RMK ANNUAL REPORT 2015

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IN PRAISE OF DIVERSITY

Aigar Kallas
Chairman of the Management Board of RMK

The motto of the yearbook, containing an overview of 2015, is diversity. RMK and the forests entrusted to our care in Estonia are both diverse.

Curiously enough, the activity which RMK's staff and its contractual partners spend the most energy on is not the one we are most commonly associated with. Growing young trees, caring for their growth conditions, replacing an old forest generation with a new one at the right time, and timber sales are areas in which RMK is active, but its main task is the establishment of recreational possibilities and nature protection. This is what the average person living in Estonia thinks about us (although average people do not exist, everyone is unique).

This knowledge is essential for a number of reasons. Firstly, it confirms that the years of work dedicated to creating free recreational possibilities have been a success. Secondly, it shows that RMK's primary role of performing nature protection works is growing in terms of visibility. And thirdly, it is a sign that foresters must further explain the necessity of their daily work. Anyway, people care what RMK is up to. There is a strong emotional bond here; a sense of trust that has been earned, but must be justified from day to day.

This is where diversity comes into play. The chapters of this yearbook are illustrated by Arne Ader's photos of different forest types: alvar forest, meso-eutrophic forest, nemoral forest, heath forest, swamp forest, and mesotrophic forest. Even the most hardened office worker will notice that not all forests are the same when looking at these photos. A forester knows this without question. Different types of forest are a sign of biological diversity and the profit earned from our only renewable natural resource can also differ. In some places it is wise to transform abandoned pasture land into forest; in others, it is necessary to build dams and cut trees down to recover valuable marsh areas; while a third location is a great place to be if you are a hiker, and a fourth supplies valuable raw materials to the timber industry, etc. By the way, the latter two are often closely linked because people especially love to hike in a well-managed, classically beautiful forest with no dark brush and where the trees are tall and tough. Diverse forests are our national wealth. The role of RMK is to use the land it takes care of as wisely and diversely as possible. We promise to dedicate ourselves to the role this year and every year that follows.

TEN FACTS ABOUT RMK

50% of Estonia is covered by forest. 44% of Estonian forest land is owned by the state. Most of it is maintained by RMK.

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

1.5 times is the amount by which the area covered by forests has increased in the last half-century. There has never been as much forest land as now, and more is growing each year than is being cut down.

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

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.

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

6000 people are employed in the state forest each year – there are ca 700 full-time employees at RMK and more than 5000 people work in the state forest via partner companies or as seasonal workers.

4 of the most unique units within RMK are: Põlula Fish Farm, Elistvere Animal Park, Tartu Tree Nursery, and Sagadi Forest Centre.

39 offices owned by RMK where the forests are growing. This means that RMK is represented all over Estonia and, for example, only 6% of its employees are working in the capital.

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	1,278,719 ha
... of which forest land	940,986 ha
Full-time employees	726
Turnover	EUR 165.2 million
Profit before taxation	EUR 36.6 million
Proprietary income to the state budget	EUR 18.3 million
Land tax	EUR 4.6 million

Alvar forests grow on a thin layer of limestone or alvar soil, being dominant in Northwest Estonia and Saaremaa.

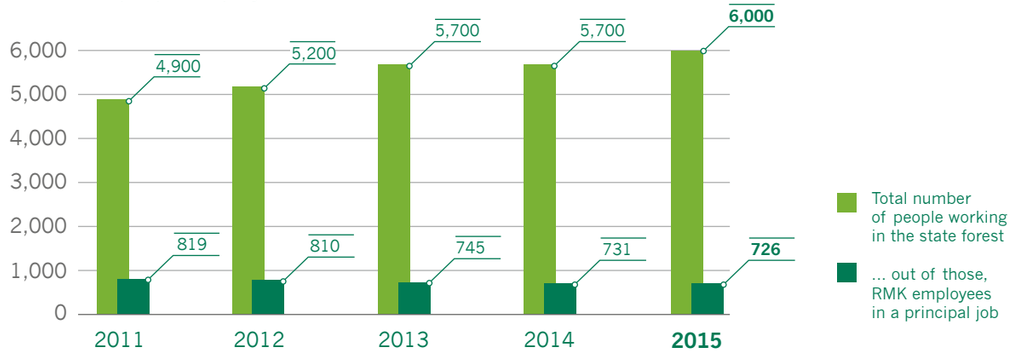
ALL OVER ESTONIA

Area managed by RMK

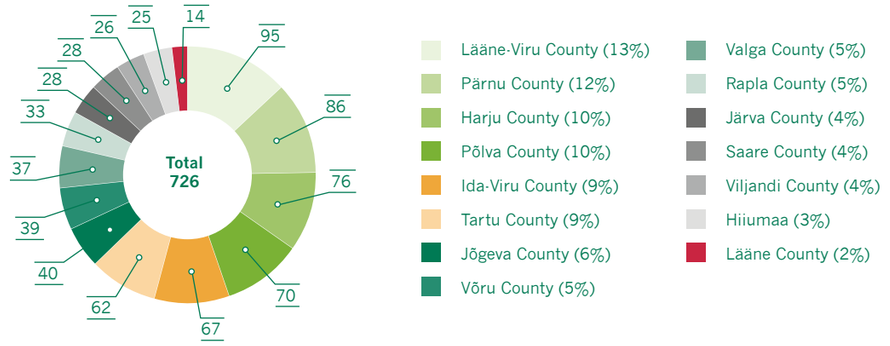
- Nature center
- Nature house
- Office
- Information point
- Plant management
- Põlula Fish Farm
- Tartu Tree Nursery
- Sagadi Forest Centre
- Elistvere Animal Park

EMPLOYEES

Number of people employed in the state forest



Staff of RMK by counties (number of people)



HONOUR BOARD

Valued employer

Half of all salaried employees and two thirds of students would consider working for RMK, as indicated by the employer reputation survey conducted by TNS Emor.

RMK ranks fourth in the overall list, behind Eesti Energia, the Port of Tallinn, and Tallink. As an employer, RMK is particularly preferred in rural areas. A similarly structured survey was conducted for the tenth time in 2015, and according to Mari-Liis Eensalu, leading expert of TNS Emor, RMK has risen the most during this time.

Student preferences regarding employers was surveyed by Instar EBC, in which RMK rose from seventh to second in the rankings. According to the survey, students mostly want to work for Skype, RMK, and Eesti Energia. When it comes to choosing a place of employment students value a job that is both interesting and helps them to develop, along with company leaders who are competent, and the fact that employees receive equal and just treatment.

The image focuses on recreation and nature protection

TNS Emor ranked large enterprises active in Estonia by their familiarity and reputation. Among large enterprises RMK ranked fourth – after Swedbank, Statoil, and Tartu Mill – and ranked first among state enterprises. In terms of socio-demographic groups, RMK was preferred by women, non-Estonians, those up to 34 years in age, and people with a higher education.

When an Estonian thinks about RMK, he or she associates it with recreation and tourism, forest, nature, protection, and preservation. According to a survey conducted by Faktum & Ariko, the main activities of RMK are considered to be growing new forest and establishing recreational areas and hiking trails, followed by growing forest plants, felling, and timber sales and nature protection works.

92% of the Estonian people know or have heard of RMK; its familiarity having grown by 6% in two years. Familiarity with RMK is lower than average among older people and the Russian speaking population; however, it has also grown among their ranks over the years.

Access for everyone

RMK has joined the goodwill and accessibility campaign “SIIA SAAB”, created by the Office of the Gender Equality and Equal Treatment Commissioner, as it also provides opportunities for people with special needs to relax in nature.

Services provided by RMK can be used by wheelchair users, the visually impaired, people who are hard of hearing, and also people with intellectual disabilities, while the majority of opportunities have been developed for persons with reduced mobility. Wheelchair access is available to the RMK Nature Centres, Elistvere Animal Park, and Sagadi Forest Centre. Hiking and study trails, campfire sites, recreational sites and forest huts accessible by wheelchair – but also with a baby carriage – are marked on RMK’s website with a special sign.

Clear message promoter

The Institute of the Estonian Language announced RMK as the winner of the Clear Message Award 2015. The prize was awarded thanks to our interactive website, www.rmk.ee/eluring, which the jury believes to be interesting to read, watch, and listen to for nature lovers of all ages. The website was created in order to help people who live far away from the forest understand why works are performed in the forest, why they are necessary, and who is performing them.

The Clear Message Award acknowledges companies and organisations who communicate with the public in a clear and understandable manner, based on the needs of their target group.

Megaphones as the Cultural Act of the Year

The Estonian Chamber of Culture selected forest bandstands or three wooden megaphones as the Cultural Act of the Year, created in cooperation between interior architecture students from the Estonian Academy of Arts and RMK, and placed in the forest near the Pähni Nature Centre in Võru County.

The forest bandstands offer wanderers a place for reflection and the opportunity to listen to nature sounds; although, a less demanding hiker can also spend the night in them. Focusing and separating yourself from the world and going into nature is becoming an increasingly scarce commodity in the world, which is confirmed by the success of the megaphones in international media.

Record trees in Ootsipalu

Kaarel Tiganik, RMK forest planter, has a good reason to be proud of his sharp eyes – thanks to him, Estonia has one new world record holder and two new Estonian record holders. In particular, the trees growing in Põlva County, Veriora Rural Municipality, Ootsipalu Valley, are so tall that together they set the record for Estonia’s tallest fir and pine tree, as well as the record for world’s tallest Scots pine (Pinus sylvestris). On the request of Kaarel Tiganik, researchers from the Estonian University of Life Sciences measured Estonia’s tallest fir tree. The result was 48.6 metres. A pine tree located nearby was two metres shorter, but still 1.3 metres taller than the previous world’s tallest Scots pine, located in Poland. The stately tree is also of a respectable age, being at least 214 years old. The fir tree is about ten years younger.

Estonia’s tallest pine and fir tree are growing on state forest land and have been placed under special care by RMK.

COOPERATION PROJECTS

RMK participates in activities that help people to better understand nature and move around within it, valorise timber as a building material, and honour the traditions of foresters.

Forestry and the use of timber

- NGO Puulaevaselts Vikan and Raudlaeva Maja NGO are building an authentic marine rescue boat, with 11-metre sails, which could be used for organising safe nature and study trips as well as excursions. A keel suitable for ship building was acquired from Tammiku Village, in Lääne-Viru County, with the help of RMK.
- NGO Vanaajamaja, in cooperation with the National Heritage Board, has begun the process of preserving a small wooden orthodox church located in Puutli Village, Vastseliina Rural Municipality, Võru County. With the help of students from the Estonian University of Life Sciences the log walls of the Puutli church were reinforced and the roof will soon be replaced, with RMK providing the required wooden material.
- In December, a stately swing forest was erected on Tartu Town Hall Square. The 7-metre tall fir trees were later turned into firewood and given to a single mother with four children, living in Tartu.
- The Estonian Woodhouse Association organised a professional competition for builders of log houses in Räpina; the required material was provided by RMK.
- With the support of RMK, the 19th wooden sculpture festival Varbola Wood Days was organised in Rapla County, Varbola fortress.
- Under the leadership of the Estonian Forest Society an international felling competition was organised, which RMK helped with advice and other support.
- In cooperation with the Estonian Forest Servants Association, information days introducing the jobs of foresters were organised.
- Forestalia, the male choir of forest workers, honours the tradition of foresters singing together.

Healthy living and activities in nature

- The RMK Kõrvemaa Complex Event invites sports enthusiasts to take part in running, cycling, ski marathons and a triathlon, with a special programme for children as well.
- In cooperation with Maaleht, mushroom hikes for exploring less known edible mushrooms were organised in Võru, Pärnu, and Harju Counties.
- The wanderers who visited RMK Nature Centres and collected stamps before the folk festival received Seto folk tickets for a reduced price.

Environmental protection and nature conservation

- Once again, nature photographers went on a bloodless hunt. Jarek Jõepera's photo of a rabbit running in the rain was declared the best shot.
- The atrium of RMK's Tallinn headquarters hosted exhibitions of seals, wooden clothing fashion, and modern bird houses.
- With parents, children made food and jewellery from forest products in the Fork Ape cookery school organised in Põhjaka manor.
- With nearly one thousand participants, the youth conference "Cool School Day" focused on life's turning points and also gave participants hiking advice.
- RMK provided firewood for the camps of the Estonian Union of Child Welfare, in Remniku, and organised nature study programmes for the campers.

FOREST MANAGEMENT

State forest reserve	174 million m³
Renewed forest area	10,400 ha
Forestry plants planted	19.3 million
Cleaning	44,300 ha
Thinning	9300 ha
Regeneration cutting	10,500 ha
Timber sold	3.6 million m³
Income from the sale of timber	EUR 157 million

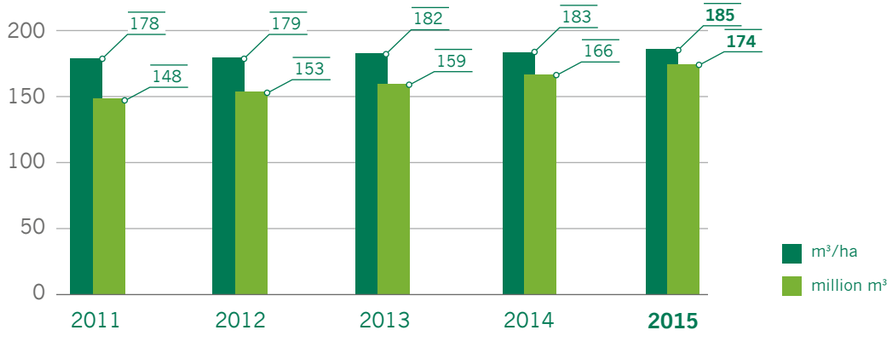
Mesoeutrophic forests grow on fertile ground and are a habitat for quickly growing highly productive dim spruce woods.

FOREST LAND OVERVIEW

RMK area of forest land and reserves by species of trees

Species	Area		Stock		
	ha	%	m³	%	m³/ha
Pine	401,084	42.6	81,797,000	47.1	204
Birch	279,176	29.7	45,997,000	26.5	165
Spruce	193,333	20.5	33,001,000	19	171
Aspen	32,905	3.5	6,599,000	3.8	201
Black alder	17,434	1.9	3,463,000	2	199
Grey alder	12,239	1.3	1,957,000	1.1	160
Others	4815	0.5	856,000	0.5	178
Total	940,986		173,670,000		185

State forest reserves



CUTTING WORKS

Cutting in state forests (ha)	2011	2012	2013	2014	**2015**
Regeneration cutting	8340	8606	8717	9513	**10,471**
... of which clear cutting	8129	8415	8568	9394	**10,387**
... of which shelterwood cutting	211	191	149	119	**84**
Thinning	13,602	11,895	10,778	9909	**9339**
Sanitary cutting	7487	10,362	6854	10,280	**6342**
Deforestation	1107	551	1142	680	**969**
Design cutting				68	**392**

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 lifespan 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.

FOREST RENEWAL

Volume of forest renewal	2011	2012	2013	2014	**2015**
Mineralization of the land for planting, ha	4697	3980	5610	5653	**6739**
Mineralization of the land to aid natural renewal, ha	529	446	1096	1202	**1343**
Forest sowing, ha	400	536	416	617	**466**
Forest planting, ha	4530	5652	5865	5785	**6069**
Aiding natural renewal with planting or sowing, ha	258	313	348	408	**397**
Leaving for natural renewal, ha	2580	1480	1648	2017	**2089**
Contribution to the forest renewal, ha	2197	2205	2955	3102	**3611**
Plants planted, million	13.4	17.4	18.4	18.5	**19.3**
... out of which container plants, %	36	26	34	42	**50**
Forest renewal maintenance, ha	15,978	18,751	20,865	23,048	**24,559**

Maintenance of young stand (ha)	2011	2012	2013	2014	**2015**
Clearance	15,624	16,481	18,150	19,375	**19,769**

Planting and sowing by tree species (ha)	2011	2012	2013	2014	**2015**
Spruce	2802	3169	3368	2885	**3197**
Pine	1951	2905	2724	3329	**3061**
Birch	413	399	516	578	**631**
Others	23	28	21	18	**42**
Total	5189	6501	6628	6810	**6931**

Three new trees in place of one

Cut down one tree ready for felling, replace it with three new ones – this is the extent of state forest management in order for the forest to provide jobs, building material, and also a resting place for future generations.

In total, within a year, RMK renewed forest on 10,400 hectares – mainly by planting, but also by sowing. One-fifth was left in the hands of nature. In these areas, mainly birchwood, aspen, and alder start to grow.

The number of trees planted in the forest has increased year after year, exceeding 19.3 million in 2015. This is a million more than a year ago, and when divided by the total population of Estonia, it equals 14 trees per person. Mostly pine trees and spruce were planted, of non-coniferous trees mainly birch, but also some alders.

Most of the works were performed in spring when RMK provided seasonal jobs in nurseries and forests for 1700 people, although 800,000 spruces were also planted in autumn. Prolongation of the planting period allows for the better organisation of operations and also provides work to planters in the autumn. Out of the counties, the largest number, i.e. 3.7 million trees, were planted in Ida-Viru County.

Forest instead of oil shale

With the help of RMK, a new generation of forests is growing in the quarries that ceased activity in Ida-Viru County. On the request of Eesti Energia Mines, RMK reforested 49 hectares of quarry fields, for which the contracting entity paid EUR 39,000.

Young pine trees are now growing on the site of a former oil shale quarry. In previous years, Kiviõli Keemiatööstus has also ordered the planting of trees in quarries; although, they did not do so in 2015.

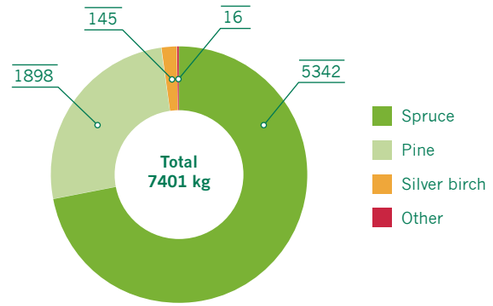
PLANT GROWING

Eesti Metsataim owned by RMK

RMK bought 30.1% of the public limited company Eesti Metsataim, a company that grows forest plants, from Metsähallitus, the state forest management company in Finland, and as a result became the sole trader of Eesti Metsataim. The entire staff of Eesti Metsataim continued their work at RMK.

Previously, RMK owned 69.9% of Eesti Metsataim, and over the past few years RMK was the company's main client. Insofar as the demand for plants for Estonia's state forest is increasing, while the forest plant market in Finland has shrunk, acquiring the entire company was a logical step.

Estonian seed stock (kg)



The Estonian-Finnish joint enterprise was founded in 2002, to learn new plant production technologies from the Finns and supply Estonian and Finnish state forests with proper planting material. In addition to the Marana Nursery, RMK has nurseries in Tartu, Räpina, Reiu, Purila, Kullenga, Rulli, and Iisaku.

From pot to field, field to forest

Five big greenhouses were built on the territory of the Tartu Tree Nursery, in which, similar to the Marana Nursery, fir and pine trees are grown with modern sowing devices in greenhouses and in growing fields.

Growing a fir tree using the pot-field system makes the plants stronger and improves their root system; in addition, the amount of time from sowing to planting the plant into the forest also decreases. If in the case of an open root system, the fir seedlings grow in the greenhouse for one year and then two years in the field, then in the case of the pot-field system, they remain for four months in the greenhouse in a cartridge, and then spend a year and a half in the field.

This is the last year that RMK is planting pine trees with open roots; hereinafter, only pot plants shall be grown and planted. An open-rooted pine tree can be planted into the forest at the age of two. As a pot plant, it will be ready for planting within a year.

Growing forestry plants (mln)

	2011	2012	2013	2014	**2015**
Pine	6.9	9.5	10.2	11.6	**10**
Spruce	7.9	9.3	10.2	9.5	**10.1**
Birch	0.8	0.6	0.8	1.1	**1.6**
Total	15.6	19.4	21.2	22.2	**21.7**

In Tartu, 3 million fir and 3 million pine tree seedlings mature each year, along with 1.5 million birch seedlings and about 100,000 alders. There are dozens of greenhouses in Marana, and the production volume is thus also higher. In total, RMK needs 22 million forest plants by 2020. Due to the increase in demand for plants, RMK no longer provides plants to private consumers and all the plants required for state forest renewal come from its own nurseries.

Strong future trees

Foresters look ahead to the distant future, which is why RMK has undertaken a job, in cooperation with researchers at the University of Life Sciences, the first fruits of which cannot be plucked until 15-20 years. Namely, the most beautiful and strongest trees from Estonia's forests shall be picked, from the seeds of which new plants will be grown that have to compete with one another in test cultures. Under the watchful eyes of researchers and foresters, the best plants shall be chosen from the test cultures, of which the offspring with especially good growth shall be selected for state forest renewal. As a result of the selection programme, our future forest should grow faster, be 10-15% more productive, and thus provide more timber as well. This activity will help to retain and carry on the most valuable gene pool of Estonia's forests for centuries.

RMK and the University of Life Sciences have made the most progress with the Scots pine selection programme, the founding of the four test cultures of which shall be completed in 2017. After which, 450 offspring of pine trees exhibiting good growth shall be growing everywhere, including, for instance, the offspring of the world's tallest, the Ootsipalu Valley pine tree and the gorgeous Kuningmänd and Riiupalu pine tree (previous record holder) of Järvselja. From among these offspring planted as 450 test trees, the 35-50 best shall in turn be chosen in 15-20 years.

Fir tree selection programme test cultures shall be established in 2017-2018. As the spruce has poorer cone-bearing, establishing the test may take more time than for the pine tree. Choosing the best birch trees in the forest shall begin in 2016, and it is planned to start establishing the test cultures required for thorough research in 2019-2020.

TIMBER MARKETING

Difficult times

Over the course of the year, RMK sold 3.6 million cubic metres of timber: logs 44%, pulpwood 36%, firewood 16%, and wood chips and residuals 4%. The sales volume increased over the year by 8%, while the proportion within goods groups was similar to 2014.

Prices decreased in all goods groups by an average of 6%, compared to last year. An even greater price decline was prevented by competition between local sawmills. One reason for the decline in sawn timber demand abroad were political crises on target markets vital for Estonia's producers, such as in North Africa and the Middle East, as well as the slowing of the development of the Asian economy. The price of birch logs declined the least (1%) due to the growth of the share of output with higher additional value for birch wood processors and a more dispersed market.

The coniferous tree pulpwood market was under great pressure throughout the year. In Southeast Estonia, a price decline of 20% even equalised it with the price of firewood. The latter remained at a stable low; demand was not increased even by the new pellet factories established in Estonia. The low price for pulpwood and firewood and outbidding also blocked the increasing of the provision of suitable raw material – cutting waste and trunks – needed for producing wood chips. The volume of cutting waste and trunks planned for the year was still successfully processed into wood chips and only the portion of firewood planned for producing wood chips was not chopped nor sold.

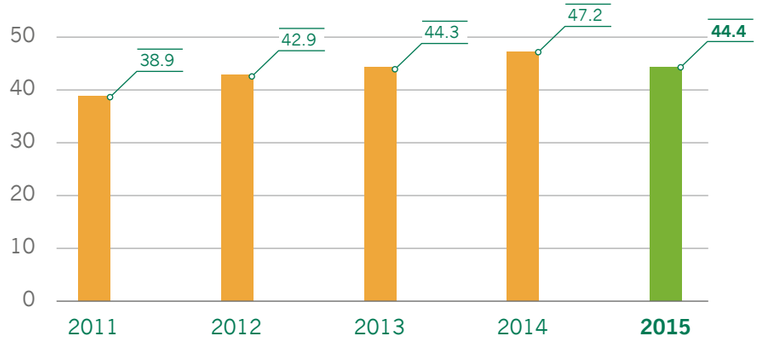
Sales possibilities for wood chips should, in the future, be expanded by the FSC® and PEFC ecolabels, because as of 2016 RMK also sells wood chips with certificates. In the international timber trade, an ecolabel is often a prerequisite for trading; the market should mainly arise as a result of the changes occurring in the renewable energy sector.

Biggest clients by the amount purchased (m³)

Stora Enso Eesti AS	360,000
Horizon Tselluloosi ja Paberi AS	227,000
Estonian Cell AS	216,000
BillerudKorsnäs Estonia OÜ	134,000
Osula Graanul OÜ	129,000
Metsä Forest Eesti AS	121,000
Toftan AS	117,000
Repo Vabrikud AS	111,000
Laesti AS	104,000
Vara Saeveski OÜ	101,000

Sale of timber (m³, %)	2011	2012	2013	2014	**2015**
Logs	1,227,000	1,249,000	1,356,000	1,492,000	**1,596,000**
	41%	40%	40%	45%	**44%**
Pulpwood	1,151,000	1,158,000	1,233,000	1,216,000	**1,292,000**
	38%	37%	37%	36%	**36%**
Firewood	294,000	399,000	571,000	487,000	**558,000**
	10%	13%	17%	15%	**16%**
Wood chips and residuals	330,000	318,000	211,000	138,000	**148,000**
	11%	10%	6%	4%	**4%**
Total (million m³)	3	3.1	3.4	3.3	**3.6**

Average price of the sold timber (EUR/m³)



FOREST IMPROVEMENT

500 kilometres of forest roads

RMK commissioned the construction and renovation of more than 495 kilometres of forest roads and the reconstruction of 23,800 hectares of drainage systems across Estonia. The works cost EUR 23.8 million.

Most of the forest improvement was carried out in Pärnu and Ida-Viru counties – the most forest-rich counties in Estonia – while work was also carried out on a significant scale in Jõgeva, Lääne-Viru, Valga and Põlva Counties, where, depending on the county, EUR 1.3 to 1.8 million was invested in sites due for completion. In total, 200 objects were completed and more than fifty companies provided services to RMK.

Investments into forest improvement will also remain on the same scale in the coming years. RMK aims to finish reconstructing old drainage ditches by 2022, leaving only regular maintenance works for an extended period of time. However, road construction is a continuous process. For the existing roads, a renovation cycle of 30 years is allowed.

Forest road construction and old drainage system reconstruction are being undertaken to improve forest access, make it easier to carry out forest works, and preserve the additional increment and improved quality of timber achieved through previous drainage. According to the estimates of researchers, approximately one million cubic metres of additional timber is grown in Estonia each year thanks to forest drainage. An improved network of forest roads is also important for putting out forest fires, while also making it more convenient for mushroom / berry pickers and hikers.

WASTE COLLECTION

Catching forest polluters with cameras

RMK cleaned up 572 tonnes of waste from the state forest under its care, which is twice as much as the year before and enough to fill 38 railway cars. On the one hand, it indicates the distorted mentality of many people, while on the other hand the amount of waste also increased due to RMK acquiring new, previously unreformed pieces of state land, where self-made landfills have emerged. For instance, in Jõelähtme Rural Muncipality, located in Harju County, RMK acquired a piece of land where first it had to clean up 146 tonnes of waste.

Most (83%) of the waste cleaned up from state forests is municipal and construction waste, the rest is metal, hazardous waste, and glass. The situation is the worst in Harju and Ida-Viru counties, where more than half of the waste cleaned up last year by RMK originated. In terms of money, EUR 145,000 was spent on cleaning up the forests; as of 2015, RMK has a specific partner for this job in every county.

In order to catch the culprits, RMK installed surveillance cameras at potential waste drop points and thanks to them the first culprits have already been punished. However, it is more efficient to deal with the underlying causes of a problem and thus RMK plans to build closer relationships with local governments in order to clarify how many households are exempt from the municipal waste collection system or have not joined the system for some other reason. If such households constitute more than 2%, the Waste Act states that the local government must take responsibility for covering the costs of municipal waste and the incurring cost of pollution.

Waste collection in state forests	2011	2012	2013	2014	**2015**
Amount (kg)	317,000	170,000	164,500	270,600	**572,000**
Expenses (EUR)	32,000	29,000	37,000	52,000	**145,000**

FOREST FIRES

Forest fires in state forests	2011	2012	2013	2014	**2015**
Number (pcs)	12	0	7	24	**10**
Area (ha)	13.7	0	186.4	37.8	**15**
Average fire area (ha)	1.1	0	27	1.6	**1.5**

HUNTING

Hunters compensate RMK for game damage

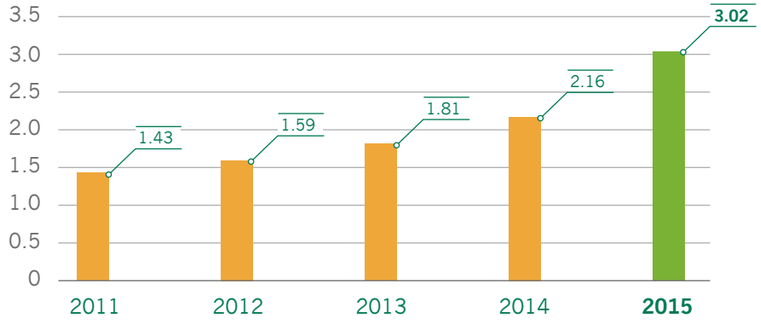
RMK earned EUR 260,000 from hunting activities, the majority of which came from the public auctioning of hunting permits. In 2015, the average fee for one hectare of hunting grounds increased by about 40%, meaning that RMK received, on average, EUR 3.02 per hectare for the hunting right. RMK manages three hunting areas – Kilingi-Nõmme, Väätsa, and Kuressaare. The hunting areas have been divided into 13 smaller hunting districts. The winner of the auction can hunt in the hunting district during one season, hunting game according to the prescribed age and gender ratio.

In those state forest areas where RMK does not manage hunting activities, but where people still hunt, RMK has concluded a hunting usage agreement for state land with hunting associations. In total, RMK has 325 arrangements of this type. The agreement also states when the hunting association has to compensate for game damage caused to the state forest. In 2015, for the first time, RMK sent a game damage invoice to nine hunting associations. A new generation of forest will be planted on 15 hectares, to replace trees damaged mainly by elk.

The works will cost EUR 8800, with the hunters having paid RMK EUR 5400 for their performance. The hunters do not have to pay the entire amount required, since they will help with the work themselves – planting trees in spring or cutting damaged young growth.

RMK registered new game damage on a total of 3178 hectares of young forests. Of those, 705 hectares are considered damaged to a significant extent, with 113 hectares scheduled for additional reforestation or repeat regeneration. Hunters provide compensation for game damage in areas where damage has arisen during the term of validity of the agreement.

Average RMK hunting grounds usage price, EUR/ha per year



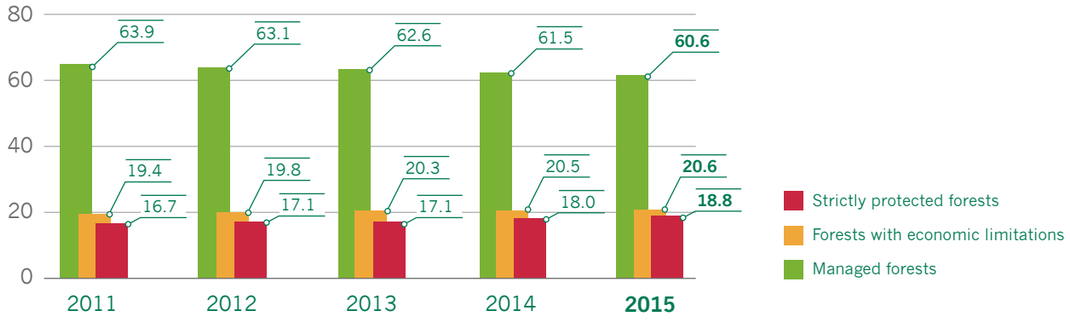
NATURE PROTECTION

Protected species	478
Protected species habitats	27,397
Key biotopes	6143
Total area of key biotopes	14,784 ha
Semi-natural biotic communities managed	21,000 ha
Cost of nature protection works	EUR 2.9 million

Broadleaf hardwood nemoral forests are very rich in species and versatile, and economic activities often give way to nature conservation.

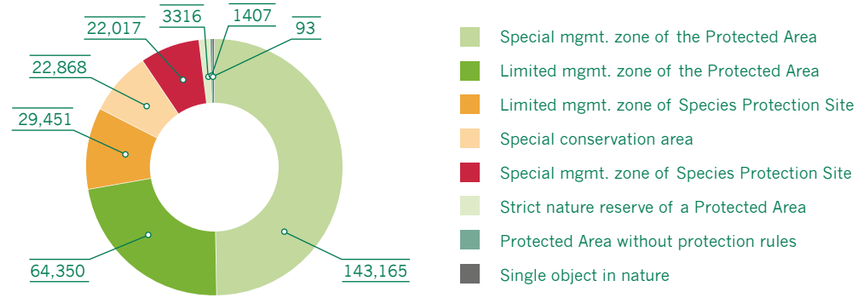
DIVISION OF STATE FOREST

Division of state forest (%)



PROTECTED AREAS

Protected Areas in state forests (ha)



NATURE PROTECTION WORKS

Expenditure on nature protection

	2010*	2011	2012	2013	2014	2015	**Total**
Self-financing of RMK	381,000	505,700	594,900	628,400	1,037,200	1,447,300	**4,594,500**
Other financing (from state budget, UCITS)	0	669,000	1,639,000	883,000	1,722,000	1,403,000	**6,316,000**
Total	381,000	1,174,700	2,233,900	1,511,400	2,759,200	2,850,300	**10,910,500**

* RMK has carried out practical nature protection works on state land since 2010.

For the Protection of Species

Flying squirrel, capercaillie, viviparous lizard, and natterjack toad – these are the species for whose better living environment RMK performed special works.

Creating routes of movement for flying squirrels was begun already in 2014. Back then, the route of movement between 47 known habitats for flying squirrels in Lääne- and Ida-Viru Counties were mapped and taken under protection. In 2015, design cutting experiments were performed on 15 hectares of permanent habitats of the flying squirrel and a protected insect species, the cinnabar flat bark beetle, the aim of which was to increase the percentage of aspen in the future forest. Aspen, in particular, is the nesting tree of the flying squirrel; but if the tree falls over when about 80-120 years old, the flying squirrel must find a new habitat.

The natterjack toad has been included in the special “support programme” for several years. In order to improve their living conditions, the forest planted on sand dunes has been previously cut on dozens of hectares in Vilsandi National Park. Now, stumps were experimentally uprooted on an area of 8 hectares, so an open sand surface, required for the toad, could develop. In Läänemaa Bog, the success of milling was tested on 6 hectares when restoring open surface sand and heath habitats; this area is also hoped to become the most suitable habitat for the natterjack toad and the viviparous lizard.

In order to determine the habitats favoured by the capercaillie, different kinds of restoration works were performed on 186 hectares in Soomaa. You can read more about them from the research chapter of the yearbook.

Habitats as the basis for everything

When restoring the habitats of endangered species or those in unfavourable conditions, the focus is on marshes and semi-natural biotic communities.

RMK restored marshlands on 1656 hectares. Of the more extensive works, the restoration work on the 1470 hectares of the Muraka nature protection area were completed: dams built there shall increase the water level of the area and transform it into a marsh again. In Kuresoo, Viru, and Rannu bog the previously completed works needed some revising.

RMK restored semi-natural biotic communities on 346 hectares. The extent of cutting works, undertaken to restore semi-natural biotic communities, increased in a year to 300 hectares. Restoration cutting was mainly performed in Saaremaa; the areas included alvars, juniper shrublands, wooded pastures, and woodlands.

In order to maintain valuable semi-natural biotic communities and mow the grass or access the area for lawn carriage, it is often necessary to first build a road, bridge, or culvert. In a year, 6 km of roads, 3 bridges, and 53 culverts were established. More extensive works were performed in Alam-Pedja nature protection area, Soomaa National Park, Struugade landscape protection area in Ida-Viru County, and Ohepalu nature protection area in Lääne-Viru County.

If required conditions for area maintenance have been established, RMK leases them in most places. By the end of 2015, RMK had semi-natural biotic community maintenance contracts with 322 legal or private persons, who take care of 21,000 hectares of state land which falls under semi-natural biotic communities. On small areas where it is not possible to find a tenant, but where public interest is high, RMK maintains the semi-natural biotic communities itself; for instance, in Tallinn, in the Pirita River Primeval Valley Landscape Reserve.

Making parks beautiful and safe

The overall appearance of the landscape was improved and works required for protecting nature were also performed in 12 parks. For instance, extensive design cutting has been performed in several consecutive years in the park of Sangaste Manor. In Toila Oru Park, the crowns of old stately trees are being maintained and supported, while trees that have become dangerous are being cut down. More extensive maintenance works for single trees were also performed in Tartu County, in the parks of Alatskivi castle and Luunja manor.

Semi-natural biotic communities rented out (ha)

	2011	2012	2013	2014	**2015**
Total	6409	7694	14,509	18,266	**21,000**
... out of them new lands rented out	501	1285	6815	3757	**2734**

PROTECTED SPECIES

478 protected species

478 protected species have been registered in RMK areas. During the year, 6 species were added to category I, the most strictly protected category; 12 to category II; and 7 to category III. The number of habitats for protected species is even more important than the number of species, with the former reaching 27,397 on RMK lands. Over the year, the number of habitats or places where the protected species live, nesting places for birds, etc., increased by 5331.

Protected species registered in RMK lands in 2015:

- **Category I:** Flavocetraria cucullata, Hapalopilus croceus, southern marsh orchid, Haploporus tuberculosus, Littorella uniflora, forked veilwort
- **Category II:** elm gyalecta, black-throated diver, Steller's eider, white-spotted bluethroat, Northern hawk's-beard, moor rush, rock pipit, raspberry milkcap, Sclerophora coniophaea, Dactylorhiza osiliensis, lesser black-backed gull, frosted glass-whiskers
- **Category III:** Northern birch mouse, black rock-moss, cupped soot lichen, Nephroma laevigatum, slender-leaved pondweed, Scottish wood ant

KEY BIOTOPES

93 key biotype experts

Training was completed by 58 of RMK's forest surveyors and nature protection specialists, who acquired the knowledge and skills necessary to identify key biotopes in nature. RMK employs 93 people with this skill set. The more people who receive training to be able to identify vulnerable or rare species in nature, the more effectively we can protect natural values.

This 10-day training event for key biotope stocktakers consisted of spring, summer and autumn training cycles, during which instruction was provided, mostly through fieldwork, on the structure and indicator species of key biotopes.

The forest maintained by RMK contains 6143 key biotopes, covering a total area of 14,784 hectares. During the year, 65 key biotopes were added and the area increased by 200 hectares

A key biotope is considered to be an area of up to seven hectares where it is highly likely that endangered, vulnerable or rare species are growing. Key biotopes are classified as strictly protected forests, with 18.8% of forest maintained by RMK falling under this classification.

Everyone can contribute

Anyone can contribute to the mapping of objects of natural and heritage culture value on plots of land placed under the care of RMK. For this purpose, RMK published the precise annual work plan on its website, so it would be clear which plots of land specialist are planning to take inventory of. Anyone who has any information on objects of value that are currently not protected and located on these plots can notify RMK of them. We are awaiting information on species belonging to protection categories I and II and on communities worthy of protection, for example key biotopes. RMK will forward the information received to the Environmental Board, who will verify it and, if eligible, approve it for entry in the environmental register.

PÕLULA FISH FARM

Fish to the river, tags returned

Põlula Fish Farm, in Lääne-Viru County, helps to rehabilitate salmon and sea trout populations in Estonia's rivers. For this, juvenile salmon and sea trout are raised and then used to stock the Pärnu River and North-Estonian rivers. In 2015, rivers were stocked with 312,000 salmon and 20,000 sea trout of different ages. Selja, Valge, Pirita, Jägala, Loobu, Purtse, Pärnu, and Pühajõgi rivers were stocked with salmon and Pudisoo, Purtse, and Pühajõgi with sea trout.

Eggs were collected from 127 female and sperm from 130 male salmon of the salmon broodstock in the fish farm and wild salmon caught from the Kunda River. A total of 387,200 salmon roe were incubated.

The adipose fin was removed from all fish that are at least one year of age, have been raised in Põlula, and then used to stock rivers. In addition, 4100 two-year-old fish received individual tags. Tagging and collecting recapture information is vital for research – in order to evaluate where fish farm fish travel, how they grow, how many of them survive, and how many are caught.

Põlula fish farm awaits information from all fishermen who have caught a tagged fish. You can inform us by using a form on website of the Põlula Fish Farm (www.rmk.ee/polula), by e-mail, or in a paid reply envelope. The sender of recapture notification shall receive a reply, a trolling line, and remuneration.

The Põlula Fish Farm has been a part of RMK since 2014.

Fish populated to rivers from Põlula	2014 Salmon	**2015 Salmon**	2014 Sea trout	**2015 Sea trout**
Larva	97,750	**98,500**		
One-summer-old	107,154	**127,541**	9569	**10,308**
One-year-old	15,368	**40,638**	6978	**3617**
Two-summers-old	9442	**3580**		
Two-years-old	35,394	**41,885**	5403	**5686**
Total	265,108	**312,144**	21,950	**19,611**

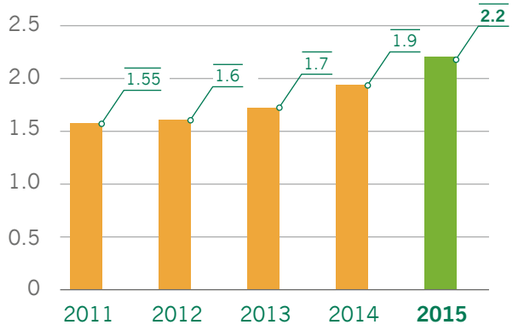
ACTIVITIES IN NATURE AND NATURE EDUCATION

Number of visits to RMK's recreational and protected areas	2.2 million
Visitors	
... at information desks	83,000
... in Elistvere Animal Park	59,000
... in Sagadi Forest Museum	28,500
Participants in nature education programmes	48,500
Cost of nature holidays and education	EUR 6.4 million

Heath forests are light and dry pine groves with a carpet of reindeer moss and heather, where you can always find rufous milkcap and chanterelles.

MOVING AROUND IN NATURE

Number of visits to RMK recreational and protected areas (million times)



Estonia's longest hiking trail

Estonia's longest hiking trail is 820 kilometres, stretching from Lääne County to the hill domes of South Estonia. The second branch of RMK's long hiking trail, from Peraküla via Aegviidu to Ähijärve, was completed in summer when the 192 km trail from Peraküla to Aegviidu was opened.

The trail, starting at Nõva Nature Centre and heading in the direction of Estonia's hiking capital Aegviidu, is mainly suitable for moving around on foot. Nõva and Keibu beaches with singing sand; mystical Rummu quarry with turquoise water; the ruins of Padise Monastery; deep forests of Harju County; and the ancient sacred Saula blue springs are only a few of the many objects found along the trail. Previously existing RMK trails and recreational objects were primarily connected, while

RMK invites you to visit the state forest

Two branches of a long hiking trail:	
Oandu-Aegviidu-Ikla	375 km
Peraküla-Aegviidu-Ähijärve	820 km
covered campfire sites	309
hiking trails	220
camping areas	59
forest huts	27
forest houses	19
cross-country areas	4

completely new trails and stopovers have also been established.

The first branch of the RMK hiking trail – the 375 km Oandu-Aegviidu-Ikla track – was completed in 2012, and its popularity continues to increase with each passing year. In 2015, the two branches of

the hiking trail had a total of 150,000 hikers and true wanderers are now issued passports. The RMK hiker's passport helps to record the covered journey and its owner can enjoy some pleasant conveniences throughout the hike. Currently, there are 250 passport holders. Many people who have completed the long hike share their experiences on the hiking diary on RMK's website.

RMK's long hiking trail should be completely ready in 2018; the currently planned third branch shall introduce Estonian nature from Lääne County, from Penijõe via Aegviidu to Kauksi in Northeast-Estonia.

Renovated

The network of recreational objects covering Estonia is sufficient and instead of establishing new ones, RMK is focusing on fixing up and maintaining already existing ones. In 2015, the Männikjärve, Vilsandi, Paganamaa, and Tsitreviewing towers, the Nigula, Männikjärve, Saare, Käsmu, and Viitna study trails, the Marimetsa, Penijõe, and Kotka hiking trails, and the Koonukõrve footbridge were all reconstructed.

The extensive works around one of Estonia's most visited tourist attractions, Kaali meteorite crater in Saaremaa, were also completed, and now nature there is better protected and it is easier for the guests to move around.

Visitor survey confirms: forest is nice

According to the recent visitor survey, 25-44 year olds enjoy resting in nature the most, with women slightly outnumbering men. Half of the 6528 people who participated in the survey conducted in RMK's recreational and protected areas had a higher education, 87% of them lived in Estonia. Mostly, they visited nature with 2-5 people and arrived by car. The clients of tourism companies made up 1% of the visitors.

People visit nature to enjoy beautiful landscapes, to commune with nature, escape from noise and pollution, achieve peace of mind, alleviate stress, and be together with their friends. 85% of visitors felt that thanks to visiting a nature area, their social and physical, but mainly mental welfare improved.

On a five point scale, nature hikers rated their experience as 4.4. This is 0.2 points higher than five years ago, when a similar survey was conducted. The people mostly valued the quality of camping areas, parking spaces, camp fire places, landing bridges, and trails. Services provided by companies and considering the needs of people with special needs received fewer points.

Daily visitors constituted 52% of the respondents, who spent, on average, 3.5 hours in nature. 48% of people stayed overnight; the average length of their hike was 2.9 days. About half of the people who visited natural areas also spent money, an average of EUR 65.

Rogaining in the state forest

In May, a big RMK rogain day was organised in six locations across Estonia, with 377 teams of 1145 people and about fifty pets. During the three-hour team adventure hike, searches took place for the checkpoints set up in the forest, while forest wisdom was also acquired.

Rogain Day, which summarised the nation-wide orienteering week, was organised simultaneously in Aegviidu, Kiidjärve, Oandu, Nõva, Reiu, and Alutaguse. It was organised by RMK in cooperation with local orienteering clubs, and the mobile orienteering app MOBO, developed in Estonia, was used for the first time in Estonia to organise a competition and view current results.

NATURE EDUCATION

To the forest with your tablet

People learn the most about nature when spending time there. It is good to have someone with you who knows how to show, talk, and raise the level of enthusiasm of the people. These people exist in RMK nature centres and the Sagadi Nature School; over the course of the year, they took 48,500 people to the forest, which is a thousand more than the year before. A good and encouraging guide will also be required in the future. In addition, RMK has set its sights on developing and using interactive possibilities for nature learning. Smart solutions help to share nature education more diversely and with more people: for instance, before going to the forest, a family can download an interesting programme to their phone or tablet and thus make the hike more exciting. The first development projects were already implemented in the Viimsi Nature Centre in 2015, and the work continues.

Competitions for children and young people continued. A total of 9495 young people from 192 schools participated in the forest quiz, while the Forest Postcard competition received 2909 works describing the greatest nature experience. Nursery school children created artworks from natural materials, and school children shared photos of natural products.

Nature programmes and their participants	2011	2012	2013	2014	**2015**
Nature programmes organised	2449	2993	2953	2455	**2695**
Participants in programmes	50,800	59,900	48,400	47,500	**48,500**

SAGADI FOREST CENTRE

True experiences

Geopolitical changes have decreased the number of foreign tourists coming to Estonia; instead, Sagadi Forest Centre is focusing more on Estonian people and developing all kinds of additional services. The fact that these ideas are worth trying out is confirmed because three Sagadi programmes were awarded the EHE quality mark: the night-time primeval forest nature hike; the “Forest Feeds” event, introducing known and less-known forestry products; and “Lady of the manor’s booze class”, which allows people to take part.

During the year, 50,000 people visited Sagadi: some stayed at the cosy manor hotel (average rating at Booking.com 8.9); some educated themselves at the forest museum or in a training session; and some participated in one of the special events. In the future, the ice cellar and the sauna shall provide options for cosy gatherings; RMK contributed EUR 246,200 to their renovation and they were completed by the end of the year. All programmes in the Nature School were renewed and in total there are now 53 programmes for different ages. The Forest Museum’s photo collection was complemented extensively as well.

Traditional events included timber days, the mushroom exhibition, and night museums. New events included Nature School family days, Lahemaa Taste Week in cooperation with neighbouring manors, and the especially popular 100 costumes day in May. All of these events will be continued in 2016.

The Forest Centre cooperated with many other culture and education institutions. For instance, the wild boar of Sagadi were “on assignment” in the wild boar exhibition of the Estonian Natural History Museum, and with the help of RMK’s staff a magic forest was created for the Rakvere Theatre’s Christmas play “Hansel and Gretel”. Throughout the month of March, a children’s Christmas series for Finnish television channel YLE was filmed in the Sagadi manor house. The series was aired in December.

Number of Visitors to the Sagadi Forest Centre	2011	2012	2013	2014	**2015**
Visitors at Forest Museum	32,000	29,000	25,000	34,000	**28,500**
Accommodation clients	9900	8600	8500	9800	**9500**

ELISTVERE ANIMAL PARK

Villu said goodbye

The joys and sorrows of the animal park are clearly associated with its inhabitants. On the sunny side, three fallow deer calves were born, while 18 year-old bison Villu – one of the first residents of the animal park – went up to heaven. Mama bison Vilja, who is now already 20, and daughters Pauliine and Paula shall remember him. Reindeer Redu also died of old age and due to the African swine fever the animal park had to give up its wild boar.

A raccoon dog, which had been injured in a car accident, and four very small pine marten babies, of which only two survived, were brought to the animal park.

There were more visitors to Elistvere Animal Park than in previous eight years: about 59,000.

NATURE CAMERA

Badgers in love and furry deer

Thanks to RMK's nature cameras, nature observers have received new and surprising knowledge about badgers and deer.

In the beginning of the year, a young stag, which was significantly furrier and darker than other deer, started visiting the deer food court in Saaremaa, where a camera is installed. The experts were confused: the longer and darker winter coat points to the attributes of a Sika deer, whereas the profile of its head hints at those of a red deer; however, the darker area around its tail is not characteristic of either of the deer species living in Estonia. While for a long time only the red deer was thought to live in Saaremaa, the furry deer could have been a hybrid between red and Sika deer or maybe simply a red deer with a coat deviation.

The badgers offered their own surprises. Spring cleaning in the burrow and the badger couple Tõnis and Kadi diligently searching for fleas on one another gave reason to hope for intensified family life and small badgers, although no babies were born this year. However, the eager badgers beat a one of a kind record in June: their mating ritual, which could be followed in real time online, lasted at least an hour and a half. According to zoologist and nature photographer Tiit Hunt, there was previously no evidence that the seemingly quite clumsy badgers could engage in such a long mating ritual. Observing the life of badgers is a good introduction for getting to know the animal of the year for 2016.

CHRISTMAS TREES

Christmas tree hike between the covers

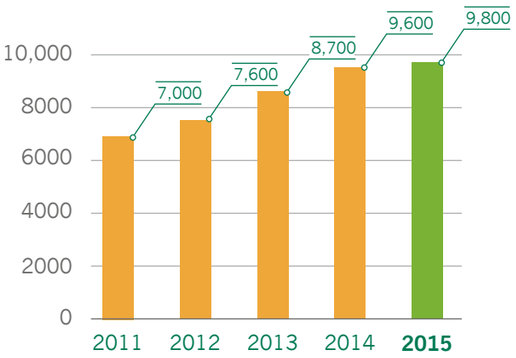
Despite the lack of snowy Christmas weather, around 10,000 spruces were brought home from the state forest. Helping to honour the old tradition is the fact that finding the right tree sites and paying for the tree have been made easy: RMK mobile app and Christmas tree website help you out.

In order to give even greater sense to going to the forest, RMK and Menu Kirjastus published a storybook "The Joys of a Snowy Forest or How Sass and Laura Brought a Christmas Tree Home". This children's book, written by Loone Ots and illustrated by Hiis Lessing, talks about the adventures of one urban family, engaged with their computers and smart devices, searching for a Christmas tree in Karula. Besides the main story, the book contains additional information on Estonian trees, plants, and animals and guidelines for making Christmas tree ornaments are given at the end of the book.

RMK gave this book as a present to all nursery school groups of 3-7 years old children as well as all public libraries across Estonia. Also available in bookshops.

RMK has provided the option of bringing your Christmas tree from the forest for eight years. Trees may be selected from places where they do not stand a chance of growing to maturity: the edges of ditches, roadsides, under electric lines, or the undergrowth of old forest.

Christmas trees from the state forest



HERITAGE CULTURE

Mapping inclusively

In 2015, RMK complemented the Land Board database's map application, accessible to everyone, with 499 heritage culture objects; these and others can be considered when planning a nature hike or getting to know your home better.

A series of 20 short videos of the most common object types were completed, giving background knowledge and showing pictures that help to recognise the hints of the activities of previous generations in nature.

Estonia's experience with valuing heritage culture is also educational for others. For this reason, representatives of RMK held a presentation at the International Council of Museums conference in India. Moreover, the Ministry of Culture has submitted RMK's activities related to heritage preservation as a good example for the inclusive management guidebook of the European Union. Under the leadership of RMK, more than 35,000 heritage culture objects located in Estonia have been mapped. A great deal of work was completed by 2011, while objects are still added and information work is continuously being done.

RESEARCH WORK

Applied research projects supported in 2008–2015	14
... including ongoing	4
Budget for applied research in 2008–2015	EUR 1.9 million
Forestry scholarships	5
Cost of scholarships	EUR 35,500

Swamp forests grow on swamp soil, where ground water reaches the surface and growing conditions for trees are poor. Only the pine can grow in a swamp forest; fen is more suitable for the birch.

APPLIED RESEARCH PROJECTS

Momentum for new projects

The RMK Research Council has selected three new research projects to receive EUR 600,000 in funding over a period of three years. Under the funded projects, researchers from different universities will investigate the conversion of non-coniferous wood into high-value chemicals, the impact of cutting activities on the carbon cycle in forests, and the intelligent protection of biodiversity.

Conversion of non-coniferous wood into high-value chemicals

An economy that is based on fossil oil and gas needs a new, sustainable approach. Renewable wood is a resource that could already be serving today as the main raw material in the chemical industry. The project is examining new technologies in order to produce high-value chemicals from cellulose, which would be used in the material, chemical, and pharmaceutical industries, for example, for treating breast cancer, as a plant protection product in pine weevil control, in cosmetics, etc. The project is taking place in cooperation between the University of Tartu and Tallinn University of Technology.

PROJECT MANAGER:
Lauri Vares from the University of Tartu

MAIN PROJECT EXECUTORS:
Aleksei Bredihhin, Piret Villo, Ilme Liblikas, Urmas Johanson, Lauri Toom, Peter Somfai, Nicholas Gathergood, Omar Parve

DURATION OF THE PROJECT:
36 months

COST:
EUR 190,473

The impact of cutting activities on the carbon cycle in forests

Forests are important carbon binders and smart forest management allows the role of forests in the carbon cycle to be further increased. However, our current level of knowledge regarding carbon supplies and flows is still insufficient in order to provide research-based options for adapting to climate changes. The project studies the impact of thinning and clear cutting on the carbon cycle in economically important forest stands: birchwoods and pine groves. As a result of the project, recommendations are given for forest management that would ensure higher carbon binding in forest stands. The project is taking place in cooperation between Estonian University of Life Sciences and the University of Tartu.

PROJECT MANAGER:
Veiko Uri from Estonian University of Life Sciences

MAIN PROJECT EXECUTORS:
Jürgen Aosaar, Mats Varik, Hardo Becker, Gunnar Morozov, Mai Kukumägi, Krista Lõhmus, Kaido Soosaar, Ivika Ostonen, Kaie Kriiska, and Katrin Rosenvald

DURATION OF THE PROJECT:
36 months

COST:
EUR 226,500

The intelligent protection of biodiversity in Estonia's natural and commercial forests: eco-informatics solutions by way of example of South Estonia

Species that require protection are found in both natural and commercial forests. Currently used biodiversity assessment measures do not easily allow for the assessment of the status of species, nor the effectiveness of activities performed for their protection.

During this project, a biodiversity measurement system shall be developed, with the help of which it shall be possible to assess the network of protected and commercial forests and provide experts support in planning activities that connect forest management and biodiversity protection. The project shall be conducted in cooperation between the University of Tartu and the Estonian University of Life Sciences.

PROJECT MANAGER:
Meelis Pärtel from the University of Tartu

MAIN PROJECT EXECUTORS:
Hardi Tullus, Aveliina Helm, and Tiina Randlane

DURATION OF THE PROJECT:
36 months

COST:
EUR 195,000

Wild Science video clips

During the nine years in which RMK has purposefully supported forest-related applied research, a lot of interesting things have been discovered about our forests. In order to translate the discoveries of researchers into a language understood by regular people, ten simple video stories were completed. In the "Wild Science" series, research project executors step up, showing the results of their work and explaining why these are important. Video stories can be viewed in the science section of the RMK website www.rmk.ee/teadus and also in ERR's science portal Novaator.

USE OF RESEARCH RESULTS

Plants are protected by sand and bio-wax

Young, newly planted conifer trees are endangered by the pine weevil, which loves to eat tree bark and may even cause the death of a young tree. It is estimated that between one fourth and one third of planted pine and fir trees die because of the pine weevil. Under the leadership of Ivar Sibul, assistant professor at the Estonian University of Life Sciences, it was studied whether the impact of insect pests on the next generation of forest could be reduced by using environmentally friendly repellents, such as bio-wax. The results were quite promising, while during the tests it also became clear that the efficacy of Actara – the preparation used routinely in RMK plant nurseries – was very low. As a result of this research, RMK stopped using Actara in 2016. The first plants protected with bio-wax have been planted into the forest – mainly in locations where the probability of pine weevil attack is the highest. In addition to biowax, RMK also protects plants against the weevil by using a mixture of sand and glue, called Hylonox, which is applied to the stems of the plants and is not very pleasant for the beetle to chew.

Estonia's own bark algorithm

Foresters sell wood without bark; the bark being included for good measure. In order to calculate the thickness of the bark on logs, Estonian harvesters were so far using parameters from Central Sweden. Under the leadership of Allan Sims, senior research fellow at the University of Life Sciences, Estonia got its very own bark algorithm. It states how thick the bark is and what the diameter for the wooden part is, depending on the tree species and its location in Estonia. With the help of the algorithm, harvesters and sawmill lines can more precisely estimate the thickness of a log's bark in the future. The model is currently being tested at RMK and the potential extent of its use is being investigated.

The dangerous life of the capercaillie

Soon, the complex study undertaken to better understand the life of the capercaillie will culminate in the final report. The main conclusions of the three-year study were presented at RMK's research seminar in the beginning of 2016. The main reason for the continuing decrease in the capercaillie population seems to be, according to Asko Lõhmus – leading researcher at the University of Tartu, and head of the research – the sad fact that most young capercaillies are simply eaten. The main enemies of capercaillie are pine martens, raccoon dogs, and wild swine; the researchers were surprised that the role of the fox was small or even non-existent. Predation pressure on capercaillies is in turn associated with a large predator population, but also with other factors acting on the landscape level.

A test with artifical nests revealed, somewhat surprisingly, that the depredation level of nests in a natural habitat was higher than in drained swamp forests. Moreover, the predation level did not depend on the nest's distance from a ditch. In terms of conservation, it is important that predators gather around capercaillie mating games and the predation level of nests located near the games starts to significantly decrease only about two

kilometres away. Therefore, in order to regulate predation pressure, additional feeding should, for example, also be limited to areas located further away from the permanent habitats of capercaillie.

Researchers have proposed two complementary strategies to protect the capercaillie: firstly, relying on large naturally functioning protected areas with permanent large predator populations and secondly, constant maintenance of habitats, including the suppression of predation, design cutting of the forest stand, etc.

According to Asko Lõhmus, it could be possible to maintain a third of the capercaillie population through the use of large protected areas in Estonia; however, the prerequisite for maintaining the rest is implementing active protection measures.

During the project, different habitats were designed for the capercaillie in Soomaa by using cutting and draining methods. The effect of this work on the procreation of the wild grouse must still be researched; however, based on observations, capercaillies were not disturbed by the design cutting, nor were they afraid of cut forest stands. In coming years, the constant monitoring of Soomaa should provide new knowledge of how people can best help with raising capercaillie chicks. It is certain that the manipulation of capercaillie habitats shall be increased, and a separate expert has started working at RMK to organise the protection of the capercaillie.

SCHOLARSHIPS

Study support

To inspire forestry students, RMK awarded EUR 35,500 in scholarships. Part of this sum was directed at recipients from the previous year, while five recipients were new.

The Endel Laas Scholarship (EUR 4800 per year), named after the legendary forester, was awarded to University of Life Sciences doctoral students Reimo Lutter and Hardo Becker.

An EUR 3200 award, given in memory of forester Heino Teder, was presented to University of Life Sciences Master's students Teele Vaarendi and Aleksi Potapov.

RMK awarded the Toomas Ehrpais Scholarship (EUR 1917) to Karlis Kevvai, at the Luua Forestry School.

Master's thesis indicated deficiencies

This year, RMK's award for the best Master's thesis at the University of Life Sciences was presented to Sandra Silm, who researched spruce woods rich in herbaceous plants.

It was revealed that many of the spruce woods rich in herbaceous plants and currently protected in the Natura 2000 network do not qualify under this classification. Habitat type was the most common reason, as the current classification does not characterise spruce woods rich in herbaceous plants. Protected areas should be studied in greater detail, in order to align the actual state of the forest with database recordings.

The Master's thesis was supervised by Henn Korjus and Teele Paluots. The award was EUR 700.

FINANCIAL SUMMARY

Mesotrophic forest are cowberry and blueberry forests with a carpet of moss as well as the real home of tall pines.

BALANCE SHEET

(in thousands of euros)

ASSETS	31.12.2015	31.12.2014
Current assets		
Cash	28,904	27,868
Receivables and prepayments	11,717	12,548
Inventories	15,422	15,141
Biological assets	50,930	29,621
Total current assets	106,973	85,178
Fixed assets		
Long-term financial investments	3,352	2,273
Investment properties	6,263	7,120
Tangible assets	459,439	432,417
Intangible fixed assets	1,288	980
Biological assets	3,119,047	3,138,417
Total fixed assets	3,589,389	3,581,207
TOTAL ASSETS	**3,696,362**	**3,666,385**

LIABILITIES AND EQUITY CAPITAL	31.12.2015	31.12.2014
Liabilities		
Short-term liabilities		
Debts and prepayments	13,855	14,606
Short-term provisions	127	100
Total short-term liabilities	13,982	14,706
Long-term liabilities		
Long-term provisions	708	605
Total long-term liabilities	708	605
TOTAL LIABILITIES	14,690	15,311
Equity capital		
State capital	1,206,413	1,112,758
Retained profit	2,523,531	100,988
Accounting year profit (loss) with profit (loss) from the revaluation of biological assets	-48,272	2,437,328
TOTAL EQUITY CAPITAL	3,681,672	3,651,074
TOTAL LIABILITIES AND EQUITY CAPITAL	**3,696,362**	**3,666,385**

INCOME STATEMENT

(in thousands of euros)

	2015	2014
Revenue	161,890	160,505
Other operating revenue	3,290	3,031
Loss from biological assets	-75	-763
Change in the inventory of finished and unfinished products	-326	3,043
Work performed by an entity in the production of non-current assets for its own purpose and capitalised	122	156
Goods, raw materials, materials and services	-87,925	-82,002
Miscellaneous operating expenses	-10,268	-11,166
Labour costs	-23,321	-21,462
Depreciation and impairment of fixed assets	-7,135	-6,904
Other operating expenses	-43	-39
Operating profit	**36,209**	**44,399**
Financial income from long-term investments	300	157
Other financial income and expenditure	80	86
Profit before income tax	**36,589**	**44,642**
Income tax	-3,652	-3,883
Profit for the financial year	**32,937**	**40,759**
Revaluation of biological assets	-81,209	2,396,569
Accounting year profit (loss) with profit (loss) from the revaluation of biological assets	**-48,272**	**2,437,328**

AUDITOR'S REPORT

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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 2015, 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 2015. We expressed an unmodified audit opinion on those financial statements in our report dated 17 March 2016.

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 2015 are consistent, in all material respects, with those financial statements.

Laile Kaasik
Auditor's Certificate No. 511

Ree Teinberg
Auditor's Certificate No. 625

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11th May 2016

SELGE SÕNUM 2015

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The yearbook uses Arne Ader's
photos of different forest types.
See more at: www.loodusemees.ee

Photo of Aigar Kallas on p. 3: Kaupo Kikkas

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