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Elements of ecology of the Grey Partridge at Grammos Mountain in Greece

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Summary

Elements of ecology of the grey partridge such as, population density and mortality, were studied in an unusual for the grey partridge habitat, in Grammos mountain, during the period of 1999-2000. The partridge population in the study area is found in subalpine and alpine zones from 1200 m to 2200 m elevation. We estimated spring populations of 2-2.5 pairs/km² and September populations of 7.4-12.9 ind/km² – we estimated summer mortality of 19-55%.

1 Introduction

The grey partridge is a resident species with a large distribution. During the 19th century the grey partridge was found throughout continental Greece, except Peloponnisos. During the 20th century and mainly after 1950, there was a severe decrease of the grey partridge's populations and today it's distribution is limited to North Greece.

Today it is situated from North Thessally and Southwest Macedonia to Thrace. In Greece the grey partridge is listed among the hunted species, however it's hunting has been forbidden since 1984. The grey partridge found in Grammos Mountain belongs to the species *Perdix perdix* (*Main Eastern haplotype*) (Liukkonen – Anttila 2001). The study area has been chosen because the particular biotope (mountain Grammos) constitutes an "extreme" biotope, comparing it to other biotopes where the grey partridge is usually found.

The purpose of this study was the estimation: a) Of the population density, b) Of the grey partridge's mortality, at the Mountain Grammos.

Grammos mountain is situated in the northwest of Greece and borders, Albania, Macedonia, and with Epirus. Its altitude is up to 2.250m. The extent of the study area is 33,7 km² and the altitude ranges from 1.500m to 2.250m. The main plant species in the study area are *Festuca spp.*, *Astragalus spp.*, *Daphne spp.*, *Juniperus spp.*, *Phalaris spp.*, *Medicago spp.*

The geographical position and the mountainous character of the area create a variation of local climates mostly mountainous - continental. Snow

covers the ground 6 - 7 months a year. The summer is cool and the winter is cold and long (6 - 8 months). The dry season is very short. Soil in the study area is mostly native and the ground is prevailed by minor clinatios (<40%).

In the study area there is nomadic grazing of sheep and cattle. The grazing livestock appears in the area from May to October in sub-alpine and alpine zone. The number of the grazing animals is not stable, and may vary from 600 – 800 cattle and 8.000 – 8.500 sheep.

2 Methods and Materials

2.1 Population Density

The method of Plots (Panek 1997) has been used. There have been set 4 (A: 0,564 km², B: 0,360 km², Γ: 0,612 km², Δ: 0,484 km² and total plots area 2,02 km²) permanent Plots in the area where the grey partridges were accurately counted during four (4) different periods: early May, late-July, mid-September, and mid-November. Two (2) specially trained pointing dogs were used as to track the partridges.

The plots area was delimited by GPS and Laser Rangefinder. The contacts with the partridges were recorded without the possibility of recording the same individual twice.

$$D = \frac{N}{\sum E_i}$$

N= the number of partridge individuals (pairs) detected in all the total plots areas.

$\sum E_i$ = the total plots areas (A+B+C+D)

2.2 Mortality

Mortality for a specific period has been estimated by the method of Ratti et al (1983).

$$\Theta = \left(1 - \frac{D_x}{D_y}\right) * 100$$

D_x= the population density in the end of the period.

D_y= the population density in the beginning of the period.

3 Results

Table 1. Grey partridge population density

A/ α	Period	D	Population density, --/Km ²	
			1999	2000
1	8-10 May	D1	2 pairs/Km ²	2,5 pairs/Km ²
2	24-25 July	D2	15,8 ind/ Km ²	16,3 ind / Km ²
3	14-15 September	D3	12,9 ind / Km ²	-
4	18-19 September	D3	-	7,4 ind / Km ²
5	10-11 November	D4	5,9 ind / Km ²	-

Other areas throughout Greece similar to the study area conserve grey partridge populations in high altitudes such as: mountain Vitsi, mountain Vermio, mountain Jena and mountain Belles (per.com. with hunters, sheperds).

The grey partridge population density in the study area is low in comparison to other areas (Table 1) (Potts 1986, Reitz 1992, Ratti et al. 1983, Panek 1997, Nosel 1992, Handrinos & Akriotis 1997, Thomaidis 1992). Comments by the reviewer: I would make another table of spring pairs, comparing your estimates with these studies.

In September 2000 the population density was underestimated because the hunting period had begun (15 September) and therefore the birds were difficult to track down due to the disturbance. The total population in the study area was estimated at about 50-70 pairs in the breeding season and 300-400 individuals in September. In the study area the highest rate of mortality is observed during the fall. This is mainly due to the illegal hunting. In the study area there are predators such as: foxes, martens and raptors in short population levels and due to the low grey partridge population density we didn't observe any influence.

During the period: July - September 2000 the mortality rate was higher because of the underestimated population density we mentioned before (Table 2). Comparing the population density in September to the one in May, we come to the conclusion that from the population in the end of the breeding season, a 38,7% manages to survive and breed the next year.

Table 2. Mortality of grey partridge

PERIOD		MORTALITY	
FROM	TO	1999	2000
25 JULY	15 SEPTEMBER	19%	55%
15 SEPTEMBER	10 NOVEMBER	54%	-

3 Management recommendations

For the protection and increase of the grey partridge's population in the study area, illegal hunting must be eliminated. Wild Life Refuge in the area and prohibition of hunting doesn't constitute a solution to the protection of the grey partridge population. During the fall, has been observed the highest mortality rate of individuals. This period concurs with the hunting period and therefore the presence of hunters in the area prevents illegal hunters to eliminate the grey partridges. The spreading of the grazing animals could as well be helpful as to diminish the over – grazing in some parts of the ecosystem which is now observed.

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References

- HANDRINOS, AKRIOTIS, 1997: The birds of Greece. C. Helm, London, U.K.
- LIUKKONEN – ANTTILA T, UIMANIEMI L, OREII M & LUMME J, 2001: Mitochondrial DNA variation and the phylogeography of the grey partridge (*Perdix perdix*) in Europe: from Pleistocene history to implications of introductions. *Acta Universatis Ouluensis*. A 367. T.VI p.8
- NOSEL H. 1992: Grey partridge (*Perdix perdix*) population dynamics in East Germany. *Gibier Faune Sauvage*, 9, 351-357.
- PANEK M. 1997: Density-dependent brood production in the gray partridge (*Perdix perdix*) in relation to habitat quality. *Bird Study* 44 :235-238.
- POTTS G.R. 1986: The partridge: pesticides, predation and concervation. Collins, London.
- RATTI T. et.al. 1983: Line transect estimates of density and the winter mortality of gray partridge. *J. Wild. Manage.* 47(4):1088-1096.
- REITZ F. 1992: Adult survival and reproductive success in abundant populations of grey partridge (*Perdix perdix*) in north-central France. *Gibier Faune Sauvage*, 9 :313-324.
- THOMAIDES C. & PAPAGEORGIU N. 1992: Nesting biology and habitat use of the gray partridge (*Perdix perdix*) in Northern Greece. *Gibier Faune Sauvage*, 9 :443-446.

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