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ОЦЕНКА СОСТОЯНИЯ ОБЪЕКТОВ ОЗЕЛЕНЕНИЯ Г. ТИХОРЕЦКА

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Аннотация. С каждым годом население России все больше перемещается в города из сельских населенных пунктов, активно растут темпы урбанизации, в связи с чем особую актуальность в наши дни приобрело создание зеленых зон для поддержания оптимального уровня здоровья человека и комфортной среды его обитания в условиях города. Целью исследования является проведение оценки состояния объектов озеленения г. Тихорецка, составление предложений по повышению привлекательности и устойчивости таких объектов. В рамках научной работы по общепринятым методикам был проведен ряд исследований, а также оценено санитарное (экологическое) состояние и бонитет древесных пород, произрастающих на территории парковых зон г. Тихорецка. Насаждения парковых зон в основном представлены сосной обыкновенной (*Pinus sylvestris* L.), каштаном конским (*Aesculus hippocastanum* L.), липой мелколистной (*Tilia cordata* L.), тополем белым (*Populus alba* L.), гледичией трехколючковой (*Gleditsia triacanthos* L.), пихтой нордмана (*Abies nordmanniana* (Steven) Spach), кленом остролистным (*Acer platanoides* L.) и вязом мелколистным (*Ulmus parvifolia* Jacq.). Наибольшие значения среднего диаметра характерны для тополя черного (72±5,3 см) в насаждениях Городского парка с составом 5Лм2Тч2Яа1Гт, а также сосны обыкновенной (49±4,5 см) в насаждения с составом древостоя 4Пн3Бп3Со. По средней высоте лидирует парк «Зеленая роща» (1-й участок), где в насаждениях с составом древостоя 7Ва3Ко высота вяза американского составляет 18±0,4 м. В результате исследований установлено, что санитарное состояние древесных насаждений большинства парков оценивается третьей категорией (сильно ослабленные), бонитет на этих объектах озеленения города оценивается одинаково III классом, за исключением парка «Зеленая роща» (1-й участок), где он имеет более высокое состояние IV класса. Результаты комплексной оценки состояния насаждений объектов озеленения г. Тихорецка могут быть использованы для выработки мер по благоустройству парковых зон. При создании насаждений необходимо производить подбор древесных пород с учетом проведенных исследований. С целью формирования более устойчивых насаждений и защиты их от неблагоприятных факторов необходимо своевременно назначать санитарные рубки, рубки ухода и другие мероприятия. В целях развития рекреационного

потенциала лесопарка следует проводить мероприятия по облагораживанию территории: формирование аллей и ухоженных троп, установка лавочек, фонарей и мусорных урн.

Ключевые слова: озелененная территория, парковая зона, бонитет, санитарное состояние, зеленые насаждения

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Original article

ASSESSMENT OF LANSCAPE GARDENING FACILITIES CONDITION IN THE TOWN OF TIKHORETSK

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Abstract. Every year, Russia's population is increasingly moving from rural areas to cities, and the rate of urbanization is rapidly increasing. Therefore, the creation of green spaces to maintain optimal human health and a comfortable urban environment has become especially relevant. The aim of this research is to assess the condition of Tikhoretsk's landscape gardening facilities and develop proposals for improving their attractiveness and sustainability. This research, using generally accepted methods, included conducting a series of researches and assessing the sanitary (ecological) condition and bonitet of tree species growing in Tikhoretsk's parklands. The plantations of the park zones are mainly represented by: Scots pine (*Pinus sylvestris* L.), horse chestnut (*Aesculus hippocastanum* L.), small-leaved linden (*Tilia cordata* L.), white poplar (*Populus alba* L.), honey locust (*Gleditsia triacanthos* L.), Nordmann fir (*Abies nordmanniana* (Steven) Spach), Norway maple (*Acer platanoides* L.) and small-leaved elm (*Ulmus parvifolia* Jacq.). The largest values of the average diameter are characteristic of the tree plantings of the City Park: black poplar (72±5,3 cm) with a composition of 5Лм2Тч2Яа1Гт; Scots pine (49±4,5 cm) with a composition of 4Пн3Бп3Со, and the leader in average height is the American elm (18±0,4 m) with a composition of 7Ва3Ко in the Green Grove Park 1. The research has established that the sanitary condition of tree plantations in most parks is assessed as category 3 (severely weakened), the bonitet of these city landscape gardening facilities is equally assessed as class III, with the exception of Green Grove Park 1, where it has a higher condition of class IV. The results of a comprehensive assessment of the condition of plantations of landscape gardening facilities in Tikhoretsk can be used to develop measures for the improvement of park areas When creating plantations, it is necessary to select tree species taking into account the conducted research. In order to form more stable plantations and protect them from unfavorable factors, it is necessary to schedule sanitary cutting, cleaning cutting, and other measures in a timely manner. To develop the recreational potential of the forest park, landscaping measures should be implemented: creating alleys and well-maintained paths, installing benches, lamps, and trash bins.

Keywords: landscaped area, park area, bonitet, sanitary condition, green plantations

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Introduction

Every year, more and more people from different settlements move to cities. As a result, the rate of urbanization increases very rapidly (Mullayarova, 2018; Starostina et al., 2022). Therefore, there is a special relevance to create green spaces to maintain optimal human health and a comfortable living environment in urban areas (Mitusova, Golubnichy, 2017; Principles of Forming…, 2022; Primakov, 2021). Green spaces have various functions. They help maintain a favorable microclimate, improve air quality and reduce noise pollution. They also enhance the aesthetic appeal of residential areas as well as provide recreational opportunities.

The scientific papers of S. V. Zalesov, N. V. Kaiser, Ya. A. Krekova [et al.], O. U. Tarasova, V. V. Khrapach, D. N. Sarsekova, N. V. Potemkina, M. E. Skachkova, V. S. Zazulya, and E. V. Avdeeva are devoted to the assessment of urban greening facilities condition (Mistakes…, 2024; Tarasova, 2019; Khrapach, 2021; Sarsekova, 2019; Potemkina, 2011; Skachkova, 2020; Zazulya, 2020; Avdeeva, 2019; Primakov, 2022а, б).

No study on the condition of greening facilities has been conducted in Tikhoretsk before. There is no systematized information on the phytosanitary woody vegetation condition. So, the study of urban woody phytocenoses is relevant now-a-days.

Materials and Methods

The purpose of this study is to assess the green spaces condition in Tikhoretsk and to develop various proposals for improving their attractiveness and sustainability.

The main objects of the study were 7 green areas, shown below on the satellite image of Tikhoretsk (Fig. 1), which include: *1* – Green Grove Park 1; *2* – Birch Grove; *3* – Green Grove Park 2; *4* – Park in honor of the 80th anniversary of the Krasnodar Territory; *5* – Zvyozdny Square; *6* – Men'shikov Park and *7* – City Park.

The artificial forest area of the park areas under study is mainly represented by: Scots pine (*Pinus sylvestris* L.), Horse chestnut (*Aesculus hippocastanum* L.), Small-leaved linden (*Tilia cordata* L.), White poplar (*Populus alba* L.), Three-ringed gleditsia (*Gleditsia triacanthos* L.), Nordman fir (*Abies nordmanniana* (Steven) Spach), Norway maple (*Acer platanoides* L.) and Small-leaved elm (*Ulmus parvifolia* Jacq.).

The study of tree plantations in green areas was carried out due to the generally accepted methodology (OST 56-69–83; Primakov, Gvozdeckaya, 2017). Typical areas were selected for establishing the test plots at each site after visual assessment conduction. The next step of our research was the measurement of

Fig. 1. Location of landscaping facilities on the satellite image of Tikhoretsk

the height and the diameter of all plantations, and the assessment of bonitet class and the sanitary category (ecological) condition.

Results and Discussion

The average values of the green spaces' characteristics are given below in the table (Table).

When analyzing Table 1, it can be seen that among the park areas of Tikhoretsk, the highest values of the average diameter are typical for tree plantations with the presence of Black poplar (72±5,3 cm) with a composition of 1Gt2Fa2Pn5Tc and Scots pine (49±4,5 cm) with a composition of 3Bp3Ps4An in the City Park (Fig. 2). The data on the best growth rates of pine and poplar in the studied region were also confirmed by many scientific researches (Primakov, 2021; Shumkova, 2024; Mishenina, 2016). Lower diameter values are noted for Domestic apple trees (11±1,4 cm) with a composition of 7Tc2Pc1Md, Small-leaved linden (22±1,3 cm) with a composition of 6Tc4Ap in the Park in honor of the 80th anniversary of the Krasnodar Territory.

The average height of the park is "Green Grove" 1 (White poplar (17±0,6 m)). The lowest values of the average height of green spaces (Black pine (6,2±0,2 m) and Horse chestnut (9,9±0,7 m)) are typical for the Zvyozdny Park (Fig. 3).

Characteristics of green spaces and landscaping facilities

№	Landscaping facilities	Composition of plantings	Diameter, cm	Height, m
1	Green Grove Park 1	6Bp4Ap	30±6,1	17±0,5
		7Ua3Ap	41±9,7	18±0,4
2	Birch grove	10Ah	28±0,9	12±0,9
3	Green Grove Park 2	2Pa2Fe2Ap4Up	67±2,3	17±0,6
		2Ac2Pa2Up4Gt	58±1,0	17±1,7
4	Park in honor of the 80th anniversary of the Krasnodar Territory	7Tc2Pc1Md	27±1,8	11±1,1
		6Tc4Ap	22±1,3	10±0,6
5	Zvyozdny Square	6Pc4Pn	24±0,8	6,4±0,3
		6Ah4Pa	50,1±1,4	15,6±0,7
6	Park named after Men'shikov	10Ah	49±6,4	17±0,3
7	City Park	1Gt2Fa2Pn5Tc	72±5,3	16,5±0,4
		3Bp3Ps4An	49±4,5	14±2,4

Fig. 2. The general view of the City Park in Tikhoretsk

Fig. 3. The general view of the Zvyozdny Square in Tikhoretsk

The assessment of tree plantations of landscaping objects was carried out not only on such taxation features as average height and diameter, but as well as on the bonitet class. The data obtained during the study for each territory were averaged and presented in the form of a diagram (Fig. 4).

In accordance to the data presented in the diagram (Fig. 4), it can be concluded that the bonitet at all greening sites in the city is rated at the same III class, with the exception of Green Grove Park 1, where it has a higher IV class, which is reflected in the reduced condition of the stand and the commercial value of the wood.

The results of assessing the sanitary (environmental) condition of the tree plantations at each landscaping site in the city of Tikhoretsk are also averaged and presented in the form of the following diagram (Fig. 5).

Due to the data presented in the diagram (Fig. 5), it can be seen that the sanitary condition is rated as category 3 (severely weakened) at all sites, with the exception of the Green Grove 1 park and the Park

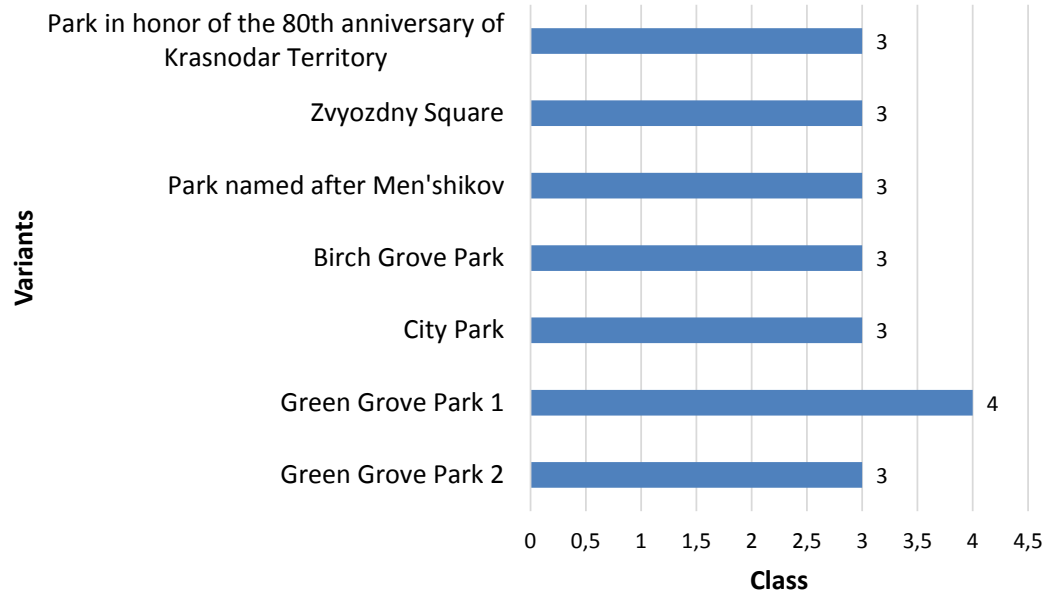

Fig. 4. The dependence of the bonitet class on the landscaping facility

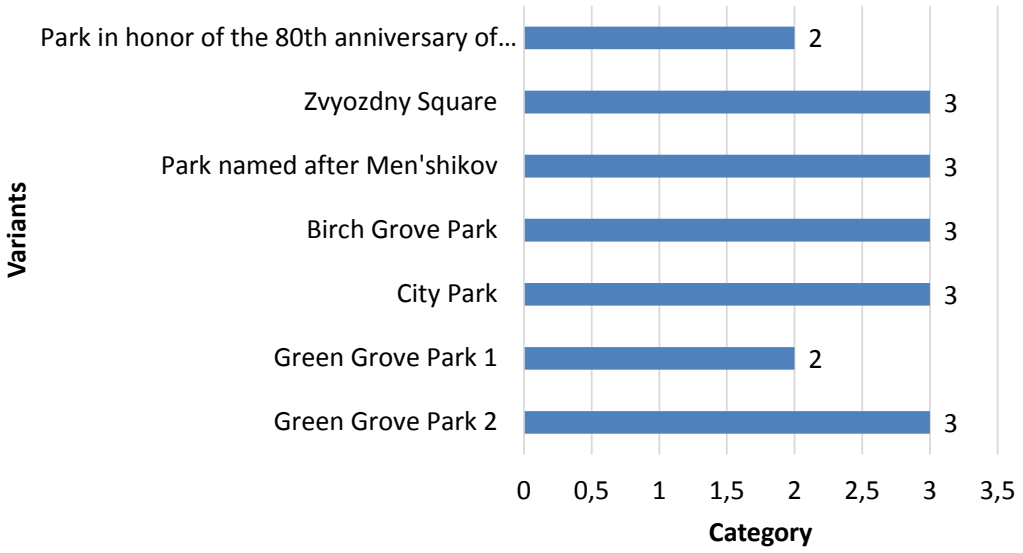

Fig. 5. The dependence of the sanitary (ecological) condition of plantations on the landscaping facility

in honor of the 80th anniversary of the Krasnodar Territory, where it is rated as category 2 (“weakened”). Thus, after assessing the condition of the landscaped areas, we can conclude that most of the park areas located within the city of Tikhoretsk are in satisfactory condition, with the exception of the park “Green Grove” 1, the condition of tree plantations of which can be assessed as “weakened” (category 2). The object is also characterized by the highest average values of height American elm (18±0,4 m), average diameter of plantations – 41±9,7 cm, composition 7Ua3Ap.

Conclusions

The data obtained as part of the comprehensive study can be used to develop measures for the improvement of park areas in Tikhoretsk. It is necessary to regularly carry out sanitary and maintenance felling in order to create more sustainable plantations and protect them from adverse factors (Primakov, 2022a). In order to develop the recreational potential of the forest park, it is also possible to carry out measures for the improvement of the territories, for example, to create convenient and beautiful alleys with well-maintained paths; to install comfortable benches, lanterns and garbage cans.

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