PROBLEMS AND THREATS RELATED TO THE RECREATIONAL USE OF NATURAL PROTECTION AREAS IN CITIES

Edyta Rosłon-Szeryńska, Mateusz Korbik
Department of Landscape Architecture, Faculty of Civil and Environmental Engineering, Warsaw University of Life Sciences, 02 787 Warsaw, Poland

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Abstract
The development of cities and suburbanization causes absorption of natural habitats (protectected and not by low), antropopressure. Despite the EU's biodiversity policy, municipalities are under pressure to make these areas available for tourism and leisure.
According to Cieszewska [2008], areas with significant abiotic and / or biotic values are naturally valuable. These areas are characterized by high biodiversity, therefore they are subject to legal protection under the Act of April 16, 2004 on nature protection (Journal of Laws of 2020, item 55, i.e.) in local and supra-local form.
The aim of the paper is: 1) presentation of problems and threats related to the use of naturally valuable areas, 2) an indication of ways to prevent or limit their degradation. The research area concerns the province Mazovia, the oxbow lake of the Vistula river in the commune of Łomianki.
Despite the implementation of plans / programs for the protection and management of green resources, the areas of nature protection and naturally valuable areas are still exposed to strong anthropopressure.
Research shows that local areas of environment protection should be considered as a functional areas. The tasks of active protection of ecosystems should also be defined in the form of specific solutions for the management and sharing of them. Also, the valuation of ecosystem services in spatial planning will be important.

Key words: anthropropression to nature protection areas, active nature protection, management of green areas

Introduction

According to Cieszewska (2008), natural valuable ones are characterized by abiotic and / or biotic natural values. They are one move on the first and on the transformation. These areas are characterized by high biodiversity, hence they are subject to legal protection under the Act of April 16, 2004 on nature protection (Journal of Laws of 2020, item 55, i.e.) in the form of:

- supra-local: nature reserves, national parks, landscape parks, protected landscape areas, Natura 2000 areas
- local: ecological lands, documentation sites, nature and landscape complexes and natural monuments.

It is protected a) genetic diversity, allele variation in the gene pool, gene exchange and mutations; b) species diversity, species diversity and richness, equality, c) ecosystem diversity the diversity of ecosystems, the extent of the range of species, communities - structural and functional diversity.
Valuable forest communities, mid-field trees, wastelands, ancient trees and others are not covered by protection.
These areas, despite the implementation of protection plans and programs, are still exposed to strong anthropopressure. Especially in cities, they become available to residents. They have an educational and recreational function (Solarek K., 2020).
A number of threats to these areas are perceived. These are:

- Changes in climate and habitat conditions, abiotic and biotic damage due to unfavorable global and local changes,
- A protection zone running along the administrative border, along roads, instead of taking into account functional boundaries, no buffer zone, unfavorable changes in the immediate environment
- Indirect destruction - overexploitation, scaring animals
- Direct destruction, deliberate destruction, overexploitation due to the limited absorptive capacity of the land
- Unfavorable changes in the process of revitalization, renaturalization - planting plants, distorting the natural habitat
- Introduce invasive plants
- Conducting nursing treatments that deplete the habitat

- removing trees as part of measures to improve the safety of people and their property.

Badly understood tree care, including excessive sanitary cuts, reduction cuts in the event of a conflict with the terrain function is visible especially in the case of nature monuments (Rosłon-Szeryńska et al. 2017).

The research of Fortuna-Antoszkiewicz B., Łukaszkiewicz J. and Rosłon-Szeryńska E. (2019) conducted, among others, by in nature-protection areas in Warsaw (Natoliński Park, The Vistula riverside), they show a significant presence of invasive plants in the undergrowth, undergrowth and layer of trees in urbanized spaces, regardless of the availability of these areas. Research by Sikorski et al. (2014) shows that the ash-leaf maple penetrates the least into large willow stands and young poplar stands. Maple monocultures usually occupy small patches.

The aim of the paper is: 1) presentation of problems and threats related to the use of naturally valuable areas, 2) an indication of ways to prevent or limit their degradation. The authors present a case study. The research area concerns the province Mazovia, the oxbow lake of the Vistula river in the commune of Łomianki.

Material and methods

The problem was analyzed on the example of the Warsaw Protected Landscape Area in the commune of Łomianki. It covers the oxbow lake of the Vistula with a basin filled periodically with water and the dominance of riparian vegetation. The natural and landscape valorization of the area was presented. Potential threats to the protection of biodiversity and durability of the plantings in question were identified. Then, the principles of sustainable management of natural resources were indicated in order to minimize the problems. An important aspect is to maintain the natural character of the facility and use its potential to improve the microclimatic conditions of the neighboring areas (including reducing the heat island and improving air quality) and increasing water retention.

The research included:

- visual inspection of the area with photographic and audiovisual documentation, air raids over the area, using a drone,
- physiographic study, environmental monitoring and dendrological inventory with a description of the conservation status of plants and basic dendrometric measurements,
- valorization determining the state of preservation, type of damage, health condition of plants and their function as well as natural value in the field,
- indications for handling trees in connection with the planned creation of a new green area and renaturalization of this area.

Natural habitats, potential and real vegetation was determined according to the Matuszkiewicz's key (2001).

The health condition of the tree was determined based on the recognition of external symptoms of the disease or damage, using a qualitative assessment, where:

a) Good condition means trees with a natural habit and appearance resulting from the development in a given environment,

b) Medium condition - means the presence of damage, defects, local rot in the knot zone, of negligible importance for the statics of trees

c) Bad condition - means the presence of damage, defects, local rot in the area of knots, significant for the statics of trees or indicative of tree dieback.

Environmental valorization is defined on the valuation scale, where:

1 - it is a low natural value, invasive plant, not constituting a food base for birds;

2 - it is an average natural value, an invasive plant (but constituting a food base for animals or increasing soil fertility) or a native plant without significant ecological significance (not constituting a food base for animals);

3 - is a high natural value, a native plant that is a habitat of wild animals, including dead trees of native species.

Based on the analysis of all data, indications for tree management were presented.

Results

The area covered by the study is the Vistula oxbow lake and is a local depression of the land with a water basin with an area of 0.5 ha. The structure of this wooded area and the species composition refer to the poplar and willow riparian forests *(Salici-Populetum).* This area is under protection as the Warsaw Protected Landscape Area (WOChK) and lies in its normal zone. At a distance of 200 m to the east, the area is adjacent to the Fabryczny park created in the manor park at Fabryczny Lake. The lake with many oxbow lakes is part of a potential ecological corridor of local importance, running along the Struga Dziekanowska in the Vistula ice-marginal valley along with the lake system, including Lake

Fabryczny, Lake Kiełpińskie and Lake Dziekanowskie. About 600 m to the east are the boundaries of the special ecological protection zone of the WOChK. The main goal of establishing the Warsaw Protected Landscape Area (WOChK) is to protect valuable ecosystems and link them with the national system of protected areas. The areas which determine the biotic potential of the areas and the significant importance for the migration of animals, plants and fungi are covered with special ecological protection. The landscape surrounding the area is typical of the valley suburban areas. Among the wastelands, which until recently were cultivated for agriculture, residential buildings with small services are developing.
The landscape surrounding the area is typical of the valley suburban areas. There are multi-family and single-family buildings with small services in the vicinity of the study area.

Fig. 1: Viewing connection of the neighboring areas with the study area. Yellow arrows mean favorable views, red ones are unfavorable views, blue ones are neutral views. (photo, M. Brach).

Fig. 2: The natural connection of the study area with the Vistula valley and naturally valuable areas enables the migration of many animals, especially birds. The reed rushes in the local water basin are marked in blue (photo, M. Brach).

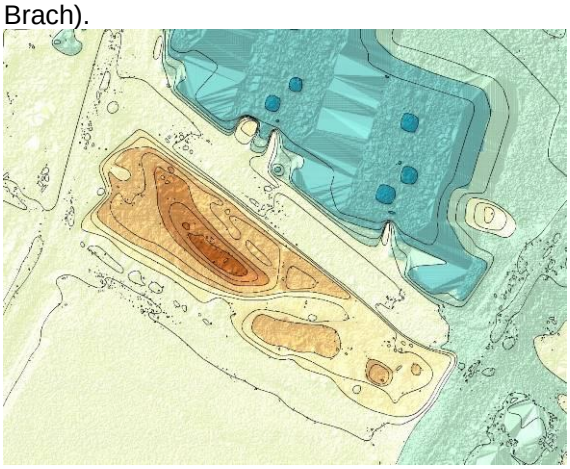

Fig. 3: Topographic features of the oxbow lake (GIS data, geoportal.pl)

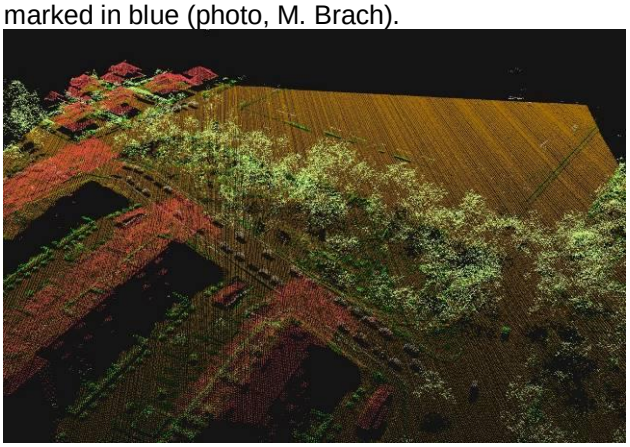

Fig. 4: Vertical structure of wooded area (M. Brach)

The oxbow lake has no surface water supply. It is a basin with a varied topography, periodically flooded in the north-west part. The difference in levels between the lowest point (with reed rushes in the central zone) and the highest point (on the northern border of the plot) is 4.5 meters.
The species composition includes species of trees and shrubs typical for poplar-willow, ash-alder riparian forests, oak-hornbeam forests and forest covers.
There were 187 lobes / groups / copies, including:
• single-species scrub communities or with the dominance of one species, undergrowth of shrubs and tree saplings - 12 patches / zones, each with an area of more than 100 m2.
• 44 groups and multi-stem forms of trees (including ash-leaved maple, small-leaved linden, cherry plum, white willow, black alder, common ash, elderberry, single-necked hawthorn, black dogwood and bird cherry.
• 131 individual trees, including: white willow, gray poplar, black alder, ash-leaved maple, small-leaved linden, common ash, black locust, and also: cherry plum (alga), single-necked hawthorn, pedunculate oak, warty birch, pear tree.

The structure of the vegetation in the area of the study is varied. In the eastern zone, it is compact, forested with a more or less rich multi-storey layout. In the western zone, it has a lobed character, where around the clearing with a water reservoir covered with rush, a community of dense shrubs and loose or dense surrounding trees is formed.
In the system, the oldest trees for valuation purposes are black alders, estimated to be> 50 years old. At the same time, these trees are in the worst condition due to the change in habitat conditions and the drying out of the land. The group of riparian trees - poplars, willows and ash trees are in the age range of 20-30 years. Later, small-leaved limes (due to the oak-hornbeam forests) and cherry plums - dragged and scattered by birds nesting in alders - came to the area. The health status of these plants is good. The last two decades have seen the expansion of the invasive ash-leaf maple and black locust. The average condition of the clones is average due to numerous deformations, tilt and drought, while the black locust are good. The table in the figure below shows the characteristics of dendloflora taking into account the process of changes in the habitat.

Tab. 1: Dendrochronological analysis of the main tree species growing in the study area

Teh most common tree species	**Number of trees**	**Average trunk circumference at. 130cm**	**Average condition**	**Average age range of trees (years)**
Alnus glutinosa	12	140	bad	>50
Salix alba	17	108	medium	30
Fraxinus excelsior	6	50	goood	20-30
Populus alba, P. X canescens	5	116	medium	20-30
Prunus cerasifera	9	35	good	20
Tillia cordata	27	43	good	20
Acer negundo	66	45	medium	<20
Robinia pseudoacacia	18	36	good	<20

The dendrochronolic analysis carried out shows that the oldest structure-forming trees (black alder) are withdrawing from the study area. Willow and poplar regeneration is limited. Lime and ash from the oak-hornbeam (riparian) habitats feel good in a given area and will constitute an important component of the species composition of tree stands. Cherry plum is associated with the presence of birds and will constitute a layer of undergrowth and thickets in the area of the study. Ash-leaf maples and black locust conquer the area expansively and compete with native species of trees and shrubs, while the black locust can play a positive role in the environment. It has allelopathic properties, positively ionizes the air, is a honey plant, and improves the nitrogen content of the soil.
The natural value and the occurrence of species forming a plant community were determined, divided into 1) trees, 2) shrubs and creepers, and 3) tree saplings. A valuation scale from 1 to 5 was used, where 1 is a low (negative) value and 5 is a very high (positive) value for a given criterion. The data is included in the table below. Plants that negatively affect the biodiversity of the habitat are marked in red. Plants that should be protected and need to be restored in the habitat are marked in green.
A threat to an area characterized by a high level of biodiversity may be its inept revitalization and management related to the removal of many plants, and the impoverishment of habitats by monoculture plantings.
An important factor reducing the value of riparian areas is their excessive trampling and uncontrolled use leading to degradation and synanthropization of the habitat. The areas of riparian forests and wet-loving thickets are not very resistant to trampling and have low absorption.
In the area of the study, the destruction of values by littering is visible. In the eastern part and on the outskirts, but also above the water basin, you can see wild garbage dumps. The proximity of roads and the "Orlik" sports complex is a nuisance due to noise emissions, which may not be conducive to rest in this place, and may also eliminate the most skittish birds from the habitat.

Tab. 2: Assessment of the natural value of dendroflora in the study area

list of the most common plants	Occurence on a scale of 1 (very rare) to 5 (very common)	Natural value on a scale of 1 (very low) to 5 (very high)
Shrubs and creepers		
Rubus fruticosa	4	5
Sambucus nigra	4	5
Euonymus europaeus	3	5
Cornus sanquinea	3	5
Crataegus monogyna	2	5
Rosa canina	1	5
Humulus lupulus	3	5
Parthenocissus quinquefolia	2	3
Tree saplings		
Acer negundo	5	1
Robinia pseudoacacia	5	2
Prunus avium	4	3
Alnus glutinosa	3	5
Prunus padus	2	5
Prunus avium	1	4
Juglans regia	2	3
Ulmus glabra, Acer pseudoplatanus	1	4
Quercus robur	1	4
Trees		
Acer negundo	5	1
Robinia pseudoacacia	5	2
Prunus cerasifera	4	3
Alnus glutinosa	3	5
Pyrus communis	2	4
Prunus avium	1	4
Populus x canescens	2	5
Fraxinus excelsior	3	5
Tilia cordata	4	5
Quercus robur	1	4

Discussion and Conclusion

The conducted nature analyzes and research allowed for the development of guidelines for the management plan for the existing tree cover and indications for the "Ptasia Oaza" green area development project in the commune of Łomianki. The great natural potential as well as phytotherapeutic and phytosanitary values of plants growing in the studied habitat have been noticed. The diversification of the area in terms of hydrogeology, topography, phytosociology and floristics allows for the creation of a space not only constituting a habitat of wild animals (including food and habitat for birds), but also performing a number of other services in the city's ecosystem, such as:

• regulation of the ecological conditions of the city by reducing noise, emission of volatile substances, air ionization;

• ability to carry out gas exchange in the atmospheric environment, modification of microclimatic conditions of the urban environment (leveling extreme temperatures and improving light conditions and air humidity);

• shaping ecological-biocenotic and hydrological relations (beneficial influence on soil water relations);

• phytosanitary and phytoremediation functions by reducing air dust and purifying water;

• health (phytoncides, phytotherapy) and educational functions (increasing environmental awareness, learning to respect nature).

An important assumption made in dealing with the existing greenery is:

a) preservation of the species composition of valuable plant communities, restoration of degraded and distorted spaces by the invasion of expansive plants (including ash-leaf maple and black locust) and due to the lack of water supply from the water system of the Struga Dziekanowska,

b) shaping and protection of habitats present in the area of fauna, with particular emphasis on birds.

For this reason, the following should be protected: dendroflora characteristic of potential natural habitats and trees with seeds and fruit that are food for animals, as well as dead trees, which are places of nesting and feeding for birds, as well as a thicket of saplings of trees and shrubs in the undergrowth of trees - which determines the existence of many timid birds. A dynamic model of landscaping should be applied, treating plant composition as a process, not a state.
Planned measures and actions towards the existing trees are of active and (in some places passive) habitat protection. Active protection applies to zones adjacent to the road and within the area of land development with an educational and recreational program. In these spaces, an important goal is a compromise between the good of nature, the preservation of biodiversity and the safety of people and property.
The conducted research shows that local nature protection areas in cities often occupy large areas. Despite this, they are not sufficiently protected due to the lack of defined rules for their protection, the lack of lagging and the limited possibility of eliminating external threats, as well as the lack of the obligation to introduce arrangements for active protection of areas.
The problem is the limitation of the scope of local plan arrangements to referring to separate provisions. Therefore, local forms of nature protection should be treated as functional areas.
It is also necessary to define the tasks of active protection of ecosystems in the form of specific solutions for their management and making them available. The valuation of ecosystem services in spatial planning will also be important.
The methods of counteracting threats and destruction of naturally valuable areas include:
• conducting ongoing monitoring with an assessment of the reasons for the changes taking place,
• land valuation and land valuation
• educating the users of these areas, making them aware of ecosystem services
• comprehensive actions on a supra-local scale for the protection of naturally valuable areas
• legal regulations, development of management and protection models for naturally valuable areas
• promoting sustainable tourism with respect for nature and humility in the face of the potential risks of staying in the wild
• temporary or complete closing of areas at risk of destruction.

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Souhrn

Rozvoj měst a suburbanizace způsobuje pohlcování přírodních stanovišť (chráněných a ne nízkých), antropotlaky. Navzdory politice EU v oblasti biologické rozmanitosti jsou obce pod tlakem, aby tyto oblasti zpřístupnily pro cestovní ruch a volný čas.
Podle Cieszewské [2008] jsou přírodně cenná území s významnými abiotickými a/nebo biotickými hodnotami. Tato území se vyznačují vysokou biologickou rozmanitostí, proto podléhají právní ochraně podle zákona ze dne 16. dubna 2004 o ochraně přírody (Sb. zákonů z roku 2020, položka 55, tj.) v místní a nadmístní formě.
Cílem příspěvku je: 1) představení problémů a hrozeb spojených s využíváním přírodně cenných území, 2) naznačení způsobů, jak zabránit nebo omezit jejich degradaci. Oblast výzkumu se týká Mazovského vojvodství, volského jezera řeky Visly v gmině Łomianki.
Navzdory realizaci plánů/programů ochrany a managementu zelených zdrojů jsou území ochrany přírody a přírodně cenná území stále vystavena silnému antropotlaku.

Z výzkumu vyplývá, že místní oblasti ochrany přírody je třeba považovat za funkční plochy. Úkoly aktivní ochrany ekosystémů by měly být definovány i formou konkrétních řešení jejich správy a sdílení. Důležité bude také ocenění ekosystémových služeb v územním plánování.

Contact
Edyta Rosłon-Szeryńska
E-mail: edyta_roslon_szerynska@sggw.edu.pl