



Success in preserving historic rural landscapes under various policy measures: Incentives, restrictions or planning?



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ABSTRACT

Historic rural landscapes are valuable not only as artefacts and as cultural heritage, but also as natural sites with great scenic qualities. Unfortunately, the total area of these landscapes was dramatically reduced in the course of the second half of the 20th century. In our study, we focus on the development of 38 fragments of medieval hedgerow-defined field patterns in Czechia referred to as *pluzina*, in an attempt to reveal significant determinants of their persistence or disappearance between 1996 and 2016. Using patch-scale spatial data generated from GIS, mixed-effect modelling was performed to test for the effects of five local drivers and their first-order interactions in explaining the variation of the preservation rate of these features. The study reveals a trend towards a slight decrease in the total area of these valuable field patterns. However, the trends vary greatly from area to area. This reflects not only the influence of natural determinants but also a significant effect of land-use policy measures in individual areas over the study period.

Our findings confirm that land-use planning measures are the most important factor: grassland is more likely to be preserved, while cropland tends to lead to a reduction in or destruction of valuable patterns. The second most powerful factor was land tenure security. While areas of historic structures managed predominantly by owner-operators were able to grow in size over the period of our study, areas managed by tenant-operators were reduced in size. Legal restrictions in the area of nature conservation were another statistically significant driver and determinant that had a positive effect on the preservation of historic landscapes. It has also been shown that *pluzina* landscapes are more likely to be preserved or enlarged in less fertile areas. In conclusion, our findings have confirmed the crucial effect of individual land-use policy measures on individual sites, where appropriately chosen measures, such as sensitive planning, restrictions and incentives, were the principal drivers of the preservation of rural landscapes.

1. Introduction

Preservation of historical rural landscapes in the conditions of 21st century agriculture presents a challenge for society, highlighting the importance of replacing standardized arrangements by more complicated but more effective solutions that will neither blindly place emphasis on production nor lead to thoughtless abandonment of the land. Historical rural landscapes were formed due to traditional land-use systems, sometimes referred to as low intensity land-use systems. These historic landscapes have been preserved predominantly in upland and remote areas, where physical constraints have prevented the modernization of agriculture (Strijker, 2005; Plieninger and Höchtl, 2006; Lieskovský et al., 2014). These structures deserve protection not only because of their historical value, but also because they are often the optimum way of management for nature conservation (Skaloš and Engstová, 2010; Špulerová et al., 2011), for anti-erosion measures, and

therefore for maintaining the retention capacity of the soil (Zeithaml et al., 2009; Dreibrodt et al., 2010). In addition, they are often visually attractive, and contribute considerably to the tourism potential and the attractiveness of the landscape (Arnberger and Eder, 2011).

Medieval field patterns called *pluzina* in Czech language are a typical representative of historical rural landscapes in the region of Central Europe. Their original structure was preserved predominantly by marking the original plot edges by woody hedgerows (Fig. 1). Therefore, the extent of preservation of these hedgerows significantly determines the level of conservation of the entire historical structure. In Czechia, 2653 fragments are currently in existence, showing various degrees of preservation. These fragments were identified within the scope of our previous 8-year project, and were described in a previous study (Sklenicka et al., 2009a). The medieval origin of the fragments was confirmed in a subsequent study by Houfková et al. (2015). According to the classification of the five principal stages of European

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Fig. 1. Examples of two basic types of medieval hedgerow-defined field patterns. 1a: The most common *strip pluzina* landscape type, typical for settlements formed along roads or streams. In the foreground, it can be observed that a part of the *pluzina* has disappeared as a result of land-use intensification. In the background, well-preserved remnants of the original medieval features fixed by hedgerows are present (there are some signs of an abandoned *pluzina* landscape that has been overgrown by young forest stages). 1b: An example of a well-preserved *radial pluzina* landscape, which was usually formed in vicinity of a round settlement. (photo: Markéta Hendrychová).

landscape history (Vos and Meekes, 1999), these landscapes belong to the middle group, originating in medieval until renaissance times. Their character is similar to that of hedged field (bocage) landscapes, which became a distinctive feature in some parts of Europe (e.g. Normandy, Brittany, Flanders, Wales, England, Ireland, and the Slovakian highlands).

As in the case of related landscape types (e.g., Pointereau and Bazile, 1995; Countryside Council for Wales, 1997; Barr and Gillespie, 2000), the area of *pluzina* landscapes was significantly reduced during the second half of the 20th century. Sklenicka et al. (2009a) reported that between 1950 and 2005, 341 out of 483 hedgerows disappeared in the study areas in the Pilsen region (Czechia), and that the total length of the hedgerows decreased by 71%. According to the findings of Plieninger and Höchtel (2006) and Lieskovský et al. (2015), this significant reduction can be attributed to the following factors: on the one hand, land-use intensification in certain areas leads to the abandonment of agricultural management and traditional rural structures, and parts of the land then became overgrown by spontaneous succession. On the other hand, land-use intensification brings pressure to remove hedgerows and to unite neighbouring plots in order to increase agricultural productivity. Development activities are a third factor contributing to the reduction of hedgerows. They often lead to the destruction of preserved historical structures in order to build residential or recreational developments. With these activities, ironically, developers damage or destroy the main attractions of the site for potential customers.

The so-called transition countries of Central and Eastern Europe dealt in various ways with the transition to a market economy after 1990, and later dealt with accession to the EU. These processes brought both positive changes and negative trends associated with land abandonment, on the one hand, and unrestricted intensification of agriculture, on the other (Swinnen and Vranken, 2009; Terres et al., 2015). In Czechia, and also in the other transition countries, an evaluation can be made of the influence on the trends associated with historical rural landscapes of more than 20 years of land management in the new environment of a market economy. Although the opportunity to farm on their own land has been given back to land-owners, this option has been taken up by only a small fraction of land-owners. For example, almost 80% of the rural land in Czechia and in Slovakia is managed by tenant-operators (Sklenicka et al., 2014).

The success of preservation strategies is dependent on an intricate blend of restrictions, incentives and land-use planning measures, complemented by economic interests. The principal incentive for sustainable development of rural landscape is land tenure security, which is represented in the circumstances of Central Europe in particular by whether the farmer owns the land or is only a tenant farmer. Tenants are often excessively motivated by short-term profit, and have no incentive to invest in the soil or in landscape protection. By contrast, owners managing their own land perceive the bond with the land in a much stronger fashion, recognizing an obligation to hand the land over to future generations in the same shape or in better shape than they received it (Sklenicka et al., 2015). Destroying historical rural

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