Transformation of the protected areas system of Siberia in 2010-2020

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Abstract. By 2020 protected areas in Siberia are represented by all the main categories of various levels of subordination mentioned in the Federal law "On protected areas", and it also provides for the possibility of creating other categories of protected areas at the discretion of the regions. In particular, in Yakutia there are regional protected areas of the category "resource reserves" and "protected landscapes", in the Tyumen region - "natural and historical complex" and "environmental monitoring polygon", which have areas that are important for territorial nature protection. In general, 421 protected areas of the main categories are currently functioning in Siberia, which includes 14 subjects of the Russian Federation, the Siberian federal district and parts of the Far East (the Republics of Sakha(Yakutia) and of Buryatia, the Zabaikalyskly kray) and the Ural (Tyumen region with the Yamalo-Nenets and Khanty-Mansi districts). Of these, 58 protected areas of federal significance (27 reserves, 8 national parks, 23 refuges or zakazniks) and 363 protected areas of regional significance (27 natural parks, 272 zakazniks, 63 resource reserves in Yakutia and 1 environmental monitoring site in the Tyumen region). This article examines the dynamics of the protected areas system in Siberia development. The starting point for this research was the creation Atlases of the "Specially Protected Natural Areas of the Siberian Federal district" and "Specially Protected Natural Areas of the Far East Federal district".

1. Introduction
The current state of protected areas within Siberia is determined by the presence of significant areas of untouched, intact territories and the preservation of the danger of industrial development of pristine and previously inaccessible areas. Important for research are the requirements for both overcoming and taking into account the administrative borders of the subjects of the Russian Federation and Federal districts (Siberian and parts of the Ural and Far East) to assess the representativeness of territorial nature protection, as well as differences in management systems and institutional conditions in each region.

An inventory of essential data for analysis on the location, conservation regime, and effectiveness of protected areas in each of the 14 subjects of the Russian Federation in the Siberian region allows us to assess the representativeness of territorial nature protection, which, in turn, makes it possible to scientifically plan new protected areas and determine the priority of their organization. This paper considers only protected areas of the main categories-reserves, national parks, nature refuges (zakazniks), natural parks, as well as additional categories of regional protected areas that are important from the point of view of area landscape characteristics.
2. Objects, data and methods

The object of research is changes in the system of specially protected natural areas (PA) of Siberia in time and space, assess the adequacy of the existing system.

The natural borders of Siberia – from the Ural range that divide the European part of Russia to the watersheds with rivers flowing into the Pacific Ocean – have been artificially changed into so-called Federal Districts in the system of statistical database. Now Siberia includes the entire Siberian Federal district (10 subjects of the Russian Federation), parts of the Ural district (Tyumen region with national districts) and the Far Eastern district (the Buryatia republic, the Sakha (Yakutia) republic and the Zabaikalski kray).

An important starting point in this study was the compilation of detailed landscape maps for each of the Siberian PA’s for atlases: "Specially Protected Natural Areas of the Siberian Federal district» and "Specially Protected Natural Areas of the Far East Federal district» [1, 2]. This mapping is based on the "one-aspect method" of Atlas mapping, where instead of multiple geographical aspects for a object under study, one aspect (landscape structure) is studied for multiple objects (protected areas). This method was developed by researchers at the Sochava Institute of Geography of SB RAS.

A historical review of the PA system creation in Siberia and the statistical database compilation allow us to identify the main stages of the system transformation under discussion.

The use of these methods makes it possible to analyze the dynamics and transformation of the PA system (table 1).

| Direction of the PA’s system dynamics | Political periods in Russian history (notes) | Economic situation |
|--------------------------------------|-------------------------------------------|--------------------|
| Positive                             | 1923-1939, the "Great depression"          | Very heavy         |
|                                      | 1946-1950, post-war reconstruction        |                    |
|                                      | 1985-1999, "Perestroika" (the largest number PA) |                    |
|                                      | 1918-1922, post revolution civil war      |                    |
| Negative                             | 1939-1945, II world war                   | Heavy, open wars   |
|                                      | 1980-1985, Afghan war active stage        |                    |
|                                      | 1951-1964, "Ottepel’", "thaw"             |                    |
| Critically negative                  | 2000-2010, "Tuchyne Gody", "fat years"    | Relatively prosperous |
| Multidirectional                     | 1966-1979, "Zastoy", "stagnation"         | Stability, stagnation, sanctions regime |
|                                      | 2011-2018, "stability"                    |                    |

3. Results and discussion

The history of the PA system can be divided into periods of development, decline, and experimentation. These periods were very illogically combined with the political stages of Russia's development. As you can see from the table 1 it is noticeable that there is no direct correlation between the transformation of the PA system and the political and economic situation.

The stages of the Siberian PA system evolution are presented below, which are accompanied by assessments of the results of implementing new initiatives.

3.1. Periods of creation

3.1.1. Post-revolutionary period. The pre-revolutionary period marked the beginning of the process of creating a system of territorial nature protection in our country. Attempts to allocate and organize private protected areas in Russia in the late 19th and early 20th centuries allowed us to outline ways to officially recognize them. The first state reserves of Russia appeared in Siberia.

According to the decision of the Irkutsk Governor-General, the first was the "Kitoysky" reserve in the Angarsk forest district (1914) [3]. From the report of D. K. Solov’yov on the organization of the
“Sayansky” reserve, it is known that from May 28, 1915 "mandatory resolution of the Irkutsk Governor-General on the basis of article 27 Forest Charter" was withdrawn forest area for the Sayan reserve [4, p 294]. Of the first reserves, only the "Barguzinsky" reserve (1918) is functioning to date.

In the post-revolutionary period, Siberia was still among the first to organize new PA’s. In 1925, the first soviet reserve "Stolby" was organized near Krasnoyarsk. In addition to nature reserves, other types of PA were also offered. For example, in 1929, at the first All-Russian Congress on nature protection, K A Zabelin mentioned the presence of three nature reserves in Transbaikalia: "Vydrinsky" (21,000 ha) and "Bryansky" (11,000 ha) refuges for the protection of sable and other animal species, as well as "Mukhinsky" refuge for waterfowl [5]. Nature reserves became a mass phenomenon in the 1920s in Western and Central Siberia [6]. According to Yu A Kudryavtsev, by 1926 the RSFSR had at least 500 refuges with an area of 4-5 million hectares, and by 1927-611 with a total area of 7.9 million hectares [7].

3.1.2. Post-war reconstruction period. The activating the creation of new nature reserves in Siberia began in the late 1960s. In 1967, the "Altaisky" nature reserve, closed in 1932, was reopened; in 1969 appeared "Baikal'sky" in the South of lake Baikal; in 1973 – "Sokhodinsky", in 1976 – "Sayano-Shushensky", in 1979 – "Taimyrsky".

The "Kirzinsky" nature refuge in Siberia was first change status to the national (previously – republican, now – federal) significance in 1958 in the Novosibirsk region.

3.1.3. Period of "Perestroika". The 1980s and 1990s were marked by the activation of the environmental activities and the creation of new PA’s: in 1982 – "Vitimsky", in 1984 – "Olyokminsky", in 1985 – "Central Siberian" and "Azas", in 1986 – "Baikal-Lensky", in 1987 – "Daursky", in 1988 – "Putoransky", in 1989 – "Kuznetsky Alatau", in 1991 – "Katunsky". And already in Russia in 1992 – "Dzherginsky", in 1993 – "Ubsnur Depression" and the "Big Arctic", the largest in the country, in 1995 – "Tungussky", in 1999 – "Khakassky" and "Tigireksky".

The first in the country special ecological and ethnic PA in 1987 was the "Eloguysky" federal refuge, now included in the structure of the "Central Siberian" reserve in the Krasnoyarsk kray [1].

The PA’s category national parks appeared in Siberia after the creation in 1983 of the first relatively small of "Sochinsky" (190,000 ha) and "Losiny Ostrov" or "moose island" (11,600 ha). In 1986, the "Pribaikalsky" (417,000 ha) and "Zabaykalsky" (269,000 ha) national parks appeared on the Western and Eastern shores of lake Baikal. Particularly noteworthy is the appearance in 1991 of the largest "Tunkinsky" national park at that time (1,184,000 ha). This is the first and probably the last PA in the country within the borders of the administrative region of the same name (Buryatia Republic), where institutional contradictions restrict the activities of the administrations of two subjects of land use and nature management on a single territory.

3.2. Periods of decline

3.2.1. Pre-war and post-war periods. In the pre-war and post-war periods of organizational transformation in the reserves has led to a certain stabilization of the system of placing and composition of the PA’s, however, the turning is the period of legalized mayhem reserves after the decision of 1951 "On the Reserves". As a result, 88 of the 128 nature reserves were closed or converted into training and experimental farms, and in the RSFSR there were 26 of them. In Siberia, the liquidation affected the "Altaisky", "Chitinsky", "Yakutsky" and second "Sayansky" reserves [8], and the area of the "Stolby" and "Barguzinsky" reserves was reduced.

In Yakutia, it was decided not to create three new reserves, although there was already a corresponding government decree. As a result, only 1.384 million ha remained out of 12.6 million protected hectares, which was only about 0.06% of the country's territory. All Republican departments on nature reserves were also liquidated and one was created under the Council of Ministers of the USSR.
Another devastating year for the reserve system was 1961. At the January Plenum of the Communist party Central Committee, Khrushchev declared the following: "A lot of reserves are being created everywhere. (...) But a significant part of the current reserves is a far-fetched affair". Extract from the minutes of the meeting of the Ministers Council Presidium of the USSR dated December 31, 1960 No. 46. XXVI "On the Regulation of the Reserve Network" results: To entrust the Gosplan of the USSR jointly with the Ministry of agriculture of the USSR, the Ministry of Finance of the USSR, Academy of Sciences of the USSR and the Ministers Councils of Union republics to check the network of existing reserves (...) and within a month to submit to the Ministers Council of USSR report and proposals, with a view to eliminate the excesses in this matter" [9]. In the USSR, 16 reserves were closed on a total area of 2.2 million hectares, and eight more were reduced by 491,200 hectares, although according to the original version, it was planned to close even more protected areas.

3.2.2. The post-perestroika period. The PA’s system was gradually restored with varying degrees of intensity and maximum activity only in the 1980s and 1990s.

In 2000, this process abruptly stopped. The only federal PA created during this period is the "Ust-Lensky" reserve (Yakutia) in 2004 (the justification for the organization was completed before 2000.) The process of development of the PA’s system resumed only in 2010 with the creation of the "Saylyugemsky" national park in the Altai and in 2011 the federal refuges of the "Dzeren Valley" (Zabaykalsky kray) and "Pozarym" (Khakassia republic). From 2004 to 2009 all reserves of federal significance were outside the system of protection and funding, i.e. they were kept only "on paper", some of them suffered significantly due to the lack of resources to combat uncontrolled poaching and forest production.

In the same ten-year period, part of regional significance refuges and natural parks were liquidated (refuges – during the period when they were transferred to the regional executive authority from the jurisdiction of federal department "Glavokhota", natural parks after the adoption of the Decree of the government of the RF № 122, 22.08.2004). In particular, it eliminated four refuges "Aulsky" in 2002, "Mokheysky", "Stepndvoretsky", "Tagleisky" in 2004 in the Buryatia republic. In the Tuva republic natural park "Ush-Beldirsy" was downgraded in 2004 in the refuge category. In the Altaisky kray in 2003 abolished refuges "Skyuiyhinskhy" and "Inskoy". In the Kemerovo region in 2006 eliminated the refuges "Tshtagol" and in 2008 "Sary-Chumyshsky"; in the Tomsk region – refuge "Paninsky" and a significant area (775,770 ha), "Paul-To". In the Irkutsk region in 2003 has been closed regional refuge "Kurtunsky". But the largest natural park "Ergaki" was created in the Krasnoyarsky kray (2005, 342,873 ha).

3.2.3. Period of the last decade. Since 2010, after a period of stagnation in the development of the PA’s system, new federal and regional protected areas have appeared. The "Vasyugansky reserve", national parks "Saylyugemsky", "Chikoy", "Kodor", "Lena Pillars", the federal significance refuges "Pozarym" and "Dzeren Valley", natural parks "Ak-Cholushpa", "Khakassia", "Tyva", and 29 regional significance refuges (zakazniks) have been created. In many ways, this was timed to coincide with the 100th anniversary of the PA’s system and the creation of one of the first reserves in the country, the "Barguzinsky" Siberian reserve.

In general, 421 protected areas of the main categories are currently functioning in Siberia, which includes 14 subjects of the Russian Federation, the Siberian federal district and parts of the Far East (the Republics of Sakha(Yakutia) and of Buryatia, the Zabaikalsky kray) and the Ural (Tyumen region with the Yamalo-Nenets and Khanty-Mansi districts). Of these, 58 PA’s of federal significance (27 reserves, 8 national parks, 23 zakazniks) and 363 PA’s of regional significance (27 natural parks, 272 refuges or zakazniks, 63 resource reserves in Yakutia republic and 1 environmental monitoring site in the Tyumen region).
3.3. Experiments in the PA’s system

3.3.1. Baikal natural territory (BNT). The adoption in 1999 of the only federal law on a natural object "On the Protection of Lake Baikal" made it possible to define BNT as a protected area of a new status, due to the inclusion of "Lake Baikal" in the World Natural Heritage Objects list of UNESCO.

The environmental paradigm of BNT is based on the ideas of territorial differentiation. Using the zoning structure the emphasis on BNT is shifted from the regulation of environmental regimes management to the regulations for preserving the state of the natural environment in its constituent ecological zones: Central, Buffer and Atmospheric Influence [10].

3.3.2. Traditional nature use territories (TNUT). TNUT, in fact, are a kind of protected natural areas, because they are supposed to limit some types of intensive nature use to preserve the way of life of small indigenous Siberian peoples. The first such PA was the already mentioned ecological and ethnic "Yeloguysky" refuge (1987).

TNUT as a specific category is not provided for by the federal law "On Specially Protected Natural Areas". However, until 2014, in accordance with the legislation on small indigenous peoples, it was possible to create a TNUT with the PA status. In particular, in the Krasnoyarsky kray in 2007, the regional Evenk PA "Popigay" was created – the first in the category "territory of traditional nature use". In addition, at the beginning of 2014, the Evenk TNUT of Kachugsky district in the Irkutsk region was organized in the PA status. But now this practice has been suspended due to changes in legislation, and the created territories of traditional nature use PA have been stripped.

3.3.3. Changing the management structure. Experiments to change the management structure of protected areas also began in Siberia. We are talking about creating joint directorates that change the management structure of groups of geographically close PA’s.

Since 2008, there has been an accession to the reserves of Federal reserves that were "suspended" without funding (previously subordinated to "Glavokhoty"), for example, the Frolikhinsky refuge to the "Barguzinsky" reserve, the "Krasny Yar" refuge to the "Priibalkalsky" national park, etc. It made sense and logic. But in 2012, the process of creating joint directorates for independent PA’s, often with their own significant areas and not always closely located PA’s has begun. The first in the country was the "Barguzinsky" reserve, it was merged with the "Zabaikalsky" national park and the federal refuge "Frolikhinsky" into the Directorate "Zapovednoye Podlemor’e" (2012). In 2013, the reserves of the North of the Krasnoyarsky kray, which are difficult to manage even separately, were merged into the "Taimyr Reserves" Directorate, which includes three of the largest reserves in Russia: the clustered "Big Arctic" with more than 4,169,000 ha, clustered "Taimyrsky" 1,782,000 ha and "Putoransky" 1,887,000 ha, as well as federal refuges "Severo-Zemelsky" 423,000 ha and "Purinsky" 787,500 ha. In the same year appeared "Zapovednoye Priibalkal’e", bringing together "Baikal-Lensky" reserve, very long and even individually, difficult to manage "Pribaikalsky" national park and federal wildlife refuges "Krasny Yar" and extremely distant from them "Tofalarsky". In addition to the "Kabansky" refuge, the "Altachensky" refuge is now attached to the "Baikal’sky" reserve.

In 2014, PA’s of the Far East joined this experiment. Directorate "Zapovednoye Priamur’e" included extremely remote from each other and part of the hard-to-reach reserves "Bolon’sky", "Bolshhekhekhtsirsky", national parks "Anyuisky" and "Shantar Islands", refuge "Khekhtsir"; Directorate "Kronotsky Nature Reserve", included "Kronotsky" reserve, "Yuzhno-Kamchatsky" refuge and "Koryaksky" reserve. More logical is the creation of the joint directorates "Land of the Leopard", which includes the "Cedrovaya pad’" reserve and the " Land of the leopard" national park; the Directorate "Zov Tigra" included the "Lazovsky" reserve and the "Zov Tigra" national park.

Now there are 10 United directorates in Russia, only two of them to the West of the Urals, and those are not in the Central part of Russia (in the Orenburg region "Zapovednoe Orenburz’he" – reserves "Orenburgsky" and "Shaitan-Tau", and in the Karelia republic "Kostomukshsky" reserve together with the "Kalevalsky" national park). It should be noted that this does not happen in the
Central European part of Russia, but there are many small protected areas that are located close to each other, have good transport accessibility and logical ways to create unified directorates to reduce management costs.

4. Conclusion

The fundamental difference between Russia and industrialized countries, where territorial nature protection is activated in economically and politically prosperous years, seems to be inexplicable. Thus, the observed trends and hidden links with political, economic and managerial factors can, with further in-depth study of their causes, reveal certain patterns. The analysis of the development of the Siberian protected areas system shows that the financial and economic situation affects the intensity of the process to a lesser extent.

There is often an inverse relationship that can be traced to individual regions of the Russian Federation in Siberia. The most subsidized regions have significant shares of the area of PA’s of the total area of the RF subject: the Zabaikalsky kray – 5.4%; the Tuva Republic – more than 8%, the Buryatia Republic – more than 8%, the Khakassia Republic – almost 15%, the Altai Republic – more than 24%. Some of the most economically developed regions – for example, Irkutsk, Tomsk and Omsk regions – have the lowest area indicators of PA’s (just over 3%).

The 2011 amendments to the federal law "On Specially Protected Natural Areas" are aimed at promoting the idea of increasing the number of visitors to natural territories and are an attempt to encourage strictly protected nature reserves to receive extra-budgetary funds for their own maintenance, similar to national parks intended for receiving visitors. The changes introduced the term "educational tourism", as well as the requirements for its mandatory development. Reserves that previously had the right to three types of activities: protection, scientific research and education outside the territory of PA, now, despite the opposition of the public, is charged with the responsibility of developing the infrastructure of educational tourism in their territories. The first "experimental sites" were the Siberian reserves "Baikalsky", "Barguzinsky", "Baikal-Lensky" and "Stolby", in the Far East – "Kronotsky" (Kamchatka kray) and "Lazovsky" (Primorsky kray). Since 1918, the "Stolby" reserve became the first reserve in the country to be downgraded to the national park category. There are plans to change "Kronotsky" nature reserve to the national park.

Controversial are the recent initiatives of the Ministry of Natural Resources and Ecology of the Russian Federation to open reserves to the so-called educational tourism, the possibility of transferring their lands to other categories of PA, as well as the creation of joint directorates for remote PA.

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