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The Ogres Zilie kalni park urban forest management

Ieva Kraukle, Ilze Stokmane, Kristine Vugule
Latvia University of Life Sciences and Technologies, Latvia

Abstract. The impact of the Covid-19 pandemic demonstrated the importance of urban forests for human well-being at a time of tight constraints, when large forests close to urban areas were in high demand. Increased use affects the management of territories. Urban forests play an important role in providing ecosystem services. Urban forests show a close link between ecosystem services and forest functions. A literature review was carried out, exploring the ecosystem services and specific urban forest services provided by such territories. This article examines the experience of the Ogres Zilie kalni during the Covid-19 pandemic, taking into account the peculiar functions of urban forests. Different types of recreation that take place in the Ogres Zilie kalni, and their impact on park management are discussed. The aim of the article is to analyse and present the challenges of urban forest governance and management under the influence of Covid-19, looking through the functions of urban forests. Taking into account the classifications of ecosystem services available in Zilie kalni, zoning and assessment of the territory have been carried out. Cartographic material has been created based on practical experience and employee interviews.

The practical experience of territory management gained during Covid-19 is important and should be taken into account in the future development of green spaces, respecting the new habits of visitors potentially affected by the pandemic, where one of the most important proposals is to develop more small localised recreation areas on smaller paths.

Key words: Urban forests, Covid 19, ecosystem services, planning documents, management of urban forestry

Introduction

Forest areas are one of the main providers of ecosystem services, contributing in many ways to the provision and maintenance of ecological processes [1]. Such areas, regardless of the type of urban forest [2], contribute to the Sustainable Development Goals (SDGs) and provide a wide range of opportunities of use of forest areas for people's needs [2; 3], most often for recreation, leisure, exploration, sports, berry or mushroom picking and enjoying nature. Urban forests and natural areas in general are an invaluable asset for promoting people's physical and mental health [5; 6], which was particularly important during the Covid-19 pandemic, when pressures on such areas increased manifold, raising questions about the suitability of the management model and user infrastructure for such areas in a changing environment. The increased awareness of the role of public green spaces in everyday life is a huge benefit that was experienced during the Covid-19 pandemic, which will also contribute to more effective action in future disease and pandemic outbreaks [7]. The Covid-19 pandemic has highlighted the need to provide accessible urban green spaces to meet the needs of different population groups [7]. Pandemics have changed the way populations interact with the surrounding environment [8]. During the pandemic, developed locations where one-way traffic could not be ensured, such as Cena Moorland Footpath, were closed [9]. These were followed by other natural objects to which access was denied, such as various lookout towers and footpaths. Unfortunately, during the period from December 2020 to May 2021, basically all natural sites with boardwalks, lookout towers and other restrictive infrastructure were closed. And as of the end of May 2021, those environmental facilities were opened which could ensure one-way and/or circular traffic [10]. The Ogres Zilie kalni lookout tower was also closed during this ban, but people used the tiniest walking trails that have not been previously noticed.

People's desire to use natural areas more and more for active and passive recreation, regaining strength, exploring new places, has been not only influenced by the pandemic, but also by climate change, when we increasingly appreciate the gifts of nature and the need to take care of it.

The Ogres Zilie kalni nature park is a well-known natural area with extensive recreational opportunities. During the Covid 19 pandemic, the area was particularly used for walking and other activities allowed during the restrictions.

The aim of the article is to analyse and present the challenges of urban forest governance and management under the influence of Covid-19, looking through the functions of urban forests.

For implementation and integration the latest insights from Covid 19 into the management of the Ogres Zilie kalni, it is necessary to analyse the new patterns of amenity use, assess their sustainability and the need to redesign and change the amenity. It is important to assess the experience of the agency's staff in planning and implementing various development projects and to update it with the latest scientific knowledge.

Materials and Methods

In order to be able to assess the conditions and challenges of urban forest governance and management, an analysis of the literature was carried out, highlighting the main ecosystem service functions and uses provided by such areas. The assessment of situation regarding changes in the management of urban forest areas was carried out for one of Latvia's urban forest areas – the Ogres Zilie kalni nature park, which is widely visited and popular with both local residents and tourists. The site has undergone both legal and management changes, influenced by various factors, including the effects of the pandemic, assessing visitor flows and trying to find the best and most efficient solutions for the management of the site.

Analysing the theory about the main ecosystem services available in the Ogres Zielie kalni nature park, a functional classification the territory was created. Further research consisted of surveys of the territory, interviews and assessment of Covid 19 influence on the park management. Schematic cartographic material was created based on the classification of ecosystem services available in the territory and practical experience of park management

The study analysed the laws and regulations governing the management of the Ogres Zilie kalni nature park. The stakeholders and interested parties involved in the management and use of the Ogres Zilie kalni urban forest area were also identified and analysed through interviews with Agency and municipality specialists, non-governmental organisations representatives (Agency project manager, Ogre Tourism and Information Centre, society "Nesēdi mājās").

The Ogres Zilie kalni nature park is a 312 ha urban forest located between Ogre and Ikšķile. The Ogres Zilie kalni provide the widest range of ecosystem services. Some parts of the forest are located right next to multi-storey housing and are intensively used for people's daily outdoor recreation. The territory of the urban forest is a specially protected nature area - the nature park Ogres Zilie kalni, which is also a Natura 2000 site protected at European level. The Ogre Municipality Agency has been established for the purposeful management of the urban forest area. Most of the territory historically belongs to Riga City Municipality, although it is located outside the territory of Riga. The territory is supervised by the Nature Conservation Agency, which monitors all specially protected nature territories in Latvia. At the suggestion of the Nature Conservation Agency, a nature management plan is drawn up for specially protected areas, setting out the main lines of action aimed at conserving and enhancing biodiversity and providing recreational resources for visitors. The Ogres Zilie kalni are in a special situation, with specially protected biotopes located right next to multi-storey residential estate in Ogre city. The protected area is widely used by the residents for their daily recreation and sports. The area is actively used for school trips and by other interested visitors, accompanied by guides and teachers.

Results and Discussion

We use the resources provided by ecosystems all the time and everywhere - at work, on vacation, in education and even just breathing the air that surrounds us. Ecosystem services are the environmental, cultural, historical, social and economic basis of our lives.

Ecosystem services are all the resources and processes that nature provides for people. Usually we speak about provisioning, regulating or supporting, cultural or intangible ecosystem services [11]:

1. Provisioning services are vital for our existence – food, raw materials of all kinds, fresh water, medicinal resources.
2. Regulatory and support services ensure climate and air quality, prevent natural disasters, prevent erosion and maintain soil fertility, habitats for species, maintain genetic diversity.
3. Cultural or intangible services are essential for people as thinking, social and creative beings – recreation, mental and physical health promotion, tourism, aesthetic inspiration. Cultural or intangible ecological services are essential in urban forest areas - the widest range of outdoor recreation, promotion of mental and physical health, tourism, aesthetic enjoyment and inspiration from natural landscapes.

The availability of all the above ecosystem services can be found in the Blue Mountains. Certain ecological services are particularly important and need to be developed. A specially protected area is primarily a habitat for species and a place to preserve genetic diversity. With reference to the Ogres Zilie kalni Nature Conservation Plan, [12] the area is primarily a habitat for typical species of Latvian forests and 18 rare species of vascular plants (*Arenaria procera* Grass-leaved sandwort, *Dracocephalum ruyschiana* Northern Dragon-head, *Onobrychis arenaria* Hungarian Sainfoin, *Peucedanum oreoselinum* Mountain parsley, *Platanthera bifolia* Lesser Butterfly-orchid, *Pulmonaria angustifolia* Cowslip Lungwort, *Pulsatilla patens* Spreading Pasqueflower; *Trifolium alpestre* Trefoil Clover - species personally observed by I. Kraukle).

Urban forests are also associated with many environmental and economic benefits, including improved air and water quality, noise reduction,

flood control, prevention of soil erosion, reduction of urban heat islands and increased property values. The costs of maintaining the system such as treeplanting, upkeeping, ensuring the recreation function, have to be taken into account.

Nowadays, in terms of urban forests, we can no longer speak of traditional forestry, but of social forestry, whose main tasks are related to the provision of social functions and services [13]and environmental education [14]. Every year, the Ogres Zilie kalni nature park serves as a training and survey site for architecture and landscape architecture students, who not only learn and educate themselves from what they see in the park, but also make certain proposals for the improvement and development of various sites. In 2020, in collaboration with Riga Technical University students, certain proposals were developed with a number of noteworthy ideas, but the need to create various pavilions and shelters for visitors to relax emerged in all the works.

As A.Alexis points out, more and more studies are showing that urban forests contain patches of relatively high biodiversity [15], which is also considered to be one of the functions of urban forests.

Urban forests are classified in different ways, both in terms of their uses and their functions. One division of urban forests is given by Konijnendijk and Nilsson, who point out that there are two large groups:

Biological or natural forest resources that can develop without human intervention.

Recreational forest values that require deliberate human intervention for their development and use [16].

In practice, a general classification of forest functions is most commonly used with three cornerstones: economic, social and ecological functions, with the economic component being the first [17]. Along with urbanisation, changing demographics and lifestyles, the importance of urban forests have also increased, with a shift in the distribution of functions [13; 14].

According to A.N.Akmar, C.Konijnendijk and other authors, the social function has become the most important one nowadays - urban forests are places for active and passive recreation, sports, gathering of wild harvest, provide an opportunity to enjoy the beauty of nature, serve as a natural laboratory for scientists and researchers, protect unique species [13; 14].

The second most important function of urban forests is environmental provision and climate regulation: urban forests regulate water flow and water quality, improve and stabilise soils, provide habitat for wildlife, dispose of debris, act as noise and wind attenuators, regulate climate, microclimate, absorb carbon dioxide and act as a major carbon sink [13]. “Observations show that on a warm sunny day, 1 ha of forest releases 150-220 kg of oxygen, which is enough for 40-50 people to breathe, by sequestering 220-280 kg of carbon dioxide” [18]. Air quality improvement functions also include the enrichment of air with phytoncides and its ionisation, whose beneficial effects on human health are well recognised and widely used in health resorts [19].

The third is the economic function, which importance has greatly reduced and can be exercised to the extent that it does not contradicts with all the others. Urban forests also produce and store usable raw materials - wood, green matter from various plants, mushrooms, berries, leaves, sap, which can be used both by people and by domestic and wild animals, birds, fish, amphibians, insects.

There is also a distinction between inherent and acquired functions of forests [17]:

The inherent functions of forests, which derive from the nature of forest: productive, i.e. the production of material goods; territorial, i.e. carrying; regulating function; information (storage) function; aesthetic function; cultural and historical function.

The acquired functions of forest are defined by legislation or rules, and can also be considered as targeted functions. For example, protected areas, buffer zones.

As a further subdivision in the detailed analysis of forest areas, it is useful to distinguish between the internal and external functions of forest territories. Internal functions are those that occur within the boundaries of the forest, inside the forest - primarily all the functions of the forest environment and, in some cases, also acquired functions. External functions are those that are formed by the forest expanse as a whole and are expressed outwards from the forest - the role of the forest edge in shaping and enclosing landscape spaces, in the flow of migration of substances [17].

When assessing and planning an urban forest as a multifunctional system, it is essential to assess different functions in terms of their compatibility or incompatibility and to clearly identify compatible and incompatible functions in order to further assess which of them will be dominant and therefore determine the type of forest management [17].

Considering an ecosystem services approach, a number of intrinsic functions of urban forests can be identified. The spatial manifestation of urban forest functions depends on the relationship between forest and human activity. Urban forests are located at a point of particularly intense human-forest interaction. In urban and peri-urban forest environments, the social function and recreation in particular will become the most important and

dominant function in determining the management practices of particular forests.

Based on theory, previous experience and field studies, the authors identify six key functions of urban forests: social, environmental, environmental education, nature conservation, aesthetic and economic.

Distribution of urban forest functions in the area of the Ogres Zilie kalni complex, everyday situation (Figure 1). An essential role belongs to the social function of recreation and sports, provided by amenity areas (1.1), paths and tracks (1.2). Historical evidence (1.3) adds to the range of social functions in the area. The environmental function (2) is fulfilled by the urban forest as a whole. The environmental education function (3) is fulfilled by individual routes, where children's trips and training are most often held. Nature conservation function (4) covers the whole area of the nature park, the map shows the nature reserve area, which requires more attention in management. The aesthetic function of the forest (5) is more pronounced in the areas near the Dubkalni reservoir and in the light pine forests, which, in a relatively closed forest landscape, nevertheless allow to see a sufficiently wide visually attractive surroundings. The economic function (6) can potentially be realised by logging in the area outside the nature park. Sanitation cutting is also possible in the nature park, but it is more exceptional. Mushrooming and berry picking are counted as both social and economic functions, but are not shown in Figure 1. The mushrooming and berry picking sites are shown in Figure 2.

1. Social functions. Today, urban forestry is no longer about traditional forestry, but about social forestry, whose main tasks are to provide a wide range of recreational functions and services. The forest is the most suitable place for active and passive recreation, various types of popular and professional sports, especially for maintaining a healthy lifestyle - systematic walks, Nordic walking, jogging, skiing, cycling. The Ogres Zilie kalni already have a sports and recreation infrastructure - existing walking trails and forest paths are maintained, and a 10 km illuminated cross-country ski trail has been created. Improvements to the Dubkalni water reservoir have been made and will be developed in the future. It is planned to improve the surface of the busiest paths with gravel/dolomite chippings. There is a need to improve the bicycle paths that are heavily used and to create a bicycle park.

The forest still allows the expression of one of the oldest human activities - gathering bounty of nature – berry picking, mushroom picking, using other natural materials, which today is no longer a matter of survival, but allows us to relax from everyday worries, connect with the oldest instincts and simply be close to the natural processes. In the Ogres Zilie kalni, berry picking and mushroom picking are very common and most often part of a walk.

Urban forests provide an opportunity to enjoy the beauty of nature even for people living in an urbanised environment. Urban forests allow or make you philosophise, to contemplate that a dead, half-decayed and moss-covered tree trunk or a scarred water spout can be beautiful in nature – we cannot use it, but for someone it is their only home.

The ability of forests to hide and protect unique places and historical evidence that would otherwise be destroyed by intense human, wind or water activity has been noted as a social function, as exemplified by the strong traces of trenches preserved not only from World War I, but also from much earlier times. A nationally protected hillfort "The Ogres Zilie kalni – hillfort" (State List of Cultural Monuments – No 1861, protected since 1998) [12] is found in the Blue Mountains, as well as World War I trenches and other historical evidence.

2. Environmental functions. In particular, woodlands regulate water flow and water quality. As rainfall increases, the ability of woodlands to slow and balance the movement of rainwater, preventing it from flowing rapidly into water bodies and causing flooding, is essential.

The continuous formation of a layer of herbaceous vegetation and its complex root system improve and stabilise the soil and prevent wind erosion. The ecosystem of forests, including urban forests, is mostly composed of wild plants and provides habitat for wild animals, insects, amphibians, micro-organisms, which in turn provide for the disposal of various biological remains and other processes as a result of their life-sustaining activities.

One of the most important environmental functions of urban forests is that of sanitation and hygiene, and they are considered to be the most accessible and useful to society. This is reflected in the ability of forests and other green spaces to reduce the concentration of carbon dioxide in the air, to bind it and use it to support life processes, and at the same time to enrich it with oxygen.

Today, when global warming is constantly being discussed, with hot temperature fluctuations, stabilising the temperature and humidity regime in cities - hot in summer, cold in winter - is very important. Climate change is also bringing stronger winds, from which even relatively small areas are physically protected by trees and shrubs. Sufficient green spaces in urban environments reduce the heat and draught effects of thermal plumes. Noise reduction around city motorways, streets and industrial areas is also increasingly important.

As an urban forest, the Ogres Zilie kalni regulate water flow and water quality, stabilise soil, provide habitat for wildlife, act as a noise and wind buffer, regulate climate, microclimate, absorb carbon dioxide, act as a major carbon sink, enrich the air with phytoncides and ionize it.

Figure 1. Urban forest functions in the Zilie kalni complex, daily situation

No.	Designatiom	The six essential functions of urban forests	Characteristics	Location
1.1		Social function	Places with amenities	Sites scattered throughout the complex
1.2		Social function	Trails and tracks	Trails and tracks scattered throughout the complex
1.3		Social function	Historical evidence	Some historical evidence readable in the terrain
2		Environmental function	All natural areas	Entire complex area
3		Environmental education function	Educational routes	Trails and their immediate surroundings
4		Nature protection function	Nature conservation area. The strictest protection zone	The entire nature park area
5		Aesthetic function	Visually attractive forest, waterscapes	Extensive forest, water areas
6		Economic function	Forest areas with potential for logging	Complex area, outside the nature park
7	—	Ogres Zilie kalni nature park border		
8	----	"The agency for development of the Zilie kalni tourism, sports and recreation complex" managed area outside nature park borders		

Fig. 1. Urban forest functions in the Ogres Zilie kalni complex, daily situation [created by authors]

3. Environmental education functions. Environmental education is an important function that has emerged in recent years. Urban forests are like a specific natural laboratory. They provides research opportunities for scientists and researchers and calls for the best answers for conservation and development of the environment, using the latest scientific findings. Educating the public about the main patterns of the forest ecosystem, information about the processes occurring in the forest stimulates public interest and willingness to go to forest. Public participation in litter pick activities and competitions promotes environmentally friendly behaviour and reduces the negative anthropogenic impact of holidaymakers in urban forests. Diligent forest visitors do not litter the forest with small household waste, do not allow the idea of dumping waste in the forest, are careful during the fire season, are careful even with small plants in the forest if they have planted tiny tree seedlings themselves, which not only the forester, but also the participant of a litter pick is waiting for to grow up. Raising awareness of the importance of sustainable forest management is essential. The Blue Mountains host various environmental education events, litter picking activities and trips that provide environmental education.

4. Nature protection functions. Recently, nature protection functions have also become more prominent in urban forest planning and management.

Many species have adapted to living in urbanised environments. Urban forests contain large areas of high biodiversity. A striking example is the Ogres Zilie kalni nature park in Ogre, where various protected biotopes, plants, insects and birds can be found throughout its territory, for more information see the nature protection plan [12].

Urban forests have areas with the priority of protection of natural values (species and habitats). Pin planning for urban forest development, including recreational use, an influx of people into such areas would not be encouraged. However, where areas are particularly popular for recreation, the highest possible level of amenity can serve to protect the environment.

Nowadays, the conservation of a natural asset is often misunderstood as preservation, which often leads to its disappearance, as most modern ecosystems require wise human management.

5. Aesthetic functions. Forests in and near cities have a high scenic and aesthetic value. Even if the existing landscape is not of high quality, it can be significantly improved by maintaining it. The forest stands out in contrast to the urban environment as an element of the natural landscape and is valuable by its very existence. The urban forest as a landscape element separates the individual urbanised parts, preventing their complete fusion, but in turn weaves the individual urban elements into the overall urban structure and pattern, which then, together with the buildings and inhabitants, creates the characteristic image of each city. Forest areas screen unpleasant views, allowing even relatively small areas to accommodate a variety of land uses - such as manufacturing, health and education facilities, housing and recreational areas. The Ogres Zilie kalni have long been famous for their attractive pine forest landscapes and distinctive topography of the narrow hills, as well as pine groves, deciduous areas, small marshes and the Dubkalni reservoir, which make the overall landscape interesting and full of surprises.

6. Economic functions. Forest areas produce and store usable raw materials such as wood, needle, fruit and berries, mushrooms. Today, the use of urban forests is less about timber extraction and more about faster regeneration, maintenance after pest or disease infestation, and improving their scenic value through various coppicing and landscaping activities. The collection of non-timber forest materials such as mushrooms, berries, leaves, twigs, roots and saps for human consumption is seen more as a social recreational function, as the ecological state of the urban environment does not always allow the urban forest products to be used for food.

Urban forests produce food and other materials for domestic animals and wildlife, as well as birds and fish, to sustain an ecosystem that must withstand greater anthropological pressures and require more careful maintenance than other forests, which can more fully express their capacity to maintain and regenerate their autonomous system.

In the territory of the Ogres Zilie kalni, outside the nature park, logging is potentially possible, and it is necessary to carry out salvage logging throughout the complex area to remove dead and dangerous trees. The Ogres Zilie kalni have extensive and popular mushroom and berry picking areas, where visitors in late summer and autumn disperse virtually throughout the area.

Visiting the urban forests in the territory of the Ogres Zilie kalni complex (Figure 2). Daily visits (1) – used for places with facilities, main paths and tracks. Seasonally, during berry picking and mushroom picking season (2) the landscaped areas are used, as well as the main trails and tracks, and in addition all forest areas where mushrooms and berries grow, regardless of trails. During the Covid-19 pandemic (3), the observation tower could not be visited. The main trails were full of visitors. To avoid contact with other people, small trails are used throughout the territory, even where mushroom pickers and berry pickers do not go, the existence of trails is important.

Wise land management is needed to ensure that the above functions work. As an example, the territory of the Ogres Zilie kalni and the legislation regulating its management are considered:

The Law on Nature Conservation establishes the administration and management of the Ogres Zilie kalni nature park. A nature park is an area that represents the natural and cultural values of a particular locality and is suitable for public recreation, education and upbringing. Recreation and economic activities in nature parks shall be organised in such a way as to ensure the preservation of their natural and cultural heritage [20].

Interested parties

The management of the territory is carried out by the Nature Conservation Agency of the Ministry of Environmental Protection and Regional Development [20] (Section 25), which also organises and coordinates the monitoring of protected areas. The development of the Nature Management Plan is supervised and coordinated by the Vidzeme Regional Administration of the Nature Conservation Agency, and its implementation is promoted after its approval. The Ogres Zilie kalni nature park does not have its own public administration body. Control of environmental protection and use of natural resources is exercised by the State Environmental Service (Lielrīga Regional Environmental Board of the State Environmental Service).

Compliance with forest management laws and regulations is monitored and sustainable forest management is ensured by the Riga Regional Forest Inspectorate of the State Forest Service.

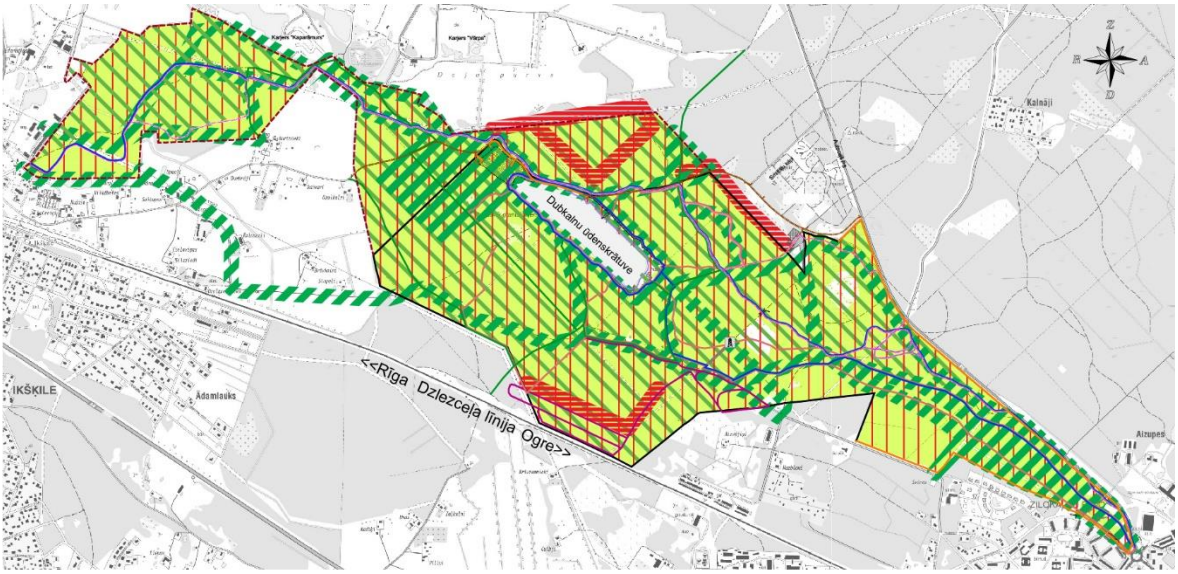

Figure 2. Visiting the urban forests in the territory of the Zilie kalni complex

No.	Designation	Visits to urban forests	Characteristics	Location
1		Daily visits	Places with amenities, paths and tracks	Places with amenities, main paths and tracks
2		Seasonal during mushroom and berry season	All forest areas where mushrooms and berries grow, regardless of trails	All suitable forest areas in a continuous line. Trails and tracks are used to get to the chosen mushroom picking and berry picking spot
3		Visits during the Covid-19 pandemic	It is forbidden to visit the observation tower. Places with amenities, main paths and tracks, all minor paths.	Vietas ar labiekārtojumu, galvenās takas un trases, sīkās takas visā meža teritorijā
4	—	Ogres Zilie kalni nature park border		
5	----	"The agency for development of the Zilie kalni tourism, sports and recreation complex" managed area outside nature park bordersm		

Fig. 2. Visits to the urban forests of the Ogres Zilie kalni complex [created by authors]

Owners and operators:

The management of the site and compliance with the rules for its protection and use are ensured by the owner or user of the land [20] (Section 24). The owners of the urban forest area in the Ogre Ogres Zilie kalni nature park and the entire territory of the complex are limited liability company of Riga City Municipality SIA Rīgas meži and Ogre Municipality. On the basis of a long-term lease agreement, the management and development of the territory is carried out by the Ogre Municipality Agency "Tūrisma, sporta un atpūtas kompleksa „Zilie kalni" attīstības aģentūra" (The agency for development of the Zilie kalni tourism, sports and recreation complex).

The main focus areas of the managers are integrated management, multifunctional use and ecosystem sustainability. The Agency has defined medium-term strategic objectives, divided into administrative, social, environmental area [21].

The objectives of the administration area are to ensure effective governance for a sustainable enterprise and to create a regulatory framework for effective governance and environmental protection.

The social area includes 3 strands. Creation and development of environmentally friendly landscaping infrastructure for quality tourism, sports and recreation services. Enhancing knowledge of the social environment, cultural history – for a better understanding. Public involvement and information about the complex - to promote participation.

The aim of the environment area is to preserve natural diversity for the sustainability of Latvian and European ecosystems and to increase the value of the environment.

Recreation

Recreation, as one of the essential social functions of the forest, is one of the main, traditional and enduring uses of the Ogres Zilie kalni. The urban forests within the complex provide recreational opportunities for people of all ages and physical condition. The main users of the territory are the residents of Ogre municipality, tourists from surrounding municipalities and Riga, visitors from Latvia and abroad. The complex is an important place for athletes, regularly used for training and competitions (runners, Nordic walkers, cyclists – XCO cyclocross, Dovnhil, skiers, orienteers, biathletes, sled dog racers).

Recreational opportunities in the Ogres Zilie kalni can be divided into several groups according to their activities, need for facilities and infrastructure. The impact of recreation types on the urban forest area and the intensity of management varies.

The largest group of holidaymakers indulge in **unorganised, low-activity recreation.** People regularly go for walks in the park to enjoy nature and the forest. There is a significant group of pleasurers who go outdoors with children of different ages. This recreation was particularly active during Covid 19 in 2020 and 2021, when many recreation areas had restrictions on visitation. Although the Ogres Zilie kalni area was freely accessible during Covid-19, people made much more use of the small forest trails, which have not been noticed previously, putting extra strain on the environment. Unfortunately, people also brought litter into the large area, which used to be collected mostly along the major paths and at the Dubkalni reservoir. There was a huge influx of cars on the forest roads and they had to immediately organise traffic using parking restrictions.

Dog walking is one of the most common types of walking. On the eastern edge of the nature park, in the territory of Ogre city, and especially in the vicinity of the Ogres Zilie kalni housing estate, dozens of people walk their dogs every day.

Unorganised active recreation – individual jogging, walking, Nordic walking - these activities are mainly associated with the eastern and central part of the complex, but since the beginning of 2015, with the creation of a skiing track, activities have also extended into the western part, increasing activity on the Ikšķile side.

Cycling has become increasingly popular in recent years. Individual cyclists train throughout the park, but the greatest flow of riders is in the western and central parts of the park, where the articulated terrain is also suitable for mountain biking.

Unorganised skiing covers the whole area of the park. In 2016-2020, 10 km of floodlit cross-country skiing trails linking Ikšķile and Ogre have been created. In good snow conditions, skiers from Riga, Salaspils and other places come to the Ogres Zilie kalni. Thanks to systematic maintenance, cross-country skiing is regaining popularity and attracting more and more people of all training levels. Even during the Covid 19 restrictions, the ski track continued to operate as it was possible to comply with the cross-country rules due to the large forest areas.

The open corridors on the steep slopes of the hills are traditionally used by a small number of people for downhill skiing, snowboarding, tobogganing and other riding. Rides in these areas are spontaneous and disregard safety. Security barriers are often destroyed. A solution is still being sought.

In the less visited areas of the complex, horse riding with horses from the nearby stables (Mangaļi, Birzītes, Zaļkalni) takes place. In 2017, some approved areas for horse walking in the southern, south-western part of the park have been marked to reduce the risk of collisions. Sometimes walking or cycling paths or ski tracks are used for horse riding, which causes disagreements between users because the surface of the path is significantly damaged by horseshoes, a fast cyclist can spook a horse, a pedestrian can be frightened by a horse, etc. To minimise conflicts of interest and dangers for different users, the network of paths and trails shall be separated as far as possible and defined in the binding rules [22].

In recent years, the association “Sniega suņi” (Snow Dogs Association) has been organising dog sledding rides in the complex to train the dogs, which are now also offered for the entertainment of visitors. Dog sledding rides take place in the less used south-eastern part of the nature park, in some places creating the possibility of collisions between horse riders, dog walkers, pedestrians, joggers and cyclists. To prevent this, dog sledding trails were marked in 2017.

After gravel extraction ceased in a gravel pit in 2003, a water body formed. Swimming in the Dubkalni quarry is very popular, as well as recreational activities on the ice in winter. The water body is also used by divers and anglers. During the swimming season, lots of people relax by the water. Even in the cold season, there is a wide range of swimmers who especially appreciate the boardwalk and stairs in the water, which make it easier to make an ice hole.

In the territory of the nature park near Ogre, there is a rope adventure park, Giant’s Trail (Milžu taka), which was created on the basis of a long-term contract by SIA MGH.

In 2017, SIA Velo SKI also started renting electric bicycles and skis at the ski track starting platform, providing visitors with easily accessible rental services not only in Ogre, but also in the territory of the nature park.

Organised active recreation and sport

Currently, all competitions and training are coordinated with the Agency and carried out in accordance with the law. To reduce the negative environmental impact of the races and training, the 1 ha starting platform established in 2014 is used as the starting point for the races. Previously, the area had turned into a rubbish dump, which was removed as a result of landscaping work.

When planning competitions, it is necessary to take into account Part 5, Sub-paragraph 12.2 of the Nature Protection Plan of the Ogres Zilie kalni park, which states that it is prohibited to cross the nature reserve zone of 142 sq. for the participants of sector 2, 5, 6 public events, whose movement takes place off the paths and roads, and the rest of the zone – if more than 40 participants take part in the event. The checkpoints required for the competition shall be located in such a way that the areas included in the reserve do not have to be crossed by the participants during the competition. In particular, these rules apply to the non-location of orienteering checkpoints in nature conservation areas, as orienteers often navigate without using the trail network, which creates additional anthropogenic pressure.

Initially, it was necessary to promote the newly created amenities. In 2015, the Agency started organising the Ogres Zilie kalni Triathlon, which included skiing, running and cycling competitions. Until 2017, the popularity of sports infrastructure among organisers of sports competitions has grown significantly. It was already decided in 2018 that the Agency would no longer organise sporting events, but would carefully consider permits for sporting events organised by other organisers in order to limit the impact on the environment and the created infrastructure. The restrictions during Covid in 2020 and 2021 effectively minimised the number of traditional competitions. Some activists organised unconventional competitions, which could be done individually.

Running and orienteering are popular sports at the complex. Runners and orienteers train and compete on the ski slopes, major trails and forest roads. The race series “Apkārt Zilajiem kalniem” (Around the Ogres Zilie kalni) has been popular for many years, as well as school competitions at regional and national level, as well as the “Reljefs” (Relief) orienteering competition. In 2017, the trail-running series “Stirnu buks” (Roe Buck) was held at the complex for the first time.

Since 2008, the park has seen a rapid development of cycling, including MTB mountain biking. For cyclo-cross races, the ski trails are mainly used. The most well-known cycling events, which also include the territory of the complex, are the MTB cycling trails, which are minimally maintained for the time being. To reduce soil erosion, trail markings have been placed and critical sections of the trail surface are being repaired. In some places, MTB, XCO and Downhill cycling enthusiasts are arbitrarily creating trails and trail facilities without taking into account nature protection and safety requirements. Considering this high demand, the possibility of a dedicated track, with sections of varying difficulty for cyclists of different abilities, is being considered

If motorised vehicles are not used, events and competitions can also be organised on the ice of the water body subject to sufficiently thick ice.

Unauthorised recreation. Unauthorised forms of recreation in the protected area can be still found in the territory of the complex. In some cases, quadricycle, motorcycle and car drivers enter unauthorised areas, leave roads and drive on or off tracks, trails, glades and, in rare cases, on ice in winter.

Conclusions

Having analysed the situation in the nature park, it is clear that the main management actions of the Agency should remain integrated management, multifunctional use of the territory and sustainability of the ecosystem. To ensure the sustainable development of the nature park in the future, it is necessary to elaborate a development strategy for the area, maintaining the defined administrative, social and environmental objectives. When developing the strategy, it is important to identify the interests and opportunities of various stakeholders (Ogre Municipality, land owners, residents of the municipality, visitors from other nearby municipalities such as Salaspils, Stopini, Riga, tourists from Latvia and abroad, sports organisations and NGOs, nature conservation institutions, etc.).

The previous planning documents of the municipality and the Agency are relevant. New insights into the development of the territory have been taken into account in the analysis of the previously identified action plans of the strategy, which include activities that have not yet been implemented. In order to judge the changes in the situation in the territory of the complex, the six essential functions of urban forests should be taken into account: recreational, environmental, environmental education, nature conservation, aesthetic and economic. When assessing these functions, it can be seen that they overlap throughout the territory of the nature park, especially in the areas of the created amenities.

Good ideas are being found in cooperation with universities training young professionals in planning, landscape architecture, architecture, design and arts.

In summarising the impact of the Covid 19 pandemic, the Agency's experience and recent studies have highlighted the importance of urban green spaces in promoting the physical and mental health of urban residents. Recent findings on the Covid 19 pandemic, which requires extensive areas where large numbers of visitors can stay at a sufficient distance, should be taken into account. We can no longer develop only large sites that bring together large numbers of people, we need to develop many small trails and individual recreational opportunities.

It is now clear that further development of the site's infrastructure can only take place through the comprehensive development of amenities. The existing infrastructure can no longer ensure that the existing number of visitors does not adversely affect the habitats in the area. A large number of visitors demand improved minimum services – parking, leisure areas, benches, rubbish bins, toilets, accessibility for people with special needs.

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AUTHORS:
Ieva Kraukle, Mg. spatial development planning, Deputy Director for Tourism, The Ogre Municipality Agency "The Development Agency of the Tourism, Sports and Recreation Complex "Zilie kalni", PhD student at the Department of Landscape Architecture and Planning, Faculty of Environment and Civil Engineering, Latvia University of Life Sciences and Technologies. E-mail ieva.kraukle@hotmail.lv
Ilze Stokmane, Dr.oec., assistant professor and leading researcher at the Department of Landscape Architecture and Planning, Faculty of Environment and Civil Engineering, Latvia University of Life Sciences and Technologies. Research interests - sustainable development and resilience, landscape democracy, emphasizing the societal dimension of landscape architecture. E-mail: ilze.stokmane@lbtu.lv
Kristine Vugule, Dr. arch., assistant professor and leading researcher, head of the Department of Landscape Architecture and Planning, Faculty of Environment and Civil Engineering, Latvia University of Life Sciences and Technologies. E-mail: kristine.vugule@lbtu.lv

Kopsavilkums. Covid–19 pandēmijas ietekme parādīja pilsētmežu lielo nozīmi cilvēku labsajūtas nodrošināšanā strikto ierobežojumu laikā, kad plašās, urbānām vietām pietuvinātās meža teritorijas bija īpaši pieprasītas. Palielinātā noslodze ietekmē teritoriju apsaimniekošanu, atgādinot, ka pilsētmežu teritorijām ir būtiska loma ekosistēmu pakalpojumu nodrošināšanā, un uzsverot, ka tāpēc jo svarīgāka ir šādu teritoriju pareiza plānošana. Pētot pilsētmežus, redzama cieša ekosistēmu pakalpojumu un mežam piemītošo funkciju ciešā saite. Pētījumā veikta literatūras avotu analīze, apskatot ekosistēmu pakalpojumus un specifiskās pilsētmežu funkcijas, ko šādas teritorijas nodrošina. Rakstā pētīta Zilo kalnu pieredze Covid–19 pandēmijas laikā, ņemot vērā pilsētmežiem piemītošās funkcijas. Kā būtiskākā pilsētmežam piemītošā funkcija, kas ietekmē apsaimniekošanu, ir apskatīta rekreācija, tās dažādie paveidi. Raksta mērķis ir analizēt un iepazīstināt ar urbāno mežu pārvaldības un apsaimniekošanas izaicinājumiem Covid–19 ietekmē, raugoties caur pilsētmežiem piemītošajām funkcijām. Vadoties pēc Zilajos kalos pieejamo ekosistēmu pakalpojumu klasifikācijas, veikts zonējums un novērtējums. Izveidots kartogrāfiskais materiāls balstoties uz praktisko pieredzi, darbinieku intervijām. Covid–19 laikā uzkrātā praktiskā pieredze teritorijas apsaimniekošanā ir svarīga un jāņem vērā zaļo teritoriju turpmākā attīstībā, respektējot apmeklētāju jaunos paradumus, ko potenciāli ietekmējusi pandēmija, kur viens no būtiskākajiem priekšlikumiem ir vairāk attīstīt nelielas lokālas atpūtas vietas uz mazākām takām.