Effect of winter temperature and maize food abundance on long-term population dynamics of the wild boar *Sus scrofa*

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In a few recent decades, population increase of the wild boar has been evidenced in various European countries. As the result of this increase, the wild boar has expanded into farmlands, especially in some regions, where the cultivated maize constitutes the main source of its diet through the larger part of the year. The effect of winter weather and land use changes on the expansion of wild boar was analysed in a farmland in southern Poland. Over 21 years (1985–2005) in the study area of about 681 km² a rapid increase in the number of harvested wild boars was recorded. While in the middle 1980’s, there were only about 40 animals harvested per hunting season, in 2005 the number increased to 180. The rapid increase was, in general, correlated positively to the increasing surface area of the maize crops – from 205 ha (0.9%) in 1985 to 3212 ha (14.9% of arable lands) in 2004. However the correlation between the increase of the average late winter (February/March) temperature and the number of wild boars seems to be negative and contrary to our expectations, the numbers of wild boars were found to be higher under the lower temperatures in that period of the year.

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The wild boar *Sus scrofa* is regarded as an opportunist forager (Herrero *et al.* 2006). Food composition varies greatly from region to region, from habitat to habitat and from season to season (Schley and Ropert 2003), but throughout its extensive range, its staple diet is composed of plants, while animal matter is only supplementary (Genov 1981, Jędrzejewska *et al.* 1997, Schley and Ropert 2003, Herrero *et al.* 2006). Four major vegetable food categories are recognized in the diet: mast, roots, green plant matter and agriculture crops (Schley and Ropert 2003). In wild forest populations, the mast of the oak *Quercus* spp., beech *Fagus sylvatica* and sweet chestnut *Castanea sativa* comprises the main component of the plant diet. The abundance of the mast is often the main factor determining the annual population growth rate in such habitats (Koslo 1970, Jędrzejewski 1977, Jędrzejewska *et al.* 1997, Biber and Ruf 2005). It has been shown that high ambient temperature and low snow cover in winter also positively affect this growth rate (Jędrzejewski 1977, Jędrzejewska *et al.* 1997).

In a few recent decades, population increase of the wild boar has been evidenced in various countries in Europe (e.g. Sáez-Royuela and Tellería 1986, Herrero *et al.* 2006, Melis *et al.* 2006, Schley *et al.* 2008, Massie *et al.* 2015). In Poland, this increase has been documented among others by Przybylski (2001, 2006), Chojnowski (2005), and Grabińska (2007). While in 1985/1986 hunting season, 64 623 individuals were harvested in Poland, in 2010/2011 hunting season this number reached the figure of 211 thousands (Grabińska 2007). Most wild boars are harvested in the north-west, west and south-west parts of the country. For example in the opolski hunting region (ca. 10000 km²), SSW Poland, 13.5 thousands were harvested in 2010/2011 hunting season (Grabińska 2007).