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Viewshed Analysis, Regional Studies and *Cultural Perception*

Abstract: This paper discusses the theoretical background of *cultural perception – sensory experience* in archaeological investigations and is especially concerned with application of GIS to regional studies. In this paper, I will present some results from my PhD research and studies with reference to the early medieval strongholds and settlements from two regions in Poland – Pomerania and Greater Poland (dated 8th/9th – 10th/11th century). The paper is divided into two parts – theoretical and practical. The first part contains a theoretical discussion about visual activity, the second part presents results of my investigations using GIS as a method. By using GIS I aim to investigate the participation of human beings in the early medieval surroundings. The starting point for my study (interpretation) is the question “how people *perceive* their surroundings”. After establishing the issue, I have tried to interpret and understand the participation of human beings in the world and society through *conflating* while looking at the early medieval model of thinking, visual activity (seeing), movement and cultural (archaeological) places.

Introduction

The main purpose of my paper is to link the idea of sensory activities of early medieval inhabitants in the Pomerania and Greater Poland regions, Poland with viewshed analysis. Hence, the paper provides a brief and overall presentation of issues connected with early medieval culture, application of GIS in archaeology (in particular viewshed analysis) and studies on cultural meaning of human sensory activities in the past. While concentrating on seeing and visibility, I do not propose an archaeological version of a view-centered approach that stresses the importance of eyesight in perceiving the world by human beings. On the contrary, I intend to focus on senses in connection with GIS. Therefore, I have left aside technical aspects of the method and its application.

Sensory Activity

Archaeological investigations and interpretative models of the past are rich in concepts of the sensory activity of acting human subjects intertwined with advocated assumptions and definitions of elements building up an interpretative picture of the past. Initially, I would like to draw attention to different concepts of sensory experience as well as concepts, which markedly stress cultural differences in sensory activities concerning, among others, visual activity. Undoubtedly, it is important to stress the importance of eyesight (seeing and visibility) in the

past culture, but also the experience that is culture laden – “how” to see, “what” to see, “where” to see and “when” to see.

Scientific View and Perception as Cultural Constructs

In the archaeological literature attention is focused on the complexity of the process of perception. Scholars tend to characterize perception as recognition. They reject a simple treatment of seeing and visibility as isolated and supreme forms and instead postulate to define them as culture-laden *perception* and *experience*. These properties are perceived as constituted by cultural imaginations, norms, beliefs as well as taboos and restrictions.

I am not interested in the question of how “contemporary science” understands and explains processes of seeing and visibility, but rather what kind of perception and understanding – that is to say, what kind of knowledge and imagination about seeing, characterize social actors. It is worth examining how perception is defined by cultural outlook (actors devoid of a contemporary scientific knowledge about eye sight and seeing) and shaped by social and cultural conditions.

Two different cultural contexts of perception are advocated in the humanities. The first of them which makes a base for experience, is understood as a process of perception. It is meant to be a process in which one has an atomic view of the thing through the visual contact. In this case, any statements based

on perception justify the objective and incontestable existence of the thing. A. PAŁUBICKA (1999, 97–126) sees the source for this concept in the English empirical philosophy. The second kind of *perception* indicative of ordinary people (that is to say a person in the street) refers to the experience and *perception* of the things and its proprieties, which cannot be spelt out in a scientific way. This kind of perception has no place in modern empirical science.

The first type of perception (typical of a reflective perspective) is of an analytic character. It works according to the following principle: from the atomic elements to the critical analysis of the connections between them with axiological neutrality. The second type of *perception* (typical of a perspective of an active human being) is defined by the following principle: from the whole to the elements. It is rooted in the cultural context of an acting human being directed by everyday engagement and practical attitudes. This concept is defined by Anna Pałubicka as a “way of organizing process of perception”.

The difference between the two above-mentioned categories of perception refers, among others, to different ways of the perception of things, particularly their “substance”. The first category of perception pays attention to the physical substance only, namely objectification of sensations. The second category of perception refers to the physical as well as non-physical substance, which is connected with and determined by the imagination of acting human subjects.

The scientific view of the thing focuses, first of all, on what the subjects sees and leaves out of the process of the *perception*. *Cultural look* at the thing almost forgets about seeing the subject (human being) looking at it. The viewer is perceived as absent. Current changes in scientific approaches tend to stress the fact that seeing a thing is a culture-laden process. A thing is perceived through the “cultural filter” (RYMKIEWICZ 2002, 36).

To my mind, it is less interesting to know how contemporaries are able to explain and understand the way in which perception (seeing) works now. Instead it is more interesting to find out how *seeing/perception* was understood in the past and what are the premises for the re-construction of different ways of seeing. In this aspect, it is also of interest how sensory activity was worked out in the past assuming the cultural character and understanding of eyesight.

Sensory Activity in Archaeological Investigation and GIS Applications

Eyesight is perceived in the interpretative models of the past as something in which a social actor is equipped. However, we are dealing with two concepts of viewing/seeing. The first defines viewing/seeing as a process of perception, which is universal and timeless, while the second treats viewing/seeing as a process of perception, which has a cultural character and meaning.

The GIS application (viewshed analysis) to the archaeological record provides an example of the differences between the modern scholarly understanding of seeing/viewing and different ways of understanding and practicing of seeing/viewing in the past. I would advocate here the non-universal understanding of the sensory activity as heuristically valuable. Below I present a scheme which, in my opinion, shows the importance and presence of eyesight in the interpretative models of the past and depicts its differences.

- Passive and universal *perception/seeing* of the acting human subjects
- Active and universal *perception/seeing* of the acting human subjects
- Active and culturally constituted *perception/seeing* of the acting human subjects

The scheme indicates how different studies ascribe social actors with some form of being (*participation*) in the world:

- Perception/seeing, which is present in the models of the past culture, but is perceived as universal and at the same time does not play an important role in interpreting and understanding the past
- Perception/seeing, which is present in the models of the past as an active element but remains conceptualized as universal and timeless
- Perception/seeing, which is present in the models of the past as an active element, which plays an important role in understanding and interpreting the past and, at the same time, is treated as a cultural product/construct.

In the archeological literature the visual relationships between social actors and places (objects, other actors) are treated as meaningfully constituted elements in a given cultural context. They may have defined a placement of some objects or elaborate the way in which subjects participate in the world.

The visual relations served as a point of departure for the discussion on systems of communication in the past and the process of social space construction, which completed an interpretative re-construction of the past through adding sensual spaces – visual spaces.

The archaeological investigations were further enriched by concepts which without doubt extended the way of understanding the process of seeing in the past. These included the concept of the offer – affordance, the concept of the seeing – experiencing etc. They referred to the broader debate about the ways of understanding the landscape in the archaeological investigations and marked a significant change in the understanding and interpreting of the past.

Very important to my studies is the concept of understanding the sensory activity developed in archaeology and in the so-called interdisciplinary studies. It underlines a peculiar way of understanding the seeing that is far removed from modern European modes. It is based upon premises and results of the investigations from cultural studies, history, cultural anthropology and linguistics. I perceive the concept of understanding the seeing as a process which is directed by cultural norms characterizing early Medieval culture (Western Slavs culture).

According to this concept, cultural seeing is treated as “agency-action”, which is in a position to influence things or people (spell casting – *rzucać urok*). Some practitioners of landscape archaeology propose to inscribe an experience into the interpretative models of the past reality. J. THOMAS (2001, 171–172), for instance, claims that experience may contain perception but also an extra sensual form of perceiving (seeing) things.

A similar attitude to things is present in the so-called “cultural archaeology”. Through appeal to the concept of the “mystical participation” in the process of seeing-experiencing a very important role is played by “magical power”, which was respected by subjects acting in the past (KOWALSKI 2001, 13). According to the described concept sensual data are not only a result of “pure seeing” as modern scientific thinking would prefer. According to A. P. Kowalski “the mystical participation” involves thinking as an inherent part of perception. People in the past perceived material objects with some added mystical properties, which for modern European minds would be not acceptable (KOWALSKI 2001, 17). Pre-modern perception of things was connected with thinking. According to

A. P. KOWALSKI (2001, 51) the modern perception consists of a particular “view of the thing”, which concentrates on seeing physical properties of things (objects as things). On the contrary, pre-philosophical attitude towards perception was based on an experience of the thing or physiognomical way of seeing the thing. With this attitude human subjects were also able to catch dispositions, the non-physical proprieties of the thing.

In his archaeological studies Robert Johnston proposes viewing the past experience on perception in terms of dwelling – being in the world. JOHNSTON (1998, 54–67) in his article entitled “Approaches to the perception of landscape. Philosophy, theory, methodology” advocates an explicit distinction between explicit approach and inherent approach to landscape perception. The explicit approach to the perception of landscape distinguishes perception within the landscape as something placed between observation and cognition. However, the inherent approach sees perception as not isolated from landscape and being rooted in ways of living. As such, the inherent approach is in opposition to the explicit approach, which does not differentiate between real landscape and perceived landscape. As the scholar says “it is not possible to isolate perception because it is embedded within ways of living – or being” (JOHNSTON 1998, 64).

Sensory Activity in the Early Medieval Culture

Seeing in the early Medieval culture, as it is stressed in the literature, was arguably strictly connected with knowing (knowledge). In the Medieval reality seeing meant knowing, understood as a confirmation of the reality with “one’s own eyes”. Observation became an active element of making the seeing a process embedded with agency.

Jacek Banaszkiewicz turned attention to mythological perception of the word surrounding acting social subjects. Seeing determined the way of perceiving the surroundings, sensory organization of space and orientation in the cultural landscape.

Furthermore, R. TOMICKI (2000, 467) in the article – “Czy Kriwe krzywał? Kilka uwag o pożytkach z przeżytków” – focused on space (space creating, constructing) and sensory activity. The author advocates visual perception as a process of getting a special knowledge. Tomicki also pays attention to seeing as an action performed from a definite point in space (from one space/point towards another space/

point). He treats this phenomenon as an example of a “safe space”, the point from which somebody perceives (looks).

Early Medieval Strongholds and Settlements – Archaeological Data

My research is based on several strongholds and settlements from the Polish territories Pommerania (Pomorze) and Greater Poland (Wielkopolska). The sites have been dated to the 8th/9th – 10th/11th century (Figs. 1, 2).

Historians and archaeologist interpret these kinds of monuments/sites as:

- Indicators of social differentiation,
- Symbolic manifestations of power,
- Elements of the military, administrative and economical systems,
- Indicators of social changes.

The application of viewshed analysis is intended to draw attention to yet another aspect of their significance, namely their active and meaningful role in shaping the everyday life experience of social actors. I would argue that they significantly contributed to the creation of social spaces aimed at acting and experiencing. Strongholds also provided an arena for being in the world for social actors.

GIS and Viewshed Analysis (Computer Software)

The analysis was based on a DTM, which was created for chosen regions by using reconstructions of the surface relief. Historical maps as well as modern and geological maps¹ were further used to build these surface models. Computer programs such as Idrisi and CartaLinX were used for this purpose². At this level of analysis, I have made an assumption about large deforestation in the studied regions. I am also aware that the results of analysis form, to some degree, a very idealistic “picture” of the past reality (a model).

Firstly, as an output of computer analysis viewshed maps for particular places were produced. Secondly, the maps were interpreted within previously



Fig. 1. Location of the five chosen regions.

explicated statements and assumptions concerning perception and visual activity (seeing) in the early Medieval culture. The results of computer analysis were also used for constructing an interpretative, narrative model of hypothetical participating and acting of social actors in the early Medieval world.

Interpretation

When looking at the results of the viewshed analysis, the differences between strongholds and individual settlements become apparent (Figs. 3–5). In the majority of cases, strongholds are situated and constructed in a different way to that of settlements, in particular as viewed by social agents. In regard to the settlements, they were clearly placed in different locations. These are places which are similar in the whole structure of the settlement system and places which are different.

Another significant observation refers to the different ways in which the relationships between settlements and strongholds are conceptualized. In many cases, as was stressed in the literature, the distance between settlements and strongholds is determined by their placement in the entire settle-

¹ Topographical maps 1 : 10,000 (1965) – Główny Urząd Geodezji i Kartografii: Wierzchowo Lake Region (sheet) 333.123, 333.141 and Lednica Lake Region (sheet) 413.431, 413.432, 413.433, 413.434, 423.212, 423.211.

² Computer Laboratory, Faculty of Geographical and Geological Science, Adam Mickiewicz University.

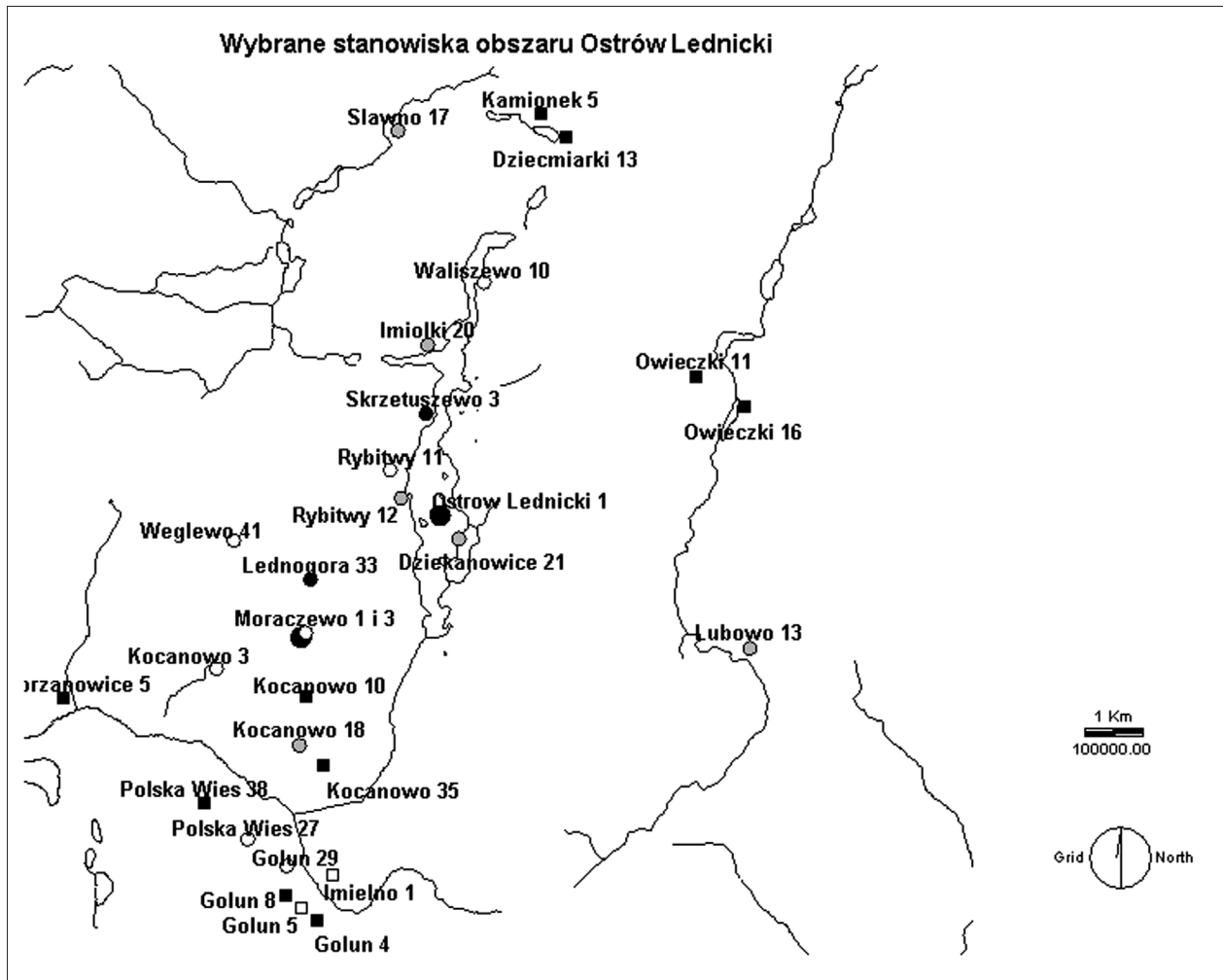


Fig. 2. Map of archaeological sites in the Lednica Lake region.

ment system. The distance from other sites distinctively marks a stronghold as a central place. Results of my studies show that many settlements, despite being at a far distance from the strongholds and other settlements, were inscribed into the sensual space of people dwelling in the stronghold. At the same time, some settlements placed in the vicinity of the stronghold were excluded from this space. It is indicative of the fact that some settlements and elements of its surroundings could become a part of the visual space for some social actors. This situation provides some participants with a possibility for *acting (sensory acting)* and constitutes them as *objects of a sensory act*. Some settlements are situated beyond this space – the space of action and control.

My intention is to spell out differences between settlements and strongholds. I see them as one of the elements of the socializing process. The socializing is strictly connected with the placement of an indi-

vidual. Different places offer different possibilities for socialization of human subjects and their sensory and cultural activity.

Looking at the results of my analysis, it appears that the change in placement of strongholds in the Wierzchowo Lake and the Lednica Lake regions can be interpreted as a change of cultural rules and norms. It also acts as reference for possibilities of participation in the social world for inhabitants of the settlements, which existed during the time when particular strongholds functioned. Changes in the spatial organization, cultural landscape or settlement structures are caused by people, but at the same time they reciprocally influence human beings. I want to interpret them as changes in *bodily movements* between places. For example, change of the experience of the successive surroundings can be an element of change in the social structure. It exemplifies the way in which the spatial order frames the individual and social activity and in what way

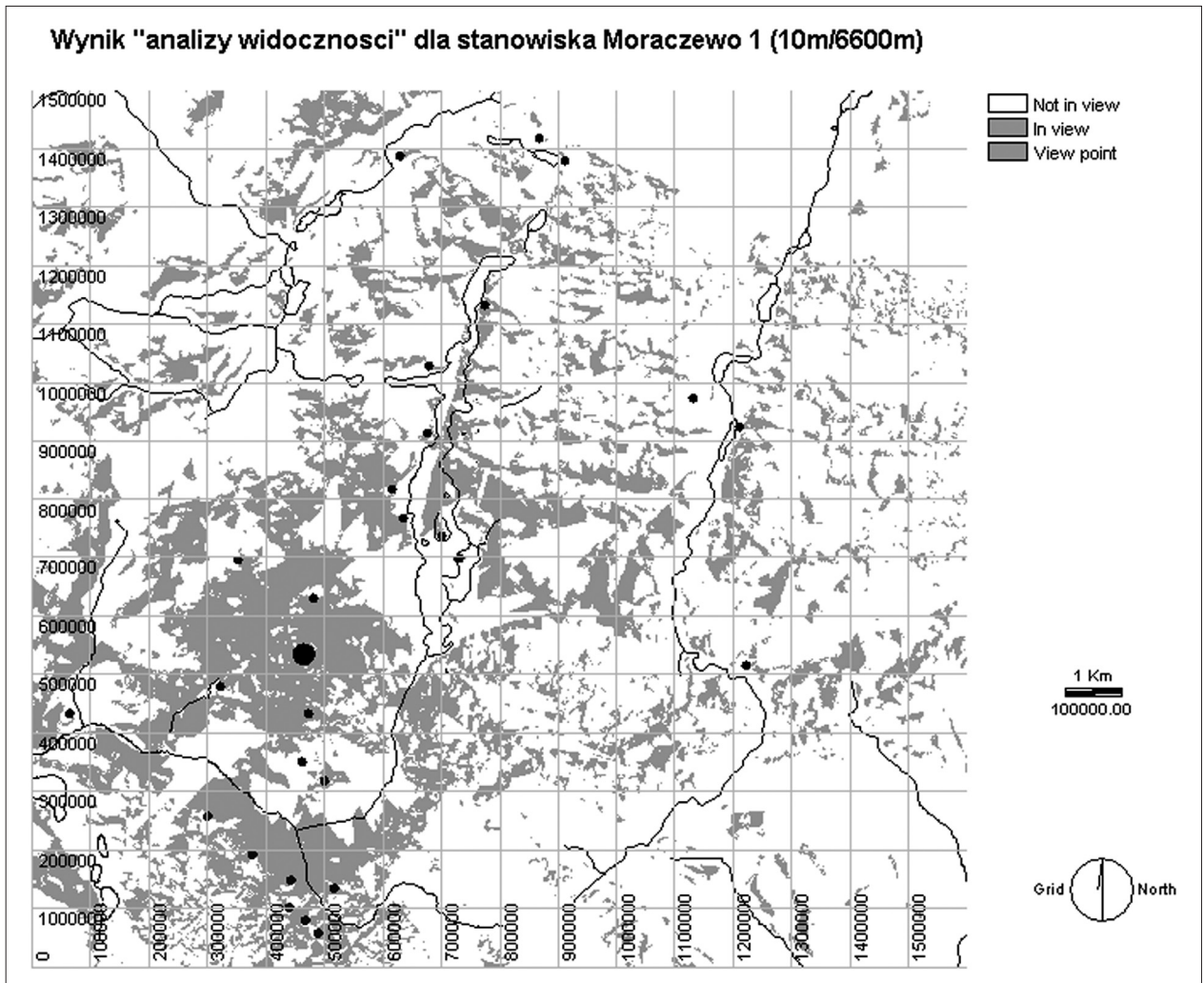


Fig. 3. Viewshed map of stronghold Moraczewo 6 (phases B/C – C/D), Lednica lake region.

spatial order can take part in expressing and constructing social differentiation.

By accepting the above assumptions about seeing in the early Medieval culture, the results of viewshed analysis allow us to interpret visual spaces of particular sites as spaces for different activities including sensory acts. This attempt to interpret settlements and strongholds as visual spaces (*przestrzeń zmysłowe*) allow to treat them as objects whose meaning and character go beyond their physical form. They appear to be safe and active places within the early Medieval landscape and culture.

Conclusions

To conclude, I would like to stress the role of visual spaces for studying and interpreting early Medieval sites. This refers in particular to the concepts

of seeing in early Medieval culture. I am aware of the limits of the method, nevertheless, I also see its usefulness in defining non-material forms of the place, re-interpreting boundaries, understanding the meaning of the place as well as forms of participation and activity of social actors in the early Middle Ages.

The computer analyses and their results (viewshed maps) were used for an extended description of participation of social subjects in the early Medieval world. I have aimed to describe the active role of particular places and relationships between human beings, things and their surroundings. My study is a supplement with which to reference regional studies, and a contribution to the interpretative model of the early Medieval Slavic culture.

With this paper I do not intend to provide the final answers on the ways of participation in the

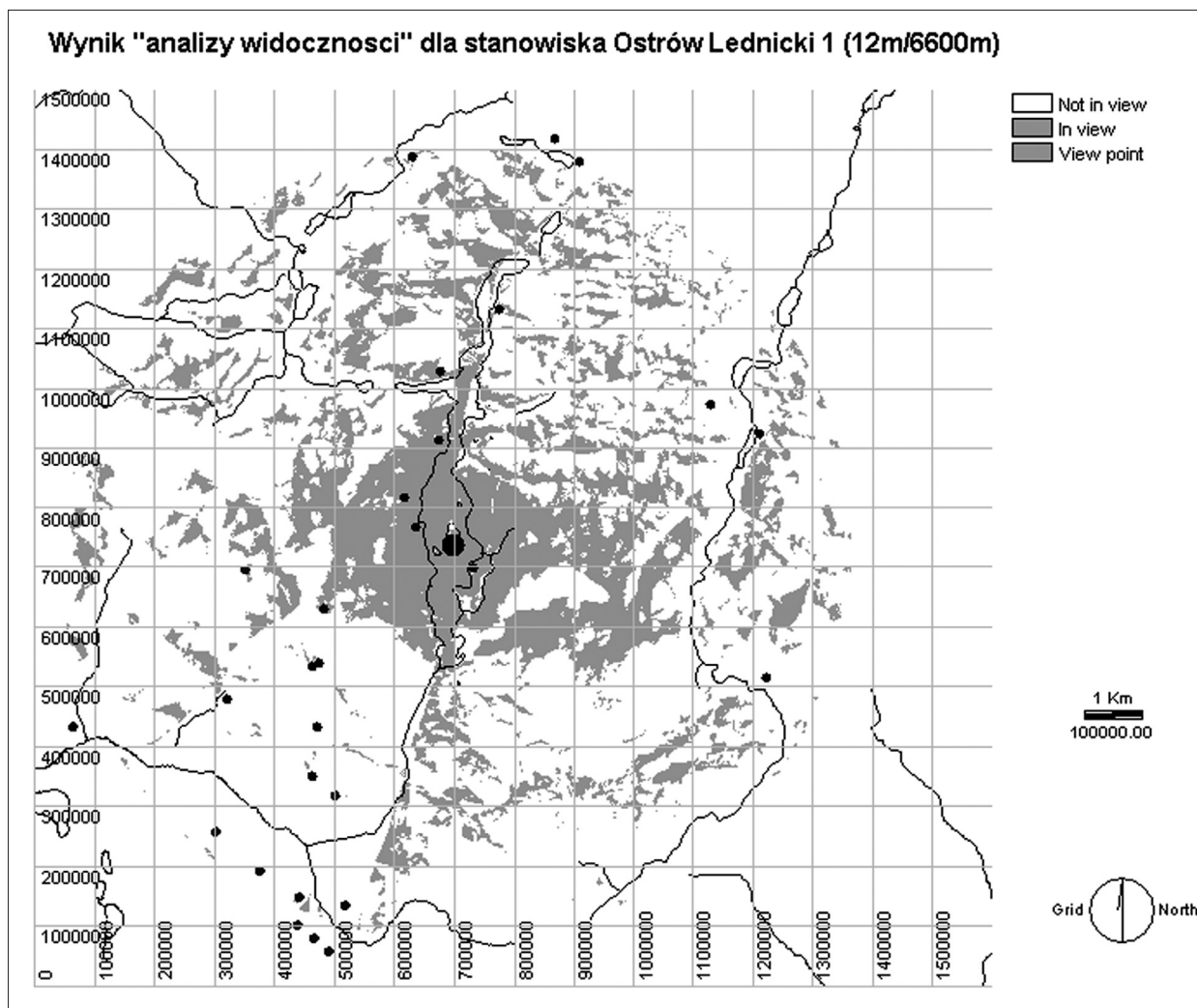


Fig. 4. Viewshed map of stronghold Ostrów Lednicki 1 (phases A – H), Lednica lake region.

world or culture, but rather I tried to contribute to the discussion on some aspects of *seeing* as a form of experiencing and participating in the early Medieval world.

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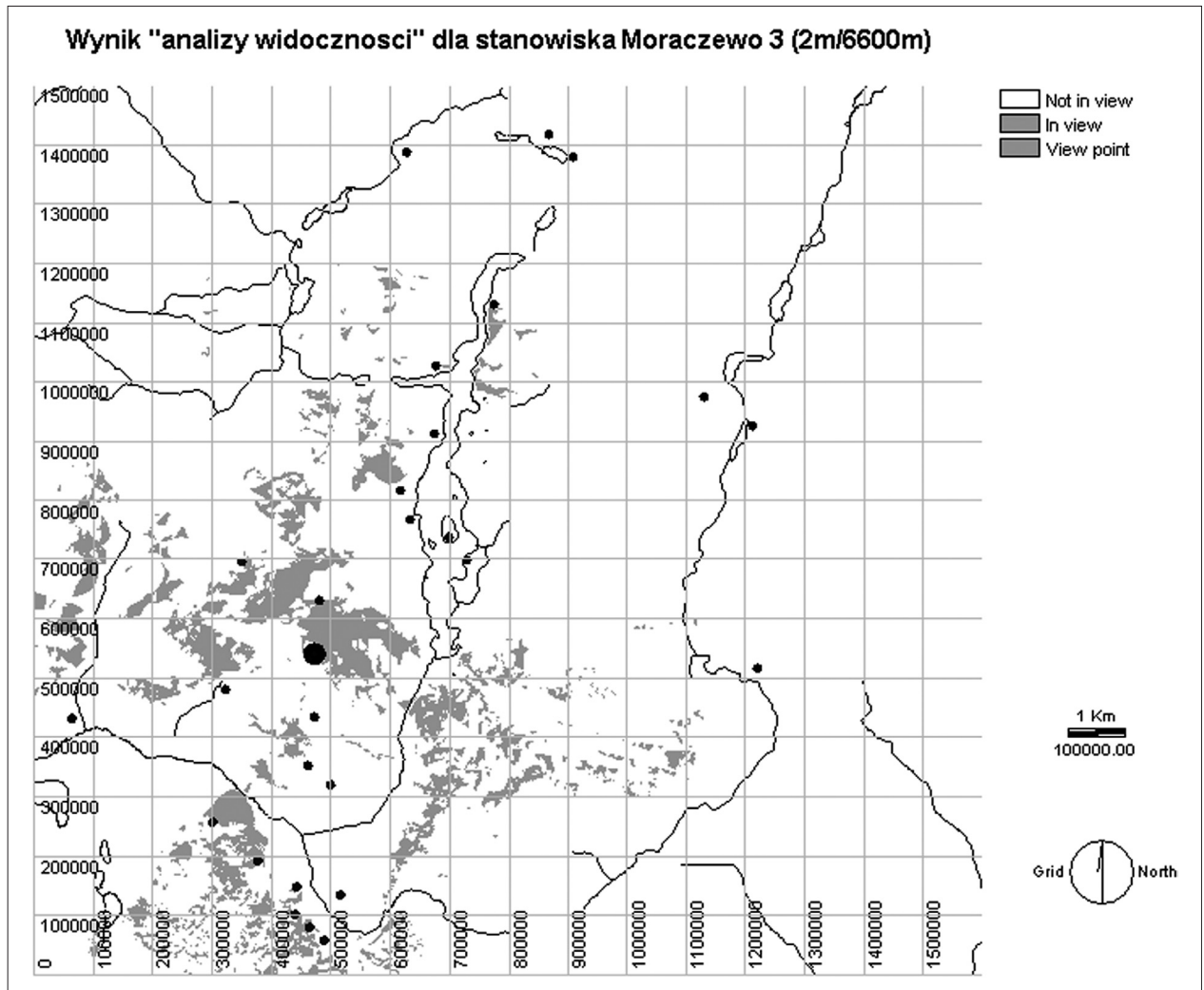


Fig. 5. Viewshed map of settlement Moraczewo 3 (phase A – E), Lednica lake region.

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