

PRESERVATION OF RIVER VALLEYS IN WIELKOPOLSKA IN THE LANDSCAPE PERCEPTION TERMS – THE CASE OF THE VALLEY OF SAMICA KIERSKA RIVER

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ABSTRACT

River valleys, apart from their natural values, have unique visual features. The perception of landscape is mainly determined by its spatial structure. Contemporary scientific research confirms significant compliance in the terms of ecological and aesthetic evaluations. The paper presents the results of the research carried out by the authors in the Valley of Samica Kierska River in Wielkopolska which is an area protected as a part of Natura 2000 network. There were three main objectives of the research: 1) an analysis of the relations between spatial structure and visual perception of landscape in the Valley of Samica Kierska River, 2) a comparison of the expert evaluation of the visual values with public aesthetic preferences towards landscape, 3) an assessment of the potential effectiveness of the existing conservation methods in Natura 2000 network for the preservation of landscape visual features.

Keywords: landscape structure, landscape perception, preservation of visual values, the Valley of Samica Kierska River

INTRODUCTION

The studies recently carried out at various research centres confirmed a clear correlation between an ecological value and a visual attractiveness of a landscape. (Gobster et al. 2007, Fry et al. 2008, Ode et al. 2008). The debate on integrated studies is also currently unfolding, what entails the need to change some of the research paradigms and to combine the natural, the social and the technical research (Raszeja 2013). The problem that still remains a significant obstacle to the integration of these studies is – on the one hand – the diversified terminology and methodology and the very nature of giving assessments (Tress et al. 2007). For quantitative assessments provide comparability,

legibility and equivalency of records, they are desirable from the point of view of landscape preservation, planning and management. This type of evaluation dominates research performed within natural studies, focusing on the search for rates describing the structure and the functioning of a landscape (gauges, indicators, metrics and landscape models). Whereas architecture and landscape planning are mainly concentrated on the formal and composition aspects as well as on searching for such methods of identification, interpretation and evaluation of a landscape that are useful in the creative process of landscape shaping. Visual evaluations that mainly refer to the visual attractiveness, harmony and consistency of composition, along with a degree of its distortion or deformation, are expressed

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as qualitative rates (Bogdanowski 1976, Sas-Bojarska 2010, Raszeja 2002, 2013). However, there are attempts to express them in an objectified quantitative approach by means of digital analysis (Ozimek et al. 2013). Qualitative evaluation also prevails in a scientific research concerned with aesthetic and cultural preferences – environmental and behavioral psychology, and the attention restoration theory (Appleton 1975, Kaplan and Kaplan 1989, Bell et al. 2004). Both objectively measured spatial parameters and qualitatively assessed composition of a landscape affect its visual reception and the image that is perpetuated in the memory of an observer due to distinctive features and elements. The perception process is significantly influenced and modified by individual experiences, set of beliefs and aesthetic preferences of observers, as well as by commonly recognised value systems, tradition and culture. Attractiveness of landscape scenery determines assessments and preferences, and consequently spatial decisions, both in the individual and social dimension (Gobster et al. 2007).

The Kaplans' preference model (1989) is a scientific theory applied to the analysis of perception based on the premise of the existence of four major features determining the perception of an environment as visually appealing: coherence (a degree of organisation), legibility (a degree of clarity of compositional structures), complexity (a number and diversity of a composition) and mystery (a number of encoded information). Another criterion for the assessment is a degree of openness of a landscape that depends on a distribution of visual obstacles closing off views and limiting their extent. This indicator meets Appleton's prospect-refuge theory (1975) that attempts to combine both human biological needs and his aesthetics needs. The areas that allow the viewer to watch a large space, while he himself remains partly hidden, are considered the most attractive. The degree of openness determines the scale of landscape interiors as units of landscape perception, depending on size, shape and density of the elements forming interior walls.

The landscapes of the Wielkopolska river valleys stand out against the surroundings thanks to their diversity and independence. Their landscape attractiveness comes from the variability of the shape, the transverse profile and the diversity of their covering. The specific feature about them is that they offer vast pan-

oramas and views. It is possible to watch these spaces from different vantage points that give a wide spectrum of aesthetic experience. The edges of river valleys are of special value, since they provide a comfort of a far view (Skalski 2006). When moving in space, the scenery also becomes dynamic. This contributes to the diversification of aesthetic experiences and thereby supports the impression seriality effect (Forczek-Brataniec 2008). The feature that distinguishes the perception process of river valleys is a synergistic effect of many aspects of space on the receiver, which forms an unique wholeness in the mind of an observer (Krzyszowska-Kostrowicka 1999). Beside nature values, visual attractiveness imparts an unusual recreational potential to these areas (Bernat 2010). In the light of the foregoing it must be emphasized that the basis for creating a concept of recreational planning of the valleys should include comprehensive acquaintance of their resources as well as learning about their future users' aesthetic assessments and preferences (Pietrzak 1998). In this context, a significant problem of confronting expert assessments with social assessments appears.

Another recognised issue lies with a lack of or insufficient effectiveness of the existing protective instruments. A substantial percentage of river valleys of the Wielkopolska, assessed as these of great importance for the proper functioning of the nature structures, has been covered by The European Network of Protected Sites Natura 2000. The aim is to maintain the valleys' spatial continuity (ecological corridors), to prevent the habitat fragmentation and to preserve biodiversity. The resulting legal regulations primarily protect the ecological values of the valleys. As mentioned above, studies carried out so far have shown a clear coherence between the criteria of natural and visual assessments. Biodiversity corresponds to the complexity of landscape composition, habitat convergence – a consistency and harmony of composition, a continuity of ecological structures – visual scale and view breadth (Fry et al. 2008, Ode et al. 2008). So, the hypothesis that the protection of natural values will allow to preserve the visual values of river valleys can be raised.

These problems have become the reason to undertake in 2015 the research on the section of Samica Kierska River valley covered by Natura 2000 program. The aim of the article is to present the results of stud-

ies conducted by the authors in three aspects, which are: 1) an analysis of a relation between spatial structure and landscape perception in the Valley of Samica Kierska, 2) a verification of the expert assessment of this area visual values with their social review, 3) an assessment of the potential effectiveness of the existing protective instruments of Natura 2000 program for the preservation of landscape visual values.

METHODS AND MATERIALS

The work has been divided into three stages, in accordance with the adopted research objective. The first stage involved the identification of the landscape structure and the analysis and evaluation of its visual perception. The research was carried out on the grounds of authors' own field studies realized in 2016–2017 and cartographic materials: ortophotomaps available on the websites www.geoportal.gov.pl and www.gdos.gov.pl and topographic maps in scale: 1 : 50 000 with sheet numbers: N-33-130-A, N-33-130-B, N-33-130-D. The landscape structure was defined on the basis of an analysis of the shape, covering and usage of the terrain. Also, the cultural background stemming from settlement history and economic development were taken into account. The landscape research led to dividing the studied area into landscape interiors varying in character and spatial scale, and limited by walls of different degrees of compactness (Bogdanowski 1978). For each one of them a specific viewpoints and ranges of visibility were determined. A catalogue of characteristic sights was created, supplemented with a graphic record of landscape metrics that allow for a comprehensible sheet of key landscape elements and features (Raszeja 2002). Due to the conducted research it was possible to assess the visual-compositional values of selected fragments of the Valley of Samica Kierska in the context of its potential use for recreational purposes.

The second stage included pilot studies of the social preferences and landscape assessments, based on the model of Scenic Beauty Estimation (Daniel and Boster 1976). The ambition behind them was to determine, which sights within the Valley of Samica Kierska are preferred by different groups of viewers. The tests run in May 2017, in Poznań, Sobota and Suchy Las took the form of a survey. It contained photographs taken by the

authors in the Samica Kierska Valley in March 2017. The photos used in the study depicted four different sceneries, with various ranges of visibility and content of views and various degrees of landscape transformations (natural and cultural elements involved). The participants in the survey were asked for an assessment of the views and rank them according to the degree of attractiveness. The survey results were summarised in a tabular form, and then interpreted and confronted with literature on the subject.

The third stage of the research involved a review of protection documents (Standard Data Form for the special Samica Valley bird protection area) and planning documents, regulating the land development in the studied area (prevailing studies of conditions and directions for spatial development of municipalities: Rokietnica, Oborniki and Suchy Las and local spatial development plans). The effectiveness of the legal instruments within the Natura 2000 program was also assessed in respect of the potential protection of landscape visual values. The subject of the research was the provisions from the Act of February 20, 2015 (Ustawa... 2015), on supporting rural development with participation of the European Agricultural Fund for Rural Development under the Rural Development Program for 2014–2020 and the Regulation of the Minister of Agriculture and Rural Development concerning “Agri-environmental-climatic management” covered by the Rural Development Program for 2014–2020 (Rozporządzenie... 2015).

The article uses also the results of Hanna Smulczyńska engineer's thesis *The concept of development of the routes and viewpoints in the valley of Samica*, 2015, under the direction of dr. hab. eng. arch. Elżbieta Raszeja in the Faculty of Horticulture and Landscape Architecture of the Poznań University of Life Sciences.

LANDSCAPE STRUCTURE AND PERCEPTION IN THE VALLEY OF SAMICA KIERSKA

The Valley of the Samica Kierska is located in the Wielkopolska Voivodeship, to the northwest of Poznań, in the area of three municipalities: Rokietnica, Suchy Las and Oborniki (see: Fig. 1). As a regional ecological corridor, connected to a corridor of an trans-regional importance, the river of a total length of 36.5 km is the

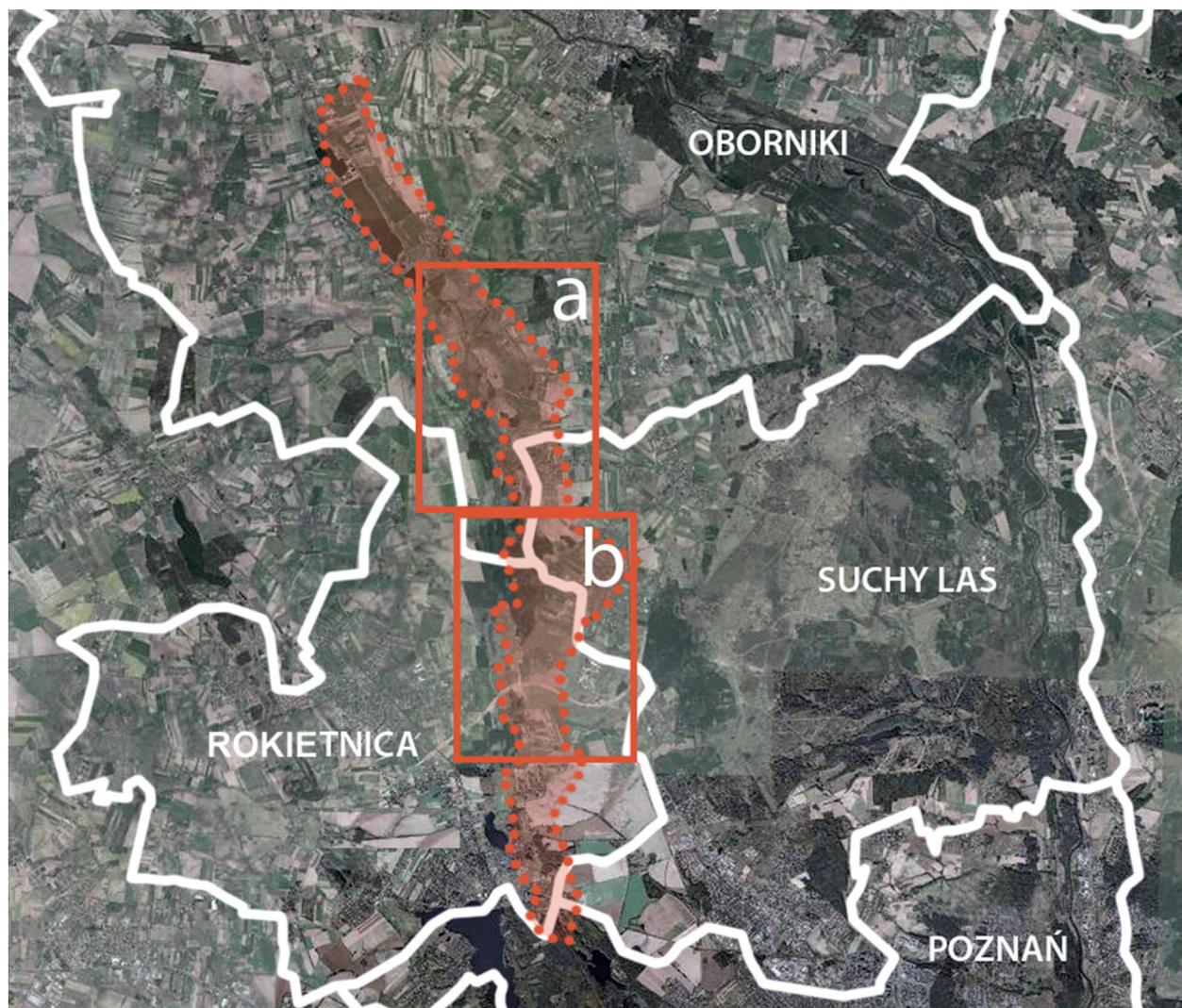


Fig. 1. The range of the Natura 2000 bird special protection area in the Valley of Samica Kierska against the background of administrative divisions: a and b – the areas selected to detailed research in the field of landscape structure and perception

left tributary of Warta, to which it debouches near the village of Kiszewo, and its source lies in the village of Rogierówko, northwest of Lake Kierskie. Having the width of 1–2 km the Valley of Samica Kierska passes through the Wielkopolska Lowlands, with a characteristic post-glacial landscape. It is a plain, slightly undulated area – the pitches are minor and do not exceed 5%. Although, the slopes have a mild inclination, the valley's form, along with diversified terrain cover (wet meadows, thickets and natural and artificial ponds), provides an apparent feature in the surrounding agricultural landscape (see: Fig. 2a, 2b).

Due to its natural values, in 2007 the Valley of Samica Kierska has become protected by the Natura 2000 program as a bird special protection area, with the registration code PLB300013 (see: Fig. 1). At least 19 nesting species of waterbirds listed in First Annex of the Birds Directive were found there. The numbers of little bittern (nesting species), taiga bean goose and greater white-fronted goose (migratory species) are in accordance with the criteria for determining bird sanctuary by BirdLife International. The preservation of bird habitats in this area is possible thanks to appropriate structure of terrain covering and land use. The

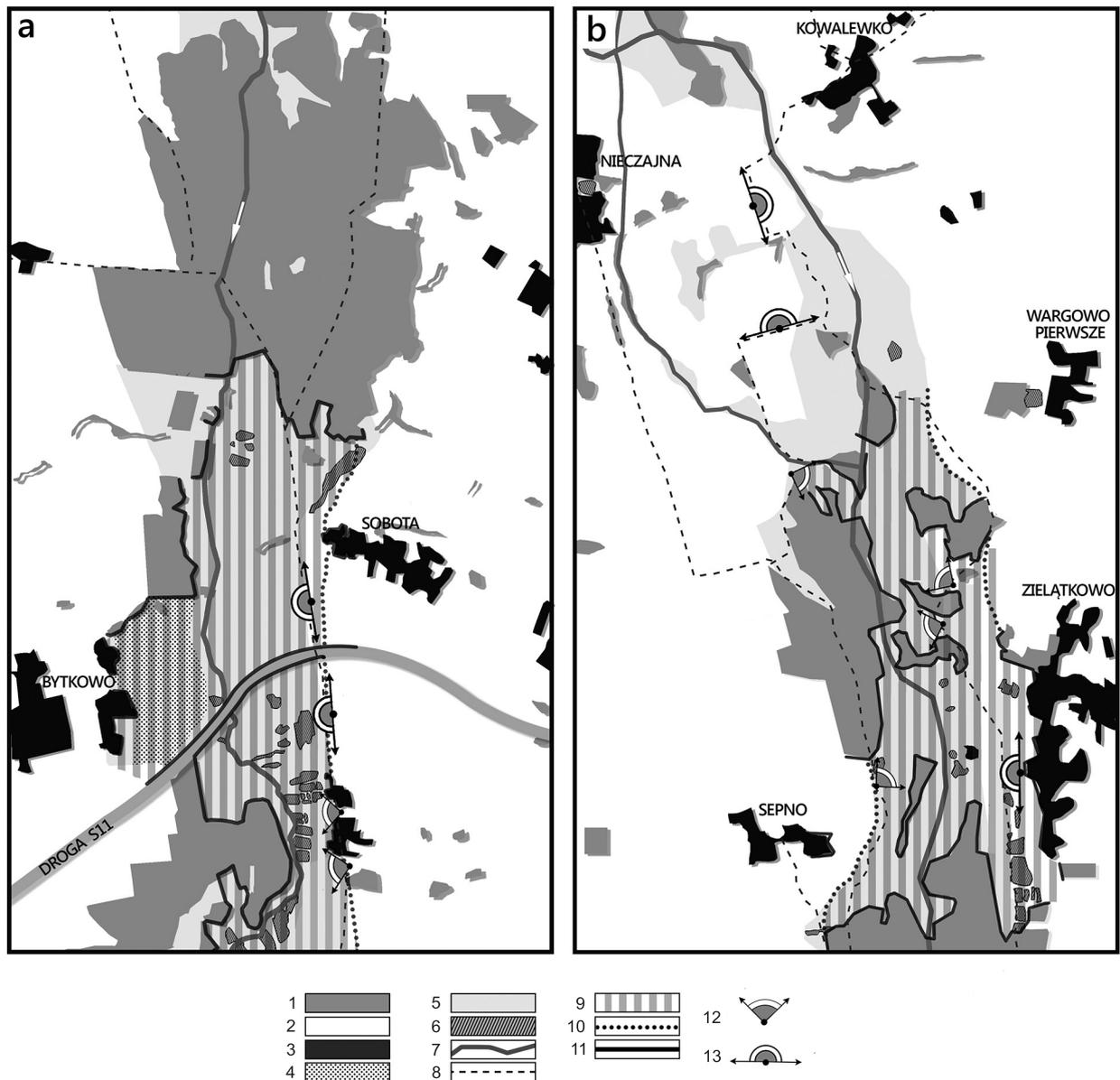


Fig. 2. Analysis of landscape structure and perception in the selected areas of the Valley of Samica Kierska: a – selected area nearby Sobota village and Bytkowo village, b – selected area nearby Zielatkowo village. Indications: 1 – woodlands, 2 – crop fields, 3 – built-up areas, 4 – golf courses, 5 – meadows and brushwoods, 6 – water reservoirs, 7 – watercourses, 8 – walking routes, 9 – landscape interiors, 10 – apparent visibility boundaries, 11 – objective visibility boundaries, 12 – framed views, 13 – panoramic views

discussed area is dominated by extensive cereal crops (48.71%) and the rest of natural habitats consist of: wet meadows and fresh meadows (17.9%), coniferous forests (8.8%), bogmoors, marshlands, swamps, vegetation bordering with waters (7.02%), mixed forests (6.67%), stagnant and flowing inland waters (6.45%), deciduous forests (4.3%) and other terrains (0.07%) (Standard Data Form for the Natura 2000 – Samica Valley – Standardowy Formularz Danych dla Obszaru Natura 2000 – Dolina Samicy 2017). The Natura 2000 Samica Valley area partly coincides with the Pawłowicko-Sobocki Protected Landscape Area and the Protected Landscape Area of the Samica Valley. The construction of a new section of the S11 expressway that crosses the valley was a major challenge for preserving the ecosystem's consistency in the discussed area (see: Fig. 2a).

Besides the natural values, the Valley of Samica Kierska also is of significant cultural importance. Its shape (flat bottom with clear edge area) conditioned the development of the settlement in the region. Likely the settlement of the valley started already in V–II millennium BC by groups of early farmers who began to transform the surrounding landscape, causing firstly a deforestation of the valley's floor and its slopes, and of larger areas located in its vicinity, in the further phases of settlement. The next areas were gradually taken by arable lands. During the early Middle Ages there was a stronghold in the present village of Pawłowice, serving important social and political functions. The distribution of archaeological sites along the Valley of Samica Kierska explicitly shows their concentration in the immediate vicinity of the river, what emphasizes its important role in shaping a settlement network in this area (Kijowski and Rączkowski 2007). Further social and economic development led to the current landscape structure, the distinctive feature of which is the preservation of natural character in the immediate vicinity of the Samica Kierska and the location of the development areas beyond the valley edge.

Detailed studies carried out in two selected areas (see: Fig. 2) included the analysis of landscape structure and composition, as well as of its visual perception. One of them includes an excerpt from the Valley of Samica Kierska nearby the villages of Sobota and Bytkowo (a), the second – the village of Zielątkowo (b). In order to identify the structure of the landscape,

an analysis of the terrain shape and covering was carried out in the first stage of the research. The results indicated that the largest part of the studied area is covered by arable lands, while in the immediate vicinity of the river meadows, scrubs and ponds prevail. In the southern part a predominance of wetlands and meadows is observed, while the northern part definitely is dominated by the agricultural areas. There are also a few fishponds and other water reservoirs within the analysed area. On both sides of the river buildings of various types can be found: residential housing, farm and production buildings. The largest forests within the analysed area are located nearby the Sobota village.

The next step was to analyse the nature and the extent of visibility. For this purpose, the area had to be divided into two different categories: closed landscapes, constituted by buildings and forests and open landscapes that include fields and meadows. The boundaries of visibility have also been determined: specific boundaries – physical barriers to visibility like forest walls and buildings; and apparent boundaries – resulting from the terrain shape. On this basis landscape interiors were defined, limited by specific or apparent boundaries. The analysis of perception was made of foot routes, potential tourist trails. It was part of the previously designated viewpoints that offer different ranges of visibility. In the process, the places with limited visibility (cropped views), points for unlimited visibility (extensive view) and an elevation of the terrain on the top of the valley, offering an exposed view, have been marked. Following the adopted criteria (Raszeja 2013), the landscape's visual assessment leads to a conclusion that the analysed area features an average level of differentiation and spatial consistency of the landscape elements' arrangement. Significant spatial openness and diverse size of landscape interiors is characteristic of this area, as well as the variability of aesthetic experiences due to the possibility of sojourn in both closed and opened landscapes and in places offering different breadths of view openness. Various possibilities of reception of landscape were stated – the opened terrains are dominated by vast sights, whereas the sequential reception of space in the form of framed views prevail within closed landscapes. The river is surrounded by terrains with high degree of naturalness that decreases the longer the distance from the course of Samica

Kierska. The most disharmonious element of the reception of the landscape is the S11 expressway, which cuts through the valley, closing off a formerly vast view and reducing the interior landscape in this area. According to an expert opinion, given by the authors on the grounds of conducted field research and posterior works, a significant visual value of the discussed area comes from a high degree of space openness, to which the analysis of the landscape structure clearly indicates. A valuable feature to the valley perception can be also found in naturally-formed landscape interiors, of which another advantage resides in their open sights. According to Kaplan's preference model (1989), such spatial structure provides a variety of aesthetic experiences, which provokes a positive reception of the landscape and has a major recreational potential.

SOCIAL RECEPTION OF THE VISUAL VALUES OF THE VALLEY OF SAMICA KIERSKA

In order to verify the expert assessment of the landscape attractiveness a pilot survey was carried out. It consisted in giving 4 photographs representing 4 different sceneries to a group of respondents (see: Fig. 3): the skyline of the Sobota village with a farmland with in the foreground of the exposition (A), a vast view of Samica River with a forest wall in the background (B), a framed view of the forest road (C), a vast view of the meadow with a forest wall in the background (D). Presented sceneries differed in terms of land's shape and covering, and the proportion of natural and cultural elements. Respondents were asked to rank the photographs by the visual attractiveness criterion following the principle that the least attractive view was to



Fig. 3. A, B, C, D – the sceneries presented in the research of social landscape preferences

be valued with 1, while the most attractive should be assigned with a value of 4. The results were received from 55 questionnaires filled in by women and men of all ages, from cities of various sizes and villages, with different levels of education.

The conducted surveys have shown that among the presented for the assessment as the most attractive was perceived the view of the forest road, obtaining a point value of 3.25. As the least attractive scenery the respondents indicated the skyline of the Sobota village with farmland within the foreground of the exposition (point value of 1.86). The views of the meadow with the forest wall in the background and of the Samica River with a forest wall in the background scored similarly – respectively 2.28 and 2.61 (see: Table 1). Among the presented views, scenery considered the least attractive has the most cultural elements within its frame. Therefore, it can be concluded

that in general the more natural scenery, the more attractive it was considered by the respondents. The forest, according to the surveyed, is characterised by the highest visual values commonly associated with the natural environment and resting in the bosom of nature. It can be inferred that the choice of this exact scenery is an expression of longing for an intimate relation with nature. However, it should be noted that this is not a natural landscape, for in fact it is a production forest, whose value as a natural habitat is not particularly high. During direct interviews, the respondents pointed out that the other three sceneries (apart from the forest landscape) seemed to them ordinary and did not exhibit exceptional aesthetic values. It also can be noted that the breadth of the sight, highly evaluated in the expert research, did not matter much to the surveyed. It seems that the usability and accessibility of presented places was more important to them,

Table 1. Summary results of the survey of social preferences of the Valley of Samica Kierska landscape

Scenery (letter symbol)	Characteristic	Rating		
		Rate	% of rates	Average rates
A	Range: a vast view; Content: the skyline of the Sobota village with a farmland within the foreground of the exposition; an average participation of cultural components	1 st place	50%	1,86
		2 nd place	19,44%	
		3 rd place	25,00%	
		4 th place	5,56%	
B	Range: a vast view; Content: the Valley of Samica Kierska with a forest wall in the background; only natural components	1 st place	27,78%	2,61
		2 nd place	11,11%	
		3 rd place	33,33%	
		4 th place	27,78%	
C	Range: a framed view; Content: the forest road; a slight participation of cultural components	1 st place	2,78%	3,25
		2 nd place	22,22%	
		3 rd place	22,22%	
		4 th place	52,78%	
D	Range: a vast view; Content: the meadow with a forest wall in the background; only natural components	1 st place	19,44%	2,28
		2 nd place	47,22%	
		3 rd place	19,44%	
		4 th place	13,89%	

Source: own elaboration

what is a consequence of the subconscious need for the landscape's usefulness. The forest road is accessible and allows for walking, while the river valley or the wetlands seem inaccessible. Analysing the obtained information in regard to differentiated assessments depending on the age of the respondents, it can be inferred that the youngest respondents pointed to the meadow and the river as the most attractive sights, while the respondents above 30 years of age clearly preferred the forest landscape. Based on the collected data, it should be noted that the sceneries presenting lands with higher natural values were ranked highly in the respondents' evaluation. In the context of further preservation of ecological values of the Valley of Samica Kierska such a result can be assessed positively, according to the principle that there is greater social acceptance for protection of landscapes perceived as more attractive visually.

The conducted research was supposed to be only of pilot nature and its single purpose was to preliminarily assess visual preferences in the reception of the landscape in the studies area. This research requires deepened, complementary and detailed sociological analysis of the phenomenon.

EVALUATION OF EFFECTIVENESS OF THE EXISTING LEGAL INSTRUMENTS FOR THE PROTECTION OF THE VALLEY OF SAMICA KIERSKA LANDSCAPE

The basic objective of the Natura 2000 network is to preserve and restore the proper condition of species and biotopes as a subject of protection in the area. In the case of habitat areas this means: the preservation of an unchanged habitat surface, the protection of an ecological structure and function typical for a given biotope as well as the maintenance of ecosystem's natural and undisturbed structure. With regard to species, the protection consists in maintaining constant numbers and geographical range of species and caring for the habitat of the species, that is, preserving its size and preventing its fragmentation (Zawadzka et al. 2013). To this end Natura 2000 areas' protection plans and plans for protective tasks are formed, including records regarding objectives and protective measures. For the special bird protection area "the Valley of Samica Kierska" such plans do not exist yet,

and their development is expected in 2018. Therefore, the entries in the existing planning documents for this area have been reviewed.

As already mentioned, the Natura 2000 site is located within three municipalities (a small fragment belongs to the city of Poznań). The conducted analysis of the documents showed that the Study of Conditions and Directions of Spatial Development of the municipality of Rokietnica from year 2016 (Studium... 2011, 2016) completely protects area in question from urban development and afforestation, and provides for the maintenance of the current spatial development of the valley. At the same time, the study allows the development of villages situated nearby the valley only in the direction opposite to the river. The Study of Condition and Directions of Spatial Development of the municipality of Suchy Las from 2016 (Studium... 2016) projects allocating parts of the protected area, residing south of the village of Zielątkowo (see: Fig. 2b), for single-family detached housing development on the plots with a minimum area of 1000 m². It was also indicated possible to develop single-family detached housing with services to the south of the village of Zielątkowo, partly located within the Natura 2000 area. In the Valley of Samica Kierska were also indicated minor lands dedicated to afforestation. The study of the Oborniki municipality from 2011 almost completely protects the Valley of Samica Kierska from any development or afforestation. Only small areas nearby the villages of Żukowo and Wymysłowo, located within the Natura 2000 area, have been designated for farm buildings. The study allows the allocation of a small area near the village Objezierze for sports and recreational services, too. An analysis of local plans for land development applicable both in the Natura 2000 area as well as in its immediate vicinity also was carried out. The plan from 2016 for the village of Pawłowice draws attention. It assumes the development of single-family housing to the west, that is – towards the valley, while there are no new lands for further development to the east of the village. Part of the new development will be separated from the valley by a large forest complex (the southern part of Pawłowice), while part will remain in the sight relation with the valley (the northern part of Pawłowice). Other analysed plans concern the areas located outside the valley and they provide for endensation of the housing within existing settlement units (Zielątk-

kowo, Sobota), and creating a golf course (Bytkowo). For the villages in Oborniki municipality (Objezierze, Bogdanowo, Kowalewko) the plan envisages keeping the agricultural use of land with the prohibition of development. It also assumes the allocation of a small area for afforestation and introduces a ban on the location of wind farms.

In connection with the preparation of the preservation plan and the plan for protective measures, their usefulness for the protection of landscape visual values was analysed and assessed. The elaboration of these plans included identifying potential and existing threats to the proper functioning of Natura 2000 sites. The identification consists of sources, the nature and range of the risks resulting from human activity, but of natural origin, too. Threats indicated to a specific area are selected from an official list of threats, pressures and activities, published by the Directorate-General for Environment of the European Environmental Agency (Załącznik... 2012). There is no provision on this list that would be explicitly referred to landscape visual values, however, some of the mentioned threats have a direct influence on the form of relationship with the sight in the open landscape. Table 2 presents the selected threats and their potential consequences for visual values. The discussed potential threats to the aesthetic values are generalized and their impact might be different depending on individual circumstances. Each situation in the landscape is specific and requires a separate analysis. Also, it is possible to make such a space-engaging act that posing a threat to ecological values might contribute to increasing the visual attractiveness of a landscape. That is a possibility, for example, in the case of forestry clearance and creating conditions for the exposure of wide, panoramic views considered as attractive.

Table 2 catalogues the threats to ecological values selected from the reference list and corresponding potential risks for the visual values of a landscape. The perceived coherence of the threats leads to formulating a thesis that conducting protective measures aimed at minimizing threats to the ecological values can also indirectly protect compositional and visual values.

A large part of the natural resources covered by the Natura 2000 program lies within areas of agricultural impact. Therefore, under the Common Ag-

ricultural Policy of the European Union there are mechanisms motivating farmers to run their farms with minimal negative effect of farming on the condition of protected habitats and species. The agri-environmental-climate programs serve as an example of such measures, although independent of Natura 2000, regarded as one of the most important mechanisms that allow to achieve the intended objectives of the protection of agricultural areas. Currently the program for the 2014–2020, period is in force, the provisions of which in relation to the previous editions put greater emphasis on the protection of the traditional rural components (incentives to grow traditional varieties of cereals, breeding traditional varieties of animals, introduction of old fruit trees varieties in orchards). Farmers benefiting from the agri-environmental-climate program are obliged to comply with the general and specific requirements resulting from participation in a specific variant within a given package, including the obligation to preserve all permanent grasslands and landscape elements not used for agriculture which function as wildlife refuges (Sazońska 2015). Such indications have a direct impact on the nature of the rural landscape and support the preservation of the diversity of landscape components, which is positive in terms of visual values. The task of a farmer benefiting from subsidies under the program is to preserve the landscape structure by carrying out treatments or omitting them in appropriate seasons (Rozporządzenie... 2015, 2017). Consequences of the provisions of the agri-environmental-climate program incessantly affects the rural landscape physiognomy in the areas where farmers are the subsidies' beneficiaries. The operations planning is developed by an agri-environmental advisor, who indicating the desired actions influences the shaping of the natural environment, and thus the rural landscape. Hence, it depends on his competence and knowledge how the relationship with sights are shaped in the areas covered by the programme. The expert also can further specify the requirements and give individual recommendations, what extends the possibilities of protecting the aesthetic values of the rural landscape by using such an instrument like the operations planning. Therefore, it is advisable to train experts in the field of rural landscape visual aspects.

Table 2. Selected threats to biotopes and species and their potential impact on visual values of the landscape

Code*	Threats to ecological values	Potential threats to visual values
A02.01	Intensification of agriculture	The reduction of the diversity of landscape components and features, the modification of the degree of landscape openness (decrease or increase)
A10.01	Removal of hedges and copses or scrubs	The change in the proportion of landscape interiors and landscape composition, the reduction of the diversity of landscape components
B01	Afforestation of open lands	The decrease of landscape openness, the decrease of view range, reducing the scale of landscape interiors
B02.02	Forestry clearance	The modification of landscape nature, the modification of the proportions of landscape interiors
C03.03	Wind energy production	The emergence of new dominants within landscape
D01	Roads, paths and railroads	The reduction of landscape openness, the decrease of view range, the appearance of nonindigenous landscape components and visual barriers, the disruption of landscape harmony
E01.04	Dispersed housing development	The loss of persistence and deformation of historical patterns of settlement structures and land use
E02	Industrial and commercial areas	The disruption of the sense of order, the decline of the “aesthetics of usage”, the appearance of nonindigenous landscape components and visual barriers
I01	Invasive non-native species	The loss of persistence of historical patterns of land use, the decrease of the diversity of landscape features
J02.03	Physical alternation of river bed and modifying the structures of inland water courses	The decrease of the diversity of landscape components and features, the disruption of the sense of landscape variability
J03.02	Anthropogenic decrease of habitat consistency	The disruption of the sense of coherence of the landscape structure

*The codes are in accordance with the reference list of threats, pressures and activities published in Appendix 5 to Guidelines and Explanatory Notes to Standard Data Forms, 2012

Source: own elaboration

SUMMARY

Recognising the problem of declining natural resources and biodiversity loss, as well as a widespread acceptance for the pro-environmental activities have contributed to the creation of a European Network of Protected Areas Natura 2000. Currently, however, still there is not enough interest in the protection of the visual-aesthetic values of landscape. Integrated protection should take into account both the biocenotic and the perceptual aspects. The preservation of the biodiversity and spatial consistency as well as the prevention of

the habitats' fragmentation is crucial for maintaining the river valleys' natural value in an unchanged condition. In the aspect of protecting their visual values, this means the preservation of the spatial structure and composition of the landscape, maintaining the nature of the exposure and the boundaries of visibility, preventing the introduction of degrading elements and the cultivation of the degree of diversification of the composition. This is particularly important in the case of river valleys of Wielkopolska, which function as a distinctive feature in the lowland and monotonous landscape.

The conducted pilot surveys on the reception of the protected by Natura 2000 site of the Valley of Samica Kierska indicated that the natural sceneries are assessed as more attractive and socially preferred. At the same time, the landscape with high visual values, which, however, perceived as inaccessible and devoid of recreational values, is rated as worse by the respondents. Appropriate management and accessibility can therefore contribute to increasing its attractiveness. In the case of river valleys it can consist in designing walking routes and viewpoints exposing the most valuable sights, but carried out in such a way as to protect the precious habitats. Maintaining high visual values can simultaneously support the preservation of ecological values.

The lack of coherent system of legal provisions ensure the preservation and proper management of landscape resources, integrated with the protection of natural resources in the Natura 2000 sites was also pointed out. Creation of such a system should be among the objectives, but at the same time it is desirable to effectively use the potential of already existing legal instruments. This applies to both spatial planning instruments and new tools introduced by the agri-environmental-climate programs. This connects with the issue of raising public awareness of the importance of landscape visual values and training professionals responsible for the implementation of those programs.

Integrated protection of the landscape is a long-term process, involving a variety of mutually supporting actions. Searching for a common ground of the two types of evaluation: ecological and visual-aesthetic, is of particular importance. This dual interpretation creates a new research plane for landscape analysis, planning and monitoring using both knowledge, methods and instruments stemming from the field of ecology as well as from the landscape architecture.

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OCHRONA DOLIN RZECZNYCH WIELKOPOLSKI W ASPEKcie PERCEPCJI KRAJOBRAZU NA PRZYKŁADZIE DOLINY SAMICY KIERSKIEJ

ABSTRAKT

Doliny rzeczne, poza wartościami przyrodniczymi, posiadają wyjątkowe walory wizualne. Percepcja krajobrazu jest determinowana przez jego strukturę przestrzenną, a współczesne badania potwierdzają znaczącą zgodność w zakresie ocen ekologicznych i estetycznych. Artykuł prezentuje wyniki badań przeprowadzonych przez autorki na obszarze Natura 2000 w Dolinie Samicy Kierskiej w Wielkopolsce. Celem badań była analiza relacji między strukturą przestrzenną a percepcją krajobrazu, weryfikacja eksperckiej oceny walorów wizualnych z oceną społeczną oraz wskazanie potencjału istniejących instrumentów ochronnych dla zachowania walorów wizualnych krajobrazu.

Słowa kluczowe: struktura krajobrazu, percepcja, ochrona walorów wizualnych, Dolina Samicy Kierskiej