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EVALUATION OF THE NATURAL RECREATION SYSTEM OF THE PERM REGION

ABSTRACT. In this paper we suggest a formula to evaluate the recreational possibilities of natural recreational systems (NRS). The formula depends on economic activity, accessibility, climate, relief and landscape attraction of unsettled territories. Unsettled territories are consisted with unpopulated areals with different scales and at the most remote points from any infrastructure, the center of unpopulated areals are situated. The aggregate of these unpopulated areas constitutes a natural recreational system - a natural area slightly modified by human economic activities in which recreation can be still carried out.

The formula will allow choosing natural fit territories to develop recreational and tourist activities and create protected natural areas. Evaluation of the Perm region natural recreational system was conducted with the help of this formula. As a result, a map of the Perm region was portrayed on which there are some separate sections of similar NRS qualities. Most part of the region (48%) is at the average level of NRS quality. Only the north-eastern and a few particular sites on hills not affected by economic activities, are up to a high quality level (5%). None of the Perm region reaches the maximum score, due to climate severity and inability to fully use the territory for touristic activities throughout the whole year.

KEY WORDS: Perm region, natural recreational system (NRS), center of unpopulated areals, unpopulated areals, nature-oriented tourism

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INTRODUCTION

Nowadays the desire of people for nature-oriented tourism is increasing, both in Russia and in other countries. This is due to a steady growth in the number of urban residents. Meanwhile, as it is known, the nature-oriented tourism is one of the most effective types of urban recreation. Throughout the world, especially in those developed countries, common problems are related to lack of territories and the low engagement of economic activities. The latter however, is also the most suitable improvement for those uninhibited lands.

In Russia there is a large number of uninhabited territories not affected by human beings. These areas are located unevenly. Some of them are interspersed

with urban sections, agricultural and industrial zones and others form extended spaces. In the central parts of these natural areas, at the spot remotest from any infrastructure – the *center of unpopulated areals* - can be allocated. They are surrounded by the unpopulated areals extending and connecting to the nearest infrastructure.

Such a set of different-functioned territories forms a polarized landscape (Rodoman 2002), which contributes to the most harmonious and sustainable development of civilization.

For the most effective development of the territory, it is important to study this phenomenon more deeply to understand where and how to develop the nature-oriented tourism and recreation in natural environment.

For this purpose, uninhabited territories, namely the areas and center of unpopulated areals can be classified by their scales.

The smallest are situated from 1 to 10 km away from the nearest infrastructure and can be called *the center of unpopulated areals of the microlevel.* They are municipal. There might be several such territories, surrounding the city in different sides and geographically limited by roads, industrial or agricultural facilities, and outlying residential areas.

The less small-scaled are the unpopulated areals of the *mini-level.* These areas are situated from 10 to 100 km away from the nearest infrastructure. If the center of unpopulated areals of the microlevel can be found in most countries around the globe, the center of unpopulated areals of the mini-level will turn out to be less widespread. Usually they are located on the border of two or more regions.

The unpopulated areals of the meso-level are of national-continental scale. Although they don't exist in all countries, they do exist in all continents. If we study such center of unpopulated areals, then we can discover the range of their sizes and possibly their length will be 00 to 500 km.

Apart from the national-continental level, there are also more global poles and unpopulated areals – the center of unpopulated areals of the *planetary scale.* They are at the *mega-level.* These huge uninhabited territories must be more than 500 km in length from the center to the nearest infrastructure and do not have an upper limit.

Unpopulated areals located throughout the Earth can be used for recreational activities. The recreational use of the territory will depend on the scale of the center of unpopulated areals.

A natural recreational system (NRS) is constituted of a set of unpopulated areals meaning natural areas slightly modified or affected by human activities in which recreation can be processed. It consists of uninhabited territories located in areas of different inaccessibility. The level of the inaccessibility in this area determines the type of recreation, which suits the land: one-day or many-day long. A multi-day recreation in the natural environment is usually centered on adventure trip. This type of trip relies on the season, the territory's characteristics and the availability of tourist attractions.

This concept does not contradict to the generally accepted conception of Territorial recreational system (TRS), (Preobrazhensky et al. 1972) but supplements it.

NRS changes the natural constituent of TRS and, at the same time, the less the anthropogenic impact is, the higher the quality of NRS and recreational abilities of the territory are. The NRS reflects the potential of less altered natural areas. This scheme is less sophisticated than TRS, it recovers the recreational activity in natural environment and minimizes human impact on nature. Some NRS sites may be located in some protected natural areas (PNA) and therefore they may have some touristic element and recreational infrastructure.

Unlike TRS, the natural recreational system includes 2 subsystems: natural complex (including possibly available recreational

infrastructure) and tourists. If the NRS site is located in a well-developed national park or other PNA then there may be a TRS, with a correspondingly larger number of subsystems like physical infrastructure, recreational infrastructure, some facilities and governing board. Each of them has its functions. Nowadays it is more common to develop a set of tourist attractions instead of separate ones. It is getting increasingly popular to create a tourist and recreational environment in vast areas, including uninhabited ones (2).

From the 1950s, tourism resource evaluation has become a important topic. It has been noted for long that there is a difference in tourism resource research between the Western and Russian scientists (Zyrianov 1995). While the Westerners paid more attention to economic benefits (Clawson et al. 1980; Krippendorf 1980; Bull 1998; Swarbrooke and Horner 2001), cognitive and entertaining tourism, in USSR, after its disintegration in the CIS countries, scientists paid a great attention on restoring health and studying the natural component (Vedenin and Miroshnichenko 1969). Moreover, if some scientists focused on the study of climate conditions (Fileusovich and Chechetov 1973; Danilov 1976; Tverdokhlebov and Mironenko 1981), the others paid more attention to the influence of the relief and forests (Tarasov 1973), rivers and lakes (Vedenin and Filippinovich 1975; Nefedova 1981).

In the 1970s, thanks to some scientists who realized that the evaluation of one or several components does not give a whole picture of the tourism potential of a place. Complex landscape studies begin to help in recreational geography. (Likhonova and Stupina 1975; Isachenko 1972; Pritula 1974; Smirnova 1981).

At a later stage, studies were made to assess the landscape attractiveness of the territory (Dirin 2010; Nazarov and Postnikov 2001). In recent years, many works on active tourism have appeared (Ganapolsky 1987; Myshlyavtseva and Zyryanov 2012).

Associated with abovementioned, the following research goal appears: to develop a methodology that would allow us to evaluate the TRS.

Also the following tasks: 1. Identify the concept of a center of unpopulated areals, The unpopulated areals and the natural recreational system (TRS). 2. To study the theoretical and practical basis for assessing natural recreational areas. 3. Describe and argue the five indicators of the evaluation of the TRS. 4. Evaluate the TRS of Perm region by the proposed method with the help of GIS-technologies.

METHODOLOGY

To assess the quality of NRS of a territory, we suggest a formula, which is calculated from the following indicators:

1. Economic activity (X). Thus, the touristic and recreational infrastructure is not taken into account and it does not bring down the quality of NRS but even elevates it in some cases. The maximum value of this indicator means a complete absence from any economic activities except for the touristic infrastructure.

2. Accessibility (D). There must be good-quality ground transportation, so that the time travelling from big cities (the places where natural recreation is highly required) to the recreation areas would not exceed several hours and it would be doable to visit such places on weekends. In this case, this indicator reaches the maximum level.

3. Climate (C). The influence of climate on tourists was studied by scientists like Tverdokhlebov and Mironenko (1981), and others. The climate should not only allow recreation in the investigated areas to suit tourists who like sports or extreme activities, but also for the mass tourists. Thus, the maximum value of this indicator is when there is a possibility of all-year-round recreation. It depends on the latitude of the terrain and the duration of the daylight time, air temperature, altitude above the sea level, proximity to the coast. Besides, the quality of this indicator is

affected by the average number of days of bad weathers in a year, such as winds, cyclones etc.

4. Relief (R). The terrain must be quite safe and convenient for organizing trips with an absolute height of 1000 to 3000 m. This is the maximum value of this indicator, concerning the fact that higher terrains no longer have profit potentials for recreation, because of less amount of oxygen in the air. Only in rare cases can beautiful landscapes exist. This indicator corresponds most closely to zones of middle altitude.

5. Landscape attraction (A). It is not easy to assess the landscape attractiveness of a territory for the standard can't avoid subjectivity. Nevertheless, Dirin et al (2010) developed a methodology for assessing the landscape and aesthetic resources of mountain landscapes

6. Thus, the quality or recreational capabilities of the NRS is calculated by the following formula

$$NRS = X + D + C + R + A \quad (1)$$

In this case, the maximum value of the NRS will be 20 points, and each figure of five, may have a maximum value of 4 points.

Also, it is necessary to make a rank for each indicator, which can be set from 1 to 4 points.

I. Economic activity.

1 point of this item means a severe change in the natural environment caused by economic activities, which usually accompanies a poor scenery. Nowadays economic power was chased by the world, so nature environment has not yet begun to recover. Therefore, there can be employment and jobs, constructions where dredges may work. These are fresh areas for deforestation.

Those get 2 points are usually those sites with earlier economic impacts on natural environment, while the restoration has already begun and the scenery of them is not very poor. It can be old felling, overgrown with deciduous trees, abandoned buildings with restoring herbaceous and arboreal vegetation and other kinds.

Those spots gaining 3 points are those where economic activities were processed in the old days, and its nature has already recovered at a greater extent. This may be secondary forests with coniferous trees, also possibly being areas of primary forests, but with certain human impact - with glades, forest roads, abandoned small villages, and so on.

Sites which get 4 points are those territories suffering no economic activity impact. Possibly there would be touristic infrastructures: trails, signs, places for rest or camp, spot for survey, ladders and handrails on slopes, and so on. There may also be traces of mankind's activity- a campfire at a fishing place, «wild» or crude hiking trails and so on.

II Availability.

The minimum score is set for places only accessible by air transportation. The maximum score – accessible by any land transportation, even along an asphalt road. For example, the ridge Ergaki in the Western Sayan, the territory of the Caucasus - the Adyrsu and Adylsu valleys in the Elbrus region, settlements Nilova Pustyn and Arshan in East Sayan.

1 point means accessible only by air transportation.

2 points – – accessible by land transportation, including the use of caterpillar all-terrain vehicles, quads, in the winter - snowmobile equipment.

3 points refers to locations that can only be reached by high-traffic heavy vehicles, or special cars.

4 points – territories reached by ordinary cars. Road condition may differ from ground to asphalt.

III Climate.

The minimum score is given to districts, with a limited time to stay in a year. For massive people this can be no more than one month in a year and in summer. For sports groups - it can be one month in winter, for ski trips, 2-3 months per year in summer. The Arctic and the polar region is a typical example, which is located in both mainland and archipelagos. There are Byrranga Mountains, Putorana Plateau, the Polar Urals. At other times of the year when the climatic condition is too harsh for travel, there appears a very short daylight or a polar night.

The maximum score is given to territories possible for all-year-round use thanks to its climatic and light conditions. These are areas located in lower latitudes, for example, the middle mountains of the Caucasus, parts of Central and middle Asia, areas located in the subtropical and tropical zones.

1 points receive areas with the possibility of organizing travel, from 1 to 3 months per year.

2 points can be assigned to territories suitable for travel for 4 to 6 months in a year. Usually, the longer season is in summer, and the shorter - in winter.

3 points – the possible duration for organizing travel and recreation, is from 7 to 9 months a year. The inappropriate time is usually months in late autumn and early winter, or at the end and middle of spring - because of the increased avalanche danger. A typical example is the Caucasus, where summer recreation and travel goes on from May to October, and in winter from December to April.

4 points – the possible duration for organizing trips ranges from 10 to 12 months a year. When assessing this item, we need to take into account the number of days of good weather in a year.

IV Relief.

The minimum score is set for areas with no certain relief, featured by small changes in altitude and lack of observing points. These can be plains, lowlands, overgrown with forest, taiga, swampy. There may also be tundra, steppes, forest-steppes, semi-deserts, deserts.

The maximum score is given to districts with altitude of at least 1,000 meters, from the foot to the peak, and with an absolute height of 1,000 to 3,000 meters. Lower elevation usually does not allow for the creation of particular landscapes and good observation points, so the absolute height of the territory should be at least 1000 m. In addition, the height of more than 3000 m - does not help the recreation, because of the declined oxygen content in the air, meaning the increased danger on this terrain.

1 point – areas with minor elevations ranging from 0 to 100 m or areas lack of observing points. In this case, the absolute height of the terrain is from 0 to 200 meters, namely, located on the plains and in the lowlands.

2 points – areas within which terrain hardly differing in heights, from 100 to 500 m, and with an absolute height of up to 1000 m.

3 points are areas from 500 to 1000 m above the sea level, and its absolute height reaching up to 1,000 m, or more than 3,000 m. These may include highlands and some plateaus. Meanwhile, in areas of more than 3000 m's height, altitude difference can exceed 1000 m. This happens to some middle-height mountains and highlands.

4 points – areas with an absolute height of 1000 to 3000 m, with elevations over 1000 m. These are middle-height areas.

Landscape attractiveness. The maximum aesthetic-resource potential is possessed by mountain landscapes. The basic study of this indicator is conducted by Dirin D.A., which did some modifications and compilation simplification. The following criteria will be taken into account: landscape diversity,

color scale, landscape-compositional device, amount of forest, the number of prominent (symbolic) objects in the landscape. This indicator can be set from 1 to 4 points, the specific way is that we need to evaluate each criterion separately, and then sum the scores up and translate them into a scoring system from 1 to 4.

The lower points (1-2) for landscape diversity will be assigned to homogeneous and monotonous landscapes, both consisting of the same components, namely the following: geomorphological (rocks, moraines, talus, pebble, kurumniki), hydrological (linear and water objects), glaciological (glaciers, snowfields), biological (arboreal, shrubby and grassy vegetation).

Higher points (3-4) will be assigned to landscapes of variety, made up of many components of different types.

The color scale is an exceptionally important objective criterion of landscape aesthetics. The colors are of the greatest significance for perception, and color inclusions in the landscape play a more crucial role. The influence of different colors on a man's perception and, in general, on his psyche was already well studied in psychology and psychophysiology. Landscape-forming colors were ranked according to their aesthetic impact.

According to the results, those being given 1 point are landscapes of black and gray colors, 2 points - light gray, brown and pale color, 3 points - blue and green, 4 points - turquoise, yellow, white, pink, purple, blue, orange, red.

With regard to the color range, the season of a year will be vital, because, it is because depending on this that the color changes. Most of the changes concern areas with vegetation, which in each season of a year have different colors.

As for the Landscape-compositional device, the most picturesque are the multi-plot (panoramic) and multidimensional views. A lower sores (1-2) are given to small or unicellular species, with fewer stories, without landscape scenery. A higher point (3-4) is for multidimensional views, with a variety of subjects, and the existence of landscape wings.

The condition and amount of forest in the landscape is also a complex indicator for assessing attractiveness. The optimum degree of forested area is from 30 to 60%. Such landscapes do not break the criterion of visibility and often form extensive panoramas.

1 point – landscapes with its forest coverage ranging from 0 to 10% and from 87 to 100%.

2 points – landscapes with its forest coverage ranging from 11 to 20% and from 74 to 86%.

3 points – landscapes with its forest coverage ranging from 21 to 30% and from 61 to 73%.

4 points – landscapes with its forest coverage ranging from 31 to 60%.

Concerning the presence of landmark (symbolic) objects in the landscape, they are dominant for the reason that the other elements of the landscape are structured around them. Symbolic objects can be peaks, waterfalls, lakes, glaciers. Factors like the natural features of the object, the size and the distance should be taken into consideration.

1 point – landscapes without an outstanding object.

2 points - landscapes with a weakly expressed object

3 points - landscapes with a strongly expressed object.

4 points - landscapes with quite a few strongly expressed objects, with one of them dominating others.

A greater distance to the object can be compensated for by its larger size and bright colors. The total score for each landscape is calculated by summing up the scores for each criterion.

When calculating scores on the indicator of landscape attractiveness, we need to sum up the scores of all the criteria. Then we get a range from 5 to 20 points. After determining the totality of scores for all 5 criteria, we need to transfer them to a system from 1 to 4 points, as with other indicators of the NRS. For this, it is necessary to divide the obtained score by 5, and it turns out that the minimum score for the indicator of landscape attractiveness is 1, and the maximum is 4, as in the evaluation of other indicators.

The most convenient way to assess the potential of the NRS is GIS technology and the mapping method. By creating maps in the ArcGIS program, you can evaluate each indicator and analyze it. After that, scores are calculated for each of the indicators, and then by overlapping cards one on another and the summation of points, a final map will appear that assesses the quality of the NRS in the territory of the selected region. In this case, it turns out that the minimum score will be 5, and the maximum score will be 20.

Hypothetically, the lowest score can be assigned to a territory located in a remote location, without a pronounced relief, to the north of the Arctic Circle, where mine development was recently carried out.

As a result of calculation using the formula: $NRS = X + D + C + R + A$, you can make gradations of its recreational opportunities. If they are divided into 4 levels: high, medium, low and very low, then the following dilution is obtained: from 1 to 5 points - very low level, from 6 to 10 points - low level and from 11 to 15 points - average level, from 16 to 20 points - a high level of recreational opportunities of the NRS.

For the development of nature-oriented tourism in any territory, it is necessary to study the quality of NRS in this region in order to know where its development is most effective and logical.

RESULTS

The Perm region is a region with many outstanding conditions for the developing nature-oriented tourism, but not all of its territory, is suitable for this purpose. Therefore, it is necessary to conduct an Evaluation of the natural recreational system of Perm region.

Let's start studying the first indicator - economic activity. Most of the territory of the region is covered with economic activities of various degrees. 9.1% of the region is protected areas of various types, where there was no economic activity that reduced the quality of the NRS. About the same amount is the isolated sites that are not located in protected areas, where also no economic activity was conducted. These territories are set with the highest score - 4. The entire southern and southwestern half of the province contains active or abandoned agricultural land. Most of the region is covered by secondary forests. Forest development was processed mainly in the second half of the 20th century. Some of them were cut down in the 70s. Sites where the development was carried outbefore the 70's are covered with already coniferous secondary forests, given 3 points, respectively, the areas covered by agricultural lands and secondary forests, appeared after the 70s 20th century, get 2 points. On the territory of the region, there are operating felling, mining sites and extensive industrial zones. They take no more than 3% of the total territory of the region. These places get 1 point (Fig. 1).

The next indicator is availability. In the study of this indicator we take into account, whether a place is possible to reach by land transportation, in all directions it is necessary to consider the distance of 10 km - the distance, tourists can easily cover in 1 day. The entire southern, western and central parts of the province have a fairly developed road network so that the place can be reached by ordinary cars, given the fact that 10 km's distance is an easy journey for tourists if from the nearest road. These places get 4 points.

Separate parts in the northern, eastern and western region are only available for heavy-duty trucks or specially-designed cars. These territories go with 3 points. The same places which are the most remote but not quite vast territories, are accessible only to caterpillar vehicles, and during winter to snowmobiles. Accordingly, these places are

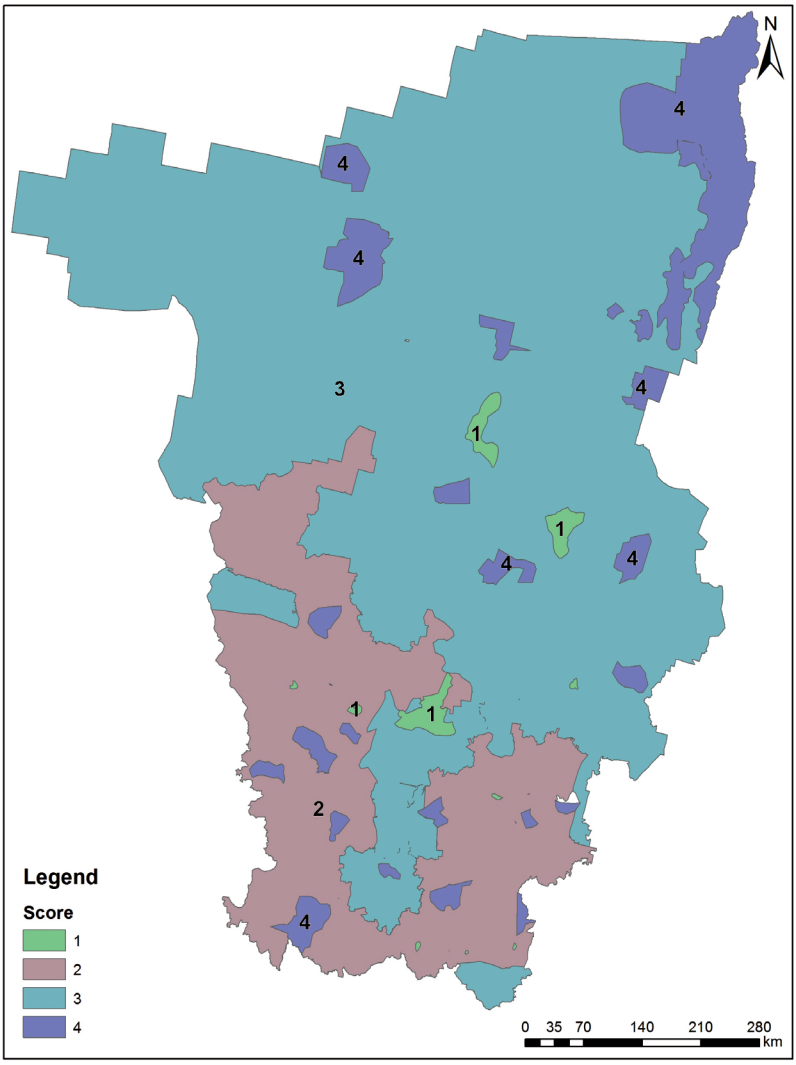

Fig. 1. Evaluation of the indicator «Economic Activity of Perm region»

assigned 2 points. The northeastern part is not accessible to ground vehicles, but only to air transportations, such territories are 1 point, although they are the most attractive (Fig. 2). Due to the climate condition, all parts of the Perm region have approximately the same level's recreational possibilities. Typically, the recreational season lasts for 7 months in a year, from May to September, and from mid-February to mid-April. This region is 3 points. As for the relief, only some ridges in the territory of the Perm region: The main Ural range, Tulim stone, Molebny and Ant mountain ranges, Isharim mountain, are at different heights of more than 1000 m and, thus, they get the maximum points - 4. Most of the territory is located at the highest sea level of the Middle Urals - Oslyanka ridge, and near the axial line of the ridges of the Northern Urals. They differ in altitude, from 500 to 1000 m, and are 3 points. Most of the territory in the region is at 100 to 500 m's height, with the Middle and Northern Urals located, as well as the Verkhnekamsk and Tulva Uplands and the Northern Uval Mountains.

These sites get 2 points. Plain territories which are mainly located in the northern, north-western and the central part among those elevated areas, only have a 100 meters' difference in height. They get 1 point. (See Fig. 3)

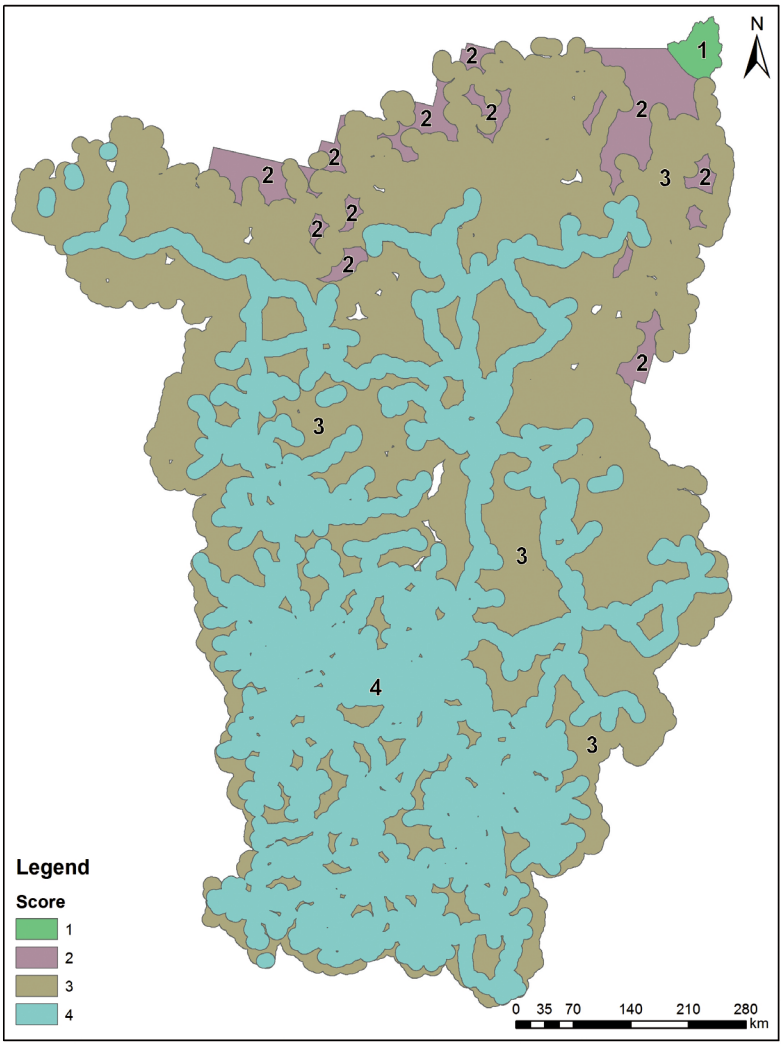

Fig. 2. Assessment of the indicator «Transport accessibility of Perm region»

Landscape attractiveness is a complex indicator consisting of 5 criteria. For the criterion of landscape diversity, 4 points can be assigned only to the northeastern region, where the mountains are elevated at the height of 700 m above the sea level. 3 points can be assigned to river valleys with its length at 1 km, located at the height of 500 to 700 m above sea level. 2 points are for some river valleys in the rest part of the Perm region. 1 point - plains and lowlands, situated at a certain distance from rivers and hills.

In terms of the color scheme, most of the region is 3 points, because of the prevailing colors - green and blue and the abundance of rivers and forests. In summer, mainly green and blue colors are predominant, which corresponds to 3 points, and at the beginning of autumn, except green (the color of coniferous trees), there is an abundance of yellow color and various shades of red.

The landscape-compositional device in most of Permsky region is the scene that there are proper conditions for the formation of panoramic and multifaceted species, due to the presence of the Ural mountains and several hills. Accordingly, the territories with the highest peaks of more than 900 m's height, get 4 points. The peaks at the height of 500 to 900 m are 3

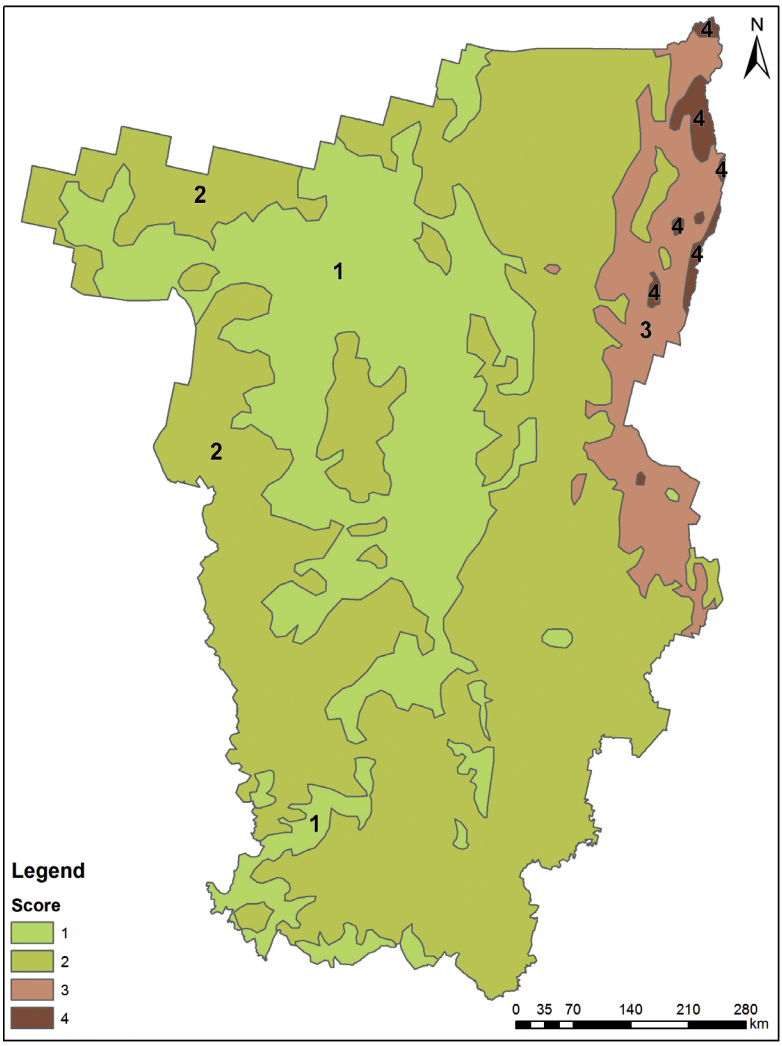

Fig. 3. Evaluation of the indicator «Relief of Perm region»

points. The lower sections of 200 to 500 m's height, located in the river valleys, with panoramic views - 2 points. And the lowest places, less than 200 m - 1 point.

Because of the different conditions and amounts of forests in the landscape, only the north-eastern part of the region where mountains are higher than the forest and with the highest mountains: ridges Belt stone, Oshnier, Ant stone, Prayer Stone, Olkhovochny, Isharim mountain, Tulimsky mountain range, Main Ural range, Kvarkush ridge, get 4 points for there the forestry landscapes take 30 to 60% of the area. The southern and south-western part with a lot of agricultural lands, fields and the Kungur forest-steppe making the forest cover 11 to 30% and 61 to 86% - get 2-3 points. Most of the territory gets 1 point, because the forest coverage is mainly at 87 to 100%.

About the criterion of the presence of outstanding objects within, parts of the northeastern Perm region where there are many peaks of the Northern Urals besides rivers, receive 4 points, because in such places there are several most symbolic objects. Territories of large water bodies with rocks in the left (eastern) tributaries of Kama, receive 3 points. Territories surrounding water bodies without rocky outcrops on shores mainly in the right (western) tributaries of Kama get 2 points.

Plain territories that are remote from rivers and without symbolic objects receive 1 point.

In general, summing up all the indexes of landscape attractiveness, and then transferring them to the scoring system, from 1 to 4, it turns out that most of the region are 3 points. Only the north-eastern part where the Northern Urals is located receives 4 points. Plains in the northern and north-eastern part, remote from rivers receive 2 points (Fig. 4). The lowest score - 1, does not go with any part of the territory, because there is not one single place that receives the minimum score in all criteria.

DISCUSSION

Taking into account all the indicators (Table 1),we can conclude that the most attractive site for organizing recreation in natural environment and developing nature-oriented activities is the north-eastern part of the region. This part is most difficult to access, but at the same time is the most attractive. Here receives 15 to 18 points. None of the Perm region gets 20 points, due to the climate severity across the whole region. When the duration for tourist accessibility is less than 7 months a year, the most attractive places can be reached only by the use of aircraft.

Most territories of the Perm region receive 11 to 14 points except the northeastern part with high availability. Although they are of the same climate conditions, lower terrain, landscape attractiveness and economic activities do negatively affect the recreation of some parts. In general, the whole region receives a rather high score from 11 to 18

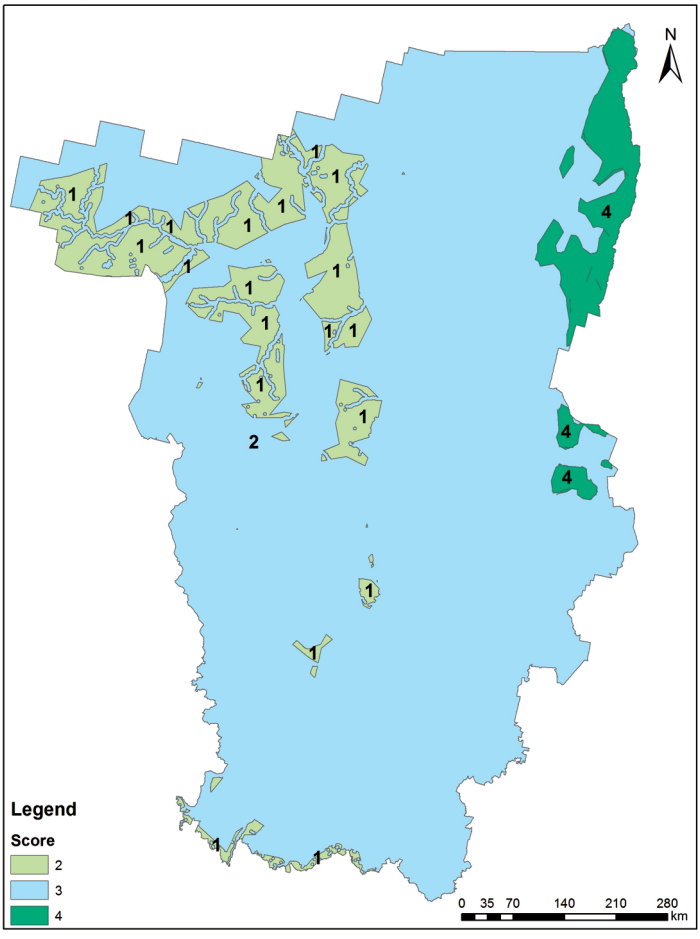

Fig. 4. Evaluation of the index «Landscape Attractiveness of Perm region»

(Table 2), reaching the average and high level of recreational opportunities of the NRS (Fig. 5).

The largest part of the Perm region reaches 14 points. The map clearly demonstrates the specific areas that are the most promising for

Table 1. Indexes of quality indicators of the NRS in the total territory of Perm region (unit: percentage (%))

Index	1 score, %	2 score, %	3 score, %	4 score, %
Economic activity	1	23	68	8
Transport accessibility	0,5	3,5	50	46
Climate				
Relief	30	62	7	1
Landscape attraction	-	9	87	4

Table 2. Assessment of the quality of the NRS of Perm region, in percentage (%) of the total territory

Totall	11	12	13	14	15	16	17	18
%	0,2	7,4	18,6	47,9	20,3	3,7	1,3	0,5

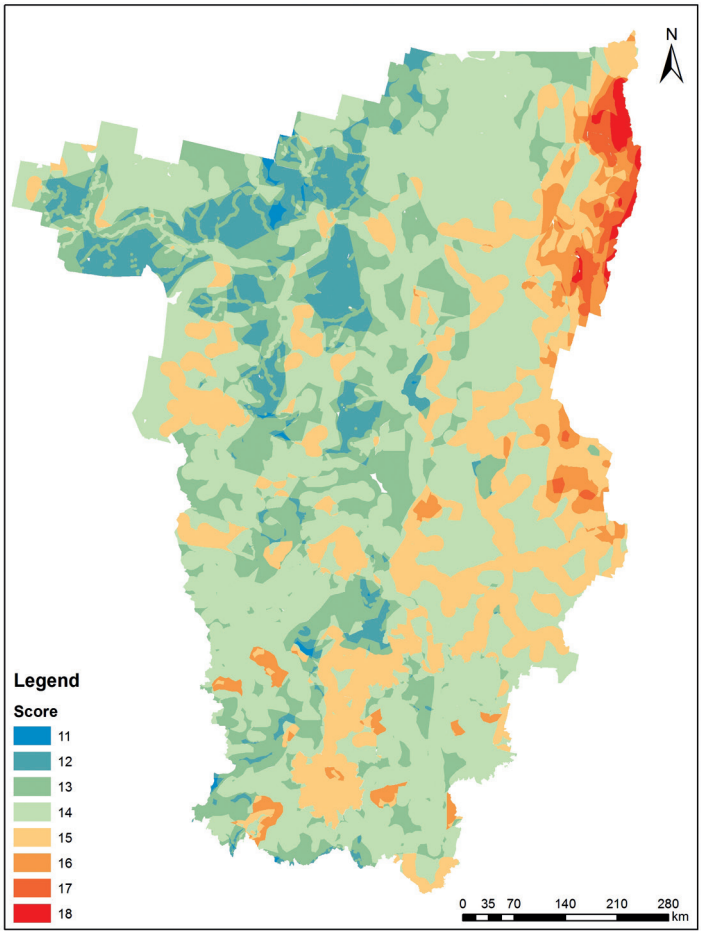

Fig. 5. Evaluation of the NRS of Perm region

the recreation development in the natural environment and nature-oriented tourism.

CONCLUSION

1. In uninhabited territories there are allocated - center of unpopulated areals - the points remotest from infrastructure are surrounded by unpopulated areals, geographically limited by infrastructural equipment. Meantime, depending on the scales, these unpopulated areals are allocated at different spots.

2. A set of unpopulated areals is a natural recreational system NRS) - the natural territories hardly changed by human economic activities can be used for recreation and nature-oriented tourism.

3. To calculate the recreational possibility of the NRS, we can apply this formula: $NRS = X + D + C + R + A$. In this formula X - economic activity, D - availability, C - climate, R - relief, A - landscape attractiveness. By analyzing these indicators, and summing up the scores, it is possible to decide which territories are possible to develop nature-oriented tourism and recreation.

4. Having estimated the quality of NRS in the territory of the Perm region, it turned out that most of the region's territory (71%) reaches the average level, but only the north-eastern part and individual sites not affected by economic activities (2%) on the hills, achieved a high level.

In general, the most promising is the north-eastern part of the region, considering its greatest inaccessibility. However, it is also noticeable that no part of the Perm region reaches a maximum score because of the climate severity and the inability to fully use its territory for tourists' need throughout the whole year.

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