Landscape historical study of the Tract of St. Mary’s Mountain, a historical and cultural monument of Central Russia

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Abstract. This paper presents a comprehensive landscape and historical study of the historical and cultural monument “The tract of St. Mary’s Mountain”. The territory of this monument, located at the crossroads of the main medieval overland roads, is ridden with numerous archaeological sites: ancient settlements, mounds and burial mounds, dating back to the 1st millennium AD, as well as natural monuments. Complex field expeditionary and office landscape-historical studies were carried out, as a result of which the modern landscape structure of the monument was analyzed, and the natural properties of the natural and cultural-historic landscapes of this territory were determined. A large-scale map of conditionally restored landscapes was compiled, and an assessment of the resource base, landscape and environmental conditions of the settlers’ life was completed. A comprehensive spatial and terrain analysis of the archaeological and historical monuments was completed, and retro-reconstructions of the landscape-economic systems of the ancient Russian period were created. As a result of the research conducted, it was established that the settlement systems and environmental management systems were clearly determined by the local landscape structure. The comprehensive studies conducted have made it possible to conclude that the historical and cultural landscape of “The tract of St. Mary’s Mountain” possesses a unique combination of natural and historical objects and is considered a model archeological monument of Ancient Russia, which historians compare with the synchronous monuments of Western and Central Europe of the "take off to the hills" era (11th–12th centuries).

1. Introduction
The tract of “St. Mary’s Mountain” (Russian: урочище горы святой Марии) is located on the right bank of the Sara River, 28 km away from the city of Rostov the Great, 23 km away from the city of Pereslavl-Zalessky, near the church of the village of Filimonovo (now part of the village of Fedorkovo), Rostov district, Yaroslavl oblast. Within the boundaries of the landholdings of the ancient settlement of the 12th–15th centuries (380 ha), the historical landscape was preserved, i.e. St. Mary’s Mountain. The historical and cultural significance of the area was confirmed by the Department for the Protection of Cultural Heritage Sites of the Yaroslavl Region (DPCHS). The most important site (with an area of about 60 ha) of the territory under consideration was assigned the status of an identified landmark, “The Tract of St. Mary’s Mountain” [1]. In 2017, the development of a quarry for the
extraction of sand-gravel aggregate began on the "Mountain", in disregard of public opinion and in violation of the regulations for the protection of this territory by environmental authorities and cultural heritage protection agencies. Unfortunately, on November 14, 2017, the Department for the Protection of Cultural Heritage Sites of the Yaroslavl Region excluded this monument from the list of identified cultural heritage sites of the Yaroslavl Region. Due to the fact that the operation of the mining enterprise can lead to the loss of this unique monument, it is necessary to conduct landscape research in the territory, in order to develop a scientific and methodological justification for the inclusion of the given identified cultural heritage object into the Unified State Register of Cultural Heritage Objects.

2. Materials and Methods
Landscape studies were carried out through field work, which included large-scale mapping, and the processing of the cartographic materials of the Rostov State Museum’s instrumental surveys, satellite images from the ArcGIS Imagery collection, as well as our own shots from the DJI Phantom 4 Pro unmanned aerial vehicle. As a result, the landscape structure was identified, and the natural properties of the natural and cultural-historical landscapes of this territory were determined. On this basis and through the analysis of numerous historical and archaeological materials, a paleoreconstruction of the initial (indigenous) landscape structure and a retrospective reconstruction of landscape economic systems (LES) that took shape in the Old Russian period were carried out.

A paired comparison analysis of primary source maps and landscape maps is the main method in landscape and historical studies of historical and cultural complexes in various chronosections. Based on the methodology of the complex landscape-historical research, the comparison of textual and various graphic materials, the analysis of archaeological and historical landscape data, it is possible to identify complex relationships and interactions that exist between humans and their environment [2, 3], and to create a reconstruction of the settlers’ methods and types of farming, as well as a paleoreconstruction of their initial environment [4].

3. Results and Discussion
To date, many monuments have been preserved in this territory, all of them reflecting the long and complex history of the development of this area. This is evidenced by archaeological sites of the early Iron Age, and traces of the presence of man form an even earlier times. The first mention of this monument is found in the chronicles for the year 1216: "And being at the hillfort on the Sara river, by Saint Mary" [5, 6]. The Church of St. Mary at the Hillfort is one of the oldest and most famous rural churches of North-Eastern Russia; it is also mentioned in the chronicles (Karamzin’s Novgorod Chronicle), under the year 1216. In the 12th century, here, on the site of an ancient settlement, a church was built in the name of Mary of Egypt [7–9].

A large morainic hill with a low-arched summit plain occupies the central part of the "Tract of St. Mary’s Mountain". This is part of a chain of hills in the southeastern outskirts of the Borisoglebskaya Upland, which is a terminal-moraine insular upland with kames [10]. It houses a complex of archeological monuments of the Old Russian time (12th–13th centuries) and 14th–16th centuries, widely known in historical and archaeological literature; the complex includes the Orthodox necropolis of St. Mary’s churchyard, "Ancient settlement, XII-XVI centuries", which arose on the site of an earlier hillfort. At its foot there is a settlement ("Ancient settlement, 12th–13th centuries", Kolokolenka and Popovka Wolds), the largest burial mound in the Yaroslavl region, "Mounds, 11th–13th centuries", consisting of 194 mounds. All these are objects of archaeological heritage of federal significance [5, 11, 12].

On the north side, the hill is cut by the river Sara, and on its steep slope, the groundwater unloads, in the form of numerous springs and water holes. One of the springs, "The Spring of the Holy Well" has been revered by locals for over four hundred years. On the opposite side, the moraine massif gently "descends" to the adjacent secondary moraine and lake-glacial plains. At the foot of the hill, archaeologists have discovered a large-sized settlement, and on the edge of it, the largest burial mound in the area. On the three terrace-shaped ledges of the moraine massif, archeological monuments of the Early Iron Age and the Middle Ages were discovered [13, 14].
The land development of this hill in the past, judging by the surviving archaeological sites, was adaptive, an example of medieval rational nature management. And even later on, nature management fit into the landscape structure of the area; it was moderate and did not violate the fundamental properties of the host landscape. This was largely due to the peculiar and to some extent unique landscape structure of the surrounding area [4].

In geological terms, St. Mary’s Mountain has a structure that is completely similar to almost all the hills of this terminal moraine ridge. On the surface, it is sporadically composed of shallow (up to 1 m) covering loam soils, laden with heavy-loam rocky moraine of the covering type (the so called "moraine cover") of various depth (also rarely more than 1 m). Below is a sandy-gravel mass, interbed with pebbles and boulders – a moraine of the "fill-up ground" type which is a common material for road construction works. Transport accessibility, shallowness of the upper covering deposits, which are completely absent in places, and the depth of 10 m or more of the sand and gravel stratum make this site attractive from the point of view of the low cost of the extraction of these mineral resources.

In this section, the Sara River runs through a deep valley (a "cross valley") with steep indigenous slopes and a narrow ribbon-like floodplain with a straightened channel. Such an atypical structure of the river valley formed as a result of the river cutting through a terminal moraine ridge. In the northwest and southeast of this moraine hill, the river freely meanders through low-lying flat and gently undulating lake-glacial kettles. Therefore, St. Mary’s Mountain, in the early stages of the development of this territory, could be a kind of supporting control (strategic) point in this area [15].

In terms of its landscape, the studied territory is distinguished by an unusually complex morphological structure, in which all its parts are interconnected and represent a single integral formation (Figure 1). This is due, first of all, to the characteristics of its soil-forming material, its extreme heterogeneity: light and medium pulverescent covering loam soils of high trophicity (fertility) in some parts, and in others, heavy loam water-resistant moraine or water permeable sandy loam and rocky sand, which in some places outcrop. Therefore, the landscape structure has an extremely variegated facies coverage and, consequently, vegetative groundcover. In the past, it was represented by soddy-podzolic soils of various degrees of podzolization, and mixed linden-oak-spruce forests with some pine trees. Pine forests with an admixture of broad-leaved species occupied low-arched and cambered plains of the kames. In general, on this stretch the soils had the air-water regime that was fairly good for agricultural development, because the noticeable slopes of the main surface, the proximity of a deep base level of erosion (a near-valley location) and short travel lines of surface water did not allow excess moisture to stagnate for a long time. In combination with a unique location, this factor could be very favorable for the development of this territory.

1. High floodplain, leveled, pit / mound relief, complicated by oxbow depressions; sandy loam soil, with floodplain soddy gleyed soils; covered with sticky alder, willow and linden-oak woods with tall grasses and wet grasses;
2. High floodplain, ribbon-like, leveled, pit / mound relief; sandy-loam soil, with floodplain soddy gleyed soils; covered with stick alder and willow forests with sedge, tall grasses and wet grasses;
3. Flat and gently sloping low above-floodplain terraces (first and second, undivided), composed of ancient alluvial loam soils over sand, with soddy medium podzolic and soddy weakly podzolic soils, often gleyed; covered with broad-leaved pine forests, shrubby, with alder and bird-cherry trees in the second (low) layer, with broad-leaved grasses and wet grasses;
4. Sloping deluvial trains, loamy-sandy, with soddy drift gleyed soils; covered with elm and alder forests with tall grasses and wet grasses;
5. Sloping and sloping-steep indigenous valley side, composed of deluvial clayed sand, underlain by water-glacial sands, with shallow soddy soils; covered with pine and oak forests with broad-leaved grasses, ferns, and sedge (Carex Pilosa);
6. Steep valley side of a complex profile, with trough-shaped depressions, composed of deluvial loamy soil, with soddy-gley soils; covered with broad-leaved gray-alder forests, with bird cherry trees in the second layer, with tall grasses and wet grasses;
7. Moraine plains, gently undulating and flat, composed of covering loamy soils, underlain by moraine, slow-drained, fresh and moist, with soddy medium podzolic soils, sometimes surface-gleyed soils; covered with linden-spruce forests with sorrel, moss and broad-leaved grasses;

8. Sloping and smooth hillslopes (riverine moraine and moraine-glacial plains), composed of deluvial loam soils, underlain by shallow water-glacial sands over the moraine, with soddy weakly podzolic and soddy medium podzolic soils; covered with linden and coniferous broad-leaved forests with broad-leaved grasses and sorrel; here and there with soddy weakly podzolic soils, covered with broad-leaved pine forests with sedge (Carex Pilosa);

9. Steep near-valley slopes of moraine and moraine-glacial plains, composed of shallow deluvial loam soils, underlain by water-glacial sands or moraine; covered with linden and oak forests with pine trees, with broad-leaved grasses and sedge (Carex Pilosa); soddy weakly podzolic and shallow soddy soils;

10. Medium and shallow moraine hills, with arched and flat summit plains, with smooth and sloping sides, composed of sand and gravel moraine, overlain by shallow deluvial covering loam soils or moraine, moderately and well-drained, with soddy weakly podzolic soils, washed off in some places, covered with small-leaved forests with spruce and oak trees;

11. Small kame hills, low-arched and arched, well drained, with soddy weakly podzolic soils, covered with broad-leaved pine forests with ferns, graminexal grasses and sedge (Carex Pilosa);

12. Hollows of inter-basin overflows of glacial waters, formed by loam soils, underlaid by glacial sands; with soddy strongly podzolic gleyey and gley soils, covered with linden and spruce forests with wet grasses;
13. Old-lake depressions, flat, composed of silty thin-bedded loam soils, poorly drained, occupied by swamp broad-leaved spruce forests with pine trees, with buckthorn, broad-leaved grasses, mixed herbs wet grasses;
14. Near-watershed depressions, gently depressed, composed of deluvial loam soils, underlain by water-glacial sands, lake aleurites or moraines, with soddy medium podzolic slightly gleyey and gleyey soils, covered with fir woods with buckthorn, common haircap moss and wet grasses;
15. Bottoms of large gulches and valleys of streams of the gulch type, flat, pit / mound relief, composed of alluvial-deluvial sheet-like deposits, with alluvial soddy gleyey and gley soils, covered with cherry and alder forests with tall grasses and wet grasses;
16. Steep slopes of small erosion forms, with soddy soils, covered with broad-leaved alder forests with bird cherry shrubs;
17. Hollows and gulches, mainly humid and moist, under broad-leaved coniferous forests with alder and bird cherry trees, on soddy soils, gleyed along the bottoms.

For the Old Russian period, the following types of landscape-economic systems were identified (Figure 2): 1) Settlement zones; 2) Arable areas (permanent plots with two-field, and possibly three-field crop rotation); 3) Pasture / arable / forest areas (low forests, short-fallow lands, which were farmed mainly for 3–4 years, followed by fallow and cattle grazing, mainly cattle, along small forests, the “turnover” of about 10–20 years); 4) Forest pastures, with agricultural development (slash-and-burn agriculture with a long-term "turnover", of about 50 years, grazing in the forest, forestry, meat and fur hunting); 5) Pasture meadows and pasture-hay fields (hayfields and pasture floodplain meadows); the agricultural development of floodplains is limited by the bottomland moisture regime; 6) Woodland pastures (grazing, mainly pigs, alder forests and oak groves of the pastoral type at the foot of slopes and deluvial trains); 7) Pasture-meadow-forest areas, interspersed with small plots of arable land (a combination of upland meadows, pastoral oak forests and arable
land – grazing, mainly small cattle, forestry); 8) Forestry systems (forestry, hunting, forest bee-
keeping). In the map legend, the ecological characteristics of the main landscape complexes involved
in these systems are also given.

This made it possible to determine the anthropogenic loads and the degree of the anthropogenic
transformation of the landscape complexes for the given period of time. The given set of LESs is
generally characteristic of most of the landscape regions of Central Russia. It was revealed that
settlement systems and environmental management systems are clearly determined by the local
landscape structure.

4. Conclusion
The "Tract of St. Mary’s Mountain" is an example of the medieval rational nature management in
Central Russia. The development of this territory in the past was adaptive, the nature management fit
into the landscape structure of the area, was moderate and did not violate the fundamental properties
of the surrounding landscape. In the nearest vicinity, on the Western and Eastern heights, as well as on
the Central and Southern plateaus, there are archaeological sites of the 13th–16th centuries, and all of
them also blend into the landscape structure of the territory.

Within a radius of only a few kilometers, in this territory, there is a set of landscape complexes,
characteristic of the vast territory of the Center of the Russian Plain. For example, terminal moraine
hills and kames are adjacent to secondary moraine and moraine-glacial flat plains, large lake-glacial
depressions, and swamps of various types along depressions and small ancient-lake basins; and
narrowed ("canyon-like") sections of valleys are adjacent to extensive broad widened ones.

Such an extraordinary variety of landscape complexes that are completely different and sometimes
contrasting in natural properties, also provided the richest resource base that allowed the first settlers
to maintain a flexible adaptive economy. Currently, the archaeological sites blend into the surrounding
landscape complexes, and together they constitute a unified cultural and historical landscape that is
typical of Central Russia and reflects the main stages of the material and spiritual development of this
territory.

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