



RMK ANNUAL REPORT 2016



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RMK
Toompuiestee 24, 10149 Tallinn, Estonia
Tel +372 676 7500
www.rmk.ee

Texts:
Katre Ratassepp

Design team: DF
www.df.ee

Cover photo and section titles:
Kaupo Kalda

Content photos:
Silver Gutmann
Tiit Hunt
Rasmus Jurkatam
Rando Kall
Kaupo Kikkas
Imre Malva
RMK

Typography:
Geogrotesque
News Gothic BT

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cover Constellation Snow Mosaico (Fedrigoni)
content Munken Lynx (Arctic Paper)

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The mark of
responsible forest
management



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STORMY YEAR

Aigar Kallas

Chairman of the Management Board of RMK

Momentum of this kind, as gained by the discussions on forest topics at the end of 2016, has not been seen for a long time. Suddenly, the forests appeared among the ranks of topics that polarized society. Substantiated or not, but this is definitely a sign of the times.

The figures confirm that the current amount of forest in Estonia hasn't been seen in a very long time and that the forest here is growing at a rate that is faster than what we are able to cut. Still, views differ – scientists, politicians, nature conservationists, civic activists – everyone approaches the topic from their own angle and the attitude may even differ within a single group. Against that background, whenever a clear-cut area is noticed through a car window, it may indeed give reason for concern and this concern must be accepted.

The search for social agreement and balance must be continuous; however, I can confirm that it is the different roles of a forest – the ecological and socio-cultural, in addition to the economic – that RMK takes into account in its activity. Otherwise we would not have obtained two international certificates for sustainable forest management; we would not be the largest performer of nature protection works in Estonia, and we would not be hosting several million visits to our protected and recreational areas. Yet, we have to improve our dialogue with the communities.

In 2016, the structure of RMK was updated. New areas of activity added were nature protection, forest survey management (in more



common language, the gathering of precise data about the forest) and land use. The latter focuses on ensuring that each plot of land in the care of RMK would be used in the best possible way for society, regardless of whether the goal is forest management, nature protection, relaxation or cultivation of land.

The new work organisation had just entered into force when a thunderstorm rolled over the forests of South Estonia. The new work organisation was given a baptism by fire, while RMK's annual cutting volume increased by one-tenth, since the trees knocked down by the storm had to be brought out of the forest. The storm illustrated a truth that is already clear to foresters – a forest is not a postcard, remaining unchanged forever. No matter how many plans man makes, nature will always be stronger. However, by acting in a wise and responsible manner, we will also be able to enjoy the forest and its benefits in the future.

51% of Estonia is covered by forest. RMK maintains 45% of it.

20.2 million forest plants made RMK's state forest grow.

5 of RMK's most important tasks are the growing of forest and the maintaining of natural values, earning a profit for the state through the management of state forests, creating opportunities for moving around in nature, and providing nature education.

6,000 people are employed in the state forest each year – there are ca 700 full-time employees at RMK and more than 5,000 people work in the state forest via partner companies or as seasonal workers.

39 offices owned by RMK where the forests are growing. This means that RMK is represented all over Estonia and, for example, only 7% of its employees are working in the capital.

TEN FACTS ABOUT RMK

19% of Estonian forests are strictly protected; although, protecting biodiversity is also important in a forest that is being managed.

1% of the state forest land is clearcut each year. All clearcut areas are reforested.

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

8,700 km of forest roads are owned by RMK. They make possible forest and nature protection works, but the roads are also needed for fire-fighters, berry and mushroom pickers and hikers.

4 certificates proving that RMK bases their activities on high standards. There are the environmental and quality management certificates ISO 14001 and ISO 9001, and the sustainable forestry certificates FSC® and PEFC.



ABOUT THE ORGANISATION

State land
managed by RMK
1,322,881 ha
... of which
forest land
971,615 ha

Full-time
employees
688

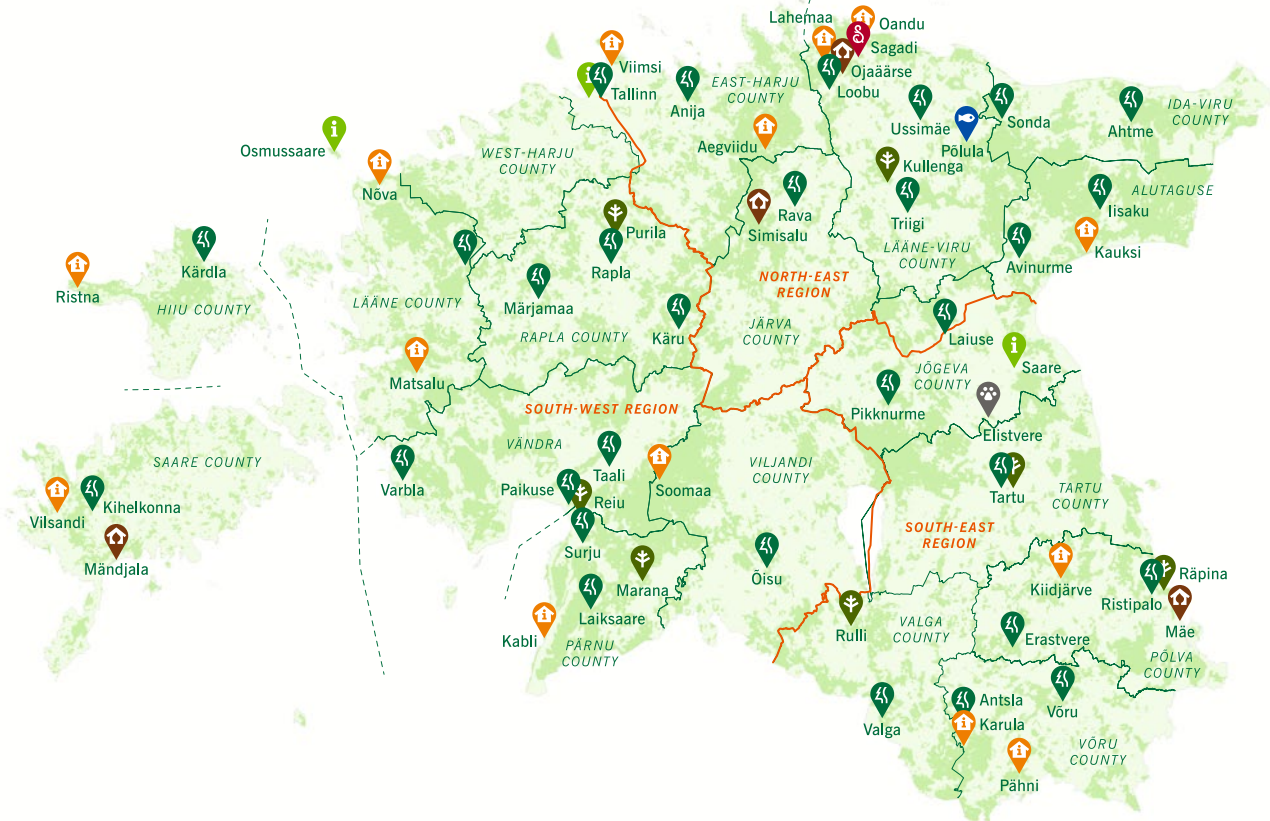
Turnover
EUR 178.5
million

Operating profit
EUR 50.6
million

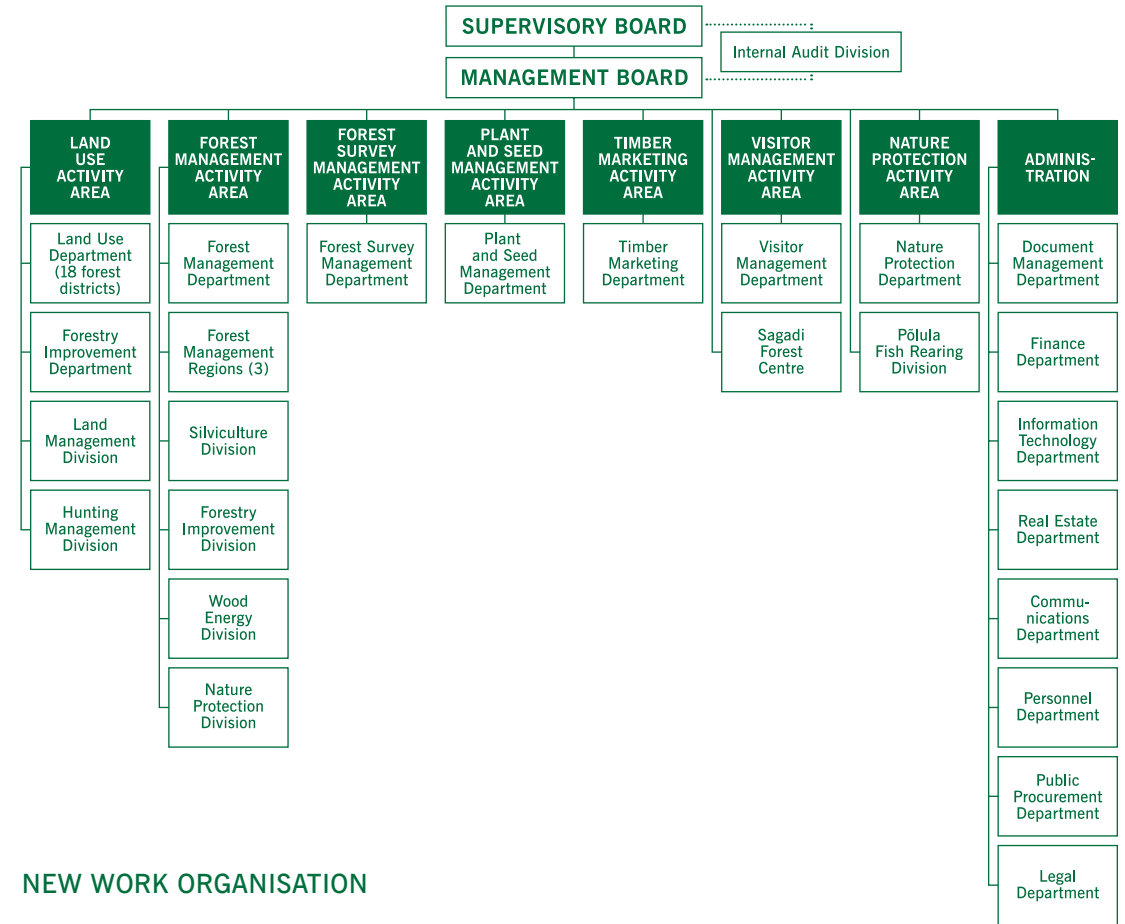
Proprietary income
to the state budget
EUR 24.5
million

Land tax
EUR 4.7 million

EMPLOYEES



- Area managed by RMK
- Forest district border
- Forestry region border
- 📍 Visitor centre
- i Information point
- 📍 Sagadi Forest Centre
- 🏠 Nature house
- 🌱 Plant management
- 🐾 Elistvere Animal Park
- 🏢 Office
- 🐟 Põlula Fish Farm



NEW WORK ORGANISATION

As of 1 July, RMK's structure changed:

- Instead of the Forest Administration Department, the Land Use Activity Area was created.
- The former Forest Administration units of Forest Survey Management and Nature Protection were made into separate Operating Areas.
- The Land Use Department now includes 18 forest districts instead of the previous 17. The Department's task is to determine the purpose of each RMK allocation, to ensure more diverse use of state land, and to determine the areas where heightened public interest must be taken into account in managing them.
- In the Forest Management Activity Area, the regional structure was changed and the unit with the most employees within RMK was established – the Silviculture Division.
- Under the Communication Department, a development team started up, working to increase awareness about forests and nature.

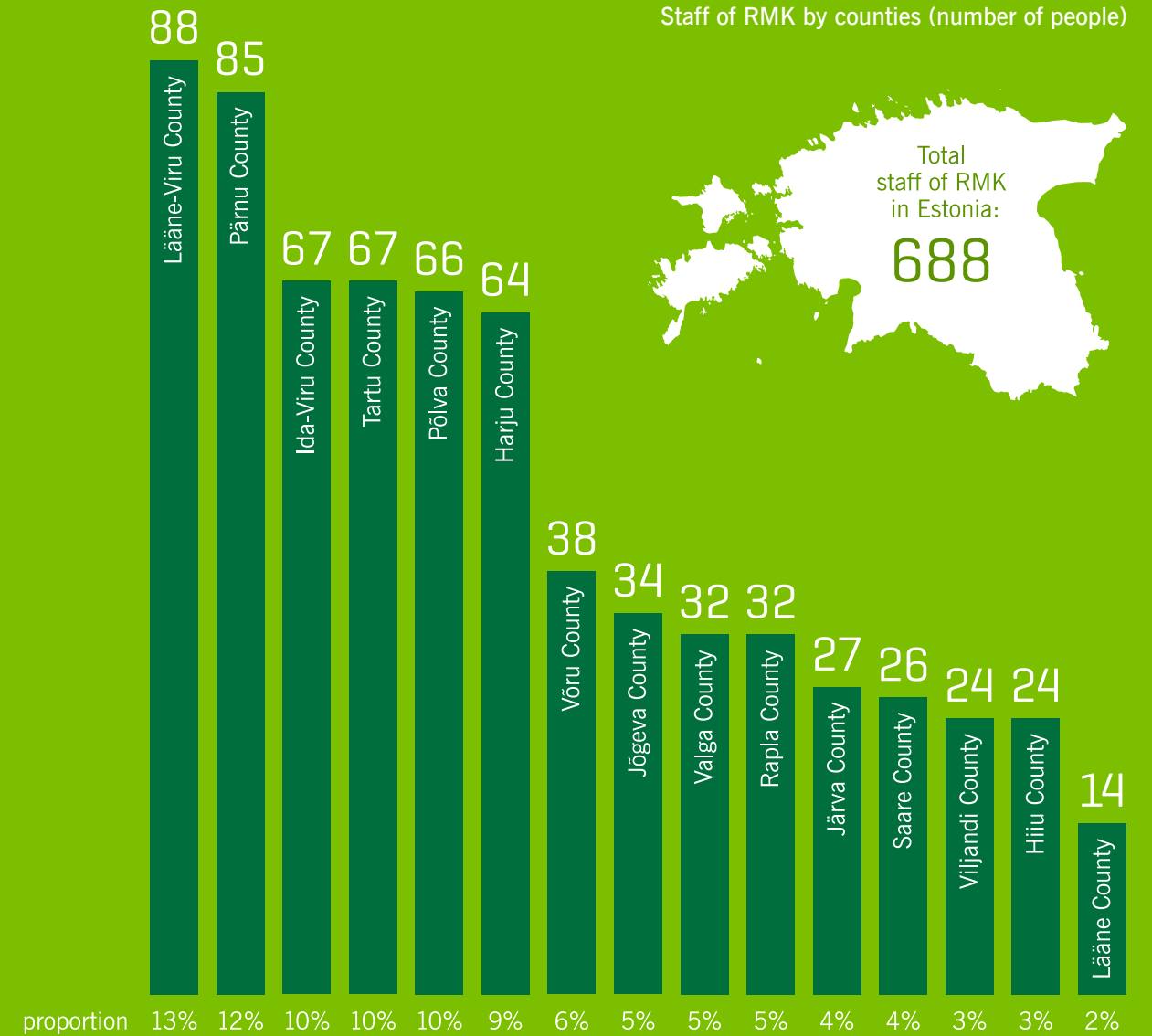
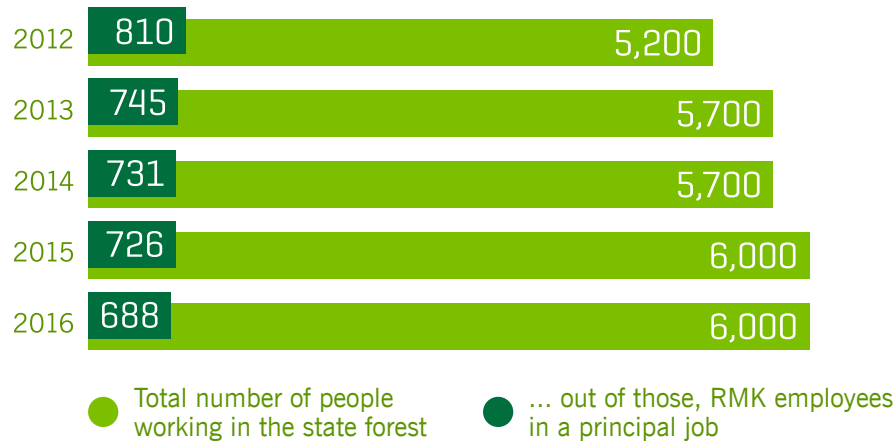
CONTRIBUTION TO THE ECONOMY

RMK's economic indicators (EUR million)	2012	2013	2014	2015	2016
Turnover	142.2	154.9	163.5	165.2	178.5
Operating profit	27,2	35,4	44,4	36,2	50,6
Proprietary income to the state budget	45.8	20	18.5	18.3	24.5
Land tax	4.0	4.3	4.5	4.6	4.7
Labour taxes	5.7	5.5	5.7	6.0	6.1

GOOD TO KNOW! 35,000 jobs in the forestry sector have a direct connection to the forest, and many jobs in the tourism, sports, transport and others sectors have an indirect connection to it.

SOURCE: STATISTICAL YEARBOOK OF ESTONIA 2016

Number of people employed in the state forest



HONOUR BOARD

THE MOST PRESTIGIOUS

RMK earned first place in the ranking of Estonian large enterprises based on their recognition and reputation. A year before, RMK placed fourth in that ranking, only ranking first among state enterprises. RMK also ranks a very high third place in the reputation ranking of employers, having managed to move up one place over the year.

According to specialists from the survey company Emor, RMK's trump card is good concordance between the pleasantness and the importance of its activities. While many large enterprises seem strong and powerful, but fail to create positive emotions, RMK is one of those that has the two sides well in balance.

TRUSTWORTHY IN ENVIRONMENTAL MATTERS

A survey of environmental awareness among residents of Estonia indicated that RMK continues to be a very trustworthy environmental organisation in their minds.

Fifteen per cent of the population spontaneously named RMK as the most trustworthy authority in the field of environment. This was the case most frequently among men, Estonian speakers, residents of Northern Estonia, and those with a higher income. Based on the presented list, the most trustworthy was deemed to be the Estonian Museum of Natural History, followed by RMK and the National Weather Service.

MEANINGFUL

Among the top 28 Estonian brands, RMK is considered the most meaningful, as evidenced in the Idea Group's survey Meaningful Brands. The survey explains not only the meaningfulness of the brands but also their perceived contribution to the people's improved personal and collective welfare. Forty seven per cent of Estonian residents, who are aware of RMK, claim that RMK helps them feel happier. In the meaningfulness index, RMK ranks higher than second place Telia by 11% and the Estonian Nature Fund by 17%.

COOPERATION PROJECTS

FORESTRY AND THE USE OF TIMBER

- MTÜ Vanaajamaja continued its cooperation with the Heritage Protection Department to conserve a small wooden Orthodox Christian church in Puutli Village, Vastseliina Rural Municipality, Võru County. The timber for its replacement roof was provided by RMK.
- The Emajõe Barge Society is in the process of preparing for the construction of a two-mast Peipus barge; the suitable material was supplied from the state forest.
- During Christmas, for the second year in a row, Tartu Town Hall Square saw the erection of a grand swinging forest. The 7 metre spruce trees brought by RMK were later sawn into firewood and donated to a Tartu family with many children; the transverse beams were given to the Supilinna actors for a tepee.
- The Estonian Woodhouse Association organised professional competitions for log house builders in Räpina; RMK contributed the necessary timber.
- At Varbola stronghold, in Rapla County, RMK supported the 20th festival of wooden sculptures.
- Estonian Forest Society, RMK and Estonian Association of Forest Servants organised the traditional professional forestry competition. Estonian team participated in the World Championship in Poland, and RMK provided its help with brains and brawn.
- In cooperation with Estonian Forest Servants Association, information days introducing the jobs of foresters were organised.
- Forestalia, the joint choir of foresters, continued its series of joint singing events.
- Substitute homes all over Estonia received a free Christmas tree from the state forest, if they so wished.

HEALTHY LIVING AND ACTIVITIES IN NATURE

- The Kõrvemaa Quadrathlon took place under the flag of RMK.
- The interior architecture students from the Estonian Academy of Arts built a unique floating stopover in Soomaa.
- Mushroom treks in Harju County were organised in cooperation with the *Maaieht* newspaper, to introduce lesser-known species of edible mushrooms.

ENVIRONMENTAL PROTECTION AND NATURE CONSERVATION

- Nature photographers went on a bloodless hunt; the best photo was deemed to be a badger photo, taken by Ollar Kallas.
- The atrium of RMK's Tallinn Headquarters housed exhibitions showing the year's animal and bird, factory-built wooden buildings and the timber industry, and the best samples of the photo competition held by the *Eesti Loodus* magazine.
- The Fork Monkey Cooking School [*"Kahvliahvi kokakool"*] let children mess around with food during the mushroom exhibition of the Estonian Museum of Natural History. The day was closed by a guerrilla action where mushrooms broke out of the museum courtyard to loudly pronounce: children need more nature in the city!
- RMK supplied firewood to the Estonian Union for Child Welfare camps at Remniku and organised nature study programmes for campers. In return, the children participated in a cleaning bee.



FOREST MANAGEMENT

State forest
reserve
180 million m³

Renewed
forest area
9,800 ha

Forestry plants
planted
20.2 million

Cleaning
43,300 ha

Thinning
9,000 ha

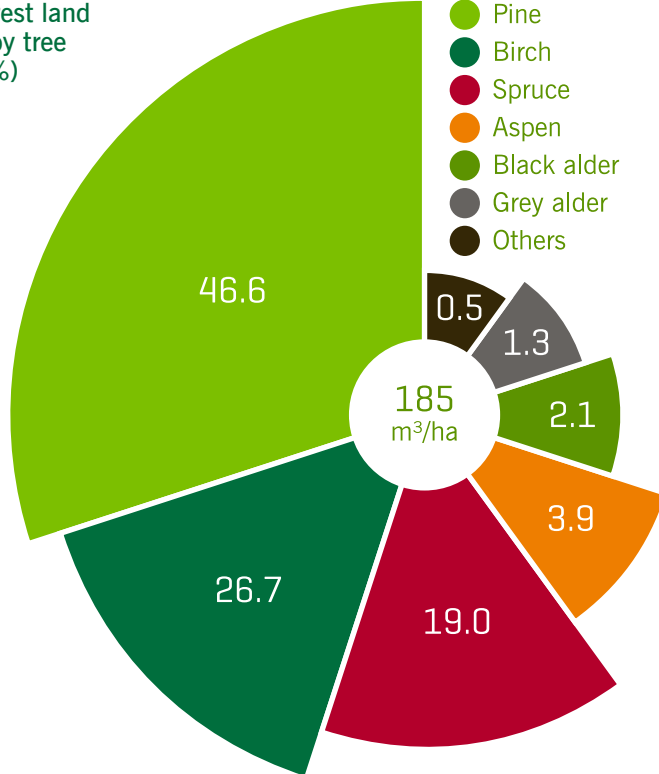
Regeneration
cutting
(incl. eliminating
storm damage)
11,900 ha

Timber sold
4 million m³

Income from
the sale of timber
**EUR 171.7
million**

FOREST LAND OVERVIEW

RMK's forest land reserves by tree species (%)

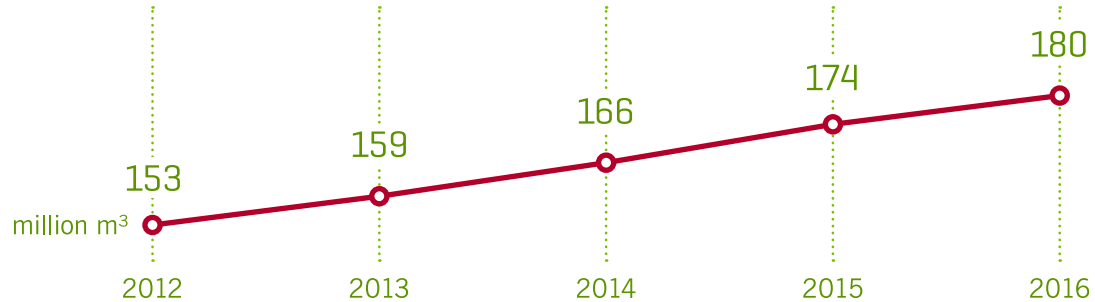


GOOD TO KNOW! The average state forest resource per hectare is 185 m³. If stacking one metre cubes onto each other, the wood growing on one hectare would make a tower taller than the TV Tower's lookout platform (170 m).

RMK area of forest land and reserves by species of trees

Species	Area		Stock	
	ha	%	m ³	%
Pine	410,081	42.2	83,758,000	46.6
Birch	290,015	29.8	48,030,000	26.7
Spruce	200,041	20.6	34,142,000	19.0
Aspen	33,948	3.5	6,951,000	3.9
Black alder	18,807	1.9	3,764,000	2.1
Grey alder	13,639	1.4	2,277,000	1.3
Others	5,084	0.5	914,000	0.5
TOTAL	971,615	100.0	179,836,000	100.0

State forest reserves



GOOD TO KNOW! The area of Estonian forests has grown from 31.4% in 1958 to 42.4% in 1988 and 51% in 2015.

Since 1988, Estonian forests have increased by as much as the total area of the islands of Saaremaa and Hiiumaa. Compared with the situation in 1958, the increase is larger than three islands of Saaremaa.

SOURCE: ENVIRONMENT AGENCY

CUTTING WORKS

Cutting in state forests (ha)	2012	2013	2014	2015	2016
Regeneration cutting	8,606	8,717	9,513	10,471	11,920
... of which clear cutting	8,415	8,568	9,394	10,387	11,799*
... of which shelterwood cutting	191	149	119	84	120
Thinning	11,895	10,778	9,909	9,339	9,079
Sanitary cutting	10,362	6,854	10,280	6,342	6,017
Deforestation	551	1,142	680	969	869
Design cutting			68	392	332

* REGENERATION CUTTING'S AREA INCREASE STEMMED FROM ELIMINATING STORM DAMAGE.

Regeneration cutting means one-time (clear cutting) or gradual cutting (shelterwood cutting) of a forest generation and after that, planting of a new forest on the cutting area or establishment of conditions promoting the natural regeneration of the forest.

Thinning is performed several times in the life-span of a forest, when necessary, by cutting out trees that are damaged, have a poor trunk form, are diseased and dead, and also healthy trees preventing others from growing, in order to create better conditions for other trees.

Sanitary cutting means the cutting of dead and diseased trees, trees conducive to pest reproduction or dying trees, and the seed trees left on the clearcut that have performed their duty, without harming the habitats of wild animals, plants and mushrooms.

Deforestation is cutting made in order to allow for the use of the land for any other purpose than forest management.

Design cutting is performed on a protected natural site for protection or for maintaining and improving a single protected natural object or a key biotype. Design cutting as a cutting system was added to the Forestry Act as of 2014.

GOOD TO KNOW! Forest cutting is a precise art where nothing is wasted. Every millimetre counts already when felling the tree (the harvester cuts with the precision of 3 mm). Everything is used in the timber industry as well. The wood not going to be sold as timber will be used in paper industry and the wood not used up there will not be just firewood but can end up as furniture or floors in our homes. One of the main materials made of such wood is the particle board used, for example, in furniture and flooring. Nearly 8 million m² of it is produced every year: enough to cover more than 1,000 Freedom Squares.

SOURCE: ESTONIAN FOREST AND WOOD INDUSTRIES ASSOCIATION

BORDER AREA CLEARED

2016 saw the end to clearing works on the Estonian side of the temporary control line between Estonia and Russia. A 136 kilometre long zone, with a total area of 366 hectares, was cleared of brush and woods; 70% of which was milled.

The average width of the cleared border area is 10 metres, although there are locations spanning up to 300 metres. A total of 28,600 cubic metres of timber and 6,000 cubic metres of cutting waste and trunks, now turned into wood chips, were yielded by the border area. The total cost of the border cleaning works was EUR 1.3 million. Out of that, the cost of milling stumps was EUR 400,000. The works were paid for out of the revenue from timber sales.

STORM DAMAGE IN SOUTH ESTONIA

At the beginning of July, a severe thunderstorm rolled over South Estonia. In a mere twenty minutes, it managed to knock down three months' felling volume worth of trees in the south-east region. The damaged area turned out to be several times larger than initially thought, reaching up to 3,500 hectares. A total of 370,000 cubic metres of timber was brought out, accounting for 9% of RMK's total felling volume for 2016.

Storm damage requires a quick reaction, in order to hinder the spread of forest parasites. During the peak period, all vehicles in the south-east region – 29 harvesters and 29 forwarders – were in action.

The most damage from the Koiva storm happened to pine forests. Forests of all age were hit, including natural forests untouched by human hands and young forests standing 6–7 metres tall. Storm damage was most extensive in Valga County. RMK will renew all clear cut areas damaged by the storm, except in forests under strict protection, where entry is prohibited even to eliminate storm damage.



THE START OF JULY STORM ENTERED ESTONIA ACROSS RIVER KOIVA AND MOVED IN A RATHER STRAIGHT LINE TO KAMBJA, TARTU COUNTY. THIS WAS THE FIRST TIME THAT RMK USED A DRONE AND A HELICOPTER TO ASSESS STORM DAMAGE.

FOREST RENEWAL

THE MOST IMPORTANT WORK

The growing of a new forest generation is a forester's most important work. The volumes of such work increased in 2016. A total of 20.2 million trees were planted, which is 900,000 more than the previous year. Forest renewal maintenance took place on 24,000 hectares, where the surroundings of trees up to 5 years of age were cleaned of grass and competing trees. Clearance was performed on 19,300 hectares, in order to improve the growth conditions of young forest.

In total, RMK renewed forest on 9,800 hectares, mostly by planting but also by leaving for natural renewal and by sowing. The most new trees were pines (11.1 million), followed by spruces (7.2 million), birches (1.8 million)

and a few black alders. A small area was used as a planting test ground for plants protected by biowax, to keep away the pine weevils that endanger young trees. In addition to biowax, RMK also protects plants against the weevil by using sand which is attached to the stems of the plants with a special type of glue and the rough surface of which prevents the beetle from damaging the trees.

The counties with the most planted trees were Ida-Viru County, with 3.6 million trees; followed by Pärnu County, with 2.3 million; and Lääne-Viru County, with 2.2 million trees. For the first time in several years, RMK once again organised a forest planting bee for volunteers; nearly 500 people participated.

GOOD TO KNOW!

Several things that are normal in forest management make urbanised people scratch their head. For example, when the underbrush is dug up in the spring, cutting the soil into large chunks. This is called mineralization of the land. It is needed to facilitate the natural renewal (seeds will sprout better) or to establish better conditions for forest planting and sowing.

Another picture disturbing to many is forest ground that has not been "cleaned up" after felling. Yet, the branches and sections of trunk – sometimes even whole trees being left on the ground – are not a sign of the foresters' laziness; it is actually needed for preserving biodiversity. In nature, such wood material rots over a period of several years or even several decades, depending on the tree species and the thickness of the tree parts.

Volume of forest renewal	2012	2013	2014	2015	2016
Mineralization of the land for planting (ha)	3,980	5,610	5,653	6,739	6,403
Mineralization of the land to aid natural renewal (ha)	446	1,096	1,202	1,343	1,419
Forest sowing (ha)	536	416	617	466	272
Forest planting (ha)	5,652	5,865	5,785	6,069	6,443
Aiding natural renewal with planting or sowing (ha)	313	348	408	397	261
Leaving for natural renewal (ha)	1,480	1,648	2,017	2,089	1,455
Contribution to the forest renewal (ha)	2,205	2,955	3,102	3,611	3,597
Plants planted (million)	17.4	18.4	18.5	19.3	20.2
... out of which container plants (%)	26	34	42	50	42
Forest renewal maintenance (ha)	18,751	20,865	23,048	24,559	23,966

Maintenance of young stand (ha)	2012	2013	2014	2015	2016
Clearance	16,481	18,150	19,375	19,769	19,366

Planting and sowing by tree species (ha)	2012	2013	2014	2015	2016
Spruce	3,169	3,368	2,885	3,197	3,015
Pine	2,905	2,724	3,329	3,061	3,101
Birch	399	516	578	631	809
Others	28	21	18	42	51
TOTAL	6,501	6,628	6,810	6,931	6,976

PLANT GROWING

Growing forestry plants (million)	2012	2013	2014	2015	2016
Pine	9.5	10.2	11.6	10.0	11.8
Spruce	9.3	10.2	9.5	10.1	9.1
Birch	0.6	0.8	1.1	1.6	1.9
TOTAL	19.4	21.2	22.2	21.7	22.8

STATE OF THE ART TECHNOLOGY

The process of growing plant in RMK has been taken to the level where all pines needed to renew the state forests are pot-grown and where spruces and partly also birches are grown in a pot field system. As the last stage, the new greenhouses at Marana and Kullenga and a modern production building in Tartu were completed in 2016. All sowing is done by special equipment in growing boxes and then taken to greenhouses. Sowing in open fields will no longer take place. This shortens the time needed for a seed to grow into a forest-ready plant and ensures better plant quality and production security. A pine needs one year of growing to become forest-ready, a birch needs two and a spruce needs two-three years.



THIS 0.16 HECTARE GREENHOUSE HOLDS HALF A MILLION PINE PLANTS. WHEN GROWN OUTDOORS, THEY WOULD REQUIRE 3 HECTARES OF LAND.

RMK itself grows all the plants needed for the planting. In 2016, RMK's greenhouses and open plant nurseries yielded a total of 22.7 million pines, spruces and birches. There are also small quantities of tiny oaks and black alders. RMK's plant nurseries are located in Tartu, Pärnu County, Põlva County, Rapla County, Valga County, Lääne-Viru County and Ida-Viru County.

GOOD TO KNOW! In the busy springtime planting period, nearly 1,700 people find seasonal work in forests and nurseries. In the winter, cone gathering provided additional income for about a hundred people.



GOOD TO KNOW! The birch has the most seeds per 1 kilogram – as many as 5 million. The spruce and the pine have 150,000 seeds per kilogram. If someone were to count one-by-one the Estonian state stock of forest seeds, the result would be 900 million birch seeds, 746 million spruce seeds and 403 million tiny pine seeds.

When are the plants taken to the forest?

A pine needs one year of growing from seed to forest-ready, a birch needs two and a spruce needs two to three years.



RESEARCH FOR THE FUTURE

So that even stronger, healthier and more timber-productive trees would grow in Estonia's forests in the future, RMK in cooperation with researchers from the Estonian University of Life Sciences to establish test cultures. Carefully chosen plants will be planted in carefully selected areas, with their growth being monitored especially closely. After decades, the seeds of the best of the best among those trees will for the foundation for next generation of forest.



A CONTRIBUTION TO THE FUTURE TREES IS ALSO MADE BY OOTSIPALU VALLEY GIANT, THE WORLD'S TALLEST PINE GROWING IN PÕLVA COUNTY.

The first to be researched was the common pine in 2011. By now, four test areas have been established to monitor the offspring of 467 plus-trees and for the plants grown from the comparison test's forest and seed-greenhouse seeds. Soon, the test area will see the planting of an additional 200 plants grown from the seeds of the Ootsipalu Valley Giant, i.e. the world's tallest common pine.

The first land plots to establish spruce test areas are ready; the first 137 offspring plants of the plus-tree will be planted in the spring of 2017. The offspring of the next 164 plus-trees are growing in Marana plant nursery and will be planted in 2018. For the remaining part, a good cone year is needed so that cones could be harvested from another 150 seed-greenhouse and plus-trees.

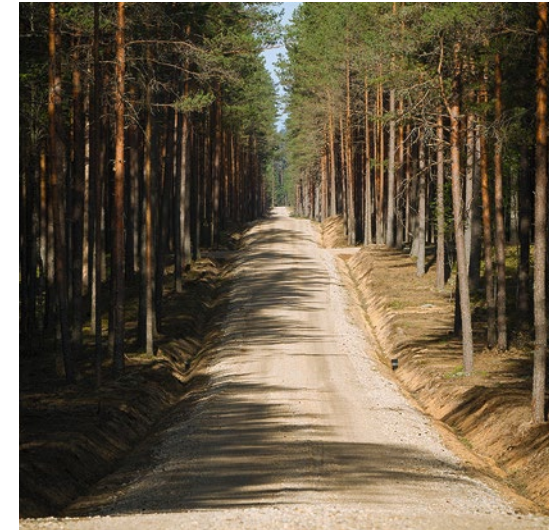
The establishing of birch test areas will start in 2019–2020. The best trees for that are currently being chosen from the forest. They have to be better than other trees by their taller height, fine branches and a good trunk shape.

FOREST IMPROVEMENT

	2012	2013	2014	2015	2016
Forest roads built, reconstructed and renewed (km)	212	346	268	495	361
Land improvement systems reconstructed and renewed (ha)	7,200	17,000	7,100	23,800	13,200
Maintenance costs of forest improvement infrastructure (EUR million)	15.5	19.4	23.2	22.9	23.5

RMK's lands contain 8,700 kilometres of forest roads and nearly 489,000 hectares of land improvement systems. Nearly half the forests of RMK are drained. No new drainage land improvement systems are established nowadays, but the existing systems are being maintained and reconstructed. Thanks to forest drainage, nearly a million cubic metres more of timber grows in Estonia every year.

RMK also establishes new forest roads, if necessary. This simplifies the forestry and nature protection works, plays an important part in putting out fires, and ensures better movement opportunities for berry-pickers and hikers.



RMK CONSIDERS 30 YEARS FOR THE RENEWAL CYCLE OF THE EXISTING ROADS.

TIMBER MARKETING

Sale of timber (m ³)	2012	2013	2014	2015	2016
Logs	1,249,000 40%	1,356,000 40%	1,492,000 45%	1,596,000 44%	1,819,000 46%
Pulpwood	1,158,000 37%	1,233,000 37%	1,216,000 36%	1,292,000 36%	1,352,000 34%
Firewood	399,000 13%	571,000 17%	487,000 15%	558,000 16%	602,000 15%
Wood chips and residuals	318,000 10%	211,000 6%	138,000 4%	148,000 4%	183,000 5%
TOTAL	3,124,000	3,371,000	3,333,000	3,594,000	3,956,000

Biggest clients by the amount purchased (m³)

Stora Enso Eesti AS	415,000
Horizon Tselluloosi ja Paberi AS	240,000
Estonian Cell AS	233,000
Toftan AS	169,000
Osula Graanul OÜ	151,000
BillerudKorsnäs Estonia OÜ	140,000
Metsä Forest Eesti AS	139,000
Graanul Invest AS	132,000
Laesti AS	117,000
Viiratsi Saeveski AS	112,000
TOTAL	1,848,000

GOOD TO KNOW! Nearly 45% of the total volume of timber from the Estonian forests is logs for houses, furniture, boards and beams. 25% is pulpwood for newspapers, books and packages. Nearly 30% is firewood for home heating and electricity.

SOURCE: ESTONIAN FOREST AND WOOD INDUSTRIES ASSOCIATION

GOOD TO KNOW! Wood can be used to reduce CO₂ emissions. Using one m³ of wood instead of non-renewable materials would reduce the CO₂ emissions from the production of other materials: by 700 kg for coal, by 600 kg for oil, by 500 kg for steel, by 1,200 kg for aluminium.

SOURCE: SVEASKOG

PRICES ARE STABLE

RMK sold nearly 4 million cubic metres of timber in 2016; this is 11% more than a year ago. The increase stems largely from the works to eliminate the damage from the thunderstorm that hit the forests of South-East Estonia, and from clearing the exercise fields of the Defence Forces. In terms of product group, the sold timber was divided as follows: 46% logs, 34% pulpwood, 15% firewood and 5% wood chips and residuals.

The year's average timber prices remained stable in all goods groups; the price of round timber dropped by 0.6% compared to the previous year. The stability was upheld by the investment activity of local sawmills and wood processing plants. The overall demand for grades of thin softwood logs and trunk sections of birch plywood increased. The storm hitting South-East Estonia in July caused a high local supply of logs and in order to save the quick-spoiling wood, additional agreements with several sawmills were signed for water-storing and later sale of logs.

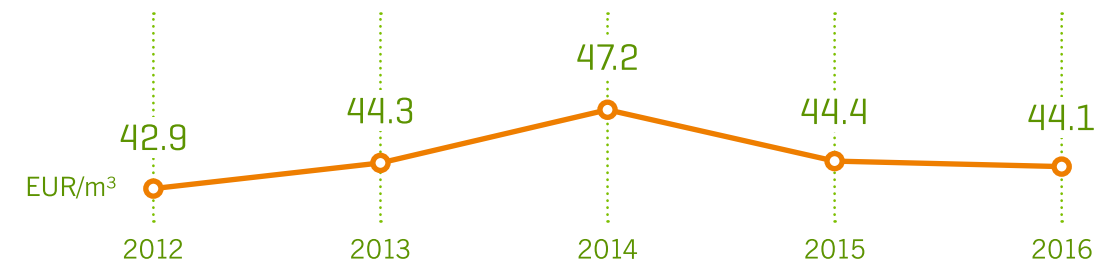
The pulpwood market continued to have a lukewarm interest in spruce and pine pulpwood; the demand for birch pulpwood was highly unstable. Higher-quality spruce pulpwood was sold more successfully.

The firewood market continued its low period and the pressure on prices rather increased over the year. Due to declining global demand, new pellet plants were forced to even reduce their production volumes and have temporary standstills in the second half of the year.

The sales of wood chips did not reach the intended quantities because both the foreign demand and the prices remained below expectations. Still, the sales volume increased a little compared with the previous year, while the price decreased by 1.9%. A significant amount of cutting waste and trunk parts minced into woodchips came from the restoration of semi-natural biotic communities.

Due to the reorganisation of RMK's activities, the Timber Marketing Department, instead of the forest districts, started selling the felling rights to growing forests. Felling rights were mostly sold to private individuals as sanitary felling for gathering firewood; also, felling rights were sold for the restoration of semi-natural biotic communities. Felling rights were sold for 15,100 cubic metres, at the average price of EUR 9.2 per m³.

Average price of the sold timber



WASTE COLLECTION

Waste collection in state forests	2012	2013	2014	2015	2016
Amount (kg)	170,000	164,500	270,600	572,000	254,000
Expenses (EUR)	29,000	37,000	52,000	145,000	53,000

CAMERAS ARE USEFUL

Over the year, 254 tonnes of waste was removed from RMK's forests; the works cost a total of EUR 53,000. A year ago, the quantity was over two times larger or 572 tonnes. That number was pushed so high by the waste heaps that collected over a long period of time in the areas recently placed under RMK's management. In 2016, the areas to be cleaned were not so large anymore and many cleaned areas also remained clean. It is believed that the waste cameras, set up by RMK in the most troubled areas, also have a part in that.

Thanks to the cameras, the culprits can be reported to the local government or the Environmental Inspectorate who will then initiate legal proceedings. If all goes well, the culprits pay a fine and also cover the cleaning costs. For example, five cases reached the desks of inspectors in Ida-Viru County in that way. In four cases, the culprits received punishment; the average fine was EUR 300.

The waste problem is traditionally the most severe in Harju County and Ida-Viru County. Most of the removed wastes (89%) were ordinary wastes; the rest were hazardous wastes, glass and metal. For the second year in a row, RMK has a designated enterprise in each county to keep the forest floor clean. In 2017, a new public procurement to find partners will be announced.

When noticing a forest polluter, it pays to take a photo of them and their vehicles. Make sure the vehicle's license plate is legible. Give the information to the Environmental Inspectorate, by calling 1313 or e-mailing 1313@112.ee. State where and when the incident happened, and provide your own contact data.

GOOD TO KNOW! Processed wood degrades in the nature in around 3 years, while aluminium takes 200–500, plastic 450 and iron and glass one million years for that.

SOURCE: SVEASKOG

FOREST FIRES

Forest fires in state forests	2012	2013	2014	2015	2016
Number (pcs)	0	7	24	10	9
Area (ha)	0	186.4	37.8	15	96.7
Average fire area (ha)	0	27	1.6	1.5	10.7

HUNTING

AFFECTED BY SWINE FEVER

RMK earned EUR 246,000 from hunting activities, most of which came from the sales of pre-emptive purchase rights to hunting permits. The average fee paid to a land owner dropped by 3%, reaching EUR 2.93 per hectare of hunting land. The price was primarily affected by the fact that the opportunities to hunt wild boars were markedly lower. African swine fever spread to all hunting areas administrated by RMK; as a result, their population numbers experienced an exponential decline in forests. Like other hunting organisations, RMK also dealt with the consequences of swine fever: eleven dead or infected boars were buried; the samples from 28 hunted female boars were presented to the Veterinary Board for verification.

RMK administers three hunting areas – Kilingi-Nõmme, Kuressaare and Väätsa. The hunting areas have been divided into 13 smaller hunting districts. In 12 hunting districts, the hunting season's hunting permits for large

game were sold in the predetermined sex and age distribution; in one hunting district, the hunting permits were sold as two-day packages for the first time.

In those state forests where RMK does not itself organise hunting activities, but where hunting still takes place, RMK has entered into hunting use agreements for state land with hunting associations. Pursuant to the agreement, the hunting association must compensate the damage done by wild game to the state forest. In 2016, wild game caused significant damage to the state forest on 536 hectares. The most damage was done to beam-age aspen forests and pine cultures; the main culprit was the elk. For 39 hectares of significant game damage where the area has to be reforested or supplemented, RMK presented a damage compensation claim to 12 hunting associations. The hunters have to pay EUR 28,300 and will also take part in planting works.

Average RMK hunting grounds usage price	2012	2013	2014	2015	2016
Price (EUR/ha per year)	1.59	1.81	2.16	3.02	2.93



NATURE PROTECTION

Protected species
482

Protected species
habitats
29,634

Key biotopes
6,168

Total area of
key biotopes
16,712 ha

Semi-natural
biotic communities
managed
22,500 ha

Cost of nature
protection works
EUR 2.1 million

DIVISION OF STATE FOREST

	2012	2013	2014	2015	2016
Strictly protected forests (%)	17.1	17.1	18.0	18.8	19.0
Forests with economic limitations (%)	19.8	20.3	20.5	20.6	19.8
Managed forests (%)	63.1	62.6	61.5	60.6	61.2



PROTECTED AREAS

Protected Areas in state forests (ha)	
Special mgmt. zone of the Protected Area	150,581
Limited mgmt. zone of the Protected Area	64,931
Limited mgmt. zone of Species Protection Site	30,190
Special conservation area	24,378
Special mgmt. zone of Species Protection Site	22,754
Strict nature reserve of a Protected Area	3,317
Protected Area without protection rules	1,156
Single object in nature	98

NATURE PROTECTION WORKS

Expenditure on nature protection	2012	2013	2014	2015	2016
Self-financing of RMK	594,900	628,400	1,037,200	1,447,300	665,000
Other financing (from state budget, UCITS)	1,639,000	883,000	1,722,000	1,403,000	1,417,000
TOTAL	2,233,900	1,511,400	2,759,200	2,850,300	2,082,000

Semi-natural biotic communities rented out (ha)	2012	2013	2014	2015	2016
TOTAL	7,694	14,509	18,266	21,000	22,462
... out of them new lands rented out	1,285	6,815	3,757	2,734	1,462

THE RESTORING OF SEMI-NATURAL BIOTIC COMMUNITIES REQUIRES CUTTING

Under RMK's lead, semi-natural biotic communities, i.e. heritage biotic communities, were restored on 1,022 hectares in 2016; out of that, 970 hectares needed design cutting to specific requirements. Compared to 2015, three times more works were performed.

The most biotic communities were restored in Saare County and Hiiu County, followed by Lääne County and Pärnu County. The areas included mostly alvars and flooded meadows, but also woodlands, a landscape that has become symbolic of Estonians. The current situation is that the volume of felling works for the restoration of heritage biotic communities is even higher than optimum. Namely, it is difficult to ensure reasonable use of all the timber on the islands, but transporting it to the mainland is not feasible.

Out of the works performed, those on 433 hectares were fully paid for by RMK itself; the Environmental Investment Centre and European Union Cohesion Fund helped with the rest.

Three new roads were completed in Alam-Pedja nature conservation area. These allow for better care of the 160 hectares of meadows there.

To maintain semi-natural biotic communities, RMK has entered into land use agreements with 349 natural and legal persons. The agreements cover 22,462 hectares of land, including 21,354 hectares of semi-natural biotic communities.

Pursuant to the current Nature Conservation Development Plan, there should be 45,000 hectares of semi-natural biotic communities maintained in Estonia in 2020. This target has been called quite unrealistic; even so, it seems that anything is possible. As its own contribution, RMK in cooperation with the Land Board created a web application that should simplify giving biotic communities to rental.

Using the web application that became available in the autumn (www.maaamet.ee/rmk), everyone interested can get information about vacant and rented semi-natural biotic communities in the areas maintained by RMK. In the first five months, rental interest has been shown towards 3,200 hectares. For the most part, rental of large coastal meadows and fens is sought. But the latter are relatively well represented in comparison with other habitat types and therefore their rental is less of a priority. It is positive that people show rather high readiness to take into use wooded pastures and woodlands.

Semi-natural biotic communities are characteristic of the Estonian landscape, used for a long time as pastures and grasslands, and needing moderate human activity to preserve their biodiversity.

BOG RESTORATION WORKS TAKE TIME

The restoration of bogs is another main direction of RMK's nature protection works, alongside semi-natural biotic communities. In 2016, the activities were completed on 70 hectares. The most notable among the sites can be considered the restoration of the spring-fed Viidumäe bog on 35 hectares, a work undertaken in cooperation with the LIFE project "Springlife", led by OÜ Eesti Loodushoiu Keskus.

The small number in this case is a little misleading. Bog restoration takes place in large areas and sometimes the landscape is very difficult, thus the works often take two to three years. As of the beginning of 2017, RMK is actively restoring the bog habitats on more than 2,700 hectares, to be supplemented by at least the same amount over the year.

BETTER HABITAT FOR PLANTS AND AMPHIBIANS

In 2016, specific works were performed to improve the habitat of 29 protected species. Design felling took place in Viidumäe nature conservation area, along the historical roads of West Saaremaa Uplands, in order to improve the conditions of rare plant species there. Works continued to improve the spawning water bodies of amphibians (common spadefoot, northern rested newt) in South-East Estonia and Lääne-Viru County. The habitats suitable for natterjack toad at Lake Veskijärve in Lääne County and on Harilaiu Island in Saare County were expanded.

BEAUTIFUL VIEWS MADE SAFE

RMK performed maintenance and restoration works necessitated by nature protection in 13 parks. For example, alleys were maintained and older trees were supported in Oru Park, in Ida-Viru County. Also, trees having become dangerous were cut in order to ensure visitor safety.

A new site for landscape maintenance works was added: the Alatskivi Landscape Protection Area, where the views of the ancient valley of Pala-Alatskivi, now overgrown around a hiking trail in use, were opened up again.

PROTECTED SPECIES

NEARLY 30,000 HABITATS

A total of 482 protected species have been registered in RMK areas. Fifty three of them fall under Category I, the one with the strictest protection; with 226 falling under Category II, and 203 under Category III.

Over the year, the number of protected species increased by four – five species were registered for the first time in RMK areas, but the location of a habitat for a species determined earlier could no longer be identified.

Protected species registered for the first time in RMK areas in 2016:

- Category I: northern hollyfern, *Cystopteris sudetica*
- Category II: Rugel's anomodon moss, Dillenius' speedwell
- Category III: *Chersotis andereggii*

The number of protected species is not as important as the number of habitats of protected species, where one habitat is considered to be the habitat of a plant or, in case of group-growing plants, the habitat of a group of plants, a nesting place for birds, etc. There are 29,634 habitats of protected species in RMK areas; 2,237 habitats were added over the past year.

OVER 6,000 KEY BIOTOPES

There are 6,168 key biotopes in RMK areas, with the total size of 16,712 hectares. Over the year, 25 key biotopes were added.

RMK provides the same protection to key biotopes of up to 7 ha entered into the Environmental Register and to larger areas conforming to the features of key biotopes where it is highly likely that endangered, vulnerable or rare species are growing. Key biotopes are classified as strictly protected forests, with 19% of forest maintained by RMK falling under this classification.

GOOD TO KNOW! Anyone wanting to map the natural and cultural heritage values in areas added under RMK's care, and having the relevant information, can do so. We are awaiting notices about cultural heritage sites, protected species and biotic communities as well as habitat types. Instructions are available on RMK's website, under the section on nature protection works.

PÕLULA FISH FARM

WHITEFISH KEEPING COMPANY WITH SALMON AND SEA TROUT

Besides salmon and sea trout, RMK Põlula Fish Farm now also helps restore the habitats of whitefish here in Estonian rivers. In 2016, 173,000 salmon of various ages, 33,000 whitefish and 3,000 sea trout were released into the rivers.

Salmon were released into the rivers of Selja, Valgejõgi, Pirita, Jägala, Loobu, Purtse, Pärnu and Pühajõgi. Whitefish were released into Pärnu River and sea trout into Puditsoo River.

In the course of breeding whitefish, chemical marking of fish and fat fin cutting were tested. Also, sump growing of whitefish was tested successfully and will be continued in 2017.

Eggs were collected from 132 female and sperm from 132 male salmon of the salmon broodstock in the fish farm and wild salmon caught from Kunda River. A total of 322,500 salmon roe were incubated.

The fat fin was cut off one-year and older fish grown in Põlula and being released into rivers. Additionally, an individual marker was attached to 4,000 two-year fish.

For research purposes, Põlula Fish Farm awaits information from all fishers about catching a fish with a cut fat fin or an individual marker. Information can be given at Põlula Fish Farm's website (rmk.ee/polula), by e-mail or in an envelope with prepaid reply. A recatch notice will receive a response in the form of a reply letter, a free troll, and remuneration.

Fish populated to rivers from Põlula

	2014	2015	2016	2014	2015	2016	2016
	Salmon	Salmon	Salmon	Sea trout	Sea trout	Sea trout	Whitefish
Larva	97,750	98,500	–	–	–	–	–
One-summer-old	107,154	127,541	86,157	9,569	10,308	–	33,810
One-year-old	15,368	40,638	44,755	6,978	3,617	–	–
Two-summers-old	9,442	3,580	5,393	–	–	–	–
Two-years-old	35,394	41,885	36,796	5,403	5,686	3,247	–
TOTAL	265,108	312,144	173,101	21,950	19,611	3,247	33,810



ACTIVITIES IN NATURE AND NATURE EDUCATION

Number of visits
to RMK's
recreational and
protected areas
2.3 million

Visitors at
information points
86,000

Visitors in Elistvere
Animal Park
52,000

Visitors in Sagadi
Forest Museum
32,800

Participants in
nature education
programmes
52,800

Cost of nature
holidays and
education
EUR 5.4 million

MOVING AROUND THE NATURE

Number of visits to RMK recreational and protected areas

2012	1,600,000
2013	1,700,000
2014	1,900,000
2015	2,200,000
2016	2,300,000

Visiting the nature when compared to other types of cultural entertainment (millions of visits)



NUMBER OF VISITS TO THE THEATRE, CINEMA AND MUSEUMS IN 2015. SOURCE: THE 2016 STATISTICAL YEARBOOK OF ESTONIA AND THE ESTONIAN THEATRE AGENCY, NUMBER OF TRIPS TO THE NATURE IN 2016.

THE PULL TOWARDS FORESTS

Over the year, the number of visits to the recreational and protected areas of RMK increased by 100,000, reaching 2.3 million. The number of visits grew the most in Haanja and Karula, in the regions of Aegviidu and Kõrvemaa, and around Tartu and Jõgeva. Certainly, part of the reason why people were attracted to the forests was the lousy beach weather and an excellent year for mushrooms.

RMK's most popular recreational areas are located around Tallinn and Nõva; the most visited national parks were Lahemaa and Soomaa. Fans of national parks are more likely to also visit the information centres; RMK's information centres were visited a total of 86,000 times over the year, which is 3,000 more than in 2015. 41% of the visitors were foreigners.

Estonians and visiting foreigners like to hike on prepared trails. The most visited places in 2016 were Taevaskoda hiking trail in Põlva County (59,152 visits); Rannametsa-Tolkuse learning nature trail in Pärnu County (45,399 visits); Viru Moor learning trail in Lahemaa (37,135 visits), and the Riisa learning trail in Soomaa (25,973 visits). The reconstructed and now opened Männikjärve Moor learning trail, located in Jõgeva County, was also visited more than in previous years.

The growing interest towards hiking in nature has been supported by sites that have been reconditioned in recent years – e.g. Mohni nature trail, in Lahemaa; Orjaku learning trail and Leemeti forest hut, in Hiiu County; Alatskivi learning trail, in Tartu County; Marimetsa hiking trail's lookout tower, in Lääne County; and Koigi learning trail, in Saare County.

COMMON BENEFIT

The state forest is open for visits by everyone; the recreational opportunities offered by RMK are free to use. Still, it must be remembered that the purpose of visit regulating infrastructure, in addition to offering forest pleasures to people, is to protect the forest and the natural resources. By establishing and maintaining hiking trails, campfire sites, lookout towers and other sites, RMK directs people to hike in areas where nature's load resistance is sufficient, and to do so in the manner that is least damaging to nature. The principle of everyone's right must be followed: hiking in nature is allowed in such a manner that does not lead to harm or disarray.

The forest is a common good and in addition to hiking, everyone is free to gather mushrooms, berries, herbs and twigs there. RMK's infrastructure is the soil, on which Estonian nature tourism companies can build their services. Supporting local enterprises is one of the principles that RMK has followed while establishing long hiking trails – that trail hikers would bring revenue to trailside stores, dining venues and lodges.

GOOD TO KNOW! RMK offers hiking opportunities in 13 recreational areas, 5 national parks and on protected areas all over Estonia. The following were established:

- 309 covered campfire sites
- 214 hiking trails
- 59 camping areas
- 28 forest huts
- 19 forest houses
- 4 cross-country areas

RMK's long hiking trail has two branches:

- Oandu-Aegviidu-Ikla 375 km
- Peraküla-Aegviidu-Ähijärve 820 km



DOWN WITH THE BARRIERS

RMK removed the first 17 barriers from protected and recreational areas all over Estonia, where they prohibited movement with cars. They were replaced by restrictive traffic signs and plaques explaining the signs.

It was decided to remove the barriers between people and nature because Estonians normally behave well in nature, appreciating the natural resources. Correct behaviour is facilitated by making it clear and convenient – if there is a trash bin, a directional sign, an explanatory plaque where needed. The removal of barriers is also largely a symbolic step – RMK does not want to put padlocks on nature.

The first barriers were removed from sites in the reserves of Kolga, Muraka and Piusa caves; in Soomaa, Matsalu, Vilsandi and Karula national parks; in Nõva, Neeruti and Smolnitsa landscape protection areas; and in the recreational areas around Pärnu County, Rāpina-Vārskas and Tallinn's surroundings.

GOOD TO KNOW! The amount of trash left by people in the trash bins near the recreational sites has decreased by 18% over the past five years. The comparison uses trash quantities per visit.

GOOD TO KNOW! 33% less firewood per visit is used in RMK's campfire sites.

FLOATING STOPOVER IN SOOMAA

The students of the Estonian Academy of Arts built a shelter and a fireplace in Soomaa, offering a dry stopover in high waters.

Keeping in mind the uniqueness of the region, the desire was to create floating architecture that would meet the needs of locals as well as travellers. Initially, the unique natural structure was comprised of three elements: a shelter, a fireplace and a sauna, but the sauna broke in two and sank during the launch. As it is, the remaining resting place is still pleasant for people travelling by water or land.

The floating site was created and built during the ten-day international summer school organised by the Faculty of Interior Architecture in the Academy of Arts. A year before, giant megaphones popped up in Pähni Forest, in Võru County, as a collaboration between RMK and EKA.

NATURE EDUCATION

Nature programmes and their participants	2012	2013	2014	2015	2016
Nature programmes organised	2,993	2,953	2,455	2,695	2,766
Participants in programmes	59,900	48,400	47,500	48,500	52,800

SOMETHING FOR EVERYONE

In 2016, nearly 53,000 people participated in RMK's nature education programme; this is 9% more than a year ago. Nearly 156,000 people took part in RMK-organised competitions, thematic days and other events.

RMK offers educational programmes for both children and adults in its nature centres, nature houses and the Sagadi Nature School. Three times a year – in spring, autumn and winter –, campaign programmes are held, meaning that nursery school groups and school classes can take part in nature learning for a symbolic fee of only EUR 1.



ENVIRONMENTAL EDUCATION VALUES OUTDOOR LEARNING, USING ALL SENSES, AND DISCOVERY AND RESEARCH.

SAGADI FOREST CENTRE

LEARNERS, MOSQUITOS AND NEW YEAR'S DECORATIONS

The number of programmes organised at the Sagadi Nature School increased by one third, compared to the year before. Nearly 10,000 young people took part in the programmes. The mansion complex, located amidst beautiful nature, is liked by adults as well. It hosts refresher trainings for teachers, nature guides, environmental education specialists and foresters, although a couple or a family staying in the hotel will also find a programme suitable for them.

Before summer, the Forest Museum opened a mosquito exhibition; the end of the year saw wonderful vintage Christmas and year-end decorations from collector Marika Plooman's private collection. This was the first year in which the renovated rooms of the ice cellar were open for use.

Number of Visitors to the Sagadi Forest Centre	2012	2013	2014	2015	2016
Visitors at Forest Museum	29,000	25,000	34,000	28,500	32,800
Accommodation clients	8,600	8,500	9,800	9,500	9,100

GOOD TO KNOW! Nuggets of wisdom from the Sagadi Forest Centre's exhibition "War and peace with mosquitos", i.e. "Did you know..."

- only female mosquitos take blood
- mosquitos mate after singing together
- a human can also get nourished by mosquitos, eating 1.6–2 kg of them per day
- unwashed socks attract mosquitos
- mosquitos carry diseases that kill over a million people a year
- "Let's do it" is the greatest anti-mosquito campaign in history



THE MOSQUITO EXHIBITION IN SAGADI FOREST MUSEUM CAN BE VISITED UNTIL THE START OF SUMMER.

ELISTVERE ANIMAL PARK

HAMLET, PICCOLO AND LARS

Elistvere Animal Park received three new residents. The first to arrive was Piccolo, the raccoon dog, whose destiny is the concern of the "Pealtnägija" TV programme and who was brought to Jõgeva County because raccoon dogs may not be kept as pets. Piccolo quickly adjusted to his new home.

Since the end of November, the bison herd has been led by Hamlet, the six-year bull brought from the Tallinn Zoo. In December, the second resident from Tallinn arrived – Lars, the four-year-old lynx. The Animal Park's staff hopes that both the bison and the lynx will soon start "doing their thing" and soon little ones will be seen in the Animal Park.

At the heart of the summer, the Animal Park was traditionally open at night for five days. A new event was also celebrated – Café Day. It brought more than 600 visitors; quite many of them were first-time visitors. It was a rainy summer, and this may be why the summer wave of visitors remained somewhat modest. Over the year, 52,000 people visited the Animal Park.

GOOD TO KNOW! Elistvere Animal Park will celebrate its 20th birthday in 2017. In celebration, entry will be free on 27 August, and the preceding week will be full of birthday celebrations.

NATURE CAMERA

LESSONS FROM THE YEAR OF THE BADGER

Three years after setting up RMK's nature camera in Saare County, the camera finally picked up badger cubs beside the adult animals. It happened after the camera was taken from the well-known badger couple Tõnis and Kadi to a new badger settlement, before Midsummer's Day. The cubs were first picked up by the camera in August, but by then they had reached the adolescent age and were no longer little smooth balls of fur. This shows that the widespread idea of badger cubs playing in front of their burrow for weeks on end is rather an extremely rare sight than a rule.

In autumn, the badger mom and her two cubs were seen laying in front of the burrow, caring for each other's coats or scratching their bellies with zest while flat on their backs. This continued until an evening in November, when the badger mom fell asleep and snored in front of the burrow for almost an hour. A twig hitting the ground finally scared the animal into the burrow, but it was a sign that the time for hibernation was growing near. The badger camera became the deer camera, and its live feed is available in RMK's nature blog.

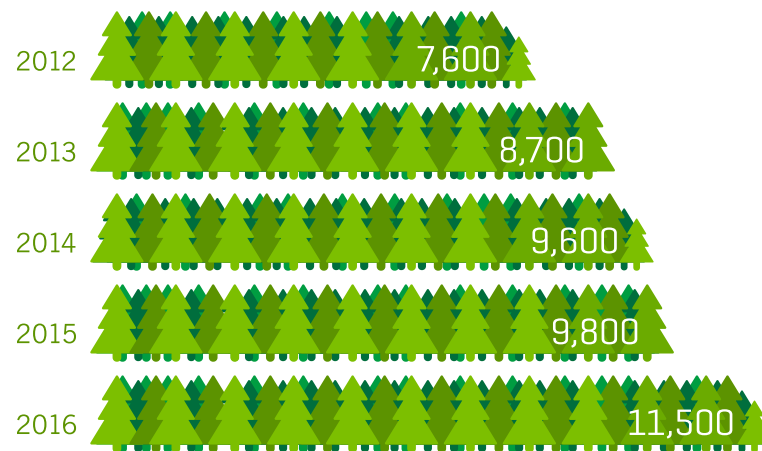
CHRISTMAS TREES

A total of 11,500 Christmas trees were brought from the state forest. The right place was found using a cell phone app, and a payment by cell phone was preferred as well. Christmas trees may be cut down only where they stand no chance of growing to maturity: along the edges of roads and ditches, under overhead power lines and under old forest. Bringing home a Christmas tree is based on trust; however, the employees of the Environmental Inspectorate and RMK do perform random inspections of forest visitors. No violations were found. Traditionally, RMK donated nearly 100 Christmas trees to substitute homes.



FETCHING THE SPRUCE TOGETHER IS A PART OF THE CHRISTMAS TRADITION IN MANY FAMILIES. RMK OFFERS THIS OPPORTUNITY SINCE THE YEAR 2008.

Christmas trees from the state forest



HERITAGE CULTURE

A DIGNIFIED LAND OWNER IS VERSED IN PRESERVATION

The heritage culture database was supplemented by 500 sites over the year; in total, more than 37,000 signs of previous generations' activities on the landscape have been mapped at the initiative of RMK. A great contribution to the database was made by forest surveyors who are not afraid to capture images of heritage culture sites with their tablet or smartphone while making their inspection rounds.

While the valuing of heritage culture got its start in the state forest a decade ago, an ever increasing number of people now appreciate. To confirm it, the mappers of heritage culture prepared a guidebook called "Heritage Culture and Forest Management" as requested by the Private Forest Centre. This free printed material gathers together good examples and recommendations about preserving sites during cutting works. The Environment Agency has developed its information systems so that in the future a forest owner will automatically receive not only a forest notice but also information about the heritage culture sites in the cutting area, if those have been entered into the database.

The design of the mobile exhibition of heritage culture was updated; it moves around Estonia, and its exhibition schedule for 2017 is already full.

Already mapped cultural heritage sites can be reviewed in the map application of the Land Board's database.



IN ESTONIAN FOLKLORE, A CROSS TREE IS A TREE WITH A CROSS CUT INTO ITS BARK TO REMEMBER THE DEAD.



RESEARCH

Applied research projects supported in 2008–2016

15

... including ongoing

4

Budget for applied research in 2008–2016

EUR 2 million

Forestry scholarships

5

Cost of scholarships

EUR 33,000

APPLIED RESEARCH PROJECTS

THE CUTTING CYCLE AND BIODIVERSITY OF THE SPRUCE

RMK's Research Council allocated EUR 300,000 for an applied research project addressing the cutting time for spruce forests and the effect of cutting methods on the forests' biodiversity and pathogen proliferation.

The forests where common spruce dominates are the most profitable in Estonia. But the management methods thus far have not ensured a good state of the spruce forests. The risk of root rot infections increases after cutting, especially in high-yield spruce forests. The voluminous research project will account for Estonia's circumstances and will assess the effect of various forest management methods and the times of their application on the population of pathogens, on the soil biome and on epiphytes (plants growing on another plant without harming it). It will also analyse how the cutting cycle's duration affects the yield of various quality assortments of timber, and will investigate the total economic damage caused by diseases. Also, the possible natural enemies of root rot will be determined, accounting for Estonian soil and climate conditions.



A PROJECT TO STUDY ESTONIAN SPRUCE FORESTS GOT THE GREEN LIGHT FROM RMK RESEARCH COUNCIL.

The project will be conducted in co-operation between the University of Tartu and the Estonian University of Life Sciences. As one goal of the applied research project, the researchers highlight the preparation of calculation models enabling them to describe the growth process of spruce forests and to calculate their maturity age, using various inputs.

RMK began targeted support for research work in 2008. At present, a funding decision has been made for 15 applied research projects in the total amount of EUR 2.2 million. Most of the projects are finished by now and RMK is applying the gained knowledge in its everyday activities.

Project name: The effect of the cutting time and cutting methods for spruce forests on the proliferation and population of pathogens and on the biodiversity of forests in high-yield types of growing areas [*Kuusikute raieaja ja raieviiside mõju patogeenide levikule ja arvukusele ning puistu elurikkusele viljakates kasvukohatüüpides*]

Project manager: Rein Drenkhan from the Estonian University of Life Sciences

Main project executors: Leho Tedersoo, Hardi Tullus, Tiia Drenkhan, Raul Rosenvald, Piret Lõhmus, and Katrin Rosenvald

Duration of the project: 36 months

Cost: EUR 299,913

GOOD TO KNOW!

The composition of the RMK Research Council:

- The University of Tartu, Head of the Chair of Natural Resources, Lead Research Fellow in Conservation Biology Asko Lõhmus
- The Estonian University of Life Sciences, Head of the Forestry Department, Professor Hardi Tullus
- The Estonian University of Life Sciences, Head of the Forest Biology Department, Kalev Jõgiste
- The Estonian University of Life Sciences, Head of the Landscape Management and Nature Conservation Department, Professor Kalev Sepp
- The University of Tartu, Head of the Chair of Applied Ecology, Professor Krista Lõhmus
- The University of Tartu, Head of the Chair of Physical Geography and Landscape Ecology, Professor Ülo Mander
- RMK, Chairman of the Management Board Aigar Kallas and Head of the Nature Conservation Department Kristjan Tõnisson

RESEARCH THOUGHTS STORED

At RMK's 5th research seminar in Tartu, the newest applied research in forestry was introduced. The presentations were filmed and made available online at rmk.ee/teadus. Among other things, the seminar included a comprehensive discussion about a voluminous research project for grouse protection; recommendations were given for protecting plants against the large pine weevil; and the carbon and nitrogen circulation of forests with a changed water regime were addressed from multiple angles.

The RMK research seminar took place on 12 February 2016, in Tartu, at the Heino Eller Music School.



THE THREE-YEAR STUDY OF GROUSE PROTECTION GAVE SEVERAL RECOMMENDATIONS THAT RMK IS IMPLEMENTING.

SCHOLARSHIPS

NEW VIDEO ABSTRACTS

Two new stories were completed for the video series titled “Wild Research” [“*Metsik teadus*”]. In the first story, Professor Meelis Pärtel, from the University of Tartu, explains the definition of dark biodiversity and the possibilities for protecting natural biodiversity using smart methods. The story is related to the research project “Smart protection of biodiversity in Estonia’s natural and economic forests: applied ecology solutions based on the example of South Estonia” [“*Nutikas elurikkuse kaitse Eesti loodus- ja majandusmetsades: ökoinformaatika lahendused Eesti lõunaosa näitel*”].

In the second video story, Senior Research Fellow Lauri Vares, from the University of Tartu, explains how to produce plastic from cellulose and thereby reduce environmental harm. This is the topic of a more comprehensive research project called “Converting hardwood into high value chemicals” [“*Lehtpuidu konverteerimine kõrge väärtusega kemikaalideks*”]. Both of those research projects will last until 2018 and are being funded by RMK.

GOOD TO KNOW! One of the most common plastics is PET; most plastic bottles are made of it. One possible replacement for PET is PEF, made for the most part of renewable raw materials. The use of biological raw materials reduces the greenhouse gas emissions from plastic bottle production by at least 55%.

SOURCE: EERHART ET AL. 2012

The “Wild Research” series was created in order to introduce RMK-sponsored research projects using simple language. 12 video stories are available for viewing at RMK’s website rmk.ee/teadus and at ERR’s research portal Novaator.



FOREST BIODIVERSITY IS OUR INSURANCE POLICY FOR THE FUTURE, ASCERTAINS PROFESSOR MEELIS PÄRTEL, WHO IS STUDYING THE TOPIC.



SENIOR RESEARCH FELLOW LAURI VARES IS SURE THAT WOOD BIOMASS BASED TECHNOLOGY ENABLES TO REDUCE THE DEPENDENCE ON CRUDE OIL AND GAS.

STUDY SUPPORT

RMK supports forest studies with the following scholarships:

Endel Laas Scholarship

- for Doctoral students at the Estonian University of Life Sciences
- EUR 4,800 per year
- Five recipients in 2016; previous recipients were joined by Gunnar Morozov and Aleksei Potapov

Heino Tender Scholarship

- for Master’s students at the Estonian University of Life Sciences
- EUR 3,200
- Recipients in 2016: Marili Laas and Kristiina Aun

Toomas Ehrpais Scholarship

- Students at the Luua Forestry School
- EUR 1,917
- The recipient in 2016: Marti Meier

RESEARCH WITH PRACTICAL VALUE

RMK granted a bonus of EUR 700 to the Master’s student at the Estonian University of Life Sciences who researched the effect of forest drainage on the growth of trees.

Aleksei Potapov’s Master’s thesis was titled “The effect of the establishment and reconstruction of a drainage system on the radial growth of trees” [“*Kuivendussüsteemi rajamise ja rekonstrueerimise mõju puude radiaalsele juurdekasvule*”] and addressed the growth of the common pine both before and after the establishment of a drainage system, based on the example of sample areas.

RMK valued the practical nature of the thesis quite highly. As the thesis confirmed, the draining effect of some ditches on trees is higher than that of others and it should be accounted for when performing maintenance works. According to Aleksei Potapov, improved knowledge about the long-term effects of forest draining facilitates the preparation of forest growth models, which in turn are important for sustainable forest management.

The tutors of the bonus-worthy Master’s thesis were Senior Research Fellow Maris Hordo and Doctoral Student Argo Strantsov, of the Estonian University of Life Sciences. Aleksei Potapov received a grade of A for the thesis and graduated from the Forest Management Programme in the Department of Organisation of Forest Management at the University of Life Sciences. RMK presented an award to the best Master’s thesis at the University of Life Sciences for the 16th year in a row.



FINANCIAL SUMMARY

Asset value
EUR 3.5
billion

Operating profit
EUR 50.6
million

BALANCE SHEET

(in thousands of euros)

ASSETS	31.12.2016	31.12.2015
Current assets		
Cash	38,411	28,904
Receivables and prepayments	13,577	11,717
Inventories	16,926	15,422
Biological assets	47,226	50,930
Total current assets	116,140	106,973
Fixed assets		
Investments into subsidiaries	0	3,352
Investment properties	4,762	6,263
Tangible assets	486,840	459,439
Intangible fixed assets	1,529	1,288
Biological assets	2,932,471	3,119,047
Total fixed assets	3,425,602	3,589,389
TOTAL ASSETS	3,541,742	3,696,362

LIABILITIES AND EQUITY CAPITAL	31.12.2016	31.12.2015
Liabilities		
Short-term liabilities		
Debts and prepayments	15,956	13,855
Short-term provisions	130	127
Total short-term liabilities	16,086	13,982
Long-term liabilities		
Long-term provisions	725	708
Total long-term liabilities	725	708
TOTAL LIABILITIES	16,811	14,690
Equity capital		
State capital	1,301,783	1,206,413
Retained profit	2,455,652	2,523,531
Accounting year profit (loss) with profit (loss) from the revaluation of biological assets	-232,504	-48,272
TOTAL EQUITY CAPITAL	3,524,931	3,681,672
TOTAL LIABILITIES AND EQUITY CAPITAL	3,541,742	3,696,362

INCOME STATEMENT

(in thousands of euros)

	2016	2015
Revenue	176,008	161,890
Other operating revenue	2,447	3,290
Gain (loss) from biological assets	2,111	-75
Changes in inventories of finished goods and work-in-progress	1,977	-326
Work performed by an entity in the production of fixed assets for its own purpose and capitalised	187	122
Goods, raw materials and services	-90,100	-87,925
Miscellaneous operating expenses	-9,876	-10,268
Labour costs	-23,336	-23,321
Depreciation and impairment of fixed assets	-8,800	-7,135
Other operating expenses	-42	-43
Operating profit	50,576	36,209
Gain (loss) from subsidiaries	-322	300
Other financial income and expenditure	32	80
Profit before income tax	50,286	36,589
Income tax	-4,902	-3,652
Profit for the accounting year	45,384	32,937
Revaluation of biological assets	-277,888	-81,209
ACCOUNTING YEAR PROFIT (LOSS) WITH PROFIT (LOSS) FROM THE REVALUATION OF BIOLOGICAL ASSETS	-232,504	-48,272

AUDITOR'S REPORT



Tel: +372 627 5500
Fax: +372 627 5501
adm@bdo.ee
www.bdo.ee

A. H. Tammsaare tee 47
11316 Tallinn
ESTONIA

REPORT OF THE INDEPENDENT AUDITOR ON THE SUMMARY FINANCIAL STATEMENTS

(Translation of the Estonian original)

To the Supervisory Board of Riigimetsa Majandamise Keskus

The accompanying summary financial statements, which comprise the balance sheet as of 31 December 2016, the income statement for the year then ended, and related notes, are derived from the audited financial statements of Riigimetsa Majandamise Keskus for the year ended 31 December 2016. We expressed an unmodified audit opinion on those financial statements on 28 February 2017.

The summary financial statements do not contain all the disclosures required by accounting principles generally accepted in Estonia. Reading the summary financial statements, therefore, is not a substitute for reading the audited financial statements of Riigimetsa Majandamise Keskus.

Management Board's Responsibility for the Summary Financial Statements

Management Board is responsible for the preparation of the summary financial statements that are derived from the audited financial statements.

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 810 „Engagements to Report on Summary Financial Statements“.

Opinion

In our opinion, the summary financial statements derived from the audited financial statements of Riigimetsa Majandamise Keskus for the year ended 31 December 2016 are consistent, in all material respects, with those financial statements.

Laile Kaasik
Auditor's Certificate No. 511

BDO Eesti AS
Licence No. 1
A. H. Tammsaare tee 47, 11316 Tallinn

19 April 2017

BDO Eesti AS
Registrikood 10309827 VAT nr EE100081343 Tegevusluba 1

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REGISTER OF SOURCES

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PHOTOGRAPHER KAUPO KALDA

Kaupo Kalda is one of the most well-known and acknowledged drone photographs of Estonia and an active promoter of the field. The photo bug has bitten him his whole life, but total love for the field came with the digital age and drones. Kaupo is inspired by the drone's possibility to move freely in three-dimensional space, finding new angles and not always from heights, by the way. His portfolio is available at www.kaupokalda.com.



REGISTER OF PHOTOGRAPHS

- Front page** Pajaka-Vardi special conservation area. © Kaupo Kalda.
- 4 Aigar Kallas' portrait. © Kaupo Kikkas.
- 6–7 Pajaka-Vardi special conservation area in spring. © Kaupo Kalda.
- 14–15 Kakumäe moor forest in spring sunset. © Kaupo Kalda.
- 19 Koiva storm damage. © Silver Gutmann.
- 22 Tartu Tree Nursery's greenhouse. © Rasmus Jurkatam.
- 23 Photos used in diagrams: RMK photobank.
- 24 Ootsipalu Valley pine. © Kaupo Kikkas.
- 25 Road reconstruction. © Rando Kall.
- 30–31 Viru Moor. © Kaupo Kalda.
- 32 Photos used in diagrams: RMK photobank.
- 38–39 A man, a dog and a bicycle in Kakumäe Moor Forest. © Kaupo Kalda.
- 43 Children wondering at mushrooms. © RMK.
- 44 Mosquito exhibition in Sagadi Forest Museum. © Imre Malva.
- 46 A Christmas tree from state forest. © Kaupo Kikkas.
- 47 A cross tree. © Rando Kall.
- 48–49 Kakerdaja Moor in winter patterns. © Kaupo Kalda.
- 50 A spruce cop. © Kaupo Kikkas.
- 51 A grouse. © Tiit Hunt.
- 52 Still shots from RMK's ordered video series "Wild Science".
- 54–55 Fog streams in Harju County. © Kaupo Kalda.
- Back cover** Pajaka-Vardi special conservation area. © Kaupo Kalda.

