

Asset value	EUR 1.5 billion
Operating profit	EUR 82.4 million

BALANCE SHEET

(in thousands of euros)

ASSETS

Current assets	31.12.2020	31.12.2019
Cash	82,924	96,527
Receivables and prepayments	13,390	14,952
Inventories	19,349	25,794
Biological assets	30,053	23,690
Total current assets	**145,716**	**160,963**

Fixed assets		
Investment properties	773	1,117
Tangible assets	571,623	556,168
Intangible fixed assets	1,474	1,375
Biological assets	746,794	642,690
Total fixed assets	**1,320,664**	**1,201,350**
TOTAL ASSETS	**1,466,380**	**1,362,313**

LIABILITIES AND EQUITY CAPITAL

Liabilities

Short-term liabilities	31.12.2020	31.12.2019
Debts and prepayments	13,928	21,239
Short-term provisions	3,049	3,075
Total short-term liabilities	**16,977**	**24,314**

Long-term liabilities		
Long-term prepayments	6	7
Long-term provisions	642	745
Total long-term liabilities	**648**	**752**
TOTAL LIABILITIES	**17,625**	**25,066**

Equity capital		
State capital	1,174,064	1,177,854
Retained profit	93,403	569,318
Accounting year profit (loss) with profit (loss) from the revaluation of biological assets	181,288	-409,925
TOTAL EQUITY CAPITAL	**1,448,755**	**1,337,247**
TOTAL LIABILITIES AND EQUITY CAPITAL	**1,466,380**	**1,362,313**

INCOME STATEMENT

(in thousands of euros)

	2020	2019
Revenue	187,540	218,709
Other operating revenue	49,032	5,615
Gain (loss) from biological assets	351	893
Changes in inventories of finished goods and work-in-progress	-6,507	1,982
Work performed by an entity in the production of fixed assets for its own purpose and capitalised	38	31
Goods, raw materials and services	-99,808	-103,753
Miscellaneous operating expenses	-9,808	-10,426
Labour costs	-27,652	-27,457
Depreciation and impairment of fixed assets	-10,702	-10,352
Other operating expenses	-99	399
Operating profit	**82,385**	**75,641**
Other financial income and expenditure	109	137
Profit before income tax	**82,494**	**75,778**
Income tax	-14,662	-9,785
Profit for the accounting year	**67,832**	**65,993**
Revaluation of biological assets	113,456	-475,918
Accounting year profit (loss) with profit (loss) from the revaluation of biological assets	**181,288**	**-409,925**

AUDITOR'S REPORT

Grant Thornton

Grant Thornton Baltic OÜ
Pärnu road 22
10141 Tallinn, Eesti
T +372 626 0500
E info@ee.gt.com
REG No. 10384467
VAT No. EE100086678

INDEPENDENT AUDITORS' REPORT

To the supervisory board of Riigimetsa Majandamise Keskus (RMK)

The accompanying summary financial statements on pages 58 to 60, which comprise the balance sheet as at 31 December 2020 and the income statement for the year then ended, are derived from the audited financial statements of RMK for the year ended 31 December 2020. We expressed an unmodified audit opinion in those financial statements in our report dated 23 February 2021. The summary financial statements and audited financial statements do not reflect the effects of events that occurred subsequent to the date of the auditor's report on the audited financial statements, which may require adjustment of, or disclosure in, the audited financial statements.

The summary financial statements do not contain all the disclosures required by the Estonian Financial Reporting Standard, which was applied in the preparation of the audited financial statements of RMK.

Reading the summary financial statements, therefore, is not a substitute for reading the audited financial statements of RMK.

Management's responsibility for the summary financial statements

Management is responsible for the preparation of the summary financial statements derived from the audited financial statements in accordance with the accounting and measurement requirements of the Estonian Financial Reporting Standard.

Auditor's responsibility

Our responsibility is to express an opinion on the summary financial statements based on our procedures, which were conducted in accordance with International Standard on Auditing (ISA) 810 *Engagements to Report on Summary Financial Statements*.

Grant Thornton

Opinion

In our opinion, the summary financial statements derived from the audited financial statements of RMK for the year ended 31 December 2020 are consistent, in all material respects, with those financial statements, in accordance with the accounting and measurement requirements of the Estonian Financial Reporting Standard.

Aivar Kangust
Sworn Auditor
License number 223

Grant Thornton Baltic OÜ
Licence number 3
Pärnu road 22, 101451 Tallinn
23 February 2021

State Forest Management Centre (RMK)
Sagadi Village, Haljala Municipality,
45403 Lääne-Viru County, Estonia
Tel +372 676 7500
www.rmk.ee

Text:
Katre Ratassepp

Translation:
Interlex

Design and layout:
Creative Agency PULT

Photos:
Jarek Jõepera
The photos show employees of RMK and its partner companies.

Typography:
Geogrotesque
News Gothic MT

Paper:
cover Munken Lynx 300 g
content Munken Lynx 120 g

Printed by
Ecoprint

Märk
vastutustundlikust
metsamajandusest

PEFC/19-23-01




RMK

See you in the forest!