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VISUAL ASSESSMENT OF TREES IN THE URBAN FOREST IN BELGRADE: A CASE STUDY OF THE AREA PLANNED FOR THE CONSTRUCTION OF THE MULTIFUNCTIONAL HALL OF THE INSTITUTE FOR SPORT AND SPORTS MEDICINE OF THE REPUBLIC OF SERBIA

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Abstract: *This paper aims to evaluate the vegetation in the area proposed for the construction of the Multifunctional Hall of the Institute for Sport and Sports Medicine of the Republic of Serbia. The assessment of the existing vegetation was based on the analysis of qualitative evaluation parameters – vitality and decorativeness – of selected trees. Vitality and decorativeness were assessed on a five-point scale (1–5) using the Visual Tree Assessment (VTA) method. A total of 509 trees were recorded in the surveyed area, including 11 dead individuals. More than 30 species were identified, comprising five coniferous and twenty-four deciduous species. Conifers predominated, with Pinus nigra J.F.Arnold as the most common, while Quercus sp., Acer platanoide L., and Betula pendula Roth were the most frequent deciduous species. The average vitality and decorativeness scores, assessed on a five-point scale, were 3.10 and 3.08, respectively. The Urban Project proposed that most new facilities be constructed on existing green spaces and meadows previously used as sports fields. Less than 5% of the analysed vegetation would need to be removed in areas designated for construction. During redevelopment, all felled trees should be replaced through appropriate greening measures. Timely visual assessment of trees and green areas is essential in the planning and development of such facilities to ensure the preservation of urban forests and the continuity of green infrastructure.*

Keywords: VTA method, urban forests, greenery, tree vitality, tree decorativeness.

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VIZUELNA PROCENA DRVEĆA U URBANOJ ŠUMI U BEOGRADU: STUDIJA SLUČAJA PODRUČJA PLANIRANOG ZA IZGRADNJU MULTIFUNKCIONALNE DVORANE ZAVODA ZA SPORT I MEDICINU SPORTA REPUBLIKE SRBIJE

Sažetak: *Cilj ovog rada je procena vegetacije na području predloženom za izgradnju Multifunkcionalne dvorane zavoda za sport i medicinu sporta Republike Srbije. Procena postojećeg stanja vegetacije zasnovana je na analizi kvalitativnih parametara procene (vitalnost i dekorativnost) odabranih stabala. Vitalnost i dekorativnost stabala procenjene su na petostepenoj skali (1–5) korišćenjem Metode vizuelne procene stabala (VTA). Na ispitivanom području zabeleženo je ukupno 509 stabala, uključujući 11 mrtvih jedinki. Identifikovano je više od 30 vrsta, od kojih pet četinarskih i dvadeset četiri listopadne vrste. Četinari su dominantni, Pinus nigra je bio najčešći, dok su Quercus sp., Acer platanoides i Betula penudla bile najčešće listopadne vrste. Prosečne ocene vitalnosti i dekorativnosti, procenjene na petostepenoj skali, bile su 3,10 i 3,08. Urbanističkim projektom je planirano da se većina novih objekata izgradi na postojećim zelenim površinama i livadama koje su se ranije koristile kao sportski tereni. Manje od 5% analizirane vegetacije bi trebalo ukloniti u područjima određenim za izgradnju. Tokom procesa rekonstrukcije, planirano je da sva posečena stabla budu zamenjena. Blagovremena vizuelna procena stabala i zelenih površina je neophodna u planiranju i razvoju ovakvih objekata jer se na taj način osigurava očuvanje gradskih šuma i zadržava kontinuitet zelene infrastrukture.*

Ključne reči: VTA metoda, urbane šume, zelenilo, vitalnost drveća, dekorativnost drveća.

1. INTRODUCTION

Urban greenery is affected by various adverse anthropogenic factors. Pollution, drought, soil compaction that restricts root growth, and mechanical damage are the most common stressors in urban environments (Burton, 2002; Haaften et al., 2021). These factors have a detrimental effect on plant health, vigour, and overall development (Smith et al., 2019). To evaluate the condition of the green space analysed, it is necessary to assess the health and characteristics of the individual plants and species present in the area. The greatest ecological and aesthetic potential of the site lies in the tree species that form the structure of the park vegetation (Tomićević-Dubljević et al., 2017). Trees in urban settings play an important ecological role, contributing to improved air quality, microclimate regulation, landscape stability, and overall quality of life. Therefore, understanding the current state of the tree population is essential for informed planning and sustainable management of urban green spaces.

The primary objective of the assessment was to provide a preliminary evaluation of the existing tree population to support the planned development of sports facilities, including a multifunctional hall and an indoor Olympic swimming pool, as well as to improve the accommodation capacity of the existing hotel. At the time of the assessment, the sports fields did not meet the standards required for elite athlete training and competition, highlighting the need for redevelopment while preserving valuable vegetation and ensuring environmental quality.

2. MATERIAL AND METHODS

The Visual Assessment of green areas was conducted in 2016 in the area of the Sports and Recreational Centre (SRC) Košutnjak, located within the Institute of Sport and Sports Medicine of the Republic of Serbia. This site is situated within the urban forest, which forms part of the green infrastructure of the city of Belgrade.

Figure 1. *Location of the analysed space, construction plan of the facilities*

The methodology used to assess and evaluate the existing greenery was based on analysing certain tree attributes using the VTA (Visual Tree Assessment) method (Mattheck & Breloer 1994; Stojanović et al. 2011; He et al., 2022). These attributes were determined from assessment data. The evaluated parameters are vitality and decorativeness, rated on a five-point scale (1–5). The vitality of individual trees was quantified using a comprehensive metric based on the ratio of measured tree height to diameter at breast height, combined with observations of specific characteristics, including the number of dry or broken branches in the crown, the presence of dry tips and dieback of lower branches, and the intensity of leaf and needle desiccation. The overall health of each tree, including the presence of mechanical damage, phytopathological infections, or insect infestations, also influenced the vitality rating. The decorativeness of trees refers to their aesthetic value. Assessment of this attribute primarily relies on the subjective judgement of researchers, considering criteria such as tree form, surface characteristics, crown mass, symmetry, coloration, and seasonal variability.

A five-level scale was applied to evaluate tree vitality and the decorativeness of individual trees.

Table 1. *Ranks given for tree vitality and decorativeness (Stojanović et al. 2011).*

Rank	Criteria for evaluating tree vitality	Criteria for evaluating tree decorativeness
1	A dead or dying tree; deformed, diseased, decaying, broken, or severely damaged, with no potential for recovery.	A visually unbalanced, asymmetrical tree that disrupts the overall spatial impression. Lacking distinct colour, variation, or dynamics, with poorly defined form and structure.
2	Still vital with any mechanical or health damage. Trees with missing a part of the crown. Extremely damaged tree that can survive.	A tree with an uneven, disproportionate silhouette and poorly defined form, showing signs of mechanical or health damage. Missing parts of the crown, with weak colour harmony and an unbalanced relationship between mass and volume.

Rank	Criteria for evaluating tree vitality	Criteria for evaluating tree decorativeness
3	A damaged tree that can be revitalized through proper maintenance. Tree with a distinctly shaped crown. Tree with a moderate level of disease or mechanical damage.	Tree with a clearly outlined crown visible in silhouette. Lacking colour variation and visual interest. Positioned in a way that appears disproportionate or poorly integrated within the surrounding space.
4	A healthy tree showing slight signs of disease or pest damage. Minor defects are present but can be easily corrected through proper maintenance.	Tree with a visually harmonious shape and only slight aesthetic imperfections. Displays a well-balanced interplay of colour, form and volume.
5	Completely healthy and undamaged tree. Tree of exceptional vitality and strong adaptation to surrounding environmental conditions.	A visually striking and highly ornamental tree that exhibits clear proportion and symmetry consistent with its species. Distinct in colour and form, it enhances the space through its elegant lines, structure, and overall appearance.

During the visual inspection, the health of each tree-including crown and leaf condition-was evaluated, with particular attention to phytopathological diseases, mechanical damage, and entomological infestations. Trees assigned scores of 1 or 2 for vitality and decorativeness, as well as species classified as invasive in Serbia, were considered unsuitable for preservation and potentially hazardous to site users. Descriptive statistical analyses included calculation of the mean ($\overline{X}$), standard deviation (±SD), and coefficient of variation (CV, %). Pearson correlation analysis was performed to examine relationships between variables, with statistical significance set at $p = 0.05$. All statistical analyses were conducted using the online program DATAtab (DATAtab e.U., Graz, Austria; https://datatab.net).

3. RESULTS

In this study, a total of 509 trees were assessed for vitality and decorativeness using a five-point scale, of which 11 were dead. Thirty tree species were recorded, comprising five coniferous and twenty-four deciduous species. Among the conifers, *Pinus nigra* was the most abundant (307 individuals). The most common deciduous species were *Quercus* sp., *Acer platanoides*, and *Betula penudla*. Species exhibiting the highest vitality included *Cornus* sp., *Prunus avium* L., *Picea abies* L. and *Aesculus hippocastanum* L., whereas *Ficus carica* L., *Pyrus pyraster* L. Burgsd., and *Morus* sp. showed the lowest vitality (Figure 2).

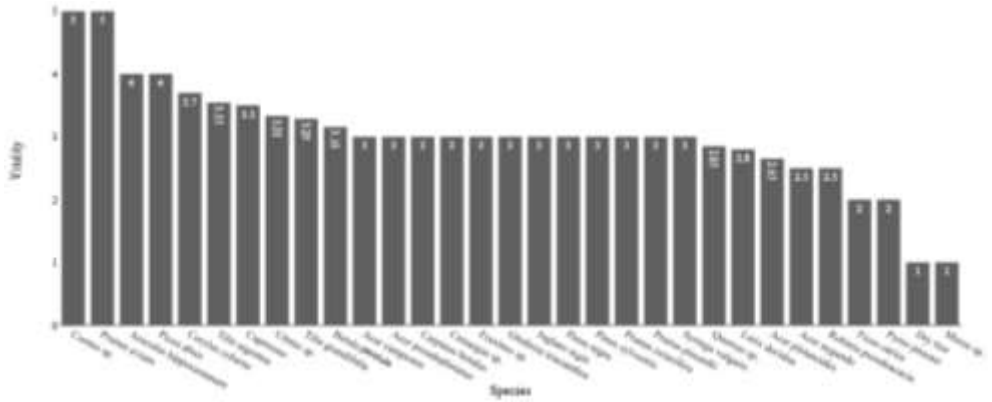

Figure 2. *Mean vitality by species*

Species of the genus *Cornus* sp., *Prunus avium*, *Picea abies*, and *Pinus nigra* exhibited the highest levels of decorativeness, whereas *Ficus carica*, *Pyrus* sp., and *Morus* sp. demonstrated the lowest aesthetic values (Figure 3).

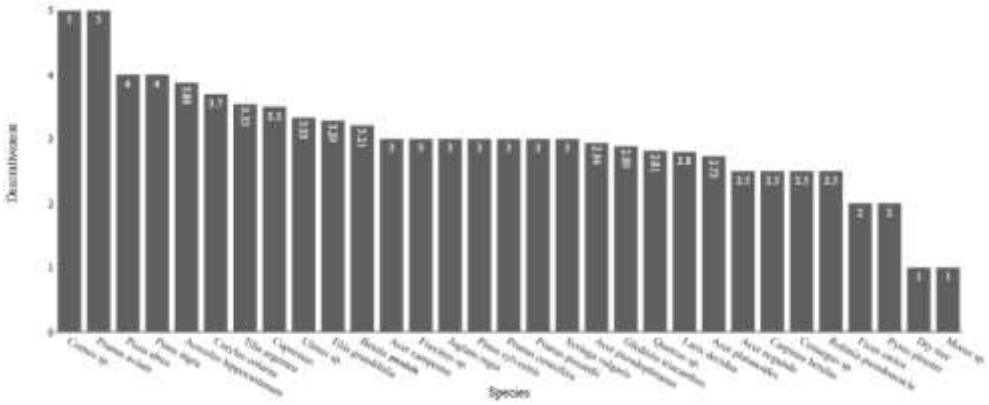

Figure 3. *Mean decorativeness by species*

Descriptive statistical analysis indicated that the mean vitality score across all assessed trees was 3.10, while the mean decorativeness score was 3.08. For coniferous species, the mean vitality was 3.02 ± 0.13 and the mean decorativeness was 3.98 ± 0.15. Deciduous species exhibited a comparable vitality score (3.01 ± 1.03) but a lower decorativeness score (2.99 ± 1.05). The higher standard deviation values observed for broadleaf species suggest greater variability in both vitality and aesthetic quality compared to coniferous species (Table 2).

Table 2. *The mean value of vitality and decorativeness in broadleaf and coniferous tree species*

		Frequency	Mean	Median	Sum	Std. Deviation	Variance	Min	Max	Range	Mean ± Std.
Vitality	conifer	307	3.02	3	926	0.13	0.02	3	4	1	3.02 ± 0.13
	broadleaf	202	3.01	3	609	1.03	1.07	1	5	4	3.01 ± 1.03
Decorativeness	conifer	307	3.98	4	1221	0.15	0.02	3	4	1	3.98 ± 0.15
	broadleaf	202	2.99	3	604	1.05	1.09	1	5	4	2.99 ± 1.05

The summarized results of the correlation analysis between vitality and decorativeness are presented in Table 3, including the correlation coefficient (*r*) and the corresponding significance level (*p*).

Table 3. *Correlation between decorativeness and vitality*

	Vitality	Decorativeness
Vitality	0.43	0.41
Decorativeness	0.41	0.68

Pearson correlation analysis revealed a statistically significant and strong positive relationship between vitality and decorativeness, with a correlation coefficient of $r = 0.76$ ($p < 0.001$). This finding indicates that trees exhibiting higher vitality scores also tend to possess greater aesthetic value, emphasizing the close association between physiological health and ornamental quality.

4. DISCUSSION

The general beneficial functions of urban vegetation, defined as ecosystem services, were also evident within the studied green space (Li et al., 2022; Mitrović et al., 2024). A decline in tree vitality reduces the capacity of species to improve environmental conditions, such as air quality and microclimate regulation, which in turn diminishes their ornamental value. This reduction in aesthetic quality further decreases their contribution to human well-being and overall environmental benefits (Chiesura, 2004; Lin & Lin, 2010). Maintaining tree vitality is therefore essential not only for ecological function but also for the aesthetic and recreational value of urban green spaces (Milosavljević et al., 2023; Mitrović et al., 2025).

In the context of the planned construction activities, 21 trees were designated for removal, while approximately 70% of the area was covered with invasive shrubs and undergrowth. The urban development plan proposed constructing most new facilities on existing grassy areas previously used as sports fields. However, the plan was not fully implemented; only part of the sports facilities and associated terrains were built, resulting in fewer tree removals than originally anticipated. Additionally, new green areas were established around the newly constructed buildings and on the roof of the sports hall. The integration of the building into the existing green infrastructure demonstrates a high level of environmental sustainability within the study area (Đurašinović et al., 2025). These measures, along with the expansion of the existing stadium and the addition of new amenities, helped minimise pressure on the remaining grass vegetation and surrounding greenery, thereby mitigating negative impacts on local biodiversity.

5. CONCLUSION

In this study, 30 tree species, comprising 509 individuals, were analysed. Using a five-point rating scale, the mean vitality of the trees was 3.10, and the mean decorativeness was 3.08. Less than 5% of the analysed green areas are planned for removal to accommodate the construction of new facilities. The selection of trees for removal has been carefully planned to minimise impacts on the overall structure and ecological functions of the urban forest. During the remodelling of the area, it is essential to replace removed trees with appropriate species, as outlined in the

landscaping project. The initial visual assessment of trees and green areas plays a crucial role in ensuring the preservation and management of urban forests during the planning and execution of construction activities. Such proactive evaluation allows planners to maintain the balance between development and ecological sustainability while safeguarding aesthetic and recreational values.

By analysing the condition of tree vegetation across the site, it is possible to identify the potential impacts of construction on the green space. Biodiversity is not expected to be threatened by these interventions, as tree removals are focused on the most common species within the area. Furthermore, the strategic planting of new trees to replace those felled is expected to enhance both the average vitality and decorativeness of the urban forest, contributing to long-term ecological resilience and improved ecosystem services.

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REFERENCES

Burton, E. (2002). Measuring Urban Compactness in Uk Towns and Cities. *Environment and Planning B: Planning and Design, 29(2),* 219-250. https://doi.org/10.1068/b2713

Chiesura, A. (2004). The Role of Urban Parks for the Sustainable City. *Landsc Urban Plan. 68(1),* 129–138. https://doi.org/10.1016/j.landurbplan.2003.08.003

Đurašinović, R., Zeković, M., Mitrović, S., Konstantinović, D., Pejić, S., Vemić, A. (2025). Indeterminacy as a Framework for Sustainable Architecture: Lessons from Spens, a Socialist Megastructure. *Sustainability 17,* 8527. https://doi.org/10.3390/su17198527

Haaften, V.M., Liu, Y., Wang, Y., Zhang, Y., Gardebroek, C., Heijman, W., Meuwissen, M. (2021). Understanding Tree Failure—A Systematic Review and Meta-Analysis. *PLoS ONE 16(2),* e0246805. https://doi.org/10.1371/journal.pone.0246805

He, K., Wei, L., Wang, B. (2022). How to Accurately Detect and Assess the Street Trees Risk in Mega Cities: A Tree Risk Assessment Method and Its Application. *Research Square,* 1- 21. DOI: https://doi.org/10.21203/rs.3.rs-1605348/v2

Li, H., Zhang, X., Li, Z., Wen, J., Tan, X. (2022). A Review of Research on Tree Risk Assessment Methods. *Forests. 13(10),* 1556. https://doi.org/10.3390/ f13101556.

Lin, B-S. & Lin, Y-J. (2010). Cooling Effect of Shade Trees with Different Characteristics in A Subtropical Urban Park. *HortScience. 45(1),* 83-86. https://doi.org/10.21273/hortsci.45.1.83

Mattheck, C. & Breloer, H. (1994). Field Guide for Visual Tree Assessment (VTA). *Arboricultural Journal, 18(1),* 1–23. https://doi.org/10.1080/03071375.1994.9746995

Milosavljević, M., Tabaković, T. M., Gavrilović, B., Mitrović, S., Milovac, Ž., Tomić, M., Eremija, S. (2023). Assessment of biotic threats to urban greenery: A case study in Stromovka Park, České Budejovice. *Sustainable Forestry: Collection 87-88*, 125-136. 10.5937/SustFor2388125M

Mitrović, S. Ž., Veselinović, M. M., Čule, N. M., Stajić, S. A., Češljar, G. D., Gagić-Serdar, R. P., Milosavljević, M. D. (2025). Visual Evaluation of Tree Health in Belgrade's Urban Forest: Čukarica Case Study. *HortScience, 60(1)*, 54-55. https://doi.org/10.21273/HORTSCI18283-24

Mitrović, S., Veselinović, M., Poduška, Z., Stojanović, V., Marković, M., Opelka, J., Milosavljević, M. 2025. Vitality as an Indicator of Aesthetic Quality: An Initial Assessment of Urban Trees in Akademski Park, Belgrade. SEEFOR 11 (1): early view. DOI: https://doi.org/10.15177/seefor.20-XX

Smith, I. A., Dearborn, V. K., Hutyra, L. R. (2019). Live Fast, Die Young: Accelerated Growth, Mortality, And Turnover in Street Trees. *PLoS ONE 14(5)*, e0215846. https://doi.org/10.1371/journal.pone.0215846

Stojanović N, Galečić N, Mešiček M (2011). *Functionality assesment of Sophora japonica L. trees used for urban land planting SC „Košutnjak"*, XIV International Eco-conference, Environmental protection of urban and suburban settlements, Novi Sad, Serbia, 379-388.

Tomićević-Dubljević, J., Živojinović, I., Tijanić, A. (2017). Urban Forests and the Needs of Visitors: A Case Study of Košutnjak Park Forest, Serbia. *Urban Forestry & Urban Greening 29*, 201-209. https://doi.org/10.1016/j.ufug.2018.07.004

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Summary

This study presents a comprehensive visual assessment of trees in the urban forest of Belgrade, focusing on the area proposed for the construction of a Multifunctional Hall at the Institute of Sport and Sports Medicine of the Republic of Serbia. The primary aim was to evaluate the existing tree vegetation in order to support sustainable planning and development of sports facilities while preserving urban green infrastructure. A total of 509 trees, representing 30 species-including five coniferous and twenty-four deciduous species-were assessed using the Visual Tree Assessment (VTA) method. The evaluation considered qualitative attributes (vitality and decorativeness), which were rated on a five-point scale.

Conifers were the dominant group, with *Pinus nigra* being the most frequent species, while the most common deciduous species were *Quercus* sp., *Acer platanoides*, and *Betula penudla*. Species exhibiting the highest vitality included *Cornus* sp., *Prunus avium*, *Picea abies*, and *Aesculus hippocastanum*, whereas *Ficus carica*, *Pyrus pyraster* Burgsd., and *Morus* sp. showed the lowest vitality. In terms of decorativeness, the highest scores were

observed for *Cornus* sp., *Prunus avium*, *Picea abies*, and *Pinus nigra*, while *Ficus carica*, *Pyrus* sp., and *Morus* sp. were rated lowest. Descriptive statistical analysis revealed that the mean vitality and decorativeness scores across all trees were 3.10 and 3.08, respectively, with broadleaf species exhibiting greater variability in both attributes compared to conifers.

Pearson correlation analysis demonstrated a statistically significant and strong positive correlation between vitality and decorativeness ($r = 0.76$, $p < 0.001$), highlighting the close association between tree health and aesthetic value. These indicate that maintaining tree vitality not only supports ecological functions but also enhances visual and recreational quality in urban green spaces.

In the context of planned construction, less than 5% of the surveyed trees are proposed for removal, primarily targeting the most common species to minimize ecological and aesthetic impacts. Strategic greening measures, including the replacement of felled trees with suitable species and the creation of new green areas around buildings and on the roof of the sports hall, aim to enhance the overall vitality and decorativeness of the urban forest. These measures also help mitigate the potential negative impacts of construction on biodiversity, ecosystem services, and recreational value.

The study underscores the critical role of early visual assessment of trees in urban planning and landscape design. By identifying trees requiring protection, monitoring health status, and assessing ornamental value, planners can make informed decisions that balance development needs with the preservation of green infrastructure. Integrating construction projects into existing urban forests, as demonstrated in this case study, promotes environmental sustainability, supports ecosystem resilience, and ensures the continuity of vital ecological and aesthetic functions in densely populated urban areas.

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Rezime

Ovaj rad predstavlja sveobuhvatnu vizuelnu procenu drveća u urbanoj šumi Beograda, fokusirajući se na područje predloženo za izgradnju Multifunkcionalne dvorane zavoda za sport i medicinu sporta Republike Srbije. Primarni cilj je bio procena postojeće vegetacije drveća kako bi se podržalo održivo planiranje i razvoj sportskih objekata, uz očuvanje gradske zelene infrastrukture. Analizirano je ukupno 509 stabala, evidentirano je 30 vrsta drveca, uključujući pet četinarskih i dvadeset cetiri listopadnih vrsta. Procena je urađena korišćenjem metode vizuelne procene drveća (VTA). Procena je uzela u obzir kvalitativne atribute (vitalnost i dekorativnost), koji su ocenjeni na petostepenoj skali.

Četinari su bili dominantna grupa, pri čemu je *Pinus nigra* bila najčešća vrsta, dok su najčešće listopadne vrste bile *Quercus* sp., *Acer platanoides* i *Betula penudla*. Vrste koje su pokazale najveću vitalnost su *Cornus* sp., *Prunus avium*, *Picea abies* i *Aesculus hippocastanum*, dok su *Ficus carica*, *Pyrus pyraster* i *Morus* sp. pokazali najnižu vitalnost. Što se tiče dekorativnosti, najbolje rezultati se su imali *Cornus* sp., *Prunus avium*, *Picea abies* i *Pinus nigra*, dok su *Ficus carica*, *Pyrus* sp. i *Morus* sp. imali najnize ocene. Deskriptivna statistička analiza je pokazala da su prosečni rezultati vitalnosti i dekorativnosti kod svih

stabala bili 3,10 i 3,08, pri čemu su širokolisne vrste pokazale veću varijabilnost u oba atributa u poređenju sa četinarima.

Pirsonova korelaciona analiza pokazala je statistički značajnu i jaku pozitivnu korelaciju između vitalnosti i dekorativnosti ($r = 0,76$, $p < 0,001$), ističući blisku vezu između zdravstvenog stanja i estetske vrednosti drveca. Ovo ukazuje da održavanje vitalnosti drveća ne samo da podržava ekološke funkcije, već i poboljšava vizuelni i rekreativni kvalitet u urbanim zelenim površinama.

U kontekstu planirane izgradnje, manje od 5% ispitanih stabala je predloženo za uklanjanje, prvenstveno usmereno na najčešće vrste kako bi se minimizirali ekološki i estetski uticaji. Strateške mere ozelenjavanja, uključujući zamenu posečenih stabala odgovarajućim vrstama i stvaranje novih zelenih površina oko zgrada i na krovu sportske hale, imaju za cilj poboljšanje ukupne vitalnosti i dekorativnosti urbane šume. Ove mere takođe pomažu u ublažavanju potencijalnih negativnih uticaja izgradnje na biodiverzitet, ekosistemske usluge i rekreativnu vrednost.

Studija naglašava ključnu ulogu rane vizuelne procene drveća u urbanom planiranju i dizajnu pejzaža. Identifikovanjem drveća koje zahteva zaštitu, praćenjem zdravstvenog stanja i procenom estetske vrednosti, planeri mogu donositi sveobuhvatne odluke koje uravnotežuju potrebe razvoja sa očuvanjem zelene infrastrukture. Integrisanje građevinskih objekata u postojeće urbane šume, kao što je pokazano u ovoj studiji slučaja, promoviše ekološku održivost, podržava otpornost ekosistema i obezbeđuje kontinuitet vitalnih ekoloških i estetskih funkcija u gusto naseljenim urbanim područjima.