

POSSIBILITIES OF THE IMPROVEMENT OF THE ANNUAL WOLF NUMBER ASSESSMENT IN LITHUANIA

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The annual wolf number assessment by tracks in snow (minimum population count) has been held since 2006. The result of this is the official number of the wolves living in the territory of Lithuania. However this number provokes a lot of discussions and doubts because of accuracy and reliability.

The hunters give the number of wolves recorded in every hunting unit each year too. However this information could be significantly comprehensive, and worth to process it by GIS technologies. But now the number of wolves, recorded in each hunting unit, is only summed. Instead of supplement or support, the results of these two records significantly differ every year. Evaluating wolf number in Lithuania every year, it would be worth to invoke other data and methods too, as sources of additional information. It is suggested to evaluate the number of wolves by set of methods, i.e., use several methods, which complement each other.

The aim of this work is to offer the possibilities of improvement of the annual wolf number assessment in Lithuania.

Key words: wolf, assessment, method, Lithuania.

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INTRODUCTION

There is little information about the spreading and abundance of wolves in Lithuania in early centuries (Rzeczyński 1721, Ładowski 1783, Prūsaitė 1961c). XIX century is known as a period of mass spreading of the wolves (Jurkštas 1977). It is known that abundance and spreading of the wolves has significant changes in XX century (Prūsaitė 1988, Бибииков 1985, Bluzma 1999, Balčiauskas et al. 2005).

The number of the wolves in the territory of Lithuania is being determined every year since the end of WWII (Girios, Mūsų gamta). The data is given by the owners of the hunting units. It is also possible to find some data about distribution of the wolves in separate districts of Lithuania (Prūsaitė 1961 a, b).

At the end of XX century researches about the number and spreading of the wolves in Lithuania became more various. In 1995 a questionnaire of the hunters was organized (Bluzma 1999).

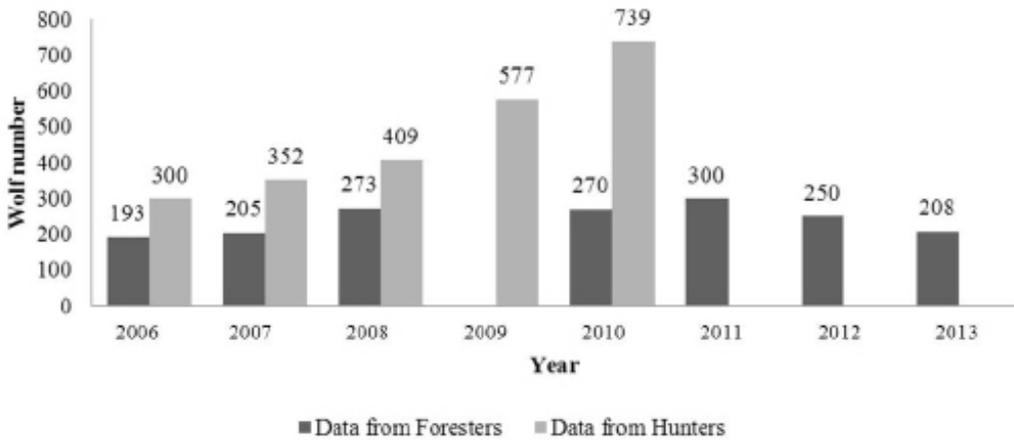


Fig. 1. Comparison of the annual wolf number assessment during 2006–2013 period in the territory of Lithuania according to two independent counts, performed by the employees of State Forest Enterprises in collaboration with employees of nature reserves and performed by game animal users.

The first wolves monitoring researches were arranged in 20 stationary sample plots in 1999 (Bluzma & Baleišis 2001). In 2003, 2004, and 2005 the research of wolves spreading was held, questioning all Forest Districts in Lithuania including protected areas (Balčiauskas 2006, Balčiauskas 2008). The partial count of wolves and lynxes was done in 2004 (Bukelskis et al. 2004). From 2006 the unified wolves’ assessment by tracks in the snow has been held in all Forest Districts (state forests) and State Reserves. In 2013 the unified wolves’ assessment was made both in state and private forests.

Although information is being gathered and renewed constantly, the discussions about its reliability still remain. Therefore there is a need to look for alternative ways for the evaluation of the wolves’ abundance in Lithuania.

MATERIAL AND METHODS

Every year (since 2006) the wolves assessment in the state forests by minimum population count method (according to fresh tracks in the snow) has been held by the employees of the State Forest Enterprises, and in protected territories – the employees of State Reserves. In 2013 the unified wolf assessment was

held in the private forests with the efforts of representatives of the hunting societies. Also the managers of hunting units provide information about the number of the wolves living in the hunting units every year. Previously presented summarized information is given in the web site of the Ministry of Environment (www.am.lt) and in annual publication “Lietuvos miškų ūkio statistika”.

Information about the number of hunted wolves during every hunt season according to the regions is available in the web site of the Ministry of Environment.

Information about the damage for the farm animals caused by the wild animals is being registered by the Agricultural information and countryside business centre since 2009.

RESULTS

According to the data obtained from the employees of the State Forest Enterprises, the number of wolves in Lithuania changed from 193 to 300 individuals from 2006 to 2013. The number of wolves has increased slowly since 2006 (in 2009 foresters did not implement the count due to the absence of the snow). According

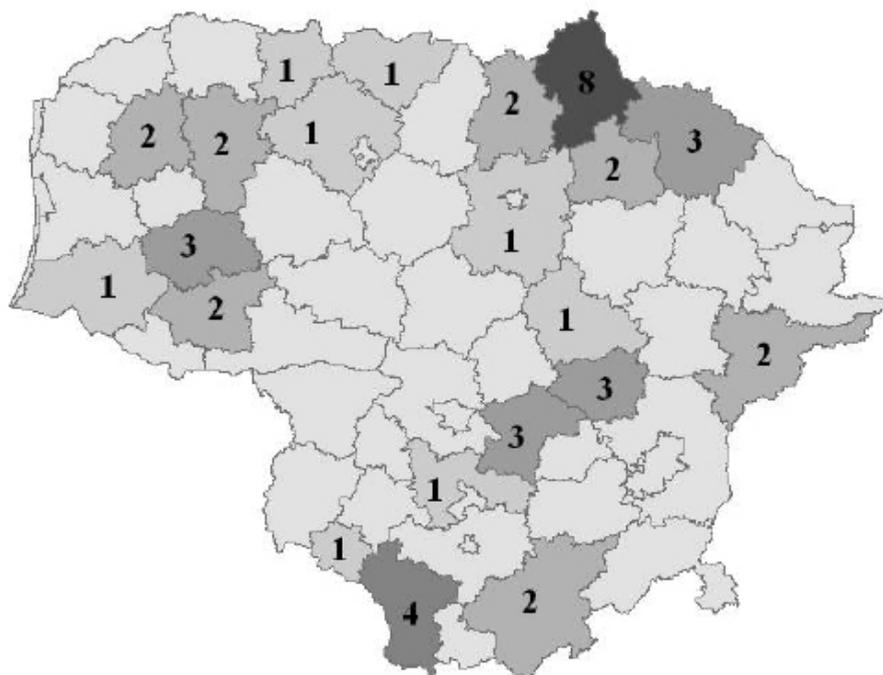


Fig. 2. The number of hunted wolves in the territories of municipalities during 2012-2013 hunting season.

to the data of this assessment wolves population reached the largest abundance in 2011. The population has increased in 1.5 times during five years. In 2012, 2013 wolf number decreased from the maximum in 1.4 times. The average wolf number in the territory of the country was 243 individuals during the above mentioned 7 years.

According to the information of the users of the game animals' recourse the lowest number of the wolves was defined in 2006 – 300 individuals, and the highest in 2010 – 739 individuals. Thus the number of the wolves according to this data has increased by 146.3 % i.e. in 2.5 times during four years.

Comparing the results of wolves' count of the foresters and hunters (Fig. 1.) we can observe that the data of the registration differed from 1.5 to 2.7 times. It is doubtful that such difference between two assessments can help to determine wolf number in the country. It brings just confusion.

Wolf hunting is being limited in Lithuania since 2005; furthermore the limit differed annually from 11 to 46 individuals. So the number of the hunted wolves cannot reflect their abundance in the country. But from the data about hunted wolves' number by the regions, given in the web site of Ministry of Environment, we can observe, where the population of the wolves is larger (Fig. 2.).

Analyzing all 2005/2006-2010/2011 years hunting seasons (6 years), the exact location of the places of the hunted wolves was explored. Autocorrelation in space showed that the places of hunted wolves are disposed in clasterization. "Nearest Neighbour" value was 0.433 and counted Z statistics value -14.428 showed that probability ($p=0.000$) that location of clasterized hunting areas was obtained accidentally is lower than 1% (when $Z < -1.96$, clasterization reliable statistically).

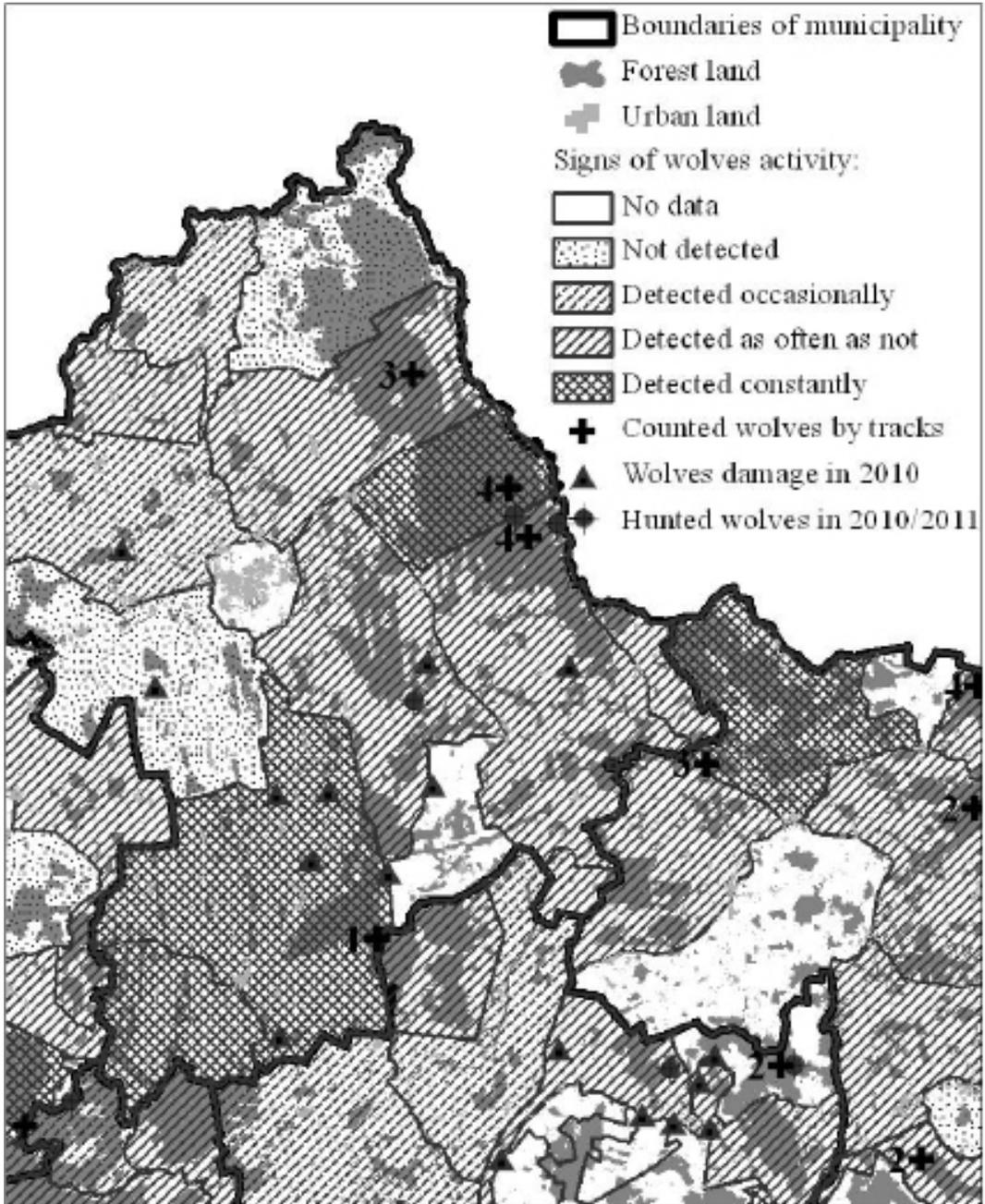


Fig. 3. The example of the suggested map for integrated data analyzing with the help of GIS (the map of Biržai district with neighbor territories).

DISCUSSION

The number of the wolves in Lithuania in the latest years obtained from the assessments of foresters is the most reliable. But there is still discussed the issue that by the method of the minimum population count (in accordance with fresh tracks) it is reliable to know only the minimum number of the wolves in the country, but not the real number of living wolves. It is believed that not all wolves are counted walking the territory only twice, besides not all forests are inscribed into the route of assessment. Other treat is that the number of the wolves in the pack is being decreased due to specific wolf behavior. By analyzing data of the wolves count in 2013 it was determined that a family of the wolf consisted of 2.9 members in average, meanwhile according to the hunters-questionnaire data (Špinkytė-Bačkaitienė 2012) wolf's family consisted of 3.6 wolves in average.

Now the number of the wolves living in Lithuania given by the hunters probably is far from reality, because numbers of the wolves in the hunting units is summed without any analyze. It may mean that the same individuals are counted few times. But if GIS analysis of this data was made, such information would be more valuable, because managers of hunting units supervise hunted animals, and define signs of their activity whole year, i.e. manage comprehensive information about the abundance, composition, distribution, etc. of the animals.

It would be worth to organize centralized gathering of the information known for hunters. Such information could be fulfilled and checked according to annual wolf assessment by tracks in the snow implemented by the employees of the States Forest Enterprises. Exploring the abundance of the wolf population the information about the damage they have done and hunted areas should be considered as well. The gathered information could be amended with GIS technologies (Fig. 3.). In such complex analysis should be obtained sufficiently exact distribution and number of the wolves in Lithuania.

By performing GIS analysis of the summarized information it was determined that there lived around 65–70 wolves' families in Lithuania in 2012 and 2013 accordingly. The data of 2013 was analyzed irrespectively of the results of 2012. But the obtained results just confirmed each other.

CONCLUSIONS

The methods of wolf assessment held by foresters has disadvantage of coincidentally chosen routes and days, and possible number decrease in wolf families, besides the assessment allows to determine reliably only the minimum number of animals.

The data from count held by hunters is not analyzed, so the value of it decreases.

It is suggested, defining the number of the wolves, to analyze all available data in complex way with the help of GIS technologies. Comprehensive information from the hunters, assessments of the foresters, damage cases and hunting places should be included into analysis.

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