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### **Cottage sprawl: Spatial development of second homes in Bory Tucholskie, Poland**

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## **Cottage sprawl: Spatial development of second homes in Bory Tucholskie, Poland**

### **Highlights**

- Second homes are an integral element of uncontrolled urbanisation in Poland.
- New second homes are located close to forests and water bodies, in isolation from existing settlements and main roads.
- Second homes development is unplanned and increasingly dispersed.
- Curbing rural-natural sprawl needs spatial planning to acknowledge multiple dwelling.

### **Abstract**

Currently, urban sprawl is one of important spatial problems in Poland, although to date it has mostly been recognised as an issue in suburban areas. This study aims to explain how the expansion of purpose- built second homes contributes to the creation of a sprawled settlement pattern in areas of high natural value, focusing on the example of Bory Tucholskie as a study area. Two research approaches are used: first, an inventory of second homes and archival aerial photographs are combined to perform a GIS analysis of the factors affecting the location of second homes and other new buildings within the past two decades; second, the results of a survey, interviews and the analysis of documents provide a deeper understanding of the quantitative results. The location of new second homes is conditioned by the presence of the forest, lakes, and their isolation from main villages. Unlike other new developments, second homes create a disorganised, discontinuous and increasingly dispersed spatial pattern in the vicinity of natural areas, which can be explained by the motives for the use of second homes, the practices of their acquisition and the planning regulations. Second homes are an integral part of

the sprawl process that is occurring in Poland, which is generated by economic restructuring, increasing consumption, and lifestyle changes.

**Keywords:** Second homes; Urban sprawl; Planning in rural-natural areas; Poland

## **1. Introduction**

Urban sprawl is currently considered to be one of the main spatial and environmental problems in Europe. The territorial expansion of urbanised areas under limited planning controls, in a low-density scattered and discontinuous form, leads to a waste of land resources, an increased cost for infrastructures, as well as congestion and excessive energy use. It also causes a loss of open areas, ecosystem fragmentation, damage to biodiversity, an increased risk of flooding, deterioration of the landscape aesthetics and quality of life, and also negative health effects (Couch, Leontidou, & Petschel-Held, 2007; European Environment Agency, 2006; Johnson, 2001). Sprawl is usually associated with the suburban areas of big cities, but a similar adverse effects are resulting from the expansion of housing beyond urban environs, particularly in amenity-rich rural-natural areas (Prados, 2009; Taylor & Cadieux, 2013). The expansion of built-up areas towards rural localities with a particular natural appeal is fuelled by the consumption-led migration from urban areas, which is often described as counterurbanisation (Mitchell, 2004) or amenity migration (McCarthy, 2008). The gravity and the character of this sprawl problem differs across countries with different geographic and historic conditions, and in Poland it poses a serious challenge (European Environment Agency, 2006; Lisowski, Mantey, & Wilk, 2014).

### **1.1. Second homes and sprawl**

Satisfying the need to live in a rural, nature-based environment does not always mean a permanent move. Instead, seasonal residences – or second homes – are often a substitute for full-time migration (Halfacree, 2012). The term “second home” does not describe a concrete technical form, but instead refers to the function of a dwelling (Hall & Müller, 2004; Paris, 2014). A large proportion of European second homes are cottages purpose-built as secondary dwellings, and used seasonally. These constitute a relatively new element of the countryside, and the proximity to nature and the escape from an everyday urban environment are among the most important motives for their use (Hall & Müller, 2004; Jaakson, 1986; Kaltenborn, 1998). As a result, second homes are often constructed in areas of high natural beauty and landscape value, including near seashores, lakesides and mountains. This leads to threats of a negative impact on the environment and the landscape, such as wildlife disturbances, biodiversity losses, landscape fragmentation, water pollution, inappropriate solid waste disposal, noise, and the general spoiling of the aesthetics of the natural and cultural landscape. Even more significantly, although not territorially localised, the mobility related to second homes and their energy use causes an additional environmental impact (Hall, 2014; Hiltunen, 2007; Long & Hoogendoorn, 2014; Müller, Hall, & Keen, 2004).

The environmental and landscape impact of second homes differs between the locations and the types of developments, and is dependent on a regional and national context. For example, there are few parallels between the coastal “residential tourism” dwellings on the Mediterranean coast (Mazón, 2006), the Alpine resorts saturated with tourist apartment blocks (Stettler & Danielli, 2008), and the cottages located in the woods and lake regions of northern Europe or America (Halseth, 2004; Hiltunen, 2007). Arguably, in peripheral depopulating rural areas, where existing vacant houses are simply adjusted for seasonal use, the second home development

creates no environmental damage, or even has a positive effect through preventing housing abandonment and infrastructure decay (Müller et al., 2004). However, other peripheral areas are particularly sensitive to the excessive development of new housing due to: their ecological vulnerability, potential conflicts with productive land use, and the high cost of providing transport, services and infrastructures. In America, exurban housing in the vicinity of protected areas is a major threat to the effectiveness of that protection (Radeloff et al., 2010), and second homes are contributing significantly to this trend (Kondo, Rivera, & Rullman, 2012). A similar concern applies to some Euro- pean countries (Kaltenborn, Andersen, & Nellemann, 2007). The second homes may also open natural areas for more intensive use: i.e. summer cottages, which may be initially austere and seldom used, are often later modernised, used with a higher frequency, or converted into a permanent dwelling, all of which multiplies their environmental impact (Berker & Gansmo, 2010; Luka, 2012).

The impact of second homes on the landscape and the environment cannot be considered in isolation from other, socio-economic effects (Hiltunen, Pitkänen, Vepsäläinen, & Hall, 2013). The construction of second homes and their use brings revenue to local economies, generates costs of the infrastructure provision for local authorities, and the second home owners form a part of the local population (Müller et al., 2004). Due to the high value they place on nature, the second home owners are often committed to preserving the natural state of the environment, which may lead to a conflict with the existing local population regarding land use policies (Overvåg & Berg, 2011). Still, second home development, as with any amenity-driven housing, will always damage the very resource that attracted it – the natural and unspoiled environment – to some degree (Prados, 2009; Taylor & Cadieux, 2013). Hence, current second home owners may try to limit further development of second homes, in an attempt to preserve the natural quality of their own leisure environment (Jaakson, 1986; Kondo et al., 2012). In fact, the limiting

of public access to natural recreational resources may even be a more important effect of the development of second homes than any of the physical environmental impacts (Granö, Roto, & Laurila, 1999).

## **1.2. Sprawl and second homes in Poland**

Poland is currently experiencing a high dynamics of both suburban sprawl (Gutry-Korycka, 2005; Lisowski et al., 2014; Lorens, 2005) and second homes development (Adamiak, 2014; Czarnecki & Frenkel, 2015; Mika, 2013). The sprawl process is facilitated by the character of the existing settlement structures and by recent economic and political transformations (European Environment Agency, 2006; Sýkora & Staniolov, 2014). Before the 1990s, there were strict regulations on land use changes in the centrally planned economy, state controls over the property market and the construction sector, and priority was given to the development of the multi-family housing, which constrained the access of the urban population to suburban or rural dwellings (Borén & Gentile, 2007; Schmidt, Fina, & Siedentop, 2015). Then, following the re-establishment of the free property market in the 1990s, the resulting suppressed demand along with economic growth, increasing individual car ownership, and the high demographic pressure on the housing market resulted in accelerated suburbanisation (Lorens, 2006; Schmidt et al., 2015; Sýkora & Staniolov, 2014). With the deep deregulation and decentralisation of the spatial planning system, property rights were prioritised over public interest (Izdebski, 2013). This led to unplanned, chaotic and discontinuous urban expansions around major cities, causing negative impacts on the landscape, the environment, agriculture and quality of life (Lisowski et al., 2014; Lorens, 2006; Schmidt et al., 2015), as well as excessive costs of infrastructure, traffic congestion and the indebtedness of local governments (Kowalewski et al., 2013). Many researchers and planners have criticised the permissive and inefficient spatial planning system for the

overutilisation of auxiliary planning permits in replacement of local spatial development plans, and limiting planning authority to the lowest municipal level of administration, which has led to an emphasis on the short-term economic benefits of housing developments above long-term community and regional sustainability (Izdebski, 2013; Lisowski et al., 2014; Wasilewski & Krukowski, 2004). Furthermore, whereas the suburban areas of large cities have experienced high housing pressure resulting in sprawl, other rural areas, particularly those peripherally located, have suffered economic stagnation and often depopulation, with a subsequent abandonment of existing housing stock (Bański & Wesołowska, 2010; Wesołowska, 2011).

While there is an increasing awareness in Poland of the adverse effects of uncontrolled suburban growth, less attention has been given to the development of second homes in peripheral amenity-rich areas, which is an equally dynamic process fuelled by similar motives and conditions. The post-war development of second homes in Poland started in the 1960s and 1970s, and was initially spatially concentrated in the vicinities of the largest cities (Kowalczyk, 1986, 1994). It was not until the 1990s that it gained momentum, as a result of the rural property market deregulation. During the most recent quarter-century, the development of second homes has spread into the more peripherally located amenity-rich areas of mountains, lake regions, and seashores (Adamiak, 2014; Bański & Wesołowska, 2010; Mika, 2013; Rydz & Jazewicz, 2009). While there are no official statistics on the number of second homes in Poland, based on surveys it can be estimated that the number has doubled within the last twenty years, reaching 600–700 thousand household-owners in 2013 (Adamiak, 2014; Czarnecki & Frenkel, 2015). This number may be expected to continue to grow, as the ownership rate still remains low in comparison with other countries in the region, such as the Czech Republic (Vágner, Müller, & Fialová, 2011). Most second homes in Poland are cottages purpose-built for seasonal use or year-round weekend use. Describing the spatial development of second homes in the Carpathian Mountains, Mika

(2013) pointed out certain characteristics of their sprawl-type expansion, including: a lack of regulations, spontaneous growth, a strong preference for areas with high natural beauty, and their spatial isolation from permanent settlements. Apart from purpose-built cottages, an increasing number of farms are also being converted into second homes, particularly in the depopulating rural regions of eastern Poland (Wesołowska, 2011).

### **1.3. Aim of the study**

This study will explore the role of the expansion of purpose-built second homes in the creation of sprawled settlement patterns. It aims to answer “if, why, and how” the development of second homes is contributing to uncontrolled sprawl in rural areas of a high natural value. It is focused on a case study of the Bory Tucholskie region in northern Poland, and attempts to provide an in-depth understanding of the process of the spatial development of second homes by employing different datasets and methods of analysis. First, a field inventory of 2.9 thousand second homes located in the study area, aerial photographs and a GIS analysis are used to track and model the spatial expansion of second homes over time, and to compare the factors affecting the location of new second homes with those that are influencing the development of other buildings. Second, the motives and the property acquisition process, as well as the role of the planning regulations and practices, are analysed based on a survey, interviews and a document analysis, in order to better understand the reasons for the location trends identified by the GIS analysis. In the end, the implications of the results are discussed, with particular attention given to the role of the planning process in curbing the negative effects of the sprawled development pattern of second homes.



## **2. Methods**

### **2.1. Study area**

The study area is a part of the Bory Tucholskie region, located in northern Poland, in the Kujawsko-Pomorskie province. It is 40–90 km north of the closest large regional city, Bydgoszcz, which had 358 thousand inhabitants in 2014 (Fig. 1). About half of the owners of the second homes in Bory Tucholskie are permanent residents of Bydgoszcz, while the other half are inhabitants of other cities and towns in northern Poland. The study area comprises ten municipalities with a total area of 1528 km<sup>2</sup>, and is populated by 53 thousand inhabitants living in 12 large villages of more than 1 thousand inhabitants, and 246 smaller agricultural villages and hamlets, as well as dispersed farms (Central Statistical Office of Poland, 2014). The town of Tuchola (with 14 thousand inhabitants) located in the western part of the area, is excluded from the analysis. Forest covers 48% of the area, and along with several water bodies – lakes, reservoirs and rivers – presents significant value from both a recreational and an ecological viewpoint (Nienartowicz et al., 2010).

### **2.2. Inventory of second homes and reconstruction of their spatial development**

There is no comprehensive information available from any secondary source on the number, distribution and history of the second homes in the study area, due to the multiplicity of their forms. Only part of the second homes have been registered as recreational properties in the municipal property databases for taxation purposes, while others are registered as permanent detached houses, or are not registered at all. Therefore, I have performed a detailed inventory of the second homes in the study area. Here, I defined a second home as any private permanently located construction used for overnight stays for leisure purposes. This includes: detached houses and cottages purpose-built and seasonally used for recreational purposes; older houses and farms,

once permanently inhabited, and later converted into second homes as a result of either an inheritance or a purchase; and semi-mobile or provisional homes such as large residential trailers or other constructions without a solid foundation, placed permanently on recreational plots and used as seasonal houses. When writing about purpose-built second homes, I include both solid buildings and semi-mobile or provisional homes located on previously undeveloped plots.

In the first step, I identified the villages and areas where second homes are located, based on information obtained from municipal employees and from the analysis of large scale cartographic materials (topographic maps, orthophotomaps, and cadastre maps), where I took into account the following characteristic features of purpose-built second homes: small and regular plots, small size of houses, location close to lakes or the forest, usually in clusters or in isolation from existing villages, no signs of farming activity on the plot (auxiliary buildings, machines) and apparently little or light traffic on the access roads. However, these features do not inform about the actual use of the houses with certainty, so in a second step I visited all of the properties suspected to be second homes in order to verify the actual use of the properties, and to gather additional information on the technical characteristics of the buildings. To do this, I took into account the appearance and the technical form of the house (its age, size, construction material, presence of auxiliary buildings); signs of activity during the winter season (presence of people and domestic animals, tracks on snow or on access roads, anti-theft blinds); and information from local residents. This procedure did not eliminate the risk of a misclassification of some properties, but this risk should not be large enough to affect the results of the analysis. I carried out the field study in the winter season of 2012–2013, and consequently I created a GIS database of second homes, where each home on a single plot is represented as a point and is accompanied by data about its technical form. For the purpose of modelling, I supplemented the GIS database with points representing the locations of other buildings, based only on cartographic sources

without field verification. As in the case of the second homes, I represented each house, house with auxiliary buildings, or farm on a single plot as one point. Only large industrial, farming or service buildings were identified as separate points even if located on the same plot.

Using the GIS database with the current locations of the second homes, I then reconstructed their spatial expansion based on archival aerial photographs. I used georeferenced scans of photographs of the whole study area taken in the years 1996–1997, and images from 1984 to 1987 that covered parts of the study area where second homes existed in the 1990s. I performed a reconstruction through verifying if a given second home already existed in the year when the photograph was taken. The aerial photographs had a high enough resolution to clearly notice individual houses. Only in singular cases was the verification of the existence of a building somewhat tentative, because of blurred image or forest cover over the houses. Although many small second homes are now surrounded by trees and are hardly visible on current aerial photographs, they were usually built on previously unforested plots, so at the time of their construction they could be easily noticed. The use of aerial photographs only enabled me to determine the fact of the existence of a house, and not to verify its use, so this method was only applied for new purpose-built second homes, and not the previously existing houses that had been converted into second homes, or the second homes which had replaced previously existing rural houses. The latter types of second homes are therefore excluded from the analysis. For buildings other than second homes, I applied a similar procedure for their historic reconstruction based only on the images from 1996 to 1997, due to the unavailability of coverage of the whole study area by the older aerial photographs.

### **2.3. GIS modelling**

I used a multinomial logistic regression to verify which geographic factors affected the location of the second homes constructed between 1996–1997 and 2013, and also to determine whether these factors differed from the factors that influenced the location of other kinds of buildings constructed in the same period. I assumed that three groups of characteristics may affect these locations, and quantified these into fourteen independent variables (Table 1). First, the location in relation to the communication network and permanent settlements is represented by four variables: straight line distance to the nearest paved road; distance to the nearest village with over 1 thousand inhabitants; distance to the nearest town; and distance to the regional city of Bydgoszcz. A further six variables describe the location in relation to natural amenities: distance to the forest; distance to a water body (lakes and rivers); share of the forest, water area, and length of rivers in the near vicinity, defined as a radius of 500 m; and location within a landscape park. A third group of four variables measure the potential agglomeration effects, assuming that the location of new houses may be dependent on the previous distribution of buildings of the same type. These variables are: distance to the nearest previously existing second homes; distance to the previously existing other buildings; and the number of second homes and number of other buildings in a radius of 500 m. To measure values of these variables for each point in the analysis I used a 1:250,000 vector map. Due to a generalisation, the map does not include the smallest rivers, water bodies (below about 5 ha) or forest patches (below about 1 ha), which do not have a significant recreational value. The shape generalisation does not bias the analysis, because only aggregate areas of the forest and lakes were calculated, and only large rivers were included. The values of the eight variables describing the distances had a highly right-skewed distribution, so I included their square root values apart from their untransformed values in the set of variables.

I calculated the values of each independent variable for the location of every newly built second home and for each other new building. As the locations are discrete, there is no real reference group of cases, so I employed a case control procedure in order to characterise the location of both types of constructions, compared with the places where they were not located. Therefore, the models identify the effects of the independent variables, but cannot predict the probability of the occurrence of a new second home or another building in any concrete place. I selected random control locations from the whole study area, with the exclusion of areas covered with water (where construction is impossible) and forests (where construction is almost impossible for legal reasons, apart from exceptional situations). I randomly assigned 8000 control points, which is five times the number of the more numerous study group of second home locations. I used the control locations as a reference group for the dependent variable, and the locations of the newly constructed second homes and of other buildings formed two other categories of the dependent variable. I compared mean values of all independent variables for each category of the dependent variable (ANOVA analysis), and afterwards I constructed a multinomial regression model through a forward selection of independent variables, until adding further variables did not meaningfully increase the accuracy of the model. In total, the model has 10 independent variables. One characteristic – the distance to the nearest previously existing second home – was included twice – untransformed and as a square root – in order to measure its seemingly non-linear effect.

#### **2.4. Survey, interviews and document analysis**

Following the GIS analysis, I used a survey and qualitative data from interviews, and performed a document analysis to interpret and explain the obtained results. I performed the survey with a sample of 255 owners of second homes in the study area. The survey was carried out personally

during the summer season of 2013. Due to the lack of an address list of the second home owners, the sample is not random, but the owners of second homes in different locations and of different types are included in order to grasp their diversity. In the analysis, I used answers to questions about the ownership history of the second home and the motives for the ownership and location. These motives were measured by two series of five-item Likert-scale questions: 12 questions about the importance of the motives for ownership; and 11 questions about the motives for the choice of location of the second home. The answers were later subject to principal component analysis with a Varimax rotation, and the resulting factor loadings were used to create scales of the groups of correlated motives.

At different stages of the study, I conducted about thirty unstructured personal interviews with local residents, second home owners, employees of municipal offices, and other local stakeholders. The information gathered in this way helped me in various ways, including: to identify the places where second homes were located during the inventory stage; to prepare the survey questionnaire; to further explain the results of the survey (e.g. stories of the development of concrete second home settlements); to understand the planning and administrative conditions for second home developments; and to understand the local stakeholders' perception of the impact of second homes on the local environment and the socio-economic situation. I also performed a content analysis of the planning documents, including the municipal development strategies, sectorial strategies (e.g. for tourism development), and the general spatial development plans of all the municipalities in the study area, as well as the protection plans for the landscape parks and selected local spatial development plans for the second home areas. I examined the degree to which second home and housing developments in natural areas are taken into account in the local planning. I also looked at how much attention is given to their impact on the landscape and the environment, and what regulations are being employed to manage them.

### **3. Results**

#### **3.1. Inventory of second homes and reconstruction of their spatial development**

The inventory resulted in the identification of 2.9 thousand second homes in the study area. The actual number of second homes is three times higher than the number of recreational houses registered in municipal property registries. This is because the remaining second homes are registered as permanent detached houses, or are not registered as buildings at all, which applies to stationary trailers and provisional constructions without a solid foundation. 15% of the identified second homes are converted from previously existing rural houses and farms, or are new houses built on their place after demolition. Such second homes were excluded from the GIS analysis, because it was impossible to determine the exact date of their conversion. The remaining 85% are second homes purpose-built on previously undeveloped plots of land. In this group, 69% are solid houses of various technical standards, ranging from small, wooden, typically seasonal cottages, to houses that are technically identical to permanent detached houses (Figs. 2 and 3). 16% are composed of various forms of provisional and semi-mobile houses, including stationary trailers, houses on wheels, and small huts without a permanent foundation. The purpose-built second homes typically have a floor size between 50 and 70 m<sup>2</sup>, and a plot size that is typically between 500 and 1000 m<sup>2</sup>. Wooden constructions prevail over brick houses, and the majority are equipped with a heating system (although this is often only supplementary). Most of them are not connected to the water infrastructure; instead, their owners use individual wells and pit latrines or septic tanks. Usually there is only a house on the plot, but sometimes there is also a garage or another supplementary building. The plots are almost always fenced, and the unbuilt space is typically covered with trees or a lawn.

Purpose-built second homes are usually grouped in clusters of between several, up to about one hundred houses. They often form larger agglomerations spanning across several villages, where agricultural land, forests and farm buildings are mixed with the newly constructed clusters of second homes of diverse sizes and densities. The location of the second homes is evidently related to the presence of two main natural amenities – forests and water bodies – most of them are located no more than 500 m from the nearest lake and not more than 200 m from a forest edge. The clusters of second homes are mostly located outside of major villages, either in isolation or near smaller villages or hamlets. The clusters also have different levels of organisation: from regular nets of rectangular plots and access roads; to jumbles of irregular plots with curvy, narrow and blind access roads.

Based on the archival aerial images, the number of purpose-built second homes has increased significantly since the end of the 1980s (Table 2). This means that the majority of the currently existing second homes are no more than 15 years old. Along with this numerical increase, there has been a change in the distribution of purpose-built second homes during recent decades (Fig. 4). In the 1980s, they were concentrated in several small and dense clusters located in the northern, most forested part of the study area. Later developments occurred in three directions: existing clusters grew; new clusters appeared, also in the less attractive southern part of the area; and the number of new second homes dispersed outside of the clusters increased. Since the late 1990s, purpose-built second homes have been the most numerable new constructions in Bory Tucholskie. Apart from the 1535 new second homes, 942 other new buildings were constructed on previously undeveloped plots, which includes mostly detached houses (83%), but also industrial and large-scale farming buildings, service buildings (mainly for tourist accommodation and catering services), as well as public service and infrastructure



buildings. The new constructions of these other types were usually located within, or close to, existing villages.

### **3.2. GIS modelling**

The location characteristics of the new second homes constructed since 1996–1997 differed from the characteristics of the other new buildings and the control cases in terms of the assumed location factors: an ANOVA analysis proves that the mean values of all the variables differed significantly between the three groups (Table 1). There is a clear contrast between the new second homes and the other buildings in terms of their location in relation to roads and settlements: non-second homes are usually located relatively close to a paved road (350 m on average) and large villages (2.7 km); whereas for second homes, these distances are much higher (1 km and 5.1 km, respectively) and also exceed the distances for the random control locations. Distance to small towns is not related to the location of new buildings, and an increased distance to Bydgoszcz seems to be positively related to the location of both types of constructions, which is an unexpected result. However, this may be an effect of other factors: i.e. the northern part of the area, located further from Bydgoszcz, is also more forested. Both types of developments are relatively numerous in the proximity of natural amenities (forests, lakes and rivers), but in the case of the second homes this effect is much stronger than for the other buildings. The second homes are also overrepresented in landscape parks (24% are within them, while only 9% of the control points are in landscape parks). Both categories of the new buildings seem to cluster near already existing buildings, but for the non-second homes this effect is much stronger. The average second home is located 700 m from the nearest previously existing construction of the same type; while for other constructions this distance is only 80 m.

The multinomial logistic regression model with ten independent variables has a fairly good classifying efficiency with a Nagelkerke  $R^2$  0.618 and 84.7% correctly classified points. All of the included explaining variables significantly affect the location of at least one category of the buildings (Table 3). Similarly to the means comparison, the coefficients in the regression model indicate that proximity to natural amenities (distance to the forest, and the share of the forest and lake area within a 500 m radius) plays an important role for the location of both categories of new constructions, but particularly for second homes. Location within a landscape park was not included in the model, hence the overrepresentation of second homes is solely an effect of the presence of natural amenities, and being in a landscape park does not favour, nor limit the development of second homes.

The location in relation to a settlement structure affects the development of new second homes and other buildings in two opposite ways: the second homes tend to be located relatively far from settlements and main roads, and other buildings are located close to settlements and roads. Contrary to what the means comparison suggests, the distance to Bydgoszcz is negatively related to the location of new second homes, which is understandable considering that half of the second home owners are residents of this city. However, the distance to Bydgoszcz has no influence on the location of non-second homes. Spatial agglomeration positively affects the location of both categories of new developments, although this effect is much stronger in the case of non-second homes. The untransformed distance to existing second homes has a positive effect on the probability of a new second home's location, while a square root of this same variable affects it negatively, with a higher absolute value of coefficient. This means that the initially strong positive effect of the proximity to already existing second homes decays quickly until a distance of 0.5–1 km; and when the distance is higher than 3 km, the relation is opposite, so that the growing distance favours the occurrence of new second homes.

To sum up, based on the model, the main factors affecting the location of a new purpose-built second home are its proximity to water bodies and to the forest, the agglomeration around already existing second homes, and its peripheral location in relation to main villages and paved roads. Other new buildings, in turn, are first located close to existing buildings, villages and roads. These also favour locations near to natural amenities, yet to a smaller degree than the second homes.

### **3.3. Survey and qualitative explanations**

The vast majority of the current owners of second homes in Bory Tucholskie are first generation owners. They acquired undeveloped plots, on which they built the houses; therefore, they made a conscious decision about the ownership and location of their second homes. A principal component analysis of the answers to the questions about their reasons for these decisions reveals four main groups of correlated motives for ownership (Table 4), and four groups of motives for the location choice (Table 5). Broadly, the two main reasons for the acquisition of a second home are the owner's desire to be near nature, and the owner's need for relaxation and a good quality family life. These are, on average, much more highly valued than the two other groups of motives, which are described as "investment" and "opportunity". With regards to the motives for the location choice, one clearly dominant category was a group of motives related to the natural recreational resources: proximity to water and the forest, the beauty of the natural landscape, and peace and quiet. Other motives including the cultural landscape, and practical reasons such as the price and knowledge of the area, all had relatively minor importance. These results illustrate the high significance of natural amenities in making the decision about the ownership and the location of new second homes.

The structure of the declared motives is not sufficient to fully understand the conditions that shape the spatial development of second homes, as decisions on the location are also dependent on constraints such as property supply, the circulation of information, and spatial planning regulations and practices. Most of the supply of the plots for second homes come from local farmers, who sold 2/3 of the properties currently used as second homes (although this share is decreasing over time, in parallel with the expansion of the secondary property market). The farmers tend to sell plots of their land in two situations. First, they sell a part of their land that is of little productive value, but is naturally attractive. This includes plots located beside the forest or close to a lakeside, and often distant from the farmhouse. As a result, single second homes or small clusters of several houses emerge on the edges of farmland. The second situation is the division and sale of a whole farmstead, which most often happens to isolated farms in or near a forest, where there is poor access, low soil productivity and thus no chance to increase or modernise the farming production. This results in the appearance of clusters of second homes, often in a regularly planned pattern. In either case, the mechanisms of the supply side favour the development of clusters of second homes in locations that are remote and naturally attractive, but agriculturally unproductive and poorly accessible.

Both the demand and the supply side of the second home property market are constrained by the accessibility of information. The survey results indicate that most of the current second home owners were informed about the availability of a plot from friends or from relatives; every fourth owner found an advertisement in a newspaper or on the internet; and every fifth was actively looking for a property or noticed information at the site. In the case of second homes, the role of property agencies is negligible, and the dominance of personal contact in spreading information about the possibility of trading a recreational property, not only on the demand but also on the supply side, favours the clustering of the second homes in the vicinity of their already

existing agglomerations. This mechanism was particularly important in the past. Until the 1980s, administration, rather than financial constraints, restricted the access to second homes. Small clusters of second homes were initially organised by influential industrial companies for their employees, or by groups of acquaintances with informal access to the needed information and administrative processes. The practice of collectively acquiring recreational properties persisted into the first years of the 1990s, resulting in the appearance of new small clusters of second homes. Nonetheless, with the maturing of the property market, this has lost importance in favour of individual purchases.

### **3.4. Planning regulations**

Another significant factor affecting the distribution and expansion of second homes is the legal regulations regarding spatial planning and construction activities. As planning is a responsibility of the municipal authority, local practices and spatial policies can be significant as well. Every municipality has a general spatial development plan, which designates areas for different land uses. Based on this general plan, more specific local spatial development plans can be elaborated to regulate the location and the character of new constructions. Yet, the local spatial development plans are not obligatory for the whole territory, and municipalities are often unwilling to elaborate them due to the high cost and the opposition of land owners. Nationally, only 29% of the territory has valid local spatial development plans, and for the study area this rate is even lower (Śleszyński, Komornicki, Deręgowska, & Zielińska, 2015).

In the studied municipalities, planning activities are usually concentrated on the central villages, where most of the economic activities and public investments are focused. As a result, second homes are rarely built on areas with a valid local spatial development plan. Instead, the second homes are usually built according to planning permits (an auxiliary planning instrument),

which are granted regardless of the assignment of the land according to the general spatial development plan, as long as the planned construction fulfils the “good neighbourhood” rule, indicating that the built-up plot should border another plot already used in the same way (Spatial Planning and Management Act, 2003). The aim of this rule is to favour clustered development and to prevent the excessive dispersion of built-up areas, but in practice, it allows for unplanned and chaotic urbanisation, does not guarantee a proper infrastructure and does not prevent construction from occurring in areas with a high natural appeal and landscape value.

Additionally, some of the new provisional and semi-mobile second homes are constructed without planning permission, and thus are outside of planning controls, as a result of the ambiguous legal status of such structures.

Second homes are often neglected in municipal planning practices because they are located outside of the central villages where the planning activity is focused, and because they are not seen as a priority economic activity. Although general planning documents usually mention second home developments, often pointing out the risk of uncontrolled developments in natural areas, this rarely results in an elaboration of the local spatial development plans for these areas. On the other hand, the strategic documents of some municipalities located outside of the most attractive part of the region express the hope for the development of second homes, as a second choice alternative for more competitive commercial tourism, particularly if these second homes are of a high-standard and belong to affluent owners. In such cases, spatial planning is sometimes used as an instrument to promote the development of second homes, and local spatial development plans are elaborated for previously undeveloped areas enabling new clusters of second homes to be built in new spots, in isolation from existing settlements.

#### **4. Discussion and conclusions**

Second homes constitute the most numerous new built-up elements in the study area. The factors affecting their location differ from those of other new constructions. Primarily, second homes tend to be placed in the vicinity of forests and water bodies, and in isolation from existing settlements and main roads. New second homes are also more dispersed than other buildings. Although there is a visible agglomeration force resulting from the characteristics of the property market, such as information and planning constraints, this is much weaker than in the case of other buildings. Such dynamics in second home development are conditioned by the general settlement structure and the character of the planning system, but also by the specific requirements of their owners. A proximity to nature is not only the main factor affecting the location choice, but also the main reason for owning a second home. Seasonal residents do not require the same level of road accessibility and infrastructure provisions as permanent dwellers. Also, the seasonal use of provisional and semi-mobile houses has an ambiguous legal status, which enables the owners not to comply with planning regulations, even though the homes are often similar to permanent constructions in their size and standard. Properties for second homes are usually provided by farmers from their stock of less productive grounds in peripheral locations, which are unsuitable for farming, but are appropriate for recreational purposes. Planning controls are not effective in managing the development of second homes, because in their planning activities the local authorities focus first on their central villages, where public functions, investments and economic activities are concentrated, while the growth of second homes often occurs on the outskirts of territorial units.

New purpose-built second homes generally develop into unorganised, discontinuous and increasingly dispersed settlements, which sprawl in the near vicinities of forests and lakes. This results in a clear visual impact on the landscape. Often, second homes occupy visually prominent

locations close to lakes and on forest borders. Therefore, despite the small sizes of the houses and their usually nonintrusive architecture, the development of second homes reduces the amount of space that can be perceived as open and natural. This visual impact is growing with the current increase in the number of big, isolated houses built to a high standard on large plots. The planning documents also mention a spatial conflict between second homes and commercial tourism or public recreation, as they are in direct competition for the same locations. Experiences from the study area, as well as reports from other regions of the country, links unplanned second home development with the problem of limiting free access to recreational resources through the illegal fencing of public lakeshores (Law on Waters, 2001; Supreme Audit Office, 2011).

There are several locally specific impacts and risks to the environment arising from the dispersed development of second homes. The construction and use of second homes increases traffic on access roads, some of which are forest roads that were previously rarely used. Most houses located outside of existing villages have their own wells and use pit latrines or septic tanks, which may create a risk of pollution on lakesides. Additionally, problems with litter have been noticed by the residents, stemming from the non-residential status of second home properties, where the responsibility for garbage collection lies with the property owners and not the municipality, as is the case for residential houses (Law on Maintaining Cleanliness and Order in Municipalities, 1996). It is hard to fully evaluate the possible adverse impact of second home development on the biodiversity and wildlife in the area, and in fact, given that the plots with second homes were often previously used as farmland, their conversion may even increase the natural biodiversity (Krysiak, 2014).

The impact of second homes on the landscape and the environment cannot be considered in isolation from other effects of their development, including the economic benefits for local communities, as sales of properties for second homes can provide additional income for rural



residents, and second home owners use local services and generate property tax income for the municipality. Therefore, the costs and the benefits of the development of second homes should be balanced in an informed manner. Also, to understand the broader environmental implications of second home development, these need to be placed in a wider mobility perspective. It has been suggested that the use of second homes replaces, to some degree, other forms of leisure mobility (Gallent, Mace, & Tewdwr-Jones, 2005), and may therefore reduce the climatic effects of long-haul travel, for example. Some researchers have suggested that second home use compensates for the deficiencies of permanent dwelling in a compact urban environment (Strandell & Hall, 2015). Also in Poland, second home owners tend to be residents of multi-family buildings in big cities (Adamiak & Sokołowski, 2012), so the degree to which the second home serves as an alternative to the suburban dwelling needs to be further examined in order to determine whether second home development actually prevents a more intensive suburban sprawl.

In this study, I used the term “second home” to describe a concrete physical object—usually a house built on purpose to be used as a second home. However, it should be noted that the function of a second home is not immanently bound to any specific physical entity. Any dwelling can become a second home; and any building used as second home may be converted into a permanent dwelling or used for another purpose. Logically then, as Paris (2014) claims, second homes “cannot have distinctive environmental impacts over and beyond the fact that the buildings used as second homes have such impacts, because they are not necessarily used as ‘second’ homes” (p. 7). This study shows that the specific motivations for second home ownership, as well as their use patterns and their legal-administrative status contribute to the fact that they are built in certain locations, and thus exert specific impacts. The difference in the location factors between second homes and other buildings justifies the speculation that the sprawling development of second homes would not have occurred had they not been built as

second homes. Nevertheless, at least part of current second homes will change their function in the future, as 15% of the surveyed owners are planning, and a further 29% would consider, moving permanently to their second home. Thus, second home use may be a gateway that will open up rural natural areas for further urbanisation, expressed in the more intensive use of dwellings, the extension of houses and the development of infrastructures and services. On the other hand, 15% of second homes identified in the study area were not purpose-built, but were converted from existing or abandoned farmhouses. However, there is little chance that the share of converted farms will become significantly higher as stock for future second homes, as most of such properties are located in a productive agricultural environment, too far from the forests and lakes sought by the future owners of second homes.

The second home-induced sprawl is an integral element of the Polish problem with uncontrolled urbanisation. It is fuelled by growing middle class consumption, and also enabled by permissive planning regulations. Second homes are developing outside of a planning system that is designed primarily to manage urban areas – not rural-natural areas – and to represent the interests of local residents—not second home owners or other non-local users of recreational resources. Therefore, it is necessary to amend spatial planning regulations, in order to better control housing development in rural areas, but it is also important that rational municipal planning practices acknowledge the costs of the sprawl and the benefits of protecting landscape values. A solution for the sustainable management of the further development of new second homes may lie in the planned clustered development of well-equipped and communicated cottage settlements, located in attractive areas (although not the most valuable places) and the prevention of all unplanned dispersals of housing. Also, the use of existing vacant housing as second homes should be promoted in depopulating rural areas. These problems and the proposed solutions are not new, nor are they only specific for the Polish case. In other regions and countries, the

planning of naturally valuable areas in rural spaces should also acknowledge the spatial implications of multiple residence.

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**Table 1**  
Statistics of model variables

Variable	Second homes		Other buildings		Control cases		Included in model
	M	SD	M	SD	M	SD	
Distance to nearest paved road (km)	0.97	0.78	0.35	0.49	0.72	0.63	Square root
Distance to nearest village >1 thousand inhabitants (km)	5.10	3.97	2.67	2.42	3.97	2.01	Square root
Distance to nearest town (km)	15.03	4.96	14.35	5.53	13.72	4.95	No
Distance to Bydgoszcz (km)	49.97	12.03	50.27	9.81	46.89	10.02	Square root
Distance to forest (km)	0.21	0.29	0.52	0.45	0.63	0.60	Square root
Distance to lake or river (km)	0.59	0.82	1.33	1.04	1.86	1.36	No
Share of forest within 500 m (%)	32.1	24.2	13.6	18.4	13.5	19.6	Untransformed
Share of lake area within 500 m (%)	11.2	12.5	3.2	7.7	1.3	2.0	Untransformed
Length of rivers within 500 m (km)	0.11	0.35	0.08	0.29	0.05	0.22	No
Location within landscape park (% share)	24.2		7.5		9.3		No
Distance to nearest previously existing second home	0.70	1.15	1.81	1.80	3.11	2.20	Untransformed and square root
Distance to nearest previously existing other building	0.16	0.12	0.08	0.07	0.40	0.55	Untransformed
Number of previously existing second homes within 500 m	9.9	14.8	2.7	9.5	0.6	4.0	No
Number of previously existing other buildings within 500 m	14.3	17.2	50.9	46.1	9.4	19.2	Untransformed

Source: own elaboration based on inventory of second homes and other buildings, archival aerial images and 1:250,000 BDO vector map.



**Table 2**

Number of purpose-built second homes according to inventory and aerial photographs

Year	Number of second homes	Annual growth since previous period
1984–86	385	
1996–97	943	8.5%
2013	2471	6.2%

Source: own elaboration based on inventory of second homes and other buildings, and archival aerial images.

**Table 3**  
Multinomial logistic regression model

Variable	Second homes				Other buildings			
	B	SE	Exp(B)	Sig.	B	SE	Exp(B)	Sig.
Distance to nearest paved road (square root)	0.317	0.101	1.373	0.002	-1.287	0.134	0.276	0.000
Distance to nearest village >1 thousand inhabitants (square root)	0.359	0.076	1.431	0.000	-0.646	0.080	0.524	0.000
Distance to Bydgoszcz (square root)	-0.402	0.058	0.669	0.000	0.118	0.066	1.125	0.072
Distance to forest (square root)	-1.793	0.232	0.166	0.000	-0.869	0.212	0.419	0.000
Share of forest within 500 m	2.243	0.298	9.421	0.000	0.731	0.372	2.077	0.049
Share of lake area within 500 m	10.434	0.483	34009.892	0.000	4.227	0.677	68.528	0.000
Distance to nearest previously existing second home	1.322	0.090	3.751	0.000	0.475	0.094	1.607	0.000
Distance to nearest previously existing second home (square root)	-4.680	0.241	0.009	0.000	-1.558	0.279	0.211	0.000
Distance to nearest previously existing other building	-5.329	0.340	0.005	0.000	-10.848	0.583	0.000	0.000
Number of previously existing other buildings within 500 m	0.002	0.002	1.002	0.484	0.014	0.001	1.014	0.000
Constant	4.057	0.516		0.000	1.727	0.628		0.006

Source: own elaboration based on inventory of second homes and other buildings, archival aerial images and 1:250,000 BDO vector map.

**Table 4**  
**Motives for second home ownership**

Principal component	% of variance	Scale consisting of variables with factor loadings higher than 0.5			
		Cronbach Alpha	M	SD	Variables included
Nature	12.79	0.48	4.47	0.61	Contact with nature; Health; Performing specific nature-based recreational activities
Free time and family	18.68	0.66	4.15	0.81	Contrast to everyday life; Spending time with family and friends; Filling free time; Good of the children
Investment	13.07	0.52	2.38	1.07	Willingness to own property; Profitable investment; Plan to move permanently
Opportunity	12.33	0.50	2.14	1.18	Know others who own second home; One-time opportunity to acquire second home

Source: own elaboration based on survey data (N=255).

**Table 5**  
**Motives for second home location**

Principal component	% of variance	Scale consisting of variables with factor loadings higher than 0.5			Variables included
		Cronbach Alpha	M	SD	
Natural landscape	17.44	0.60	4.75	0.50	Proximity to water; Beauty of natural landscape; Proximity to forest; Peace and quiet
Cultural landscape and sentiment	11.23	0.33	2.62	1.08	Beauty of cultural landscape; Return to home area
Price and opportunity	13.34	0.48	2.31	1.16	Low price; One-time opportunity
Knowledge and experience	13.71	0.50	2.19	0.96	Previous touristic visits; Know others who own second homes in the area; Proximity to place of residence; Return to home area

Source: own elaboration based on survey data (N=255).



**Figure 1.** Location of study area

Source: own elaboration based on 1:250,000 BDO vector map.



**Figure 2.** Isolated purpose-built second home

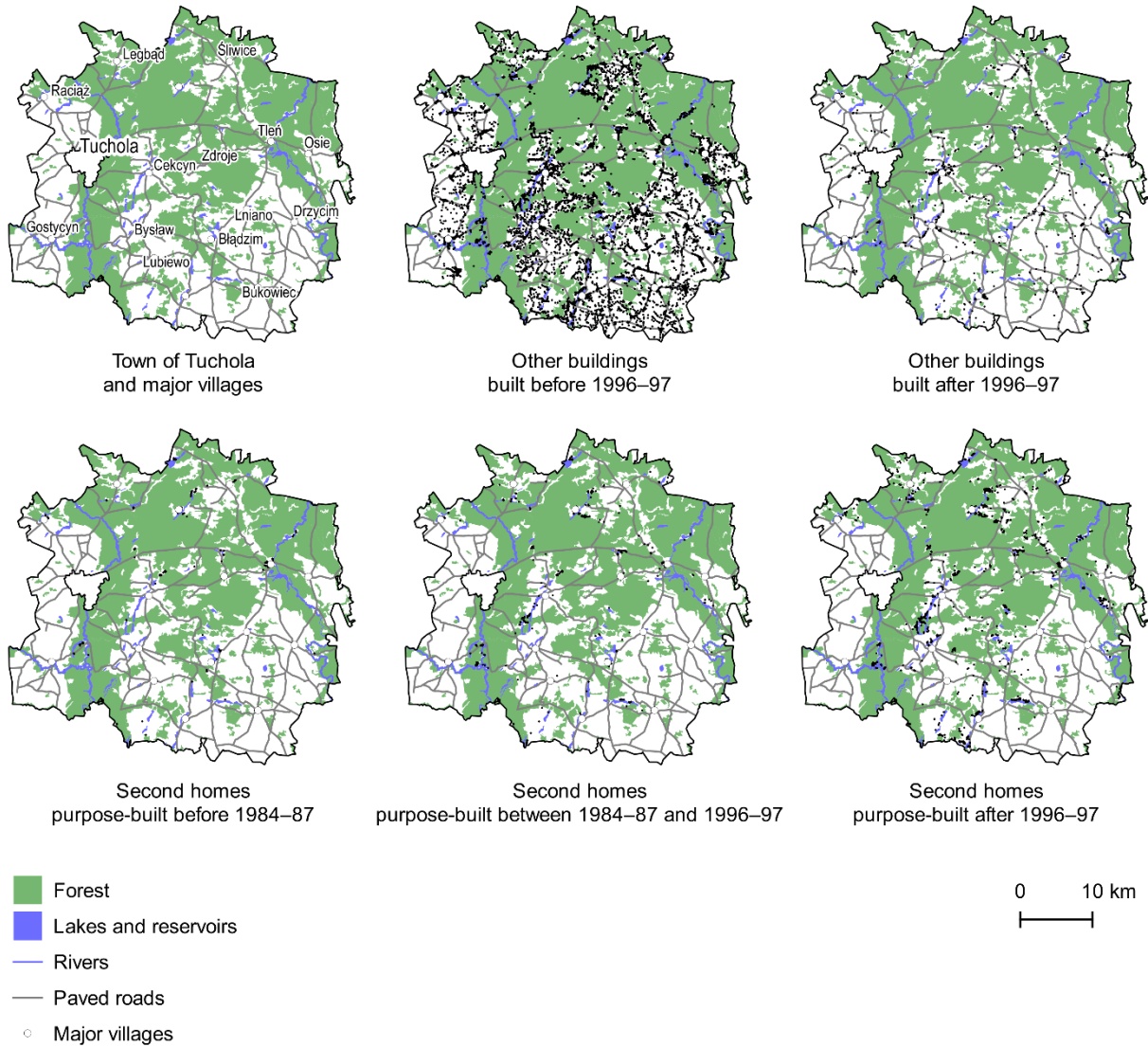
Source: own photograph.





**Figure 3.** Cluster of purpose-built second homes along forest edge

Source: own photograph.



**Figure 4.** Changes in distribution of second homes and other buildings between 1984–87, 1996–97 and 2013

Source: own elaboration based on 1:250,000 BDO map, other cartographic materials, field inventory and archival aerial images.