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Forests of Russia and Climate Change

Status Report 2021

Air Pollution & Climate Secretariat

AirClim

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By: A.Yu. Grigoriev, A.P. Laletin, K.A. Pakhorukova, S.I. Zabelin

This analytical report provides information on the forests and forestry complex of Russia, the impact of climate change on them, and possible measures to combat these changes and enable adaptation. The material is intended for environmental activists involved in solving the problems of global climate change, preserving forests and specially protected natural areas, sustainable forest management, reforestation and afforestation. It should hopefully also be useful and informative for teachers, journalists, and the general public.

Cover illustration: Lars-Erik Håkansson (Lehån).

Layout: Sven Ängermark/Monoclick.

Language consultant: Malcolm Berry, Seven G Translations, UK.

Photos: Photos by Andrey Laletin on pages 6, 9, 16, 19, 24, 26, 35 and images from Unsplash on pages 12, 21, 28, 31.

ISBN: 978-91-984717-4-8

Published in Janury 2022 by the Air Pollution & Climate Secretariat (AirClim).

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The Secretariat is a joint venture between Friends of the Earth Sweden, Nature and Youth Sweden, the Swedish Society for Nature Conservation and the World Wide Fund for Nature Sweden.

The report is also available in pdf format at www.airclim.org.

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One of the most famous and distinguished environmental activist in Russia. For a long time he was the leader of the International Socio-Ecological Union. Awarded the prestigious international Goldman Prize. Currently he lives in a village in the Vladimir region, where, in addition to ongoing social activities, he is also engaged in various practical activities. Behind Svet in the photo we see a section of forest he planted 30 years ago.

Contents

Foreword

The analytical report "Forests of Russia and Climate Change" was prepared by members of the Campaign for the Conservation of Forests and Biodiversity of the Russian Social-Ecological Union: A.Yu. Grigoriev, A.P. Laletin, K.A. Pakhorukova and S.I. Zabelin.

The problems of preserving Russian forests, especially in the context of the intensifying changes in the global climate in recent decades, have attracted more and more attention both domestically and internationally. Changes that are already occurring in air temperature, an increase in the number of extreme weather events, the risk of forest fires, and early signs of the active destruction of permafrost can have a catastrophic effect on Russian forests, which make up 21% of all forests on the planet.

The residents of the European part of Russia will remember the grave negative consequences of forest and peat bog fires in 2010. Similar forest fire disasters regularly occur in Siberia and the Far East. In 2019, more than one million residents of the Krasnoyarsk and Irkutsk regions and neighbouring regions signed an electronic petition demanding that the authorities take emergency measures to combat forest fires.

In the event of a catastrophic scenario due to the impact of climate change on Russian forests in the coming decades, a carbon bomb scenario is possible, when, as a result of large-scale destruction of forests, huge additional amounts of carbon dioxide will be released into the atmosphere, increasing the greenhouse effect.

If timely and effective adaptation measures are taken and the area of plantations is increased, Russian forests can retain huge amounts of carbon in their biomass and soils and provide a powerful counteraction to anthropogenic greenhouse gas emissions.

Russia's ratification of the Paris Climate Agreement in 2019, and the adoption and initial implementation of the Green Deal in 2020 by the European Union contributed to a sharp intensification of the activities of Russian public authorities and businesses to preserve and enhance the climate-regulating role of Russian forests and their adaptation to climate change.

When compiling information sources for this report the authors strove to ensure their balance, correctness, and accuracy. Nevertheless, there are likely to be some individual factual errors and disagreements between assessments and conclusions. We are ready to make clarifications and additions, and to take part in discussions.

Sections 1, 2, 3, 4, 7, 8, 9 were written by A. Grigoriev and A. Laletin; sections 5 and 10 by A. Grigoriev, A. Laletin and K. Pakhorukova; and section 6 by A. Grigoriev, A. Laletin and S. Zabelin.

1. Russian forests and nature protection

Due to the inconsistency of world data on the state of forests, data from the United Nations Organization for Agriculture and Food (FAO) was used to show the role of Russia in world forestry. This organization has been preparing and publishing summaries of this kind of information for many decades (1.1).

According to FAO, the total forest area in the world is about 4 billion hectares. Of these, 45%, i.e. 1.8 billion hectares are tropical forests, 27% (about 1.1 billion hectares) are boreal taiga, while the rest are temperate and subtropical forests.

In terms of forest area among the countries of the world, Russia is in first place, with 815 million hectares (21% of all world forests). It is followed by Brazil, with 497 million hectares; Canada, with 347 million hectares; the USA, with 210 million hectares; and China, with 220 million hectares.

Unlike the rapidly destroyed tropical forests of Africa, Latin America and Southeast Asia, boreal forests (two-thirds of which are located in Russia) are stable in area. If we take into account the new forests that have arisen on abandoned agricultural land, but are so far ignored by the authorities, the area of forests in Russia is actually increasing. At the same time, a change in their species composition should be noted. As a result of forest fires, felling, the impact of diseases and pests, the areas of typical coniferous plantations (spruce and pine) are somewhat reduced, and these species are being replaced by secondary species – birch and aspen.

According to FAO estimates, about 700 million hectares of forests in the world officially have the status of protected natural areas of various kinds.

The area of intact forest territories in the world that have still not experienced significant anthropogenic impact, is about 1.1 billion hectares (i.e. slightly more than a quarter of all forests in the world).

According to FAO, the largest areas of intact forests are preserved in Russia – 255 million hectares, followed by Brazil – 216 million hectares, and in third place Canada – 205 million hectares. These FAO data are interesting in that within Russia, forest management authorities still shy away from identifying and recognizing the status of such forests.

When switching to the use of data from Russian forest statistics, one should be aware that a number of common indicators in this data may differ from the FAO estimates. The FAO sources allow for maximum global comparability of data.

The data from Russian forest statistics allow for a deeper and more detailed analysis. However, it should be borne in mind that for some indicators they have low reliability, and in certain cases (for example the impact of forest fires) are not at all connected with reality.

According to the latest published summary data from forest fund accounting (State Forest Register 2013 – as of 1 January 2014), the total land area of the State Forest Fund (SFF) of Russia amounted to 1,146 million hectares. (1.2).

At the same time, the area of forest land (on which forests can grow) amounted to 874 million hectares. The difference between these indicators is mainly in the swamps.

Of the total area of forest land (874 million hectares), 771 million hectares were covered with forest. The difference of 103 million hectares represents burned-out areas and areas of plantations that died due to other causes (not fires), open spaces, unclosed young stands, etc.

Forests also grow on land in specially protected natural areas, which are not part of forest fund land. Their total area is 26.6 million hectares, of which 16.7 million hectares are covered with forest.

Forest areas that are insignificant in comparison with the area of the State Forest Fund of the Russian Federation, also grow on defence and security land, settlements and other categories of land.

However, these official statistics ignore the presence of 30–50 million hectares of forests, which in recent decades have grown on currently unused agricultural land (for more details, see section 8).

Of the total 1,146 million hectares of SFF land, 287 million hectares (22%) are classified as protected forest land, of which 160 million hectares are covered with forest.

The largest protection categories in terms of area are desert, steppe, mountain, forest tundra and similar forest land, covering an area of 136 million hectares, of which 49 million hectares are covered with forest.

The next category of protection in terms of area is spawning forests, allocated along rivers, in which valuable species of fish spawn. The area of these forests is 56.9 million hectares, of which 44.0 million hectares are covered with forest. In recent years, conservation organizations have fought against plans to weaken the protective regime of these forests and create more favourable conditions for logging.

The third category of protection in terms of area is water protection forests, with a total area of 28.0 million hectares, of which 23.0 million hectares are covered with forest.

Anti-erosion forests occupy 14.6 million hectares (of which 9.9 million hectares are forested) and green areas of populated cities and forest parks occupy 13.7 million hectares (of which 12.2 million hectares are forested). An interesting feature of Russia is the category of protected walnut zones – these are cedar forests used by the local population to collect walnuts and are traditionally protected. These zones cover an area of 10.3 million hectares (9.4 million hectares of which are forested).

Another classification of forest, in addition to protective forest, is production forest. Their total area is 598 million hectares, of which 440 million hectares are covered with forest. They are mainly used for industrial logging. However, it should be borne in mind that only about half of these forests are leased. The remaining half of these commercial forests are unattractive for logging, which is explained by the lack of transport infrastructure and population, low forest productivity, very difficult natural conditions, etc.

Reserve forests have also been designated to cover an area of 270 million hectares, of which 170 million hectares are covered with forest. According to the Forestry Code, these are forests in which there are no plans to harvest timber in the next 20 years, with the exception of felling for the needs of the local population.

A significant part of non-leased production forests and reserve forests are intact forests. Obviously, with a few exceptions, these hitherto undeveloped forest areas are not of interest to the timber industry. In recent years, public environmental organizations have proposed giving these forests the status of the National Forest Heritage of Russia and making their conservation a priority, which is becoming increasingly important in connection with the problem of climate change (1.3).

Russia has a highly developed and complex network of specially protected natural areas (PAs).

At the top level there are federal protected areas, of which the most valuable in nature are 108 nature reserves covering an area of 33.6 million hectares. These are wilderness areas with a strict regime, very limited access, mainly for conservation and scientific research purposes.

63 national parks cover an area of 26.6 million hectares. Their main purpose is the development of nature tourism. The best-preserved and naturally valuable parts of the national parks may have a regime similar to that of a nature reserve.

The system of protected areas at the federal level is supplemented by more than 10,000 protected areas at the regional level covering a total area of 117.5 million hectares. The regime for their protection and restrictions on nature management are much weaker than those for protected areas of the federal level. However, this status can significantly affect the development and implementation of regional and local development plans, the implementation of industrial projects, etc.

Within the territory of Russia, as of 1994, there were 35 Ramsar wetlands with a total area of 10.3 million hectares. 60% of these territories had the status of protected areas at various levels, which ensured their status as protected natural objects (1.4).

Literature

1. 1. Global Forest Assessment 2020. Main Report, FAO, http://www.fao.org/3/ca9825en/ca9825en.pdf

1.2. State Forest Register 2013 (as of 1 January 2014), Ministry of Natural Resources-Rosleskhoz, 2014. Source: Forest Forum.

1.3. D. Aksenov et al. Conceptual approaches to the creation of the national forest heritage of the Russian Federation. Sustainable forest management, 2015, No. 3. https://wwf.ru/upload/iblock/20f/01-_4_.pdf

1.4. State report on the state and protection of the environment in the Russian Federation in 2019 by the Ministry of Natural Resources, 2020. https://www.mnr.gov.ru/docs/gosudarstvennye_doklady/proekt_gosudarstvennogo_doklada_o_sostoyanii_i_ob_okhrane_okruzhayushchey_sredy_rossiyskoy_federat2019/

2. Forest and environmental legislation

The main laws governing nature protection and forest management in Russia are the laws "On Environmental Protection" (2002), "On Environmental Expertise" (1995), "Law on Specially Protected Natural Areas" (1995), and the Forest Code (2006).

The peculiarity of forestry legislation is its redundancy and low quality. This entails the need for constant amendments, sometimes of fundamental importance, which creates a situation of legislative chaos. Unfortunately, environmental legislation has also suffered from constant changes in recent years, mainly aimed at weakening its requirements.

In addition to laws, there is a huge number of bylaws developed and approved by the executive authorities, which brings additional chaos to the Russian legislative and regulatory framework in the field of forest management and use and nature protection.

The current version of Federal Law No. 7-FZ "On Environmental Protection" was adopted on 10 January 2002, and since then more than 50 amendments have been made to it.

The law includes more than 80 articles defining state policy in the field of environmental protection, nature conservation, biological diversity, natural resources, and environmental safety.

An interesting feature of the law is the absence of articles on climate change and the need to adapt to these changes.

The law includes a separate chapter "Rights and obligations of citizens, public associations and non-profit organizations in the field of environmental protection", which contains three articles [2.1].

Federal Law No. 174-FZ "On Ecological Expertise" was adopted on 23 November 1995 and includes about 35 articles. Since its adoption, more than 45 amendments have been made to the law.

The law contains a separate chapter "Rights of citizens and public organizations (associations) in the field of environmental expertise, public environmental expertise", which includes 7 articles. Potentially, this law could become very important for regulating the use of forests. Attempts by environmental organizations in the 1990s and early 2000s to introduce the requirement for environmental assessments of forest management plans were ultimately unsuccessful. Since the beginning of 2000 there has been a decline in state support for ecological research.

Nevertheless, although the list of objects subject to environmental impact assessment has been significantly reduced in recent years, it is one of the few remaining mechanisms for obtaining information about projects that may have an impact on the environment, ensuring citizen participation in the discussion of these impacts.

In this regard, legislative bodies regularly make attempts under various pretexts to cancel or weaken the requirements for environmental impact assessment for a large number of objects. Such attempts were made in early 2020 in connection with the coronavirus pandemic, in the summer of 2020 in connection with construction plans in the Baikal-Amur Mainline zone, in February 2021 in connection with the need to drill for oil on the Arctic shelf, and so on [2.2].

Federal Law No. 33-FZ "On Specially Protected Natural Areas" was adopted on 14 March 1995 and includes about 40 articles. Since its adoption, more than 45 amendments have been made to it.

It contains a separate article devoted to the participation of citizens, as well as public associations and non-profit organizations operating in the field of environmental protection, in the organization, protection and use of specially protected natural areas [2.3].

Federal Law No. 200-FZ "Forest Code of the Russian Federation" was adopted on 4 December 2006 and includes more than 120 articles [2.4]. Since its adoption, 53 amendments have already been made to it, and the adoption of subsequent amendments is being prepared. The remnants of the original text make up less than 20% of the current text [2.5].

To implement this law, the executive authorities have developed a large number of bylaws, which in turn have to be constantly amended in connection with the ongoing changes in the Forest Code.

Unlike the laws mentioned above, the Forest Code does not contain a separate article defining the rights of citizens and public organizations to participate in forest management, although a separate chapter was devoted to this in the previous version of the Forestry Law.

The law also lacks any articles on the impact of climate change on forests and the need to adapt to it.

Literature:

2.1. Federal Law No. 7-FZ "On Environmental Protection" dated 10 January 2002. http://www.consultant.ru/document/cons_doc_LAW_34823/

2.2. Federal Law No. 174-FZ "On Environmental Expertise" dated 23 November 1995 http://www.consultant.ru/document/cons_doc_LAW_8515/

2.3. Federal Law No. 33-FZ "On Specially Protected Natural Areas" dated 14 March 1995 http://www.consultant.ru/document/cons_doc_LAW_6072/

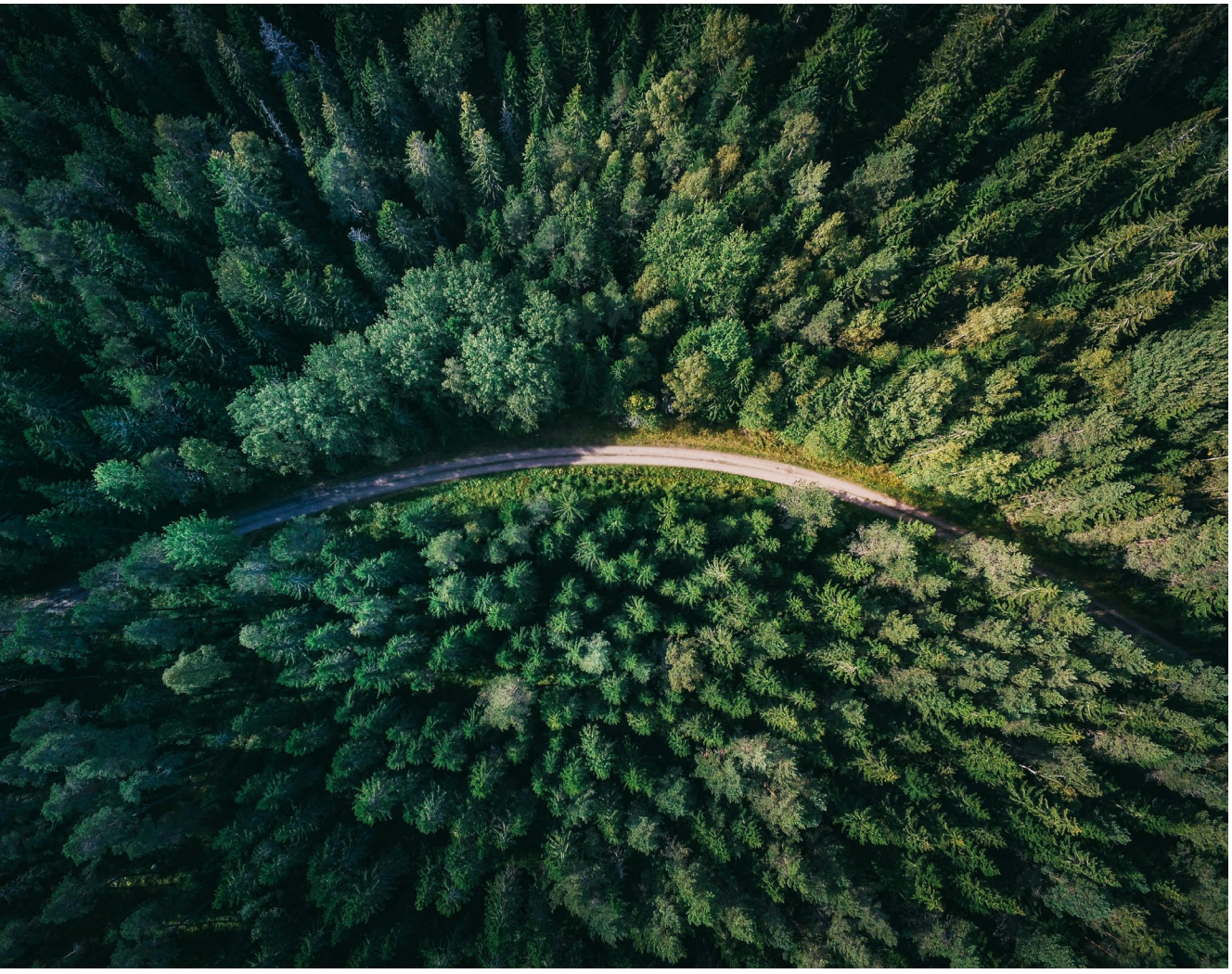
2.4. Federal Law No. 200-FZ "Forest Code of the Russian Federation" dated 4 December 2006 http://www.consultant.ru/document/cons_doc_LAW_64299/

2.5. Brief quantitative results of the decade of legal chaos in the Russian forestry. Greenpeace Forest Forum, 25.12. Source: Forest Forum.

3. The system of state forest management in Russia

Officially, almost all of the country's forests were state-owned. This property was managed by a system of state forest management bodies.

During the Soviet era, in the territory of Russia, this system had three levels: the Ministry of Forestry of the Russian Federation, the regional Forest Management Departments, and the forestry enterprises (leskhozes). Leskhozes, in addition to carrying out forestry work, were also engaged in forest felling, which provided a significant supplement to the insufficient budgetary support for forestry work. However, this integrated forest management has been criticized, since the leskhozes exercised management and control over forests while also carrying out forest use, including logging, which created a conflict of interest.



With the beginning of market reforms, the forest management system was also reformed. It currently consists of five levels, with forestry contractors making up a sixth level: The Ministry of Natural Resources, the Federal Forest Service (Rosleskhoz), Rosleskhoz' departments in federal districts, forest management bodies in the regions, local forestry enterprises (lesnichestva), and the contractors who perform forestry work.

The system of forest management bodies, with rare exceptions, does not carry out logging work itself, but hires contractors for this. As a result, the forestry complex became fragmented between numerous, sometimes frequently changing contractors, and the management system became cumbersome, highly bureaucratic and ineffective.

Since 2010, Greenpeace Forest Forum regularly conducts surveys of participants who have a professional background in the forestry complex. They are attended by 250–350 people.

In 2020, the question: "How much of your time does 'paperwork' require?" gave the following distribution of answers: less than 50% of my time – 11% of respondents; 51–70% of my time – 18%; 71–100% of my time – 71% of respondents.

To the question: "What proportion of this 'paperwork' makes sense?" 63% of respondents indicated less than 30%; 25% felt that 40–50% of it made sense, and only 12% responded that more than 60% made sense.

Thus, according to the respondents, the majority of forestry workers are mainly engaged in paperwork that has little meaning.

After the next change of leadership at Rosleskhoz, the Forest Forum also conducted polls with a request to evaluate the results of the directors' activities.

	Years worked by director			
Evaluation of results (% of the number of respondents)	2004–2008	2008–2010	2010–2013	2014–2019
Forestry flourished	6	2	5	6
No significant changes	10	6	24	22
Decline, but the role of the director of Rosleskhoz was not decisive in this	46	50	46	40
Director of Rosleskhoz played a decisive role in decline	39	41	24	31

The table shows the results of assessments (%) of the total number of respondents (350 to 650 people) regarding the performance of four managers who were in charge of Rosleskhoz for more than one year.

Beginning in 2004, just 2–6% of survey respondents felt that the work of the directors of the Federal Forestry Agency had led to the flourishing of forestry. During the same period, 70–91% of respondents believed that forestry had declined.

A survey conducted in December 2020, which asked: "When will Russian forestry move from decline to restoration and improvement?" gave the following results: "in the next two years" – 5%; "within 3-10 years" – 26%; and "in 15 years or more " – 73% (3.1).

Despite the fact that these polls have been carried out annually for more than 10 years, and these problems have been repeatedly raised by public environmen-

tal organizations before the leadership of the Federal Forestry Agency and the Ministry of Natural Resources, the problems of excessive bureaucracy in the forestry complex have not been resolved.

The so-called "Regulatory Guillotine" that was carried out in 2019–2020 to update the regulatory framework and abolish some outdated rules and requirements gave dubious results, and clearly did not correct the flaws in the system.

In response, in 2021 the authorities stepped up the digitalization of documentation. The volume of information is enormous, including 3.5 million declarations of timber transactions, 9.8 million title and reporting documents, 206,000 lease agreements and 4.1 million contracts for the sale and purchase of forest plantations, 4.8 million answers about use of forests, 657,000 forest declarations and 40,000 government contracts. And this is just a part of the available documents. There are serious doubts that simply translating the information into digital form, without radically restructuring the forest management system and, most importantly, getting rid of bureaucracy, will yield positive results.

Some optimism can be found in the fact that the deputy head of Rosleskhoz in charge of this area considers it important to digitize Russia's forestry not only for officials, but also for the public, and in his previous work he has shown support for opening up access to information on forestry and establishing constructive relations with the population (3.2, 3. 3).

Literature:

3.1. Forest Forum of Greenpeace Russia. Survey results section. Source: Forest Forum.

3.2. Rosleskhoz: digitalization of forestry will take four years. 28 August 2020. Source: http://rosleshoz.gov

3.3. Press centre of Rosleskhoz, "The President of Russia signed the federal law on digital transformation of the forestry complex", 02 April 2021. Source: http://rosleshoz.gov

4. Timber industry in Russia

Having the largest area of forest in the world, according to FAO, in 2018, Russia ranked second in the world in logging (10% of global output), and third in the production of sawn timber (9% of global output) and wood-based panels (5% of global output).

However, in terms of the production of cellulose, Russia only takes eighth place in the world (4% of output), and with 0.9% of the global output of paper and cardboard it is not even among the ten leading manufacturers of these products (4.1,4. 2, 4.3).

The relatively low level of consumption of forest products within the country allows a significant part of it to be exported. Thanks to this, in 2019, Russia provided 11% of the world trade in roundwood, 22% in lumber, 6% in wood-based panels and plywood, 3.5% in cellulose, and 3.0% in paper and cardboard. Of the total sales volume of forest products on the global market, Russia accounts for about 5% (4.3,4.4).

The forestry complex accounts for a small share of the country's GDP, amounting to about 0.7%. The relatively significant level of timber exports, on average about $12 billion per year, accounts for only about 3% of this total volume, which in recent years has consistently exceeded $400 billion per year, mainly due to the sale of hydrocarbons and other raw materials.

Nevertheless, in some regions of Russia the forestry complex plays a significant role in the local economy and employment. In the European part, these are the Arkhangelsk, Vologda, Leningrad and Perm regions, the Republics of Karelia and Komi. In Siberia and the Far East, they comprise the Irkutsk, Krasnoyarsk and Khabarovsk regions.

Harvesting of wood, production of lumber.

After the start of market reforms, as a result of which the timber industry was completely privatized, initially in the 1990s, the volume of logging decreased by a factor of 3–4 compared to that achieved in the USSR. However, the logging industry gradually stabilized and began to increase the logging output, which is currently stable at the level of 200–220 million cubic metres per year.

Due to the relatively small investments needed to organize the production of sawn timber this industry has developed very actively. Over the past 20 years, the production of sawn timber in Russia has more than doubled. Thousands of private companies are engaged in production, from the smallest to large modern industries. The total volume of Russian sawn timber production, according to various estimates, ranges from 30 to 40 million cubic metres per year (discrepancies are apparently caused by incomplete statistical reporting) (4.4,4.5,4.6).

Manufacture of wood-based panels and plywood.

Only a few dozen private companies operate in this sector, as establishing production requires significant investments. Since the mid-1990s plywood production has tripled in volume, and currently exceeds 4 million cubic metres per year. During this period the production of wood-based panels increased at an even higher rate, more than six-fold, and reached 10 million cubic metres per year. This has made it possible to use a significant amount of low-value wood, which could not be sold previously (4.4,4.5,4.6).

Manufacture of pulp, paper and cardboard.

The production of these products is controlled by a small number of private companies. Russian pulp and paper industries are fully integrated into the global market and operate on market conditions. The largest Russian pulp and paper company, Ilim Pulp, is a joint venture with the American company International Paper. The second-largest company in the sector, Syktyvkar Pulp and Paper Mill, is part of the large Mondi Group. There are also large pulp and paper mills owned by Russian industrial groups, such as Segezha Group, part of AFK Sistema.

Since the drop in the volume of cellulose production from 8 million tons per year under the USSR to 3 million tons in the mid-1990s, it has now recovered again to the level of 7–8 million tons per year. A similarly dynamic change in production volumes can be seen in the output of paper and cardboard (8–9 million tons per year in the USSR, then a drop to 3–4 million tons per year in the 1990s, rising to 8–9 million tons of paper and cardboard per year today (4,5,6).

All this was achieved through the reconstruction of existing enterprises, which pay significant attention to the social and environmental aspects of forest management and logging and are mainly certified according to the FSC system. At the same time, serious problems remain with the environmental consequences of the activities of these enterprises (discharges of pollutants into the water, the use of chlorine compounds for bleaching, etc.).

Swedish and Finnish forestry companies, which became active in the Russian forestry sector in the 1990s, now have relatively small capacities in the production of roundwood, sawn timber, sanitary products and packaging.

Despite active discussion of this topic in the media, large well-known Chinese pulp and paper companies do not have significant production facilities in Russia. At the same time, China is the largest buyer of Russian timber products, including pulp and paper products, in other words Russian companies mostly work for the Chinese market.

In February 2021, the Government adopted a new "Strategy for the development of the forestry complex until 2030", which declared much more realistic output forecasts for forest products, compared to the previous Strategy until 2020, which was adopted in 2007 and has mostly not been implemented.

This time around, logging volume is forecast to grow from 219 million cubic metres in 2019 to 231–286 million cubic metres in 2030. Lumber production is expected to increase from 45 million cubic metres to 62–66 million cubic metres; wood-based panels from 9 million cubic metres to 9.5–11.1 million cubic metres; and paper from 9.2 million tons to 11.7 million tons per year.

Among highly processed products in the optimistic scenario, a significant increase in pulp production is predicted – from 8.2 million tons at present to 14.0 million tons. At the same time the Strategy recognizes that the investment climate in Russia is not conducive to implementation of such projects, which are very costly for the timber industry (6). It should be borne in mind that, despite regularly announced intentions, not a single large pulp mill has been built in Russia over the past 30 years.

Literature

4.1. FAO «Forest product consumption and production» http://www.fao.org/forestry/statistics/80938@180723/en/

4.2.FAO Global Forest Products – Fact and Figures 2018, FAO – 2019. http://www.fao.org/3/ca7415en/ca7415en.pdf

4.3. Measures of state support for the timber industry complex in Russia. Ministry of Industry and Trade, 2020.
https://programlesprom.ru/mery-gosudarstvennoi-podderzhki-lpk-rossii/

4.4. FAO «Global production and trade in forest products in 2019» http://www.fao.org/forestry/statistics/80938/en/

4.5. Timber industry of Russia in 2019: production results. "Proderevo" portal, 6 February 2020.
https://proderevo.net/analytics/main-analytics/lpk-rossii-v-2019-godu-itogi-proizvodstva.html

4.6. Strategy for the development of the forestry complex until 2030. 02/11/2021. Portal of the Government of the Russian Federation.
http://government.ru/news/41539/

5. History of forest conservation in Russia

The history of state measures to preserve forests in Russia begins in the Middle Ages. As in Europe, hunting grounds became some of the first protected forests. One example is the largest forest to the north-east of Moscow – Losiny Ostrov National Park. It survived due to the fact that in the 17th century it was the royal hunting grounds for game such as elk [5.1].

However, unlike Europe, a powerful system of protected forests was created in Russia in the 15th–17th centuries, in addition to hunting grounds. These were used to protect against raids by steppe nomads and are known as the serif forests. A system of fortifications was built, separated by forest blockades that made it difficult for cavalry to pass. The felling of such forests and even movement outside the officially permitted paths was strictly prohibited.

The first line of these defensive serif forests is located 150–200 kilometres south of Moscow, but gradually it shifted south. The total length of these defensive, protected forests, which were 3–5 kilometres wide, reached 4000 kilometres.

A number of sections of these defensive forests have survived to this day, and are now reserves (Bryansk Forest, Kaluzhsky Zaseki) and a national park – Ugra.

Russian environmental organizations, including the Social-Ecological Union, were actively involved in the debate on pristine forests in the 1990s. Conservation of these unique natural and historical sites is actively covered in the work of reserves, national parks and museums [5.2, 5.3, 5.4, 5.5].

During the rule of Peter the Great in the early 18th century, ship groves and, in particular, oak forests growing along the rivers were taken under strict state protection for the construction of the naval fleet. Regular forest protection was established there. During this period more than 100 decrees and orders were issued concerning forests.

In 1798, during an inspection trip, Emperor Paul 1 was informed about the barbaric destruction of state forests. As a result, a unified Forestry Department was established to administer forests. In 1802, the "Charter on Forests" was adopted.

In 1888, when deforestation sharply intensified following the abolition of serfdom, the Forest Protection Law was adopted. This began to regulate the use of forests by private forest owners. At the same time, the importance of forests for preventing droughts and soil erosion was realized, and work began on their restoration, especially on sandy soil, as well as in the steppe and forest-steppe zones [5.6].

After the revolutions of 1917, all forests in Russia were nationalized. During the civil war the management system collapsed and logging could no longer be controlled by the state.

At the same time, the new authorities understood the need to regulate the use of forests, and in 1918 the "Decree on Forests" was adopted. This is a very extensive law (120 articles), which regulates in detail the creation, conservation and use of protective forests, which were created to protect soils, agriculture and popu-

lated areas: to "preserve the influence of forests on the climate" (as stated in the original text!), protect rivers, strengthen sandy soils and ravines, protect natural monuments, solve aesthetic and cultural problems, etc. Obviously, at the time of its adoption, this decree was more in the nature of a declaration and could not be implemented in most of the territory of Russia due to the absence of Soviet power there [5.7].

After the end of the civil war, the state forest management system was gradually strengthened. Despite the priority given to industrial logging, some of which was carried out by prisoners in labour camps, measures were taken to preserve forests.

In 1936, water protection zones up to 20 kilometres wide were established along the main rivers and their tributaries, in which deforestation was prohibited or sharply limited. These forests, covering a total area of 75 million hectares (15% of all forests in the country) were transferred to the Main Department of Forest Protection and Plantations.

The Second World War caused a sharp increase in the felling of forests, which were used both as a source of timber for industrial purposes and for heating. The volume of logging in some places was dozens of times higher than the allowable cut. However, the negative consequences of this felling became so acute that in April 1943, at the peak of hostilities, the division of forests into groups 1, 2 and 3 was introduced according to their functional purpose, and this is still one of the foundations of the Russian forest management system today [5.8].

The first group included forests, the main purpose of which is to perform water protection, protective, health-improving and other similar functions, forests of specially protected natural areas that perform conservation and protective functions, field protection, located around settlements, etc. Felling was only permitted for the maintenance of forests and their restoration.

The forests in the second group included those in areas with a high population density, which also perform protective and conservation functions, in regions with insufficient forest resources. In these forests, felling was limited and regulated.

The forests in the third group included forests of multi-forest areas, mainly intended for logging.

In the 30 years since the start of market reforms, non-governmental environmental organizations (NGOs) have begun to play an important role in forest conservation.

Their activities do not allow the authorities to dismantle the forest conservation system by refusing to divide them into three groups, or to weaken their restrictive functions. NGOs actively demand recognition of the need to stop logging and the development of old-growth intact forests.

Timber companies are also involved in this activity, thanks to certification by the Forest Stewardship Council. As of early 2020, out of 49 million hectares of certified forests, 1 million hectares of high conservation value forests were completely excluded from forest use, and on an additional 9 million hectares, companies assumed voluntary restrictions on deforestation [5.9].

Literature:

5.1. The site of Losiny Ostrov National Park, the History of the Park section. https://losinyiostrov.ru/about/history

5.2. Ponomarenko et al. The Green Wall of Russia: A Bridge from the Past to the Future, Prirody No. 6, 1993. https://www.researchgate.net/publication/322147316_Ponomarenko_EV_Ponomarenko_SV_Ofman_GU_Havkin_VP_Zelenaa_stena_Rossii_most_iz_proslogo_v_budusee_Priroda_No6_1992_s84-94

5.3. V. Zakharov. Green wall of Russia. Vesti SoES No. 1 (20) 2002. http://www.seu.ru/vesti/2002-01/34.htm

5.4. Site of the museum "Tula Kremlin", section "The large line". https://xn--e1afdcccfh8afjm2jj.xn--p1ai/large-serif-line/

5.5. Kozelskie Zaseki website. http://kozelskie-zaseki.narod.ru/

5.6. A.I.Pisarenko, V.V. Strakhov. Forestry of Russia – from use to management, publishing house "Jurisprudence" 2004. https://www.booksite.ru/fulltext/les/noy/eho/zya/yst/vo/index.htm

5.7. Decree on forests. Adopted by the Central Executive Committee on 27 May 1918. http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=ESU&n=9898#06361656682121959

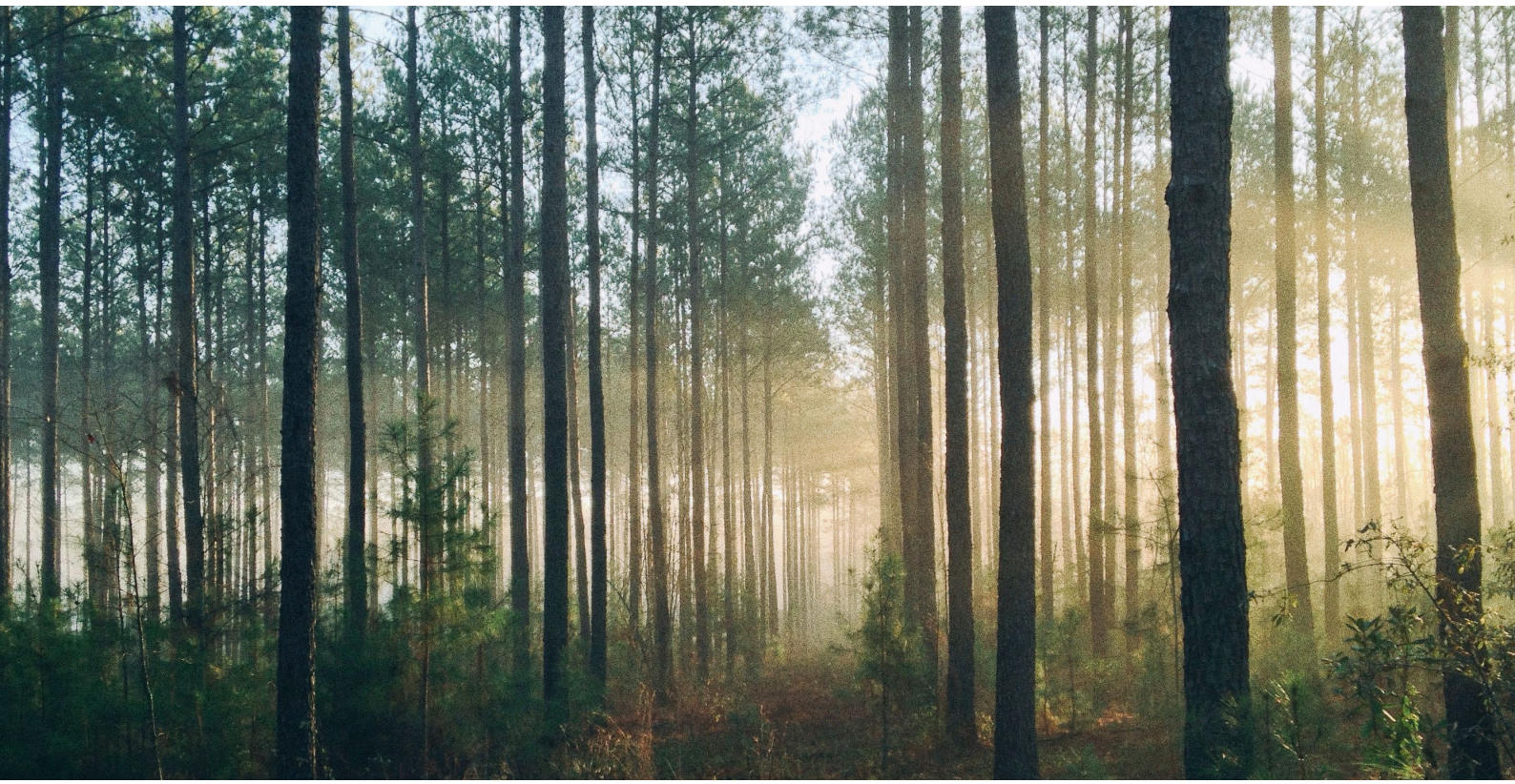
5.8. Resolution of the Council of People's Commissars of the USSR No. 430 of 04/23/1943 "On the Procedure for Allocating Cutting Areas in the Forests of the State Fund of the USSR and on the Cutting Fund for 1943". http://base.garant.ru/58051634/#block_11

5.9. Strategic plan for the development of FSC in Russia until May 2022. Sustainable Forestry # 1 (60), 2020. https://wwf.ru/upload/iblock/087/07.pdf

6. Public environmental organizations and movements

The movement of student nature protection teams ("Druzhinas").

Under the USSR, the All-Russian Society for Nature Conservation (VOOP in Russian) was the official structure organizing public activities in the field of nature protection. Youth activity was controlled by the Komsomol (All-Union Leninist Communist Youth Union – VLKSM in Russian). Independent activity that did not receive the support of these structures was not approved, and sometimes even suppressed.



However, some liberalization in the mid-1950s provided opportunities for the emergence of independent public activity in the field of environmental protection. This developed in the form of Student Nature Conservation Druzhinas. The first of these teams appeared between 1958 and the 1960s in the university cities of Tartu (Estonia), Moscow and Kazan.

Members of student druzhinas managed to maintain their organizational independence, manoeuvring between officials from the VOOP, VLKSM and various departments. The movement actively fought against poaching, protected rare and endangered species, especially primroses, conducted environmental education, and contributed to the development of specially protected natural areas.

At its peak in the 1980s, 120 druzhinas operated in the USSR, including 70

in Russia. They united several thousand people on the principles of network self-organization, distinguished not only by extensive social activity, but also receiving high-quality professional education and training in the fields of biology, game management, education, etc. (6.1, 6.2).

In the late 1980s, the movement and the specialists who left it took an active part in perestroika, including the public discussion of such problems as the transfer of water from north to south, land melioration, etc.

International Social Ecological Union (MSEU)

In December 1988, activists of the druzhinas movement registered one of the first independent public environmental organizations in the territory of the USSR – the International Social Ecological Union (MSEU) – which was active in the 1990s and 2000s.

The MSEU's Forest Programme actively participated in the work of the international Taiga Rescue Network, dealt with issues of preserving intact forests, increasing the social and environmental responsibility of logging, mining, oil and gas companies, and actively working with the Federal Forest Service. However, the activities of the MSEU began to decline due to a number of reasons, and in 2017, following a court decision, the MSEU was shut down as a legal entity. Currently, MSEU continues to act as an expert and educational community, uniting several hundred participants from more than 20 countries around the world.

Russian Social Ecological Union (RSEU)

In October 1991, the Russian Social Ecological Union (RSEU) was established, largely by the same activists who created the MSEU. Unlike MSEU, it managed to survive as a legal entity and to integrate into international non-governmental environmental movements. Since 2016 RSEU has been a member of the international organization Friends of the Earth. Despite the unfavourable environment for independent public activity and the denouncement of a large number of local public organizations that belonged to the RSEU as "foreign agents" (generally followed by their liquidation), RSEU activists continue to actively work on both traditional forest issues (forestry and forest management, peri-urban and urban forests) and on emerging forest-related topics such as mining, oil and gas, the impact of climate change and the need to adapt to these changes. Internationally, forest activists of the RSEU actively cooperate with the Global Forest Coalition (6.3).

Greenpeace

Greenpeace has been operating in Russia since 1989. In 1992, the Greenpeace office in Russia was established. From the very beginning, a powerful forestry department was formed within it, which was engaged and continues to be engaged in the organization of forestry, forest fire prevention, openness and reliability of information, specially protected natural areas, legislative and regulatory

frameworks, and so on. Its leader was originally a member of the movement of student druzhinas.

Greenpeace Russia has become the driving force behind the organization in Russia of natural sites included in the UNESCO World Heritage List, which includes the virgin forests of Komi, Lake Baikal and a number of others. This status has significantly helped in the protection of these unique natural sites from attempts to implement a number of environmentally destructive industrial projects.

The Greenpeace team of experts working on the problem of wildfires is highly respected by both federal and regional authorities and the local population. Its activities have contributed to the achievement of significant results in the fight against grassland burning and peat fires.

In more than 10 regions of Russia, a public programme of reforestation and environmental education is being actively implemented among rural schools.

The Greenpeace Forest Forum is the most authoritative platform on which professionals and the public in Russia discuss the acute problems of Russian forestry. The materials from this forum are used in thousands of media publications every year (6.4, 6.5).

The World Wide Fund for Nature (WWF)

The World Wide Fund for Nature (WWF) began implementing environmental projects in the territory of the USSR in 1988. A WWF office was opened in Russia in 1994, the director of which is a well-known activist from the student movement of nature conservation druzhinas.

From the very beginning WWF Russia has actively worked on issues such as the creation and support of specially protected natural areas, the allocation of high-conservation-value forests, the greening of forestry and the forest industry, the development of environmental certification under the Forest Stewardship Council (FSC) system, and publications on forest topics, including the quarterly magazine "Sustainable Forest Use", published since 2003.

For many years, the representative of WWF Russia was the co-chairman of the Public Council at Rosleskhoz, which contributed to the active work of this body (6.6,6.7).

The All-Russian public movement "People's Front" for Russia" (ONF)

The all-Russian public movement "People's Front" for Russia" (ONF) was created in 2011 on the initiative of Vladimir Putin, who is the leader of this organization. One of the goals of the ONF is to care for the environment. From the very beginning, forest problems were one of the most important and active areas of the all-Russian People's Front. The membership of ONF is estimated at 100,000 people and about 25,000 experts.

In recent years, collaboration between the Department of Youth Projects of the ONF and Rosleskhoz has reached an especially large scale within the framework of the all-Russian "Save the Forest" campaign, which works to plant forests in response to the disastrous forest fires of 2019 in Siberia and the Far East. It is carried out within the framework of the national "Ecology" project. In 2020, its membership reached 1 million people, who planted 42 million trees throughout the country.

In addition, young members of the ONF helped to extinguish forest fires and natural fires in the Trans-Baikal Territory, Irkutsk and Rostov Regions (6.8, 6.9).

Literature.

6.1. A.Yu. Yaroshenko. The nature conservation squad of the Biological Faculty of Moscow State University is 60 years old. 13 December 2020. Greenpeace Forest Forum. Source: Forest Forum.

6.2. V. Larin, R. Mnatsakian, I. Chestin, E. Schwartz. Nature Conservation in Russia: from Gorbachev to Putin. Moscow, 2003. https://wwf.ru/resources/publications/booklets/okhrana-prirody-rossii-ot-gorbacheva-do-putina/

6.3. The website of the Russian Social and Ecological Union. https://rusecounion.ru/ru/node

6.4. Sections of the Greenpeace website. https://greenpeace.ru/projects/lesa-i-osobo-ohranjaemye-prirodnye-territorii/ https://greenpeace.ru/projects/pozhary-na-prirodnyh-territorijah/

6.5. Greenpeace Forest Forum. Source: Forest Forum.

6.6. Forest section of the WWF Russia website https://wwf.ru/what-we-do/forests/

6.7. Section of the journal "Sustainable Forest Management" on the website of WWF Russia. https://wwf.ru/resources/publications/periodicals/zhurnal-ustoychivoe-lesopolzovanie/

6.8. ONF website. https://onf.ru/

6.9. Publication on the website of the Ministry of Natural Resources of the Russian Federation "Rosleskhoz and Molodezhka ONF: ecological culture in action", 24 December 2020. https://onf.ru/2020/11/18/molodezhka-onf-podpisala-soglashenie-o-sotrudnichestve-s-federalnym-agentstvom-lesnogo/

7. The problem of the impact of climate change on Russian forests

In the first assessment report of 2008, the issue of the impact of climate change on forests was not considered separately, but it was mentioned in connection with the displacement of natural zones to the north and an increase in the risk of forest fires (7.1).

The second assessment report, published in 2014, already included chapter 6.8. "Forestry". It considered climate as a factor in forest productivity, the impact of climate change on forests due to extreme weather events (windblows, droughts), an increase in the risk of outbreaks of pest reproduction and the development of diseases. Particular attention was paid to the growing risk of forest fires – schematic maps of the increased risk of fire in forests under various scenarios of climate change were included. In order to adapt forests to climate change, general recommendations were given for the creation of mixed plantations, improvements in forecasting methods and elimination of the foci of diseases and reproduction of pests, etc. (7.2).

The report "On Climate Risks in the Territory of the Russian Federation", published in 2017 by Roshydromet, also contains section 3.5. "Forestry", but in terms of content and detail it did not differ from the information in the Second Assessment Report (7.3).

The preparation and publication of the Third Assessment Report, in which you can expect more detailed and relevant materials on the impact of climate change on Russian forests, is planned for 2022.

One of the most complete and up-to-date works on the impact of climate change in Russian forests is the monograph "Russian forests and climate change" (EFI, 2020) published in December 2020 by the European Forest Institute. Leading Russian experts in this field participated.

It examines the results of modelling achieved so far, as well as the remaining fundamental uncertainties in maintaining the stability of Russian forests, the impact of extreme weather events, the possible beginning of the destruction of permafrost, and the problem of the stability of tree plantations in the southern part of the forest zone (7.4).

In the annually published State reports on the state and protection of the environment in the Russian Federation, there are sections on the climatic conditions for the year, which show the results of the ongoing global changes, as well as very brief sections on the state of forests. However, they are not related to each other. No analysis of the possible relationship between annual climatic conditions and the state of forests is carried out (7.5).

In the strategic documents on forest planning until 2018, there were no specific activities related to the problem of the impact of climate change on forests.

In mid-2018, unexpectedly, during the preparation of new ten-year forest plans for the constituent entities of the Russian Federation, the Ministry of Natural

Resources sent a request to include sections on adaptation to climate change in this document. Recommendations for the development of these sections contained the first official list of possible risks (7.6). However, due to the unpreparedness of the developers, this section was developed formally (7.7).

However, the actions of the authorities in this direction continued.

In 2019, by order of the government of the Russian Federation, the National Plan for Adaptation to Climate Change was approved, under which the Federal executive authorities (including the Ministry of Natural Resources and Rosleskhoz) must develop and approve sectoral plans for adaptation to climate change and post them on the Internet by 30 September 2021. The authorities in the constituent entities of the Russian Federation were recommended to organize work on adaptation to climate change and to approve regional adaptation plans by 10 May 2022 (7.8).

The "Strategy for the development of the forestry complex until 2030", adopted in February 2021, contains a separate section 6 "Climate Policy", which emphasizes the need to conserve forests and use forestry activities for carbon absorption, primarily through combatting deforestation through reforestation and afforestation. Climate risk assessment should be carried out, and sectoral plans for adaptation to climate change should be developed and implemented, etc. (7.9).

Russian non-governmental environmental organizations are actively discussing the impact of climate change on Russian forests and the need for adaptation.

In 2018, WWF, with the participation of RSEU, held a series of Russian-Swedish-Finnish seminars, at which, taking into account the experience of Sweden and Finland, the problem of the impact of climate change on the forests of the north-west of the European part of Russia – in the Republics of Komi and Karelia and in the Arkhangelsk region – was discussed (7.7).

Work on this subject continued with a course of lectures and seminars on the topic of climate change prepared by WWF Russia in 2020 within the frame-

work of the Russian-German project. In addition to general information, we considered in more detail climate changes and their impact on the situation in a number of Russian regions, including such important forest and timber-processing regions as the Arkhangelsk and Primorsky regions (7.10).

Literature:

7.1. First Assessment Report on Climate Change and its Consequences on the Territory of the Russian Federation, v.2. Consequences of Climate Change, Roshydromet, 2008.
http://climate2008.igce.ru/v2008/htm/2.htm

7.2. Second Assessment Report on Climate Change and its Consequences on the Territory of the Russian Federation, Roshydromet, 2014.
https://cc.voeikovmgo.ru/images/dokumenty/2016/od2/od2full.pdf

7.3. Report on Climate Risks in the Territory of the Russian Federation, Roshydromet, 2017.
https://cc.voeikovmgo.ru/images/dokumenty/2017/riski.pdf

7.4. Russian forests and climate change, EFI, 2020.
https://efi.int/articles/russian-forests-and-climate-change

7.5. State report on the state and protection of the environment in the Russian Federation in 2019 by the Ministry of Natural Resources, 2020.
https://www.mnr.gov.ru/docs/gosudarstvennye_doklady/proekt_gosudarstvennogo_doklada_o_sostoyanii_i_ob_okhrane_okruzhayushchey_sredy_rossiyskoy_federat2019/

7.6. Order of the Ministry of Natural Resources No. 692 dated 20 December 2012: "On approval of the standard form and composition of the forest plan of the constituent entity of the Russian Federation, the procedure for its preparation and amendments to it".
http://publication.pravo.gov.ru/Document/View/0001201804090039

7.7. A. Grigoriev, A. Shchegolev, D. Lugovaya. Global climate change and adaptation to it in the forestry complex of the Northwestern Federal District of Russia: using the experience of Sweden and Finland. Sustainable forestry, 2019, no.2.
https://wwf.ru/upload/iblock/22a/06.pdf

7.8. Order of the Government of the Russian Federation of 25 December 2019, No. 3183-r - National action plan for the first stage of adaptation to climate change.
http://static.government.ru/media/files/OTrFMr1Z1sORh5NIx4gLUsdgGHyWIAqy.pdf

7.9. Strategy for the development of the forestry complex until 2030. Official portal of the Government of the Russian Federation 02 November 2021.
http://government.ru/news/41539/

7.10. WWF Russia. Lectures on "Climate Change in Russia".
https://wwf.ru/what-we-do/climate-and-energy/lektsii-izmenenie-klimata/

8. Forest fires

Every year in March–April, in most of the regions of Russia, a period of high fire risk begins, which lasts until October–November. Despite the measures taken, every year, as a result of natural (including forest) fires, hundreds of houses are destroyed, people are killed, and the operation of transport, power transmission systems, and oil and gas production and transportation is disrupted.

In recent years the population of the country has increasingly reacted to the negative consequence of forest fires, such as as severe smoke, in the impact zone where millions of people live. In 2019, in connection with severe forest fires in the Krasnoyarsk and Irkutsk regions, the smoke from which spread to neighbouring regions, more than 1.2 million people signed an electronic petition on the change.org platform demanding that the authorities take emergency measures to improve the situation. For modern Russia, this is a very high level of independent social activity among the population (8.1).

One of such standard measures taken by the authorities is the introduction of a special fire-prevention regime, in which the use of open fires is limited, the burning of grass is prohibited, and restrictions on visiting forests are imposed.

There are active patrols of the forests, and tens of thousands of people are fined for violations of the fire regime every year. Usually, depending on weather conditions, a special fire regime is introduced in more than half of all regions of Russia. For example, on 1 May 2020, this kind of special fire regime was introduced in 60 out of 85 regions of the Russian Federation (8.2,8.3).

Forest fires and the measures taken by the authorities to prevent them have a significant negative impact on opportunities for the recreational use of forests, such as fishing, hunting, and foraging, which are traditional customs and important to the inhabitants of Russia.

In the event that forest fires spread over large areas and begin to directly threaten settlements, an emergency regime is introduced. People and equipment are sent to fight forest fires, including the aviation and professional fire departments of the Ministry of Emergency Situations. In especially severe cases, equipment and members of the armed forces may be involved. In mid-July 2020, an emergency regime was introduced in connection with forest fires in eight regions of the Russian Federation (8.4).

Forest fire prevention and firefighting become a leading topic in the media every summer. As part of the federal information campaign "Stop the fire!", which is supported by the authorities, in 2020 more than 37,000 articles were posted in the media and on the Internet aimed at preventing wildfires (8.5).

In addition, the media also post tens of thousands of their own articles on forest fires, both informative and analytical, some of which can be quite critical. Non-governmental environmental organizations make a significant contribution to these information flows.

One example is the position of WWF Russia on forest fires, published in April 2020. It notes that as a result of forest fires, three million hectares of forest die annually, which is three times more than the area felled for timber harvesting. In addition to creating threats to the life and health of the population, forest fires cause enormous damage to biodiversity, habitats of rare and endangered species of animals and plants, many of which are concentrated in intact forests. The position contains a set of specific measures:

- introduction of a ban on burning dry vegetation, including fire clearing of cutting areas and preventive burning;
- increasing the level of finance for the prevention and control of forest fires;
- implementation of programmes to restore natural ecosystems that are more resistant to fire, including the formation of mixed stands, watering of drained swamps, etc.;
- creation of a mechanism for providing information on the state of forests, including data on forest fires.

Although the amount of misrepresentation and concealment of forest fire data has decreased in recent years, this problem has not been resolved (8.6).

Currently, the most powerful information platform on which independent information on forest fires is regularly published is the Greenpeace Forest Forum. It is actively used by the leading mass media, which post several hundred messages a year with reference to this source.

The issue of the reliability of data on forest fires, noted in the WWF position, is one of the most active topics in the Forest Forum. In October 2020, another article was posted here, that critically examined the data provided in the report "On the state and protection of the environment of the Russian Federation in 2019", which is published by the Ministry of Natural Resources of Russia.

According to official statistics, the total area of forest fires in Russia has been constantly increasing, and in 2018 and 2019 it reached a level of 8–10 million hectares per year, which is comparable with space observations. Although there is now reasonable agreement between official statistics and satellite imagery on the area covered by forest fires (prior to 2015 official data was underestimated, sometimes by several hundred percent), when it comes to the area of forests that have died from the impact of fire, assessments using space data show an area tens of times larger the data from official statistics.

The Forestry Forum also notes that the data on the area of dead forests presented by the Ministry of Natural Resources does not agree by an order of magnitude (underestimated) with the official data on the indicator "burned-out forests". In 2019, this indicator exceeded 300 million cubic metres, which corresponds to an area of 3–4 million hectares, not 100,000 hectares (8.7, 8.8).

Addressing the issue of reliability of information on forest fires in Russia is critically important, since without this it will be impossible to provide adequate preventive measures to combat forest fires, or to develop and implement effective actions to adapt Russian forests to climate change. Without clarification in this area, internationally credible changes in assessments of the climate-regulating role of Russian forests will not be possible.

Literature

8.1. https://www.change.org/p/%D1%82%D1%80%D0%B5%D0%B1%D1%83%D0%B5%D0%BC-%D0%B2%D0%B2%D0%B5%D1%81%D1%82%D0%B8-%D1%80%D0%B5%D0%B6%D0%B8%D0%BC-%D1%87%D1%81-%D0%BD%D0%B0-%D0%B2%D1%81%D0%B5%D0%B9-%D1%82%D0%B5%D1%80%D1%80%D0%B8%D1%82%D0%BE%D1%80%D0%B8%D0%B8-%D1%81%D0%B8%D0%B1%D0%B8%D1%80%D0%B8-%D0%BF%D0%BE-%D0%BB%D0%B5%D1%81%D0%B-D%D1%8B%D0%BC-%D0%BF%D0%BE%D0%B6%D0%B0%D1%80%D0%B0%D0%BC-%D0%B8%D1%8E%D0%BB%D1%8C-2019%D0%B3

8.2. President-ru/presscenter

8.3. https://www.rbc.ru/rbcfreenews/5eaba3f79a79472cea999da1

8.4. https://ria.ru/20200707/1574003854.html

8.5. https://aviales.ru/popup.aspx?news=6366

8.6. https://wwf.ru/about/positions/lesnye-pozhary/

8.7. Source: Forest Forum.

8.8. Unified interdepartmental information and statistical system (EMISS), indicator "burned-out forests" https://www.fedstat.ru/indicator/55862

9. Discussion of issues of climate change, land use and absorption of carbon dioxide

The estimates of the amount of carbon accumulated by the ecosystems of Russian forests published in recent years vary over a very wide range – from 96 to 191 billion tons – with a predominance of values in the region of 120–130 billion tons.

Estimates of carbon sequestration in Russian forests vary over an even wider range. Although conservative estimates of about 150–200 million tons of carbon (C) per year have been declared at the international level until recently, there has lately been a stream of scientific publications that give estimates ranging from 200–300 million tons per year to 400–600 million tons per year and even more [9.1, 9.2].

Given the sheer size of the country, land-use, land-use change and forestry (LULUCF) interventions can have a significant impact. According to Roshydromet specialists:

- improving the efficiency of forest fire protection can reduce greenhouse gas emissions by 65–113 million tons of C per year;
- changes in harvesting technologies, reducing soil damage and reducing the amount of wood waste can reduce emissions by 27–29 million tons of C per year;
- replacement of coniferous monocultures with mixed, more sustainable stands will increase absorption by 14–19 million tons of C per year;
- an increase in the content of organic matter due to optimal crop rotations and the application of organic fertilizers can reduce emissions of carbon dioxide from agricultural soils by 27–43 million tons of CO_2 [9.3].

The Kyoto Agreement entered into force in 2004 following its ratification by the Russian Federation. However, due to a number of reasons, including bureaucratic obstacles, it proved impossible to implement international climate projects, including those in the field of LULUCF [9.3].

In 2016, Russia signed the Paris Climate Agreement, but ratified it only at the end of 2019, three years after its entry into force. One of the main conditions for Russia's participation in the Paris Agreement was to give maximum consideration to the absorbing capacity of forests and other ecosystems [9.4]. However,

the actions of the Russian authorities in this direction until recently were not quick or effective.

The situation began to change dramatically in 2020, when Russia began to implement the Paris Agreement, and especially in connection with the Green Deal adopted by the European Union in December 2019.

The introduction of border carbon regulation, planned within the framework of the Green Deal, caused a sharp reaction from Russian business, including its largest association, the Russian Union of Industrialists and Entrepreneurs (RSPP). In response, it set up the Committee on Climate Policy and Carbon Management. The head of the companies SUEK and Eurochem A. Melnichenko was appointed as head of this committee, and L. Fedun, co-owner of Lukoil, became its deputy. The committee also included about 30 heads of the largest Russian companies: Norilsk Nickel, Novolipetsk Metallurgical Plant, Segezha Group (forest assets of AFK Sistema).

At the first meeting of the committee in October 2020, Minister of Economic Development A. Reshetnikov said that consideration of the issue of achieving carbon neutrality in the Russian economy could begin after the implementation of a set of measures to reduce carbon intensity and use the potential of forests to absorb greenhouse gases. At the same time, according to the minister, the implementation of the unaccounted absorption capacity will allow Russia to reduce its estimate of net emissions by about 30–50 percent.

Ruslan Edelgeriev, the special representative of the President of the Russian Federation on climate issues, noted that the current regulatory framework lags behind modern requirements. Business initiatives, including the early actions of the new RSPP committee, take into their own hands certain powers of the government, since government does not have the time and cannot create the tools with which business can work.

The Chairman of the RSPP committee drew the companies' attention to the importance of participation in the preparation of a negotiating position and participation in international negotiations on climate issues [9.5].

In December 2020, the second meeting of the RSPP Committee on Climate Policy and Carbon Regulation took place. More than 100 representatives of the largest Russian companies, the scientific community and government authorities took part in it.

At the meeting, the representative of the Ministry of Natural Resources spoke about the development of a comprehensive plan (in accordance with the instructions of the President of the Russian Federation and the Government of the Russian Federation), which will include measures to clarify the initial data and methods for calculating the absorptive capacity of forests.

The representative of the Roshydromet Institute drew attention to the fact that there is great potential for increasing both the completeness and objectivity of the current assessment of the absorption of carbon dioxide by forests, and its increasing role in this absorption through forest management, especially the fight against forest fires.

The representative of the Ministry of Economic Development and Trade pointed to the underestimation of the absorption of greenhouse gases by Russian forests at the international level and the need for the authorities to rectify this, given the tight deadlines determined by the EU's plans to submit a draft transboundary carbon regulation as early as June 2021.

The speeches also drew attention to the fact that the United States and the European Union are actively developing satellite systems for monitoring carbon balance. At the same time, the European Union plans to measure the carbon balance around the world using such a system. In this regard, it is important for Russia to have its own satellite monitoring system in order to independently control its carbon balance in order to obtain reliable and objective data.

Based on the results of the survey of companies, it was decided that priority attention will be given to the issues of European transboundary carbon regulation, implementation of climate projects, absorption of greenhouse gases by forests and other ecosystems and its role in economic turnover [9.6].

On 12 February 2021 a message was posted on the website of the Ministry of Natural Resources and Environment of the Russian Federation on the amendments to the "Methodological guidelines for quantifying the volume of absorption of greenhouse gases". The document was prepared by the Ministry of Natural Resources in cooperation with federal executive authorities with the participation of the Russian Academy of Sciences. It aims to clarify the initial data of the calculated indicators to increase the accuracy and reliability of calculations of the absorbing capacity of Russian ecosystems through:

- clarification of the areas of "managed forests", taking into account the reserve forests and forests on agricultural land;
- use of data from the first stage of the state forest inventory;
- clarification of the areas of dead forests as a result of the impact of forest fires, harmful organisms, windblows, as well as clear cutting;
- clarification of regional coefficients of carbon accumulation in the main pools;
- clarification of the areas of drained and watered peatlands.

The cumulative effects of the implementation of a set of measures to correct the methodology may amount to an additional 270–450 million tons of CO_2 (73–122 million tons of C), and the balance of absorption of greenhouse gases by Russian forests will amount to 1.1 GW of CO_2 per year (297 million tons of C per year) [9.7].

Judging by the figures published in the "Strategy for the development of the forestry complex until 2030" for the projected volumes of carbon sequestration by Russian forests, which must reach at least 600 million tons per year in the period 2022–2030, additional "methodology refinements" will need to be made in the near future [9.8].

This means that the carbon sequestration rate achieved in February 2021 by Russian forests (297 million tons C per year) needs to double and reach 600 million tons per year, possibly slightly more.

Literature:

9.1. DG Zamolodchikov et al. Dynamics of the carbon balance in the forests of the federal districts of the Russian Federation, Problems of Forest Science, 2018, No. 1. http://jfsi.ru/1-1-2018-zamolodchikov_et_all/

9.2. AN Filipchuk et al. Boreal Forests of Russia: Opportunities for Climate Change Mitigation. Forestry information, 2020, no. 1. http://lhi.vniilm.ru/PDF/2020/1/LHI_2020_01-10-Filipchuk.pdf

9.3. The opinion of A.A. Romanovskaya, Director of the Institute for State Ecology and Ethnography, on the implementation of the Paris Agreement in Russia – website of the Federal State Budgetary Institution "Institute of Global Climate and Ecology named after Academician Y.A. Israel", March 2020. http://www.igce.ru/2020/03/%D0%BC%D0%BD%D0%B5%D0%BD%D0%B8%D0%B5-%D0%B4%D0%B8%D1%80%D0%B5%D0%BA%D1%82%D0%BE%D1%80%D0%B0-%D0%B8%D0%B3%D0%BA%D1%8D-%D1%80%D0%BE%D0%BC%D0%B0%D0%BD%D0%BE%D0%B2%D1%81%D0%BA%D0%BE%D0%B9-%D0%B0-%D0%B0/

9.4. Nationally determined contribution of the Russian Federation to the implementation of the Paris Agreement of 12 December 2015. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Russian%20Federation%20First/NDC_RF_eng.pdf

9.5. RSPP Committee on Climate Policy and Carbon Regulation held its first meeting, RSPP website, 28 October. https://www.rspp.ru/events/press/komitet-rspp-po-klimaticheskoy-politike-i-uglerodnomu-regulirovaniyu-provel-pervoe-zasedanie/ https://www.rspp.ru/events/news/sostoyalos-pervoe-zasedanie-komiteta-rspp-po-klimaticheskoy-politike-i-uglerodnomu-regulirovaniyu-5f998b0673d4c/

9.6. The second meeting of the RSPP Committee on Climate Policy and Carbon Regulation took place, RSPP website, 14 December 2020. https://www.rspp.ru/events/news/sostoyalos-vtoroe-zasedanie-komiteta-rspp121-po-klimaticheskoy-politike-i-uglerodnomu-regulirovaniyu-5fd737405c31c/

9.7. The Ministry of Natural Resources of Russia has developed an order on amendments to the Methodological Guidelines for the quantitative determination of the volume of absorption of greenhouse gases, website of the Ministry of Natural Resources, 12 February 2021. https://docs.cntd.ru/document/573598905 and https://docs.cntd.ru/document/456077289#64U0IK

9.8. Strategy for the development of the forestry complex until 2030. 11 February 2021. Portal of the Government of the Russian Federation. http://government.ru/news/41539/

10. Existing experience in afforestation and additional opportunities for carbon dioxide absorption by forests

Creation of a system of protective forest plantations.

At the end of the 19th century, the steppe black soil ("chernozem") zone of the Russian Empire, which was the main grain-producing region, began to regularly suffer from severe droughts, which led to mass starvation. An analysis of the reasons carried out by Professor V.V. Dokuchaev and published in 1892 in his work "Our steppes before and now" showed that such grave consequences of droughts are caused by the destruction of forests as a result of intensive ploughing of land. Reforestation was proposed as a solution. With the support of the Ministry of Agriculture and State Property, reforestation started on several experimental sites (10.1).

Work in this direction also continued after the 1917 revolution. But it was insufficient to solve the persisting problem of droughts, dry winds and soil erosion in the chernozem zone.

After the end of the World War II there were other droughts and famine in 1946 and 1947. In the autumn of 1948, a decision was made to implement the largest state programme of field-protective afforestation, under the slogan "And we will defeat the drought!". The plan was to create a total of more than 5.7 million hectares of field-protective plantations in the form of forest belts, as well as a large number of ponds and small reservoirs. This was supposed to improve the conditions for farming over an area of 120 million hectares (10.2).

In addition to field-protective plantations in Russia, systems of protective forest plantations along roads, and anti-erosion and water protection plantations along the banks of reservoirs, etc. have been created.

Despite the slowdown in the creation of field-protective plantations after 1953, these works did not stop, and as a result, their area increased to 5.2 million hectares. However, in the 1990s, the need to care for aging plantations and their reconstruction became more and more urgent. As a result of land privatization, uncertainty over the legal status of protective plantations arose; in fact, they became ownerless, unregistered. As a result, their area is currently estimated at

only 2.7 million hectares, but it is necessary to have at least 6–7 million hectares and, ideally, up to 14 million hectares (10.3, 10.4).

The creation of new and reconstruction of existing systems of protective forest plantations is one of the obvious options for reforestation in Russia, which, under new conditions, could also perform the function of absorbing carbon dioxide in order to combat climate change.

Organization of forestry on abandoned agricultural land.

As a result of the transition to a market economy in Russia, according to various estimates, there are from 40 to 70 million hectares of abandoned agricultural land that are overgrown with forests. These new forests found themselves outside the current Russian legal framework. Formally, these areas continue to be listed as agricultural land – arable land, pastures, and hayfields – but in reality they are covered with forest.

The situation has become even more tense as a result of the privatization of agricultural land. The new owners often wanted to use this land to continue growing private forests, i.e. engage in forestry rather than agriculture. However, land inspectors insisted on deforestation, land clearing, fining landowners and threatening to seize land.

Conservation organizations, including Greenpeace and WWF, supported the development of private forestry on overgrown, unproductive agricultural land, since this will:

- provide employment and income for the local population;
- solve the problem of wildfires on overgrown agricultural land;
- thanks to the developed road network, it will allow the introduction of an intensive model of forestry. Logging volumes in new private forests can be increased to 200 million cubic metres a year or even more, which will make it unnecessary to continue the development of intact forest areas;
- provide an opportunity to make full use of the initiative of private entrepreneurs;
- contribute to the accumulation of significant amounts of carbon in the biomass of new private forests.

As a result of many years of work by environmental organizations in support of this idea, in January 2020 President Vladimir Putin instructed the government for the second time to take measures to allow the growing of forests on agricultural land. The previous order of this kind, given in 2013, was not fully implemented. In September 2020, the government finally passed a decree allowing forests to be grown on agricultural land, making private forests and forestry farming legal (10.5, 10.6, 10.7).

However, in the spring of 2021, public organizations discovered that the Ministry of Natural Resources had developed clarifications to the rules for growing forests on agricultural land, which, due to bureaucratic restrictions, made this virtually impossible. Public organizations launched a massive campaign of criticism of the draft of this document, which was supported by more than 6,000 people.

The controversial situation that arose was discussed on 11 March 2021 in the Public Chamber together with the Public Council of Rosleskhoz (National Forestry Committee). The representative of the Ministry of Natural Resources said that the draft document will be revised (10.8, 10.9).

This problem has become a topic of heated discussion in the media. As a result, lobbyists for decisions that make it virtually impossible for legal private forests to emerge in Russia were forced to appear – these are the heads of two State Duma committees. The Ministry of Agriculture was also mentioned in connection with its intentions to begin the implementation of a multi-billion-dollar state programme to restore land use and land reclamation, although the Soviet experience has convincingly shown the complete ineffectiveness of such programmes.

The media reported that the government has set up a working group with the task of finding a compromise solution, as well as the possibility of experimentally testing the possibility of forest farming in some regions of Russia (10.10, 10.11).

Literature:

10.1. V.V. Dokuchaev. Our steppes before and now, 1892, St. Petersburg. https://rusneb.ru/catalog/000199_000009_003630944/

10.2. Decree of the Council of Ministers and the Central Committee of the All-Union Communist Party of Bolsheviks, dated 20 October 1948, No. 3960, "On the plan for field-protective afforestation, the introduction of grass crop rotations, the construction of ponds and reservoirs to ensure high and sustainable yields in the steppe and forest-steppe regions of the European part of the USSR." http://www.consultant.ru/cons/cgi/online.cgi?req=doc;base=ESU;n=14933#07389379163760246

10.3. Kulik K.N. and others. "Forecast for the development of protective afforestation in Russia until 2020 – Problems of forecasting", INP RAS 2015, issue 4. https://cyberleninka.ru/article/n/prognoz-razvitiya-zaschitnogo-lesorazvedeniya-v-rossii-do-2020-goda

10.4. Erusalimsky V.I., Rozhkov V.A. The multifunctional role of protective forest plantations. Dokuchaev Soil Science Institute Bulletin, 2017, issue 88. https://cyberleninka.ru/article/n/mnogofunktsionalnaya-rol-zaschitnyh-lesnyh-nasazhdeniy

10.5. List of instructions following the meeting of the Council for the Development of Civil Society and Human Rights and the meeting with the ombudsmen for human rights. http://www.kremlin.ru/acts/assignments/orders/62700

10.6. Decree of the Government of the Russian Federation of 21 September 2020, No. 1509, "On the peculiarities of the use of protection and reproduction of forests located on agricultural land" http://publication.pravo.gov.ru/Document/View/0001202009230018

10.7. For the first time, private forests will appear in Russia – on agricultural land. WWF Russia website, 25 September 2020. https://wwf.ru/resources/news/lesa/v-rossii-vpervye-poyavyatsya-chastnye-lesa-na-selkhozzemlyakh-/

10.8. Forest on unused land: to prevent the destruction of the industry. Public Chamber, 3 November 2021.

10.9. The Ministry of Natural Resources announces the amendment of the project prohibiting forestry on agricultural land. Greenpeace website, 12 March 2021. https://greenpeace.ru/news/2021/03/12/minprirody-zajavilo-ob-ispravlenii-proekta-zapreshhajushhego-lesovodstvo-na-selhozzemljah/

10.10. V. Nekrasov. Some in the forest, some about firewood. Kommersant, 15 February 2021. https://www.kommersant.ru/doc/4692078

10.11. A. Komrakov. Parliamentarians opposed private forests on private agricultural land. "Nezavisimaya Gazeta", 18 March 2021

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