

## Proposals and performances for restoration and conservation of Cantabrian capercaillie (*Tetrao urogallus cantabricus* Castroviejo, 1967) habitat and populations

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**Abstract:** The species *Tetrao urogallus* (Linnaeus 1758) is not globally threatened thank to its wide distribution range and its habitat, mostly located in remote places. However, it is suffering important declines in its occidental distribution area and in central Europe, where local extinctions are isolating its populations.

The Cantabrian subspecies (*Tetrao urogallus cantabricus* CASTROVIEJO 1967) is the most threatened and the one which has worst future perspective in middle term, since its populations begin to be isolated without the possibility of genetic renovation.

Although the Cantabrian capercaillie is protected species in Spain, its populations have been declining during the last 20 years till dramatic levels. The main causes are deforestation, human activities (stockbreeding mainly) and urban development, combined with some reproduction requirements such as the sound that males in heat need to emit, which requires no human interferences and their type of egg-lying which does not help to get many viable eggs.

One of the few places where the Cantabrian capercaillie can still be seen is "Pinar de Lillo" (in Cantabrian mountains) which is included in a Site of Community Importance (SCI) and in a Special Protection Area (SPA). In the management plan of this site an inventory and analysis of the mesohabitat and microhabitat, which has the requirements needed for the maintenance and conservation of the species, have been made. And following the recommendations of the Strategy for the Conservation of the Cantabrian capercaillie in Spain, some specific actions have been defined.

**Keywords:** *Tetrao urogallus cantabricus*. Natura 2000. Conservation. Habitat management.

### Introduction

Cantabrian capercaillie (*Tetrao urogallus cantabricus* CASTROVIEJO, 1967) is nowadays the bird most threatened in the Iberian Peninsula, as well as one of the most threatened in the world (Ballesteros, F. 2006). It is listed in the National Catalogue of Threatened Species as "In danger of Extinction" (Real Decreto 439/1990), also in annex II of Law 4/1989 of Conservation of Natural Spaces and wild flora and fauna, in annex I of Birds Directive (79/409/CEE) and in different agreements of protection at international level (IUCN, Bern, Cites, Bonn). Nowadays, the trend of their populations are clearly regressive in the Cantabrian mountains (northern Spain), what is causing a reduction in its distribution and an isolation in two subpopulations (Ballesteros, 2006). Strategy for the Conservation of the Cantabrian capercaillie was approved on 7th March 2004. The strategy includes guidelines and criteria for the species recuperation, as well as the minimum contents for Regional Recuperation Plans. In November 2006 The Recuperation plan for the Cantabrian capercaillie and the Measures for its Protection in Castilla y León was approved, and Castilla y León Regional Environment Ministry made an agreement with the Technical University of Madrid to draw up planning and management criteria for Natura 2000 Network biodiversity conservation. Within the

objectives of this agreement it is the elaboration of a management plan for the reserve area called "Pinar de Lillo".

One of the few places where the Cantabrian capercaillie can still be seen is "Pinar de Lillo" (in Cantabrian mountains), which is included in the Site of Community Importance (SCI) and Special Protection Area (SPA) called "Picos de Europa en Castilla y León" (Fig. 1).

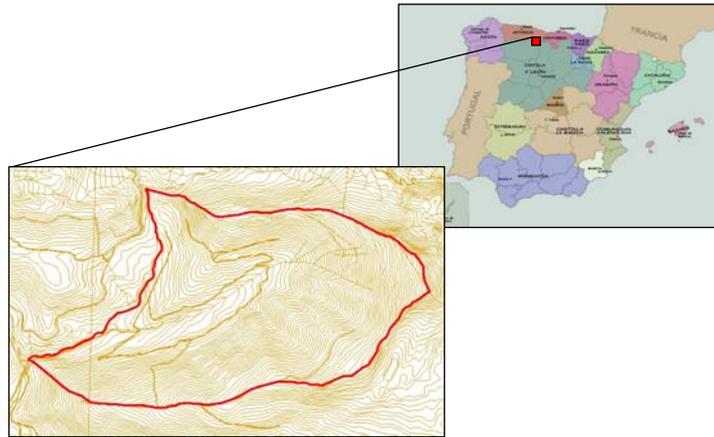


Figure 1. Location of Pinar de Lillo (Cantabrian mountains, northern Spain)

## Materials and methods

For the study of capercaillie populations in "Pinar de Lillo", it is necessary to identify the requirements and characteristics of its habitat at the general scale (Cantabrian mountains), landscape and local scale (Fig. 2.).

At the general scale, in the Cantabrian mountains, capercaillie uses mainly beech forest (*Fagus sylvatica*), oak forest (*Quercus robur*, *Q. petraea*, *Q. pyrenaica*) and birch woods (*Betula pubescens* subsp. *Celtiberica*) (Pollo et al., 2006). In exceptional cases, capercaillie can use relict pine forests of *Pinus sylvestris*, like in "Pinar de Lillo".

Cantabrian capercaillie, apart from the forests that inhabits, it uses grasslands and bush lands, mainly hedgehog heaths, as well as patches of birch wood, stands of holly tree and yew, streams, peat bogs and rocky areas with juniper.

Continuous and not fragmented forest stands are the type of habitat used by capercaillie at landscape scale (Storch 1997), so it is a very sensible species to forest fragmentation (Rolstad & Wege, 1989a, 1989b, Storch 1995, Obeso 2003).

At the local scale, the forest structure has more importance than tree composition, if it covers its main vital necessities (Moss y Picozzi 1994, Sachot, 2002) and allows the entrance of enough light to get an adequate forb and shrub stratum (Storch 1995, 1997). Capercaillie is very sensible to changes in habitat structure, and it selects mature forest structures instead of medium age forests, with many clears in it. (Pollo et al., 2006).

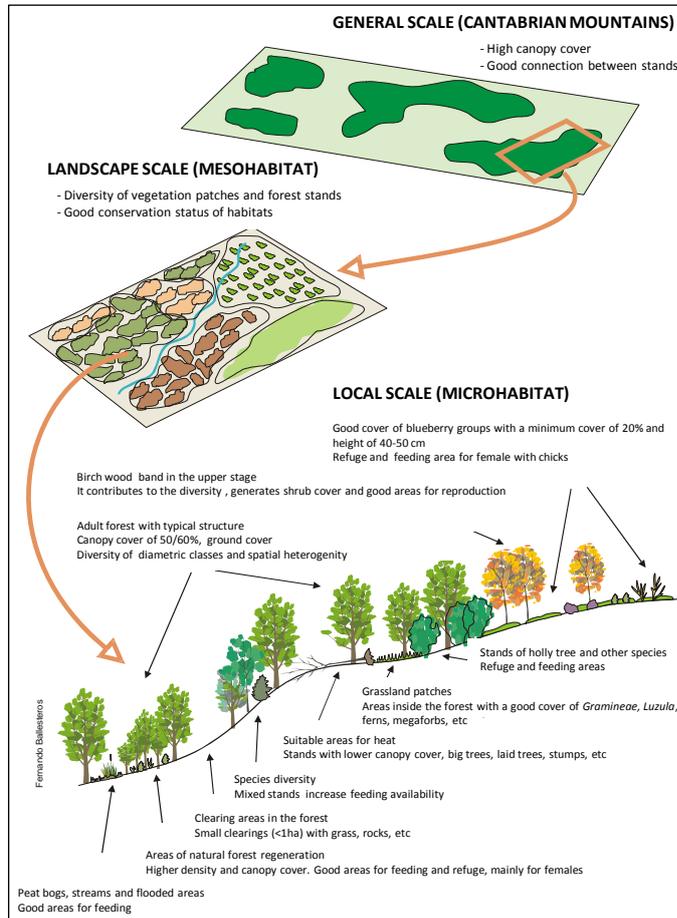


Figure 2. Requirements and characteristics of the habitat of capercaillie at different scales

In order to study the habitat of capercaillie in "Pinar de Lillo", an exhaustive forest inventory was carried out. This forest inventory characterizes the optimal structures and vegetation for the presence of capercaillie in the study area. In this way, within the forest space the most important areas for feeding, reproduction and settlement of capercaillie were identified. Moreover, the main threats and dangers for the survival of Cantabrian capercaillie were distinguished.

### Results and discussion

The main result of the study of capercaillie habitat at local scale (by means of the study of forest structure and vegetation in "Pinar de Lillo"), general and landscape scale shows that "Pinar de Lillo" contains all the environs, composition and structures for the

presence and survival of Cantabrian capercaillie. The intermediate results of the study show that:

- The structure of the pine forest is adequate, so the irregular structure in clumps is adequate for capercaillie populations (Moss y Picozzi 1994).
- Favorable mixture of vegetation species, with a high percentage of blueberries (*Vaccinium myrtillus*), is basic for feeding.
- Mosaic distribution of vegetation, with dense and cleared areas, provides an adequate habitat for Cantabrian capercaillie (Pollo et al., 2006).
- The high regeneration of the study area contributes to the maintenance in middle and long term of forest structure and composition, and therefore the capercaillie populations can be maintained.
- The main threats and dangers for capercaillie populations in Cantabrian mountains and "Pinar de Lillo" are predation (i.e. wild board) and disturbances and competence for feeding with ungulates (mainly deer and roe deer) (Obeso, 2003).

### Conclusions

Performances for strict protection of capercaillie, based on avoiding habitat fragmentation, are needed for "Pinar de Lillo" management:

- Strict protection of habitat in areas of settlement, hibernation, molt and breeding.
- Avoid creation of new forest roads and exploitations.
- Control deer and wild board populations at local and landscape scale, due to their incompatibilities and disturbances with capercaillie populations.
- Enclose shepherding to forest and adjacent areas, allowing its usage during summer, and avoiding any conflict with capercaillie.

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