

## POPULATION OF PHEASANTS (*Phasianus colchicus*) IN SELECTED AREAS WITHIN LUBLIN CITY BOUNDARIES

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**Summary.** The study deals with selected population parameters such as density, territory range, and sexual structure of pheasants (*Phasianus colchicus*) living in particular urbanised areas of the city of Lublin. The research was carried out on the basis of a survey conducted between March and May 2009. The sexual structure of pheasant population within the city of Lublin was 1 : 1.5 to the advantage of hens. The spring pheasant population density within the studied area was 6.3 birds/100 ha, which was higher than that for pheasants living in the neighbouring rural areas, suggesting that studied birds find better living conditions in green urbanised areas than in intensively performed agrocenoses.

**Key words:** pheasant, territory, population density

### INTRODUCTION

Urban and suburban areas often provide better living conditions for wild species than adjacent rural territories. Changes in agricultural landscape consisting in the formation of large-area monocultures, elimination of trees, mid-field bushes, water spots, etc., contributed to the disappearance of natural shelters, tooting-grounds and nesting places for many species of small wild animals [Ryszkowski *et al.* 2001]. In that aspect, urban and suburban areas can be considered as an ecological isle with specific habitat conditions, yet green areas should be assumed to be the main component of that system from the ecological point of view [Matuszkiewicz 1992].

Numerous populations of game animal species live in the urban and suburban territories of Lublin – parks, allotment gardens, arable areas, and meadows situated in river Bystrzyca valley. Those species have adapted to urban conditions characterised by strong anthropopressure, large number of prey crow family representatives, seasonal grass mowing, noise, etc.

The present study aimed at evaluating selected population parameters such as density, territory range, and sexual structure of pheasants (*Phasianus colchicus*) living in particular urbanised areas of the city of Lublin.

### STUDIED AREA

The studied area covered a section of river Bystrzyca valley spreading from Ludowy Park to the Lublin Equestrian Club. The study included the whole park along with the area between Nadbystrzycka and Krochmalna streets (Fig. 1). River Bystrzyca is the right tributary of river Wieprz and one of more important

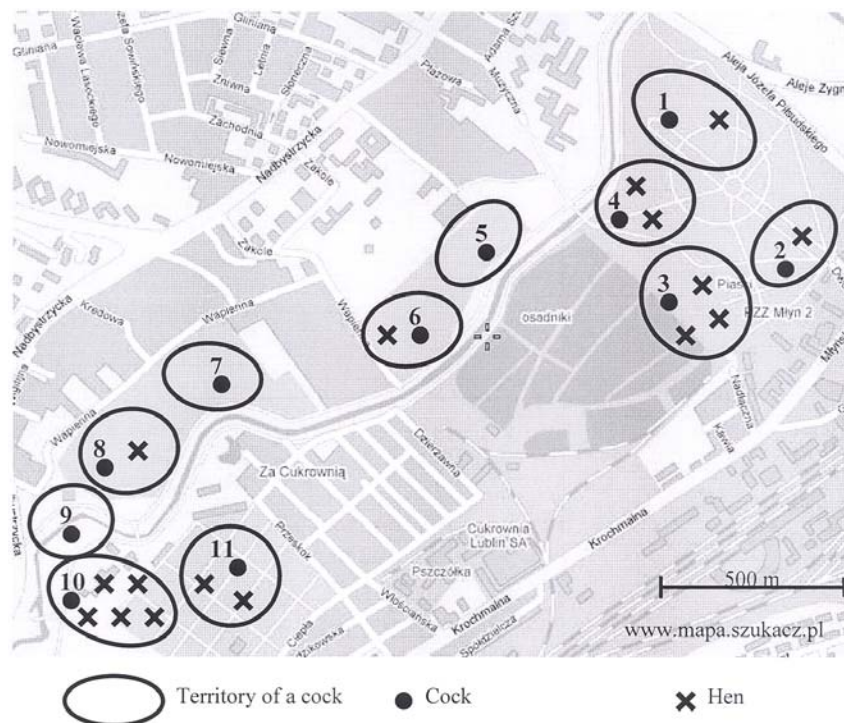


Fig. 1. Territories of pheasants in the study area

tributaries in the Lublin Upland, as well as the main water course crossing the city of Lublin. The river Bystrzyca valley cuts the city into two parts of distinct landscapes – left-side with diverse land relief, deep valleys and old loess ravines, and flat right-side being a part of the Świdnicki Upland [Fijałkowski 1972]. Mean annual air temperature in the area is  $+8.0^{\circ}\text{C}$ . July is the warmest month with mean temperature of  $+18.7^{\circ}\text{C}$ , while January is the coldest ( $-5.0^{\circ}\text{C}$ ). Summer and vegetation seasons last for 100–110 and 210–220 days, respectively. Mean annual precipitation sum amounts to about 550 mm with the highest intensity in summer (220 mm) and the lowest in winter. Snow covers the area for about 80 days.

## MATERIAL AND METHODS

The study was carried out on the basis of a survey performed from March till May 2009 – during the mating season – i.e. the period of the peak activity of pheasant cocks. The size of pheasant territories was estimated basing on the observations of distribution of particular individuals as well as cocks' fight sites. The area of the ellipse surrounding all places where a given individual bird was recorded was assumed as a territory. The average number of cocks observations reached about 5 per a single bird. Collected information was put onto a situation map (1 : 10 000), which allowed the estimation of the shape and size of particular territories. In order to calculate the surface area of these territories, the formula for ellipse area was applied:  $S = \pi ab$  ( $a$ ,  $b$  – semi-axes of the ellipse). All tooting cocks within the studied area were observed. Every cock was observed for several days in the morning. The research also involved cataloguing the pheasants by means of counting the sounds of tooting pheasant cocks. The cataloguing consisted in daily listening to the sounds of tooting cocks. A single „listening” of a particular bird lasted about 20 minutes. When more cocks sounded at the same time, the „listening” period was prolonged to assess the number of individual birds more precisely. When a cock was noticed, the accompanying hens were also counted, which permitted the evaluation of the sexual structure of pheasants. The spring pheasant population density ( $n/100$  ha) was calculated according to the formula:  $Y = (0.9X - 0.8) \cdot (1 + Z)$ , where:  $X$  – mean number of cocks found at the control points,  $Z$  – number of hens per a single cock [Kamieniarz *et al.* 1992]. Three control points were selected, where tooting sounds were listened to: Park Ludowy, allotment gardens opposite the former Sugar Plant sedimentation dumps, and near the Lublin Equestrian Club. The survey was completed with own observations of pheasant behaviour in winter (December 2008 – February 2009), as well as unpublished data on the species sexual structure for the area of the city of Lublin. Achieved results allowed the calculation of the mean size of pheasant territory within the studied area, standard deviation, and standard error. The sizes of pheasant territories were correlated with the numbers of hens found with a single cock by calculating the Pearson coefficients.

## RESULTS AND DISCUSSION

The pheasant cataloguing carried out within the studied area revealed 11 tooting cocks that set their territories within Park Ludowy and along river Bystrzyca (Fig. 1). The cocks began tooting in March, although their most intensive tooting period was observed in May. The sounds of tooting pheasant cocks could be heard at the beginning of August. Territories of all cocks overlapped with tree and bush spots, allotment gardens, and other green areas. This is consistent with the findings by Wasilewski [1986], according to whom pheasant territories over-

lap with the direction of band-type mid-field tree clusters. It may prove that the pheasants did not choose their territories randomly, but their choice was determined by the location of green areas.

Mean territory area amounted to 5.0 ha; the smallest was 3.6 ha, while the largest had 7.4 ha of surface area (Tab. 1). The variation in the numbers of hens gathered by particular cocks was also recorded. Pearson coefficient between the

Table 1. Size of a cock's territory and the number of gathered hens

Number of cock	Size of a cock's territory, ha	Number of gathered hens
1	6.41	1
2	3.96	1
3	7.37	3
4	4.87	2
5	3.96	0
6	4.26	1
7	3.96	0
8	4.87	1
9	3.59	0
10	6.41	5
11	5.78	2
Mean	5.04	1.45
SD	1.27	
SE	0.38	
max.	7.37	
min.	3.59	

number of gathered hens and the size of a territory revealed highly significant correlation of both parameters (Fig. 2), which indicates that pheasant hens choose the strongest cocks that are able to conquer the largest territory. British scientists had the opposite opinion [Ridley and Hill 1987], because they did not find any dependence between the harem size and the size and quality of the pheasant's territory. According to those authors, hens are loyal to the same cocks for several years, even when it moves to another territory. Their observations indicated that more hens are gathered by those cocks that have had the same territory for several of years. Pheasant cocks that have been recorded for several years on a given area and always owned quite a numerous harem had the largest number of hens also in this study. Within the surveyed area, the sexual structure of the population expressed as the number of females per a single male pheasant amounted to 1 : 1.5, which was similar to that observed in natural populations [Dzięciołowski *et al.* 1971].

The spring population density of pheasants in the studied area was 6.3 birds/100 ha, which was over twice as high as that living in rural areas adjacent to Lublin [Czyżowski *et al.* 2009]. It suggests that pheasants find better living conditions in urbanised green areas rather than in intensively utilised agrocenoses. Higher attractiveness of urban environment in winter may also be

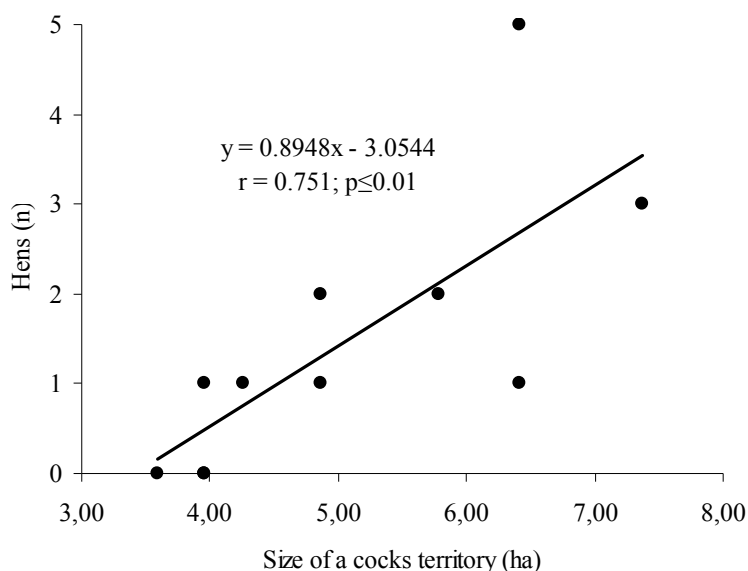


Fig. 2. Pearson coefficient between the number of gathered hens and the size of a cock's territory

a factor that affects the higher pheasant population density. In the opinion of Pisarski and Trojan [1976], winter conditions in a city make that bird biomass may be many times higher in urban than in forest environments and agrocenoses. Our own observations revealed that pheasants living in a city during winter choose southern edges of tree spots and city parks. Pheasants are encountered there in numerous groups – even several cocks on a single tree were recorded. That situation changes at the end of February, when birds spread over the city of Lublin during the spring territory occupation. Pheasant wintering within Park Ludowy was also reported by Biaduń [1994a]; however he did not find representatives of the species in that area during the hatching season [Biaduń 1994b].

## CONCLUSIONS

1. Pheasants do not choose their territories in Lublin in a random pattern; it is determined by the location of green areas.
2. Average pheasant's territory within the studied area was 5.0 ha, pheasant population density amounted to 6.3 birds/100 ha, which was higher than the populations of pheasants living in rural areas adjacent to the city of Lublin.
3. The sexual structure of pheasant population within Lublin city boundaries was 1 : 1.5 to the advantage of hens and it was similar to that observed in populations living in rural ecosystems.

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POPULACJA BAŻANTA *Phasianus colchicus* NA WYBRANYM TERENIE LUBLINA

**Streszczenie.** W pracy przedstawiono wybrane parametry populacji bażanta (zagęszczenie, wielkość terytoriów, struktura płciowa) zasiedlającej wybrane tereny miejskie Lublina. Praca została wykonana na podstawie obserwacji terenowych trwających od marca do maja 2009 r. Struktura płciowa populacji wyniosła 1 : 1,5 na korzyść kur. Wiosenne zagęszczenie bażantów na terenie badań wyniosło 6,3 osobnika/100 ha i było większe od zagęszczenia na przyległych do Lublina terenach rolniczych, co pozwala sądzić, że na terenach zieleni miejskiej bażanty znajdują lepsze warunki bytowania niż na intensywnie użytkowanych agrocenozach.

**Słowa kluczowe:** bażant, terytorium, zagęszczenie