

STATE OF FOREST MANAGEMENT CERTIFICATION IN RUSSIA BY THE END OF 2016

Nikita Debkov

Institute of Monitoring of Climatic and Ecological Systems of the Siberian Branch
of the Russian Academy of Sciences, 634055 Tomsk, 10/3 Academicheskoy av., Russia.
E-mail: nikitadebkov@yandex.ru

Received: 09 October 2018

Accepted: 13 March 2019

Abstract

Some global markets' demand towards sustainable forest management is contributing to the displacement of national governments as the central source of environmental rule-making authority. Forest Stewardship Council (FSC) is a particularly innovative example of a voluntary non-state market-driven governance mechanism. Hosting the largest proportion of the global forest resources the Russian Federation is particularly important arena for forest certification. A new Russian forest management FSC standard based on International Generic Indicators is planned for approval at the beginning of 2019. It is thus crucial to understand what this voluntary mechanism identifies as barriers to different aspects of sustainable forest management. We assessed the overall state of FSC forest management certification in Russia by analysing quantitative and qualitative variables of non-conformities exhibited regarding (1) regional specifics, (2) size of forest management units of certificate holders, (3) certification bodies and (4) type of evaluation. The current state of FSC forest management certification in Russia is characterized by the dominance of the certified area in the European part of the country, where its density is 3–4 times higher. The geographic location of various certification bodies has been established; in particular, LLC 'Forest certification' dominate in Siberia, 'SGS Qualifor' in Far East, and the rest are operating mainly in the European part. As a result of the analysis, no differences were revealed in the number of non-conformities exposed due to the size of forest management units and their geographical location. In most cases, there is no significant difference between the certification bodies. However, we reliably found a greater number of non-conformities exhibited by LLC 'Forest certification' in comparison with 'NEPCon'. In addition, a significant difference is found between the number of non-conformities and the type of evaluation. Principles 6, 8, and 9 are more problematic, with a higher frequency of non-conformities.

Key words: forest certification, Forest Stewardship Council, non-conformities, Russian Federation, sustainable forestry, map of certified forests.

Introduction

Voluntary certification of forest management (FM) has become a widespread approach toward responsible use of forests (Rotherham 2011, Alves et al. 2011). Created in 1993, Forest Stewardship Council's (FSC) certification is one of the most commonly adopted schemes worldwide (Araujo et al. 2009), and its application is growing. FSC certification has experienced phenomenal growth across temperate and boreal forest regions. Currently, about 201,000 M ha of forest is FSC

certified and FSC certificate holders (CHs) are based in 86 countries (www.ic.fsc.org). FSC's vision reflects the principles of sustainable development. FSC Principles and Criteria operationalize this vision, setting out social, economic and ecological requirements applicable at a global scale. FSC International approves national FSC standards, which include nationally or regionally adapted indicators.

An important feature of FSC certification is its greater environmental friendliness compared to other certification systems (Garrelts and Flitner 2011, Moore et al. 2012).

Pioneering the approach of certifying socially and environmentally responsible forestry practices, FSC has been replicated across multiple sectors, from agriculture to fisheries and mining.

During recent years, FM practices certified by FSC have provoked considerable public debate and controversy in many countries. A number of well-known environmental NGOs have not withdrawn their support for FSC (e.g., the Swedish Nature Conservation Society in 2011, Greenpeace Russia in 2014).

FSC provides a comprehensive assessment of the sustainability of FM (Merger et al. 2011) and contributes to combating illegal logging (Trishkin et al. 2015). The impact of forest certification on the ecological condition of forests (Cubbage et al. 2010, Johansson et al. 2013, Kalonga et al. 2015, Simonsson et al. 2016, Elbakidze et al. 2016) and social institutions (Maletz and Tysiachniouk 2009, Nysten-Haarala 2013, Miteva et al. 2015) can already be considered proven.

However, limited evidence of tangible and intangible outcomes of FSC certification is a major constraint for both end-consumers and interest groups, such as NGOs, governments, industry and In-

igenous organizations. There is lack of studies that analysed main challenges in implementation of FSC certification on the ground as well as audit process of certified FM is not studied properly.

At the end of 2016, standard FSC-STD-RUS-V6-01-2012 expired. The new Russian FSC FM standard based on International Genetic indicators is planned for approval at the beginning of 2019. During the transition period, version 6.01 continued to operate, but with additions and changes, in particular relating to intact forest landscapes, etc.

The aim of the study is to assess the overall state of FSC FM certification in Russia by analysing quantitative and qualitative variables of the non-conformities (NCs) exhibited, by taking into account (1) regional specifics, (2) size of the FM units of certificate holders (CHs), (3) certification bodies (CBs) and (4) type of evaluation.

Methods and Materials

The study included analysis of the official evaluation reports available on www.info.fsc.org platform. Subject of analysis were all FM certificates issued in Russia till 2016-12-31 to individual companies (single certificates) or group entities (group certificates). All formulated NCs were grouped according to (1) regional specifics, (2) size of the FM units of CHs, (3) CBs and (4) the type of evaluation.

We analysed the public version of evaluation reports (main evaluations and re-evaluations) across European and Asian parts of Russia.

The quantitative and qualitative characteristics of the exhibited NCs compared to the national FM standard by various CBs were also assessed (7 CBs were re-

viewed in total). To quantitative indicators, we attributed the number of NCs, and to qualitative – their nature (social, environmental aspects, etc.).

Analysis of NCs was carried out for all CBs, except for 'Bureau Veritas', 'Control Union Certification' and Certification association 'Russian Register', because each of them has just a few CHs. The premise of it was the fact that the national office of FSC Russia periodically conducts calibration workshops with the participation of CBs representatives on the interpretation of the Russian FM standard. This suggests that CBs have somewhat different opinions on certain issues. To assess these differences, we have identified 10 indicators, which NCs are allotted most often.

The total number of NC reports analyzed (without division into minor and major NCs) was 2209. Considering that during re-evaluations, often the gradations of NCs increase due to their repetition, in the study did not separate them by type.

The number of NCs reports per CBs was as follows: 'NEPCon' – 831, LLC 'Forest certification' – 1043, 'GFA Certification GmbH' – 151, Certification association 'Russian Register' – 29, 'Bureau Veritas' – 15, 'Control Union Certification' – 8, 'SGS Qualifor' – 131.

FSC CHs were divided into 4 categories according to the area of FM units: small (<10,000 ha), medium (10,000–50,000 ha), large (50,000–500,000 ha) and extra-large (>500,000 ha). This separation is based on the standard FSC-STD-20-007 (V3-0) En Forest Management Evaluations. Additionally, we identified a category of extra-large companies. This is done taking into account the internal state of forest industry in Russia.

An analysis of the impact of certification cycles (the main, the 1st re-evalua-

tion, the 2nd re-evaluation) on the number of NCs exhibited was also carried out. A total of 50 public versions of re-evaluation reports were analyzed, including 7 based on the results of the 2nd re-evaluation.

NCs were recorded in a database, developed in Microsoft Excel, and their distribution was traced and quantified. Statistical differences were calculated by use of STATISTICA 10.0 software. The Mann-Whitney U-test was applied to reveal the differences between two groups, while the differences between several groups were tested using Kruskal-Wallis Analysis of Variance (ANOVA) method, with a transgression probability of $p = 5\%$.

Results

Characteristics of FSC certified forest in Russia

As of December 31, 2016 in Russia, a total of 146 FSC FM certificates were issued for an area of over 40 million ha. The distribution of certified forests across the country is uneven, with 24 M ha (or 60 %) located in the European part, and 16 M ha (or 40 %) in the Asian part (Fig. 1). Taking into account the fact that the area of the European part constitutes 23 % of the total area of Russia, it turns out that the density of certified forests here is 3–4 times higher than in the Asian part. One reason of this difference is that the main markets for FSC-certified wood and products exported from Russia are located in the European Union (EU) and the FSC-certification in the country is driven mainly by demand of a global green market (Trishkin et al. 2014). Most of the forest companies in the Asian part of Russia supply certified products to China, which go further to Japan or Europe.

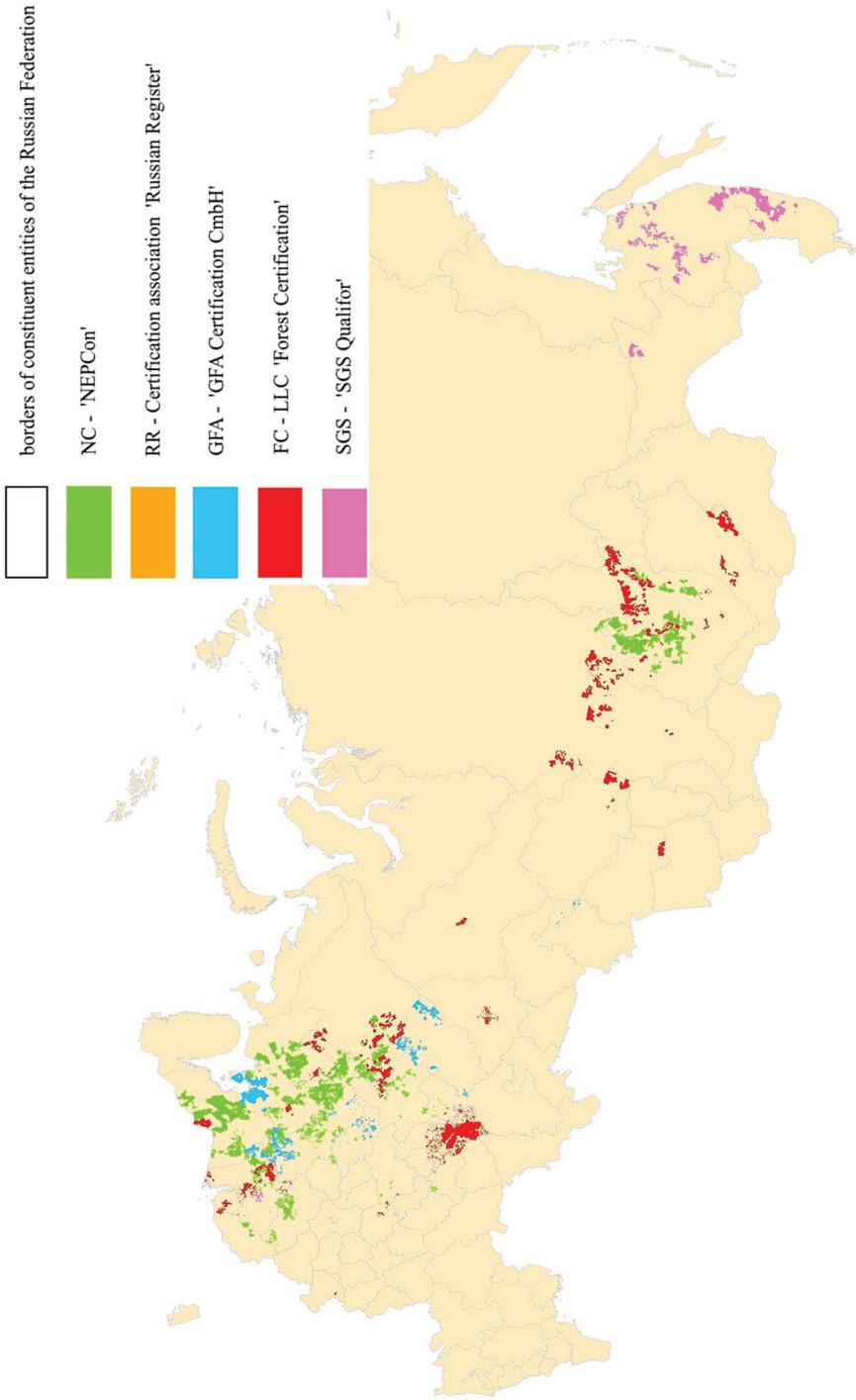


Fig. 1. Certified forests under FSC scheme in February 2016 by CB.

In general, 74 % of FSC certificates were issued for FM units located in the European part of the country, and 26 % for units in the Asian. Areas of single CHs were smaller in the European part than in the Asian. In general large and extra-large timber tenures accounted for 97 % of certified forests in the European part, and for 99 % in the Asian (Fig. 2) due to the reason that mainly large vertically integrated forest companies were motivated to certi-

fy FM in order to export timber products. However, given the relative proximity to the EU, many, in the European part medium- and small enterprises established international business activities successfully as well. The accuracy of differences between the number of NCs between companies from the European and Asian part was not confirmed (Mann-Whitney test $p = 0.3263 > 0.05$).

The dominant type of certificates was issued to single forest companies (88 %). The remaining certificates were issued to group entities (12 %) which meet the requirements of FSC Standard for Group Entities in Forest Management Groups (FSC-STD-30-005 V1-1). A total of 17 group certificates were issued for FM units with a total area of about 4 M ha, which included 65 forest companies. All group certificates were issued to companies located in the European part. In general, the development of group certification is conditioned by the needs of large European companies, such as Stora Enso, which develops this type of certification most actively in the North-West Russia.

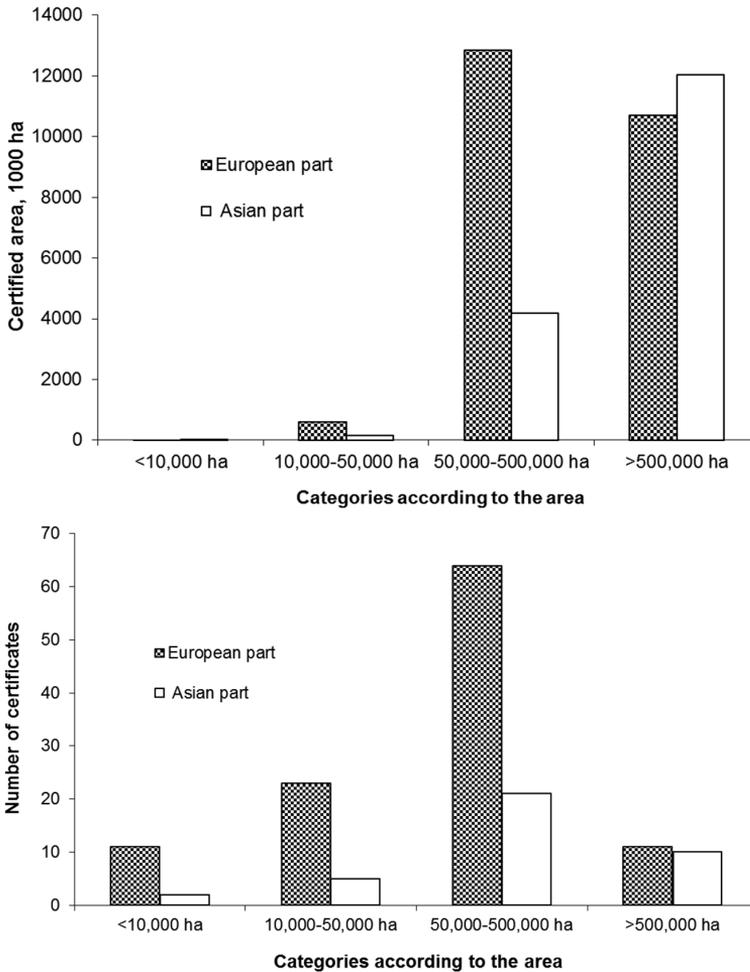


Fig. 2. Area of certified forests (top) and number of certificates in relation to size of FM units.

Approximately half of the certificates were issued to forest companies operating in four regions: Arkhangelsk (20 certificates), Irkutsk (18), Vologda (17) and Leningrad (16). The three regions (Arkhangelsk, Vologda, and Leningrad) are the most forested regions in the European part that are closely located to EU markets. The same applies to Irkutsk region, located in the Asian part in close proximity to China market.

There were five CBs operating in Russia in 2016: 'GFA Certification GmbH' (Germany), 'NEP-Con' (Denmark), 'SGS Qualifor' (France), LLC 'Forest certification' (Russia), and Certification association 'Russian Register' (Russia). Based on the number of CHs, 'NEPCon' had been leading for many years, with a market share of 49 %. Another major CB was LLC 'Forest certification', which certified FM in 34 % of the companies. Other CB account for 17 %, including 'GFA Certification GmbH' (10 %), 'SGS Qualifor' (6 %), and Certification association 'Russian Register' (1 %). 'Bureau Veritas' had lost several of its clients in Russia. The largest group certificates were issued by 'GFA Certification GmbH' and 'NEPCon'.

CBs differed by the geographical location of their CHs. In particular, 68 out of 75 clients of 'NEPCon' were located in the European part, and only 7 companies were located in Siberia. 'GFA Certification GmbH' had about the same situation with

13 CHs located in the European part and 2 CHs based in Siberia. The Certification association 'Russian Register' had been operating only in the European part. Siberia was mainly covered by LLC 'Forest certification', which had 37 % of CHs in that region, and the Far East was represented by 'SGS Qualifor', which operated there exclusively.

The number of FM certificates that were terminated, on average, for the period from 2006 to 2016 is 7 per year (Fig. 3).

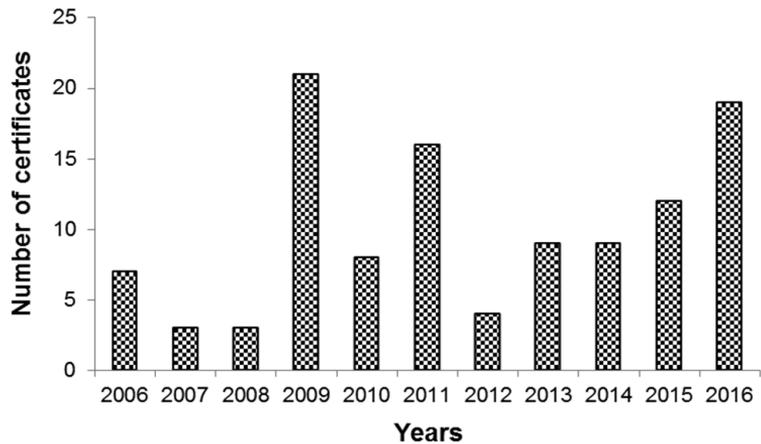


Fig. 3. Dynamics of terminated FSC certificates.

The calculation excludes 2009 and 2011, as well as 2015 and 2016. In 2009, the CB of LLC 'Europartner' ceased to exist. Almost all companies have moved to another CB LLC 'Forest certification'. Out of 21 terminated certificates in 2009, 11 were clients of LLC 'Europartner'. In 2011, the transfer of 'NEPCon' from cooperation with 'Rainforest Alliance' under 'Smart Wood Program' to its own accreditation began. In connection with this, 13 terminated certificates out of 16 this year were clients of 'Smart Wood'. These sharp spikes in the number in 2009 and 2011

are due to purely technical reasons and are not related to the quality of certification. However, starting from 2015, active cooperation between Accreditation Services International (ASI) and the national office of FSC began to improve the quality of certification in Russia. In addition, a sharp increase in terminated certificates is a vivid confirmation of that. The dynamics of the number increase of terminated certificates is convincing, for the first half of 2017 18 certificates on an area of 2.4 M ha have been suspended.

Main NCs related to regional specifics, size of FM units of CHs, CBs and the type of evaluation

'GFA Certification GmbH' auditors most often found NCs related to compliance with the national legislation and forest exploitation activities (indicator 1.1.2), provision of personal protective equipment to employees (indicator 4.2.10), ensuring a sustainable level of forest exploitation (indicator 5.6.2), execution of the technical documentation for slashing sites (indicator 5.6.5) and the availability of a program for transition from large-scale clear-cutting to selective, gradual and small-scale clear-cutting (indicator 6.3.7). 'SGS Qualifor' found NCs with indicators associated with provision of the employees with personal protective equipment (indicator 4.2.10) and its application (indicator 4.2.11), environmental impact assessment at the landscape level (indicator 6.1.5) and collection, removal from the slashing sites, and disposal of waste (indicators 6.7.5 and 6.7.6). 'NEPCon' auditors most often allot NCs as per indicators related to holding of a special assessment of work conditions (indicator 4.2.5), use of personal protective equipment (indicator 4.2.11), execution of the technical documentation for

slashing sites (indicator 5.6.5), and collection of information on the dynamics of flora and fauna (indicator 8.2.7), as well as on changes in the number of rare species (indicators 8.2.7 and 8.2.8). For LLC 'Forest certification' auditors, the most common indicators are those related to holding of a special assessment of work conditions (indicator 4.2.5), execution of the technical documentation for slashing sites (indicator 5.6.5), as well as those related to the issues of provision for the non-confidential information on the forest management plan (indicator 7.4.1), a summary of the monitoring results (indicator 8.5.1) and the parameters of allocation of high conservation value forests (indicator 9.2.4).

In particular, the auditors of 'GFA Certification GmbH' pay more attention to compliance with the legal requirements in the course of production activities, the issues of transition from large-scale clear-cutting to other types of logging and ensuring sustainable FM; the auditors of 'SGS Qualifor' prioritized the fuels and lubricants and waste handling problem and the impact on the landscape, while 'NEPCon' concentrated mostly on monitoring of flora and fauna, including rare species, and LLC 'Forest certification' – on access to non-confidential information for stakeholders.

During audits of 'GFA Certification GmbH' an average of 10.1 ± 2.4 NCs per 1 main evaluation or re-evaluation was allotted; the same value for 'SGS Qualifor' is 14.6 ± 4.8 NCs, 12.6 ± 1.4 NCs for 'NEPCon', and 21.7 ± 3.6 NCs for LLC 'Forest certification'. Differences in number of exhibited NCs between different CBs were unreliable (Kruskal-Wallis test $p = 0.1699 > 0.05$). However, the pairwise comparison revealed a significant difference between 'NEPCon' and LLC 'Forest certification' (Table 1).

Table 1. Estimation of significance of number of NCs exhibited by CBs (non-parametric Mann – Whitney U-test).

CBs	'GFA Certification GmbH'	'NEPCon'	'SGS Qualifor'	'Forest certification' LLC
'GFA Certification GmbH'	-	0.5114	0.5194	0.0534
'NEPCon'	0.5114	-	0.6990	0.0382*
'SGS Qualifor'	0.5194	0.6990	-	0.3816
'Forest certification' LLC	0.0534	0.0382*	0.3816	-

Note: * – the differences are significant, p -value < 0.05.

An analysis of the number of NCs allotted by the size of certified area showed lack of significant differences (Table 2). The significance of differences between number of NCs and size of FM units has not been confirmed (Kruskal-Wallis test $p = 0.4761 > 0.05$). The pairwise comparison using the Mann-Whitney test also did not confirm the connection.

It was found that the evaluations of small forest landowners exhibited 15.6 ± 3.8 NCs, the most often – as per 7 indicators (4.2.5, 4.2.10, 5.6.5, 6.2.12, 8.2.7, 8.2.8, 9.2.1). For medium forest landowners 12.1 ± 1.7 NCs allotted with 9 most common indicators (4.2.5, 4.2.10, 5.6.5, 6.1.7, 6.3.7, 6.3.15, 8.2.8, 8.5.1, 9.2.4). For large forest landowners 17.4 ± 2.3 NCs allotted with 8 most common indicators (4.2.5, 4.2.11, 5.6.5, 6.3.15, 8.2.7, 8.2.8, 8.5.1,

9.2.4). And for particularly extra-large forest landowners 11.8 ± 3.3 NCs issued with 8 most common indicators (4.2.10, 4.2.11, 6.1.7, 6.3.8, 6.7.3, 6.7.5, 8.2.7, 8.2.14, 9.1.5).

In general, forestry companies of the European part exhibited fewer NCs in comparison with those in the Asian. In the European part the most often issued NCs were associated with 8 indicators (1.6.6, 4.2.5, 4.2.10, 4.2.11, 5.6.5, 8.2.7, 8.2.8, 8.5.1), and for the Asian one these indicators are 4.2.10, 4.2.11, 6.7.3, 6.7.5, 7.4.1, 8.2.7, 8.2.8, and 8.5.1. The CHs based in the European part most often had challenges with knowledge of the national FM standard, and in the Asian there with use and storage of fuels and lubricants, domestic, and industrial wastes, as well as their disposal.

Table 2. Estimation of significance of number of NCs exhibited by CHs with different areas of managed forest units (non-parametric Mann – Whitney U-test).

Size of FM unit	Small	Medium	Large	Extra-large
Small	-	0.7472	0.9258	0.2701
Medium	0.7472	-	0.6899	0.1931
Large	0.9258	0.6899	-	0.1523
Extra-large	0.2701	0.1931	0.1523	-

Note: The differences are insignificant, p -value > 0.05.

We have analyzed impact for the 1st (through the example of 50 companies)

and the 2nd (through the example of 7 companies) re-evaluations. It was found

that in the course of the 1st re-evaluation 11.2±2.5 NCs are allotted with 5 most common indicators (4.2.5, 4.2.11, 5.6.5, 8.2.7, 8.5.1). During the 2nd re-evaluation, 9.7±3.7 NCs are allotted with 7 most common indicators (2.1.1, 4.2.5, 4.2.11, 6.7.1, 8.2.7, 8.2.8, 8.5.1). On average, 15.3±1.5 NCs are allotted throughout Russia during FM evaluations. There was tendency towards reduction in the number of NCs allotted from cycle to cycle. Confirmed the relationship of cycles of certification with a number of NCs (Kruskal-Wallis test $p = 0.0012 < 0.05$). Thus, re-evaluations are conducted with significantly fewer NCs.

Main NCs related to forest functions

The most common problem was the insufficient level of labour protection in enterprises (14 %).

According to the reports of CBs, most of the Russian forest enterprises did not provide their workers with the uniforms and equipment that meet the quality and quantity requirements of the Russian Federation and the International Labour Organization. There was also a problem when employees did not wear the personal protective equipment provided by the employer. Another complaint was that there was no special assessment of working conditions, or it was done improperly.

Additionally, all CHs provided poor personnel training, both in general knowledge of FM standard, and regarding environmental aspects as it was reflected in reports. Largely, this is due to the high turnover of manpower in the forestry sector, which is characterized by low wages.

Most of the enterprises had executed poorly and did not fill in correctly the technological documentation for logging sites. Basically this is due to the fact that

according to the current Russian forestry legislation, the technical chart is an internal document of timber companies. Only the new (end of 2016) 'Rules of logging' feature a unified form of this document. However, most likely, CBs will continue to allot NCs, since this form does not fully meet the requirements of FSC forest certification.

The problem of use of fuel and lubricants, waste collection and disposal is the most inveterate for Russian forestry enterprises. Often times both domestic and industrial garbage is left at the logging sites, and at the best, it is burned or buried. It should also be noted that a situation where this practice takes place regardless of the fact that there is a valid contract for disposal with specialized organizations is not uncommon. In addition, no one is used to dealing with fuel spills.

NCs related to environmental issues total 48 %. One of the main NCs regarding the 8th Principle 'Monitoring and Assessment' was about monitoring of changes in flora and fauna, and also the dynamics of rare species number. Often certified companies did not have reliable data and research organizations were not able to provide this data of proper spatial resolution to forest companies. The second problem, according to the reports, was related to the fact that forest enterprises had to identify key habitats for protection of rare species, however, annual monitoring based on field observation had not been developed and/or applied properly.

The availability of non-confidential information and its communication to the parties concerned is extremely bad. Moreover, cases when certified companies ignore requests for provision of non-confidential information by scientific and public organizations are common. For small and extra-large ones, a weak involvement of

the stakeholders in the process of allocation of the high conservation value forests of social types (HCVF of types 5 and 6).

NCs related to social-cultural functions total 4 %. Issues related to indigenous people also have led to solutions at the state level, and when conducting FM evaluations in case of applicability of the 3rd Principle, close attention is paid to the interaction of the forest company with representatives of indigenous people. However, there have been no precedents when companies in their production activities would use any knowledge of indigenous peoples and they would pay them a compensation for this.

Given the low population density in the well-forested regions, forestry companies are constantly in need of skilled workers, and the local population, as a rule, does not cover these needs. In recent years, there has been a tendency to partially compensate for the staff shortage by involving citizens of China under the quotas approved by the state. As practice shows, they work exclusively on industrial sites, and are not involved in forest work.

In general, there are no discrimination problems. The only example of such issue is indication of gender in job advertisements, when it comes to purely male professions (e.g. a turner), or female ones (e.g. a cleaning woman).

The sustainable use in the long-term are also problematic for Russian enterprises. Again, this is largely a phenomenon of the Soviet past. In the Soviet Union, the annual allowable cut was made, as a rule, for 40–60 years. Also losses of forest resources from various factors (fires, windfalls, outbreaks of insect pests, etc.) were not taken into the total planned annual harvest level. Considering the need to exclude voluntarily protected areas with high conservation values of types 5 and 6,

this problem is typical for the majority of Russian forestry enterprises.

NCs related to economic functions total 14 %. In terms of use of raw materials, there is a tendency according to which larger companies have capacities for deep processing of wood, including low-grade wood and waste, and tend to have orientation toward export. Smaller enterprises manufacture minimally processed products and, as a rule, are oriented toward local or regional markets within the country. However, there are exceptions.

Despite the fact that there were no NCs related with indicator 5.3.4 'Silvicultural operations do not lead to complete or partial destruction of sites of special significance for maintenance and reproduction of other forest resources (recreation, water, soil, fisheries, mushrooms, berries etc.)', potentially there are risks of destruction or damage to areas that support maintenance of various forest resources. For medium forest landowners there is a problem of ensuring sustainable forest exploitation and the lack of programs for the transition from large-scale clear-cutting to small-scale selective or gradual clear-cutting. Extra-large forest landowners face the problem of sustainability of use of forest resources and the abandonment of the key elements, as well as the problem of storage of fuels, lubricants, and waste, and their recycling.

For 29 indicators there were no NCs issued (Table 3). Such indicators are called 'sleeping'. According to FSC principles, their variation is as follows: 1 – 5 %, 2 – 22 %, 3 – 14 %, 4 – 1 %, 5 – 33 %, 6 – 12 %, 7 – 4 %. There are no sleeping indicators only in Principles 8 and 9. The average share of sleeping indicators in Russian FM standard is 11% while their share in FSC Principles 2, 3, 5 and 6 is above that value.

Table 3. List of indicators not addressed in NC reports.

Indicator number	Formulation
1.3.3	The organization shall not use forced labour.
2.3.2	Disputes and grievances consistent with 2.3.1 shall be resolved through communication, negotiation or mediation. Legal procedures are used only if negotiations fail.
2.3.4	There shall be no outstanding disputes of substantial magnitude involving different interests.
3.4.1	Rights of indigenous people for commercial use of their traditional knowledge and skills regarding the use of forest species or management systems in forest shall be recognized and if possible documented.
3.4.2	The organization shall reach an agreement with indigenous people on compensation for commercial application of their traditional knowledge and skills regarding the use of forest species or management systems in forest silvicultural operations.
3.4.3	Indigenous people shall be compensated in consistency with 3.4.2.
4.1.1	The organization shall give employment priority to workers from local people.
4.1.2	Employment of workers from other regions of Russia and other countries shall be justified.
4.1.3	The organization shall not discriminate staff on the basis of their sex, nationality, religion and other characteristics with regard to employment, workplace and human rights issues.
5.2.1	The organization shall seek the best economic use of forest resources, taking into account its financial and technical possibilities.
5.2.2	The organization shall process harvested forest resources or delivers the resources to local or regional wood processing organizations, if this is economically and technically justified.
5.3.2	The organization shall utilize cutting waste (small diameter stems, snags, short cuts, wood dust, etc.) and products of their on site processing (e.g. chips) if it is economically and technically justified and under condition that this does not exert adverse implications on forest productivity, biodiversity, and forest regeneration.
5.3.4	Silvicultural operations do not lead to complete or partial destruction of sites of special significance for maintenance and reproduction of other forest resources (recreation, water, soil, fisheries, mushrooms, berries, etc.).
5.4.1	When planning forest management the organization shall explore technical and financial feasibility of production of a range of forest goods and services.
5.4.2	The organization shall expand the range of goods and services delivered to the market, including those demanded in the local market if economically practical.
5.4.3	The organization shall not prevent the development of different kinds of forest use (e.g. collection of mushrooms and berries, hunting, recreation) within the forest area being certified.
5.5.5	Wetlands shall be drained only if this is required for restoration of their natural hydrological regime.

Indicator number	Formulation
5.6.6	Secondary forest uses of the forest area being certified shall not lead to the depletion of secondary resources.
6.5.7	Construction of forest roads and bridges shall not disturb habitats critical for lifecycles of animals (in particular, by avoiding sensitive areas, restricting number of water crossings, no water-crossing construction during fish breeding period and preserving natural ways of animal migration).
6.7.7	When economically and technically justified, environment friendly fuels and oils shall be used for machinery and equipment.
6.8.1	Organisms (entomophagous insects or biological substances) shall only be used as biological control agents when the inefficiency of other methods of non-chemical pest and disease management is scientifically proved).
6.8.2	Biological control agents shall be used in consistency with applicable administrative regulations.
6.8.3	Genetically modified organisms shall not be used.
6.9.1	The use of exotic plants shall only be allowed for maintenance of man-made stands consisting of introduced species, which are of high historical and cultural value (e.g. larch stands), for urban gardening and in plantations (see Principle 10).
6.9.3	If exotic species consistent with 6.9.2 occur within the forest area being certified, the organization shall undertake measures to prevent their uncontrolled spread.
6.10.1	<p>Conversion of forests to plantations shall only be permitted when it occurs on the very limited portion of the forest management unit being certified. This means that all conditions below are met:</p> <p>a) Conversion does not occur on high conservation value forest areas (see also 6.10.3, 6.10.4), and</p> <p>b) It does not affect a total of more than 5 % of the area of the FMU, and</p> <p>c) It does not exceed 0.5 % of the area of the FMU in any one year, and</p> <p>d) It enables clear, substantial, additional, secure, long-term conservation benefits across the FMU.</p>
6.10.2	<p>Conversion of forest lands to other categories, which function cannot guarantee conservation of forest cover in the long term (except building forest infrastructure and local mineral resource quarries), shall only be permitted when it affects a very limited portion of the forest management unit, corresponds to the area development plans (housing, road construction, etc.) and is approved at the federal, regional or municipal levels and supported by local people. Very limited portion means that all conditions below are met:</p> <p>a) Conversion does not occur on high conservation value forest areas (see also 6.10.3, 6.10.4), and</p> <p>b) It does not affect a total of more than 5 % of the area of the FMU, and</p> <p>c) It does not exceed 0.5 % of the area of the FMU in any one year, and</p> <p>d) It enables clear, substantial, additional, secure, long-term conservation benefits across the FMU.</p>

Indicator number	Formulation
6.10.3	The organization shall not initiate conversion of HCVF to lands of other categories, which function cannot guarantee conservation of forest cover in the long term (except construction of forest infrastructure.
7.1.12	The forest management plan shall describe the system for monitoring of forest increment and dynamics consistent with Principles 6 and 8.

Discussion

In the Russian national FM standard, the number of indicators per Principle varies: from 9 indicators in Principle 2 to 82 indicators in Principle 6. In the remaining Principles, with the exception of Principle 10, which, as a rule, is not applied to evaluations (in Russia, there are no forest plantations created for the purpose of timber growing), there is a more balanced number of indicators – from 20 to 32. At that, judging from Figure 4, Principles 1, 2, 3, 5, and 7 have the frequency of NCs allotment lower than the proportion of their indicators.

Principles 6, 8, and 9 are more problematic (Table 4), with a higher frequen-

cy of NCs allotment. This suggests that, on the one hand, audits reveal mostly the problems associated with the environmental aspects of certification, and on the other hand, Russian forestry enterprises have problems with environmental requirements' implementation. A comparative analysis in five European countries also showed that Principle 6 (Halalisan et al. 2016) is the most problematic. However, number of NCs on Principles 4 and 8 is also high. Gullison (2003) after analyzing the reports of 30 companies from 11 countries showed that 66 % of NCs relate to ecological and environmental aspects.

A similar study conducted in Latin America (Basso et al. 2011) showed that the main NCs were related to environmental and labour legislation.

Normally, number of NCs should not be correlated with certified area (Newsom et al. 2006). Our results confirm this finding, despite the large variation in size of FM units in Russia, reaching several orders of magnitude. However, there are cases when the relationship between the certified area

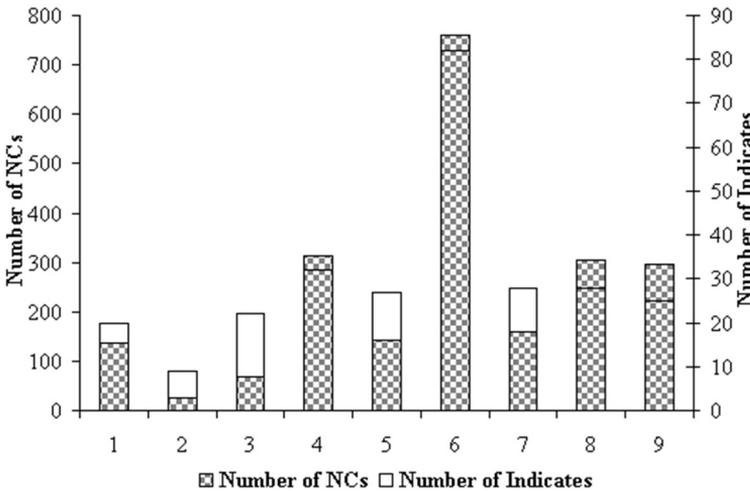


Fig. 4. NC reports per indicators divided into 9 Principles FSC.

and the number of detected NCs is confirmed. E.g. Halalisan et al. (2016) proved that this relationship had a positive correlation (Spearman $r = 0.583$).

Table 4. List of indicators addressed in NC reports (in every 3rd evaluations).

Indicator number	Formulation	Total number of NCs
1.6.6.	The requirements of the Russian National FSC Standard shall be explained to staff.	35 or 25.4 %
4.2.5	The organization shall have certified working places.	44 or 12.5 %
4.2.10	Forest workers shall be provided with personal protective equipment.	39 or 12.5 %
4.2.11	The requirements of health and safety regulations, including the use of relevant tools and machines, and work clothing and personal protective equipment in accordance with Table 1 of ILO Code of Practice on Safety and Health in Forestry Work (2001) shall be adhered to by the staff.	46 or 14.7 %
	The technological map and/or other documents specifying the development of a particular harvest area (lesoseka) shall contain at least the following information:	
	- location, including district forest management unit (lesnichestvo), forest group, numbers of blocks (kvartals), sections (vydels), harvest areas;	
	- type of management operation (use);	
	- type and technique of harvesting or type of resource harvested;	
	- grade of harvested timber;	
	- size of harvest area;	
	- pre-harvest stand composition;	
5.6.5	- area at which young growth shall be retained;	48 or 33.6 %
	- AAC for the leased area in terms of timber and/or other forest resources;	
	- indication which trees shall and shall not be harvested;	
	- timelines for timber harvesting and removal from forest;	
	- non-exploitable areas (NEP), other retention stands/stand elements;	
	- forest protection measures and their timelines;	
	- method for clearing the harvest area;	
	- peculiarities of harvesting techniques;	
	- forest regeneration activities;	
	- bays, industrial and household waste disposal sites;	
	- waste removal/disposal operations.	
6.3.15	Staff shall be familiar with measures aimed at preserving and maintaining ecological functions and conservation values of forest (see 6.3.5–6.3.14) and are trained in their application.	34 or 4.5 %
8.2.7	Information permitting to assess the composition of flora and fauna and its changes in relation with the forest management shall be collected and analyzed.	41 or 13.4 %

Indicator number	Formulation	Total number of NCs
8.2.8	Information shall be collected and analyzed with purpose to monitor changes in the populations of rare, threatened and endangered species of plants, animals and fungi.	40 or 13.1 %
8.5.1	A summary of the monitoring results of parameters consistent with 8.2, except confidential information, shall be available to the public.	44 or 14,4 %
9.2.4	Identification parameters of HCVF as well as mapped HCVF shall be publicly available.	36 or 12.1 %

The share of NCs in labour protection is very high (Table 4). This can be explained by the fact that such NCs are related to the level of country's development and the stability of its economy. The connection between the development of a country and the number of NCs identified in the protection of labour and health of employees of timber industry companies is shown by Newsom and Hewitt (2005) and Hain (2012).

Forest certification positively affected the ecological condition of the surveyed streams, but its effects were only measurable after 5 years of certification (Dias et al. 2015). Our study showed that there is a positive effect of re-evaluations on the number of identified NCs. In the long run, this may also lead to the strengthening of not only ecological, but also social and economic functions. The implementation of forest certification requirements provides a real improvement in the company's management system. This applies to almost all aspects, including the greening of forest exploitation and the rights of workers (Cubbage et al. 2010). The FSC arose with the participation of environmental NGOs and therefore a greater effect should be expected in ecological aspects (Moore et al. 2012).

In conducting evaluations in Russia, auditors give 15.3 ± 1.5 NCs. This data is not different, for example, from the num-

ber of NCs detected on FM evaluations in USA. There, on average, 13.9 NCs are exposed on the main evaluations, and at the 1st re-evaluation only 6.4 NCs (Newsom et al. 2006). Those, as in Russia, the number of NCs in USA decreases from a main evaluation to a 1st re-evaluation.

The results of the study showed that, in general, the number of NCs by different CBs is not significantly different. It meets the requirements of forest certification. However, the difference was established between the two CBs ('NEPCon' and LLC 'Forest certification'). Perhaps this is due to the fact that auditors of different CBs have differences in interpretations of one or another requirements of FM standard (Simonsson et al. 2016). The examples of this were given by Maletz and Tysiachniouk (2009).

The paper (Lukashevich et al. 2016), devoted to the general state of FSC forest certification in Russia, shows that by the end of 2015 the largest share of the market for audit services belongs to 'NEPCon' (more than 40 %). In the second place is LLC 'Forest certification', which has 28 % of CHs. The third place is occupied by 'GFA Certification GmbH' with 11 %. Our characteristic of the distribution of CHs by CBs coincides with this data, but differs in greater detail. This study also states that the most often NCs was fixed in principles 6, 8, and 9.

Conclusions

The current state of FSC FM certification in Russia is characterized by the dominance of the certified area in the European part of the country, where its density is 3–4 times higher. It is there that the leading regions by the number of certificates are located. This is due to more stringent consumer requirements in the European Union countries compared to Asian ones (mainly China). A characteristic feature of certification in Russia is the predominance of large and extra-large forest owners certified according to single schemes. The main CB is 'NEPCon' (Denmark), however LLC 'Forest certification' (Russia), 'GFA Certification GmbH' (Germany) and 'SGS Qualifor' (France) have also significant market shares. The geographic location of various CBs has been clarified; in particular, LLC 'Forest certification' dominates in Siberia, 'SGS Qualifor' in the Far East, and the rest CBs operate mainly in the European part. The dynamics of suspended certificates testifies to the significant role of ASI for improving the quality of certification. As a result of the analysis, no differences were revealed in the number of NCs exposed due to the size of the FM units and their geographical location. In most cases, there is no significant difference between the CBs. However, a greater number of NCs issued by LLC 'Forest certification' in comparison with 'NEPCon' has been found. In addition, a significant difference is found between the number of NCs and the certification cycle. Thus, enterprises undergoing certification for first time receive a greater number of NCs. In general, the development of FSC FM certification in Russia has positive trends and in future, we should expect its moderate growth and quality improvement.

Acknowledgements

The author thanks P. Angelstam and M. Elbakidze (Swedish University of Agricultural Sciences) for valuable comments on the manuscript and as well as to the non-commercial organization 'Transparent World' (Russia) for providing the map of certified forests in Russia.

References

- ALVES R., JACOVINE L., DA SILVA M. 2011. Forest plantations and the protection of native forests in certified management units in Brazil. *Revista Arvore* 35(04): 859–866. DOI: 10.1590/S0100-67622011000500011
- ARAUJO M., KANT S., COUTO L. 2009. Why Brazilian companies are certifying their forests? *Forest Policy and Economics* 11: 579–585. DOI:10.1016/j.forpol.2009.07.008
- BASSO V., GONCALVES J., LAERCIO A., ALVES R., VALVERDE S., DA SILVA F., BRIANEZI D. 2011. Evaluation of the influence of forest certification in compliance with environmental legislation in forest plantations. *Revista Arvore* 35(4): 835–844. DOI: 10.1590/S0100-67622011000500009
- CUBBAGE F., DIAZ D., YAPURA P., DUBE F. 2010. Impacts of forest management certification in Argentina and Chile. *Forest Policy and Economics* 12: 497–504. DOI:10.1016/j.forpol.2010.06.004
- DIAS F., BUGALHO M., RODRÍGUEZ-GONZÁLEZ P., ALBUQUERQUE A., CERDEIRA J. 2015. Effects of forest certification on the ecological condition of Mediterranean streams. *Journal of Applied Ecology* 52(1): 190–198. DOI: 10.1111/1365-2664.12358
- ELBAKIDZE M., RAZAUSKAITE R., MANTON M., ANGELSTAM P., MOZGERIS G., BRÜMELIS G., BRAZAITIS G., VOGT P. 2016. The role of forest certification for biodiversity conservation: Lithuania as a case study. *European Journal of Forest Research* 135(02): 361–376. DOI: 10.1007/s10342-016-0940-4

- GARRELTS H., FLITNER M. 2011. Governance issues in the Ecosystem Approach: what lessons from the Forest Stewardship Council? *European Journal of Forest Research* 130(3): 395–405. DOI: 10.1007/s10342-009-0350-y
- GULLISON R. 2003. Does certification conserve biodiversity? *Oryx* 37(2): 153–165. DOI: 10.1017/S0030605303000346
- HAIN H. 2012. The role of voluntary certification in promoting sustainable natural resource use in transitional economies. PhD Thesis, University of Tartu, Estonia. 180 p.
- HALALISAN A.F., IORAS F., KORJUS H., AVDIBEGOVICH M., MARIC B., PEZDEVSEK MALOVRH S., ABRUDAN I.V. 2016. An Analysis of Forest Management Non-Conformities to FSC Standards in Different European Countries. *Not Bot Horti Agrobo* 44(2): 634–639. DOI: 10.15835/nbha44210263
- JOHANSSON T., HJALTEN J., DE JONG J., VON STEINDINGK H. 2013. Environmental considerations from legislation and certification in managed forest stands: A review of their importance for biodiversity. *Forest Ecology and Management* 303: 98–112. DOI: 10.1016/j.foreco.2013.04.012
- KALONGA S., MIDTGAARD F., EID T. 2015. Does forest certification enhance forest structure? Empirical evidence from certified community-based forest management in Kilwa District, Tanzania. *International Forestry Review* 17(02): 182–194. DOI: 10.1505/146554815815500570
- LUKASHEVICH V., SHEGELMAN I., VASILYEV A., LUKASHEVICH M. 2016. Forest certification in Russia: development, current state and problems. *Lesnicky Casopis – Forestry Journal* 62: 48–55. DOI: 10.1515/forj-2016-0006
- MALETZ O., TYSIACHNIUK M. 2009. The effect of expertise on the quality of forest standards implementation: The case of FSC forest certification in Russia. *Forest Policy and Economics* 11: 422–428. DOI:10.1016/j.forpol.2009.03.002
- MERGER E., DUTSCHKE M., VERCHOT L. 2011. Options for REDD plus voluntary certification to ensure net GHG benefits, poverty alleviation, sustainable management of forests and biodiversity conservation. *Forests* 2(02): 550–577. DOI: 10.3390/f2020550
- MITEVA D., LOUCKS C., PATTANAYAK S. 2015. Social and Environmental Impacts of Forest Management Certification in Indonesia. *PLoS ONE* 10(7): e0129675. DOI:10.1371/journal.pone.0129675
- MOORE S., CUBBAGE F., EICHELDINGER C. 2012. Impacts of Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI) Forest Certification in North America. *Journal of Forestry* 110(02): 79–88. DOI: 10.5849/jof.10-050
- NEWSOM D., HEWITT D. 2005. The global impacts of SmartWood certification. Final Report. 39 p.
- NEWSOM D., BAHN V., CASHORE B. 2006. Does forest certification matter? An analysis of operation-level changes required during the SmartWood certification process in the United States. *Forest Policy and Economics* 9(3): 197–208. DOI: 10.1016/j.forpol.2005.06.007
- NYSTEN-HAARALA S. 2013. Creating trust in institutions in Russian forest localities. *Forest Policy and Economics* 31: 12–19. DOI: 10.1016/j.forpol.2011.12.004
- ROTHERHAM T. 2011. Forest management certification around the world – Progress and problems. *Forestry Chronicle* 87(5): 603–611. DOI: 10.5558/tfc2011-067
- SIMONSSON P., ÖSTLUND L., GUSTAFSSON L. 2016. Conservation values of certified-driven voluntary forest set-asides. *Forest Ecology and Management* 375: 249–258. DOI: 10.1016/j.foreco.2016.05.039
- TRISHKIN M., LOPATIN E., KARJALAINEN T. 2014. Assessment of motivation and attitudes of forest industry companies toward forest certification in Northwestern Russia. *Scandinavian Journal of Forest Research* 29(3): 283–293. DOI: 10.1080/02827581.2014.896938
- TRISHKIN M., LOPATIN E., KARJALAINEN T. 2015. Exploratory Assessment of a Company's Due Diligence System against the EU Timber Regulation: A Case Study from Northwestern Russia. *Forests* 6: 1380–1396. DOI:10.3390/f6041380