In 2021, there is an increase in tourists compared to previous years. Nevertheless, thanks to total clean-ups, usually carried out in April–May, the state of the natural monument has improved significantly. By the way, we did not notice unauthorized dumps. Garbage bags with recycled waste were observed around the entire perimeter of the territory.

When visiting the “Sudzhuk lagoon” in 2021, the first thing that caught our attention was the large number of urns. 30 additional waste bins were installed on the lagoon, including 5 waste containers for collecting solid municipal waste. We also allocated 3 more equipped smoking areas. As a result, the amount of garbage has decreased: cigarette butts, plastic bottles, polyethylene and other waste left by recreators.

When analyzing the ecological state of the “Sudzhuk lagoon” in 2021, we noticed a change in the structure of the territory – a closure channel connecting the Black Sea and the Salt Lake was restored. Environmentalists and activists of Novorossiysk are concerned about the state of the “Sudzhuk lagoon”. Therefore, the problem is that the closure channel is covered with pebbles. Because of this, fry of fish from the reservoir cannot get into the sea, and migratory birds, which usually come to the “Sudzhuk lagoon” for wintering, will have nothing to eat. Local residents have repeatedly turned to the environmental prosecutor’s office to pay attention to the situation and clear the closure channel. Nevertheless, the necessary work on this site did not begin, so the residents of Novorossiysk took buckets and shovels and decided to open the closure channel themselves [5].

Thus, in order to preserve a rare natural object, it is necessary to regulate the recreational load, prohibit all types of economic activities that damage the lagoon ecosystem, organize a centralized and permanent disposal of household waste. To maintain the right functioning of the lagoon ecosystem and water circulation, it is important to monitor the presence of the closure channel connecting the Salt Lake and the Black Sea, which prevents siltation.

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To the Question of the Recreational Load on the Littoral Ecosystems of the Nature Monument «Salty Lake» (Veselovka settlement)

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Abstract

The article presents the results of the study devoted to the assessment of recreational load on littoral phytocenoses in the vicinity of the settlement of Veselovka (Temryukskiy district), confirming that the studied area is actively used for recreational purposes and is experiencing a high anthropogenic load. Violations of water and environmental legislation have been registered. It is necessary to develop a set of measures to optimize recreational environmental management, taking into account the maximum permissible levels of recreational use.

Keywords: recreational load, phytocenoses, littoral, Veselovka settlement, natural monument, Salty Lake.

Аннотация

В статье представлены результаты исследования по оценке рекреационной нагрузки на литоральные фитоценозы в окрестностях поселка Веселовка (Темрюкский район), подтверждающие, что изученная территория активно используется в рекреационных целях и испытывает высокую антропогенную нагрузку. Зарегистрированы факты нарушения водного и природоохранного законодательства. Необходима разработка комплекса мероприятий по оптимизации рекреационного природопользования с учетом предельно допустимых уровней рекреационного использования.

Ключевые слова: рекреационная нагрузка, фитоценозы, литораль, поселок Веселовка, памятник природы, озеро Соленое.

Introduction.

The purpose of the research is to assess the recreational load on ecosystems in the Salty Lake area. The research objectives are: a) the calculation of the number of recreants with subsequent analysis of the gender and age information; b) the calculation of the number of vehicles; c) the assessment of the violation of the regime of water protection legislation. On the Taman Peninsula, there is a positive trend in the development of recreational economy, which is associated with the needs of the population in health improvement, active recreation, travel. Satisfaction of citizens' needs for active recreation is carried out at the expense of recreational areas adjacent to the settlement, which, in turn, causes an increase in recreational load and, as a consequence, the threat of degradation of natural ecosystems. Human economic activity and active nature management are rapidly reducing the number of rare species [1].

The study area is located in the Temryukskiy district of the Krasnodar region, on the southern coast of the Taman Peninsula between the Zhelezniy Rog Cape and the Bugazskiy estuary. The Salty Lake is an ancient lagoon with the length of 1500 meters and the width of 1000 meters [2]. The lake is separated from the sea by a 150-200 m wide sand bridge. The lake is a drainless and salty reservoir. At the bottom of the lake lies mud with healing properties. The thickness of the deposits is not less than 0,6 m. The presence of mud deposits causes a characteristic hydrogen sulfide odor near the reservoir [3]. The territory under the study is protected by environmental and water legislation. The Salty Lake is a natural monument of regional significance, approved by the Decision of the Krasnodar region Executive Committee No. 488 of 14.09.1983 and the Temryuk district Executive Committee No. 406 of 10.06.1981 and No. 269 of 7.09.1988. The landscapes of the territory are located within the water protection zone of the Sea of Azov, which is 500 m from the water edge.

The territory of the nature monument "Salty Lake" is characterized by high species richness and originality of flora. Sagebrush-grass and grass-grass-steppe communities are common, in the littoral part (psammophytic and halophytic phytocenoses) on the southeastern and southwestern slopes of the Salty Lake. Our floristic and geobotanical studies have shown the growth of 123 species of higher vascular plants on the littoral and steppe landscapes of the studied territory. The top ten families include 74,8% of the flora: Asteraceae (20,4%), Roaceae (17%), Caryophyllaceae (8,2%), Fabaceae (7,5%), Brassicaceae (5,4%), Chenopodiaceae (4,8%), Lamiaceae (3,4%), Rubiaceae (2,7%), Plumbaginaceae (2,7%), Apiaceae (2,7%). The rare gene pool is represented by 13 species of federal [4] and regional status [5].

Analysis and Results of the Study.

During the holiday season, many recreants gather on the embankment of the lake. It negatively affects the ecosystem of the Salty Lake. By the method of route accounting, we calculated the number of recreants on weekdays and weekends on a sandy embankment at a distance of 1500 m along the coastline of Salty Lake, with a width of 1000 m [6]. The statistical data are given in fig. 1.

Figure 1. Variability of recreants for the period 23.06.2021 - 28.06.2021

Therefore, it is established that on weekday, vacationers begin to arrive at 12 o'clock in the afternoon, and in weekend at 8 o'clock in the morning (fig. 2).

Figure 2. Variability of recreants on weekday (06.23.2021) and in weekend (06.27.2021)

The number of recreants in weekends is more than on weekdays. Accordingly, on a day off (Sunday), the recreational load on the sandy embankment is greater than on a weekday (Wednesday). We also calculated how the auxiliary means of vacationers in the form of transport, tents, sun beds changed for 6 days of our observations (fig. 3).

Figure 3. Variability of auxiliary means of vacationers for the period 23.06.2021 - 28.06.2021

As the density of vacationers increases, the density of the road and path network increases. In accordance with Article 36 of Federal Law No. 33-FZ of 14.03.1995, it is prohibited to drive and park vehicles within the water protection zone on country and sandy roads, with the exception of asphalt pavement. The passage of motor vehicles is registered everywhere along the ridges and the coastal part of the lake. Therefore, during one day on the territory of the lake, in adverse weather 117 cars were registered and on a sunny day up to 171 cars were registered. We think that it can cause the degradation of the landscape and the reduction of littoral phytocenoses. Traces of wheels from drifting vehicles are recorded on satellite images in the form of ring drawings (fig. 5). So, it is prohibited to pollute the territory with household garbage and human waste within the water protection zone. We have noted the fact of installing several toilets at the beginning of the complex, but they do not function. So, the recreants are forced to solve their personal needs independently by using littoral phytocenoses. As a result, the plant communities of sand dunes are polluted with biological waste of many hundreds of vacationers. Plastic bags with garbage are also seen everywhere. The recreants leave them on the border of the embankment and the littoral zone of the

Salty Lake. All mentioned cause the cluttering of the territory and a decrease of its recreational significance.

Figure 5. Photo on the left: satellite image of the coastal territory of Salty Lake, Photo on the right: parking on the territory of the protected area "Salty Lake" (photo by Yu.A. Postarnak, 06.24.2021)

Conclusion. The studied area is of extremely great recreational and balneological significance. At the same time, it is very important for the preservation of unique biodiversity on the species and ecosystem levels, including the rare gene pool of Russia. However, the fact of irrational use of these resources is noted without taking into account the recreational capacity of ecosystems, compliance with the requirements of water and environmental legislation, which causes the degradation of vulnerable littoral sandy and halophilic landscapes. It is necessary to develop a comprehensive program for the sustainable recreational use of the territory, which allows combining favorable conditions for the recreation of the population and the preservation of landscapes. It is required to determine the norms of recreational loads on natural complexes.

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Recreational Pressure on Changes of Soil Density of the Protected Area

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Abstract

Recreational use of the resource potential of protected areas is associated with anthropogenic impact on the components of the ecosystem, which at its high level can lead to negative consequences. The purpose of the article is to assess the transformation of soil properties depending on the recreational load and their genesis. The relevance of this work is due to the high anthropogenic load on suburban forest ecosystems. The object of research is the protected area "Rock Zerkalo".

Keywords: recreation, recreational load, soil density, transformation of soil properties, forest ecosystems, morphological characteristics of soil.