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# Analysis of counts of grey partridge (*Perdix perdix* L.) in natural breeding grounds in central Croatia

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**GRUBEŠIĆ, M., V. ŠEGRT, D. KONJEVIĆ: Analysis of counts of grey partridge (*Perdix perdix* L.) in natural breeding grounds in central Croatia. Vet. arhiv 76, S161-S166, 2006.**

**ABSTRACT**

The grey partridge (*Perdix perdix* L.) is a native game species in the Republic of Croatia. The success of natural breeding in recent years is decreasing as a consequence of several factors. In this research, the relationship between habitat quality (vegetation structure and predation) and partridge numbers was analyzed for four different hunting grounds in the Zagreb County. Preliminary results showed that grey partridge populations are stable in habitats with varying plant cultures, particularly where cereals are well represented. Pesticide treated monocultures and meadows, without close growing cereal crops are not suitable for grey partridges. Furthermore, we suggest measures of habitat improvement in order to manage free-ranging partridges more effectively. Continued research should show the interaction of grey partridges in relation to changes in the culture structure in the research area.

**Key words**: grey partridge, *Perdix perdix*, cereals, habitat conditions

## Introduction

The grey partridge (*Perdix perdix* L.) is a common bird species of Asian and Central European moderate steppe grasslands (AEBISCHER, 1997). Agricultural modernizations (use of protective chemical substances, establishment of monocultures, etc.) have lead to habitat destruction/alteration for all bird species of the steppe areas, including the grey partridge. This sequence of events resulted in the grey partridge population

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decline observed in the early 1950s, which corresponded to the onset of herbicide use (AEBISCHER, 1997). Nowadays the grey partridge population in Croatia has decreased; with an average of 4800 partridges hunted each year (according to the State Statistics Bureau in 1992-1994.)

In order to determine the most suitable habitat structure and all conditions needed for successful breeding and maintenance of partridge population, a project was launched entitled "Possibility of revitalizing grey partridge breeding in open hunting grounds in Zagreb County". The aim of the project is to determine the actual population size, as well as the influence of pesticides and modern models of agriculture on partridge population. The results obtained will provide us with knowledge about which areas should be preserved and what measures could be taken to improve landscape and increase the grey partridge population (KLASNEK, 2002).

## Materials and methods

Four hunting grounds (Jakovlje, Pisarovina-Jamnica, Donja Lomnica and Varoška Dubrava) in the Zagreb county region were selected for this research. From them, three had satisfactory grey partridge numbers, while in the fourth grey partridge have not been recorded for the past 6 years. Numbers of grey partridges were determined by spring and winter counting. For that purpose the help of trained hunting dogs was used in daily field observations. Furthermore, analysis was conducted of individual habitat factors essential for grey partridge survival.

Analysis of agricultural cultures was conducted with the help of the Garmin GPS device, Geko 201 and Geko 301, Garmin (Europe) Ltd. The obtained GPS points were exported to a 1:25000 map. Points were joined into polygons which show the exact surface structure.

## Results

The established surface structure (cultures) on plots of the selected hunting grounds was carried out with the assistance of GPS points recorded in the field, and is presented in Fig. 1.

The rate of different cultures in total surface of examined areas is presented in Table 1.

Establishment of grey partridge numbers on the plots was conducted in the late spring (June), when the grey partridges had chicks and in the autumn, at the start of the hunting season. Detailed data on hunting grounds in question, total ground area, area of the plots and established number of grey partridges are presented in Table 2.

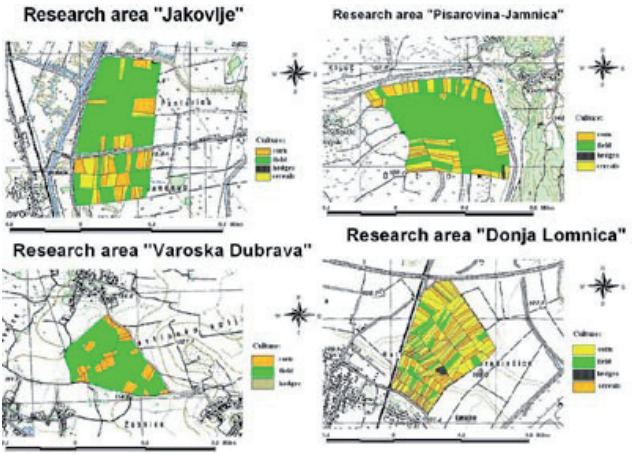


Fig. 1. Surface structure (cultures) of selected hunting grounds

Table 1. The rates of different cultures in the total surface of analyzed hunting grounds. Note the absence of cereal fields in the area of Varoška Dubrava.

| Research area | Cereal crops (%) | Corn fields (%) | Hedges (%) | Fields (%) |
|---|---|---|---|---|
| Jakovlje | 13 | 22 | - | 65 |
| Pisarovina Jamnica | 15 | 18 | - | 67 |
| Donja Lomnica | 31 | 56 | 1 | 12 |
| Varoška Dubrava | - | 18 | - | 82 |

Table 2. Hunting grounds where the study was carried out

| Hunting ground | Total hunting ground area (in acres) | Area of the plots (in acres) | Number of grey partridges in spring period | Number of grey partridges in autumn period |
|---|---|---|---|---|
| «Jakovlje» | 2955 | 78 | 41 | 29 |
| «Pisarovina-Jamnica» | 5314 | 89 | 14 | 28* |
| «Donja Lomnica» | 1746 | 68 | 35 | 10** |
| «Varoška-Dubrava» | 4016 | 41 | - | - |

Legend: * in the autumn period, two significantly large flocks were recorded, which indicates that they came to the research plot from the surrounding areas; ** in the autumn period, migration occurred to areas outside the experimental plot with better coverage

The obtained results clearly show that the majority of grey partridges are found on surfaces with a higher rate of cereal crops. A higher number of partridges are common in the summer period when young grey partridges can be found among the cereal plants (GREEN, 1984).

The impact of predators in the analyzed areas was controlled daily and was considered non-significant.

**Discussion**

Based on the results obtained, we can conclude that the key factor for the survival of grey partridge in this study was surface structure, especially the amount of cereal crops. As insects participate almost exclusively in chick diet for the first two weeks of life (FORD et al., 1938), it is very important that crops are not treated with total herbicides. In that case, sufficient numbers of small less harmful annual weeds can survive and form suitable habitats for insects. This high protein diet is very important for chick development, ensuring faster feather growth (POTTS, 1986), increasing the ability to flee predators. Furthermore, these seeds serve as a food source for chicks older than fourteen days and for adults (AEBISCHER, 1997). Beside cereal crops, an important positive influence on successful management of grey partridges is the formation of conservation headlands (SOTHERTON, 1991). Conservation headlands are cereal crop belts 6 m in width, which are only treated with selective herbicides. This approach enables useful annual weeds to grow and by that to support larger insect fauna, however it does not permit the spread of harmful weeds such as poverty brome (*Bromus sterilis*) and cleavers (*Galium aparine*) (SOTHERTON, 1991; AEBISCHER, 1997). A positive step forward in the management of grey partridges in areas where they are not found due to the lack of adequate nesting space can be made by dividing fields into smaller grassy belts, known as beetle banks (RANDS, 1987; THOMAS et al., 1991). These models should direct farmers toward nature preservation and the use of selective herbicides (AEBISCHER, 1997).

In addition to habitat improvement, predator control with its positive effect on the number of the young and larger yields during the hunting season must be carried out (TAPPER et al., 1996).

Our experience has shown that the presence of extensive agriculture, or rather the tending of smaller plots, gives the effect of conservation headlands or beetle banks. Leaving stubble-field over the winter period also allows the vegetation to recover naturally, providing the feed sources for the grey partridges. Moreover these stubble-fields provide insects a place to survive the winter and give the young grey partridges a feed source in the early spring (AEBISCHER, 1997). In hunting grounds where the grey partridge

was found, in addition to cereal crops, a dominant characteristic were extensively used meadows which are either not mowed or are mowed once per year (in July), when the young grey partridges are already adults. Such meadows are rich in flora composition and provide additional feed and shelter for grey partridges.

The observed absence of partridges in the hunting ground (Dubrava) was the result of the lack of cereal crops, while meadows are mowed two to three times per year, with the first mowing early on, such that weeds as a feed source and shelter for the grey partridges were removed. While conservation headlands exist in the first three plots thanks to extensive agriculture, for partridge management it is necessary to form such headlands in the Dubrava hunting ground.

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**GRUBEŠIĆ, M., V. ŠEGRT, D. KONJEVIĆ: Studija o brojnosti trčke (*Perdix perdix* L.) u prirodnom uzgoju u središnjoj Hrvatskoj. Vet. arhiv 76, S161-S166, 2006.**

**SAŽETAK**

Trčka (*Perdix perdix* L.) autohtona je vrsta divljači u Republici Hrvatskoj. Posljednjih je godina prirodni uzgoj ove divljači sve manje uspješan. U radu je analizirana kvaliteta staništa (vrsta vegetacije, broj trčki i utjecaj grabežljivaca) trčke u četiri lovišta na području zagrebačke županije. Prvi rezultati pokazuju stabilne populacije trčki u staništima s različitom vegetacijom, posebice s većim udjelom žitarica. Monokulture i livade obrađene pesticidima nisu prikladne za održavanje trčki. Nadalje, u radu se predlažu mjere poboljšanja stanišnih uvjeta u cilju boljeg gospodarenja trčkama.

**Ključne riječi**: trčka, *Perdix perdix*, žitarice, stanišni uvjeti