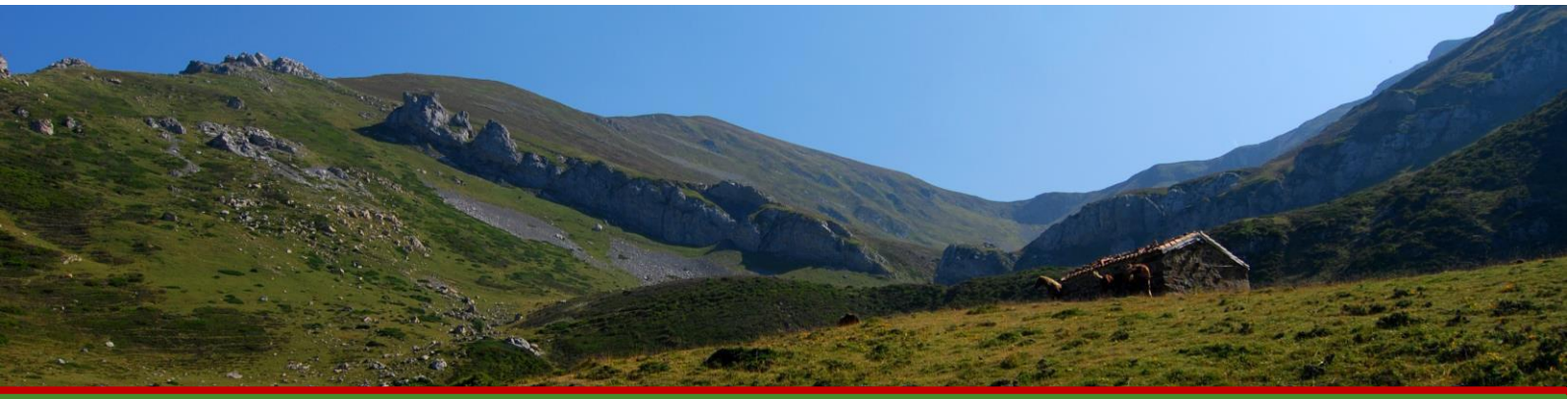
UROGALLO CANTÁBRICO

Cantabrian capercaillie conservation programme following the LIFE + Cantabrian capercaillie project



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1. The LIFE + Cantabrian Capercaillie project

The **main objective** of the LIFE + Cantabrian Capercaillie project has been to **halt the decline of this endemic subspecies of the Iberian Peninsula and encourage its recovery**. Specifically, this initiative has sought to ensure a favourable conservation status of Cantabrian capercaillie habitats through restoration and improvement activities, promote reproductive success and the survival of adults, and promote social awareness and public participation, increasing knowledge about the subspecies and its habitat. Within the framework of the project, the following **specific objectives** have been identified:

- Promote activities to improve the habitat in the 16 SPAs included in its distribution area in the Cantabrian mountain range.
- Reduce the impact of predation on the species and competition with other herbivores.
- Define and implement a captive breeding program and create a genetic reserve for the subspecies.
- Reinforce existing populations with specimens bred in captivity.
- Make traditional uses in the Cantabrian mountain range compatible with the conservation of the subspecies.
- Disseminate the results of the project and establish awareness and environmental education programmes, facilitating knowledge about the Cantabrian capercaillie and its habitat.

In order to achieve these objectives, the following **32 activities** have been developed:

Preparatory activities (A)

- A.1 Preparation of a technical document on the conservation and improvement of the Cantabrian capercaillie habitat.
- A.2 Preparation of technical documents on the predation and competition of the subspecies.
- A.3 Preparation and improvement of an operational protocol for the breeding centre and genetic reserve of the Cantabrian capercaillie.
- A.4 Drafting of a technical document on strengthening the population.
- A.5 Preparation of a genetic characterisation programme for the Cantabrian capercaillie population.
- A.6 Preparation of a technical document on land custody in the Biosphere Reserves.

Conservation activities (C)

- C.1 Conservation activities and improvement of Cantabrian capercaillie habitat.
- C.2 Reduction of threats and causes of natural mortality.
- C.3 Reduction of threats and causes of non-natural mortality.
- C.4 Correction of dangerous electrical infrastructures.
- C.5 Operation of the breeding centre and genetic reserve of the Cantabrian capercaillie in Sobrescobio (Asturias).
- C.6 Capture Programme, marking and removal of nests.
- C.7 Reinforcement programme for the population in the Cantabrian mountain range.

- C.8 Development of a land custody programme in the Biosphere Reserves.
- C.9 Promotion of traditional uses compatible with the conservation of the Cantabrian capercaillie and its habitat.

Awareness and dissemination activities (D)

- D.1 Communication Plan
- D.2 Production of a DVD.
- D.3 Layman report writing.
- D.4 Organisation of briefing seminars.
- D.5 Briefing and educational campaign.
- D.6 Sessions for exchange of experiences with experts on the capercaillie and its habitat.
- D.7 Environmental volunteer programme.
- D.8 Creation and updating of the project web page.
- D.9 Publishing of informative materials.

Co-ordination and follow-up activities (E)

- E.1 Management and co-ordination.
- E.2 Management Committee
- E.3 Scientific Committee.
- E.4 Communication Committee.
- E.5 Financial audit
- E.6 Post-LIFE + conservation programme.
- E.7 Project Supervision

- E.8 Networking.

The **project activity area has been 16 SPAs** of the Cantabrian mountain range

1. ES 0000374 Los Ancares
2. ES 0000198 Liébana
3. ES 0000251 Sierra del Cordel and Nansa and Saja headwaters
4. ES 1200002 Bosque de Muniellos
5. ES 0000055 Fuentes del Narcea y del Ibias
6. ES 1200001 Picos de Europa in Asturias
7. ES 0000316 Ponga-Amieva
8. ES 0000054 Somiedo
9. ES 1200008 Redes
10. ES 0000315 Ubiña-La Mesa
11. ES 0000210 Alto Sil
12. ES 4140011 Fuentes Carrionas and Fuente Cobre-Montaña Palentina
13. ES 0000364 Omañas
14. ES 4130003 Picos de Europa in Castilla y León
15. ES 0000003 Picos de Europa
16. ES 4130010 Ancares Mountains

The project has been co-ordinated by the **Biodiversity Foundation of the Ministry of Agriculture and Fisheries, Food and Environment**, and its partners are the autonomous communities of the **Government of Cantabria, Principality of Asturias** and Castilla y León, the latter through the **Natural Heritage Foundation of Castilla y León**; the **Inter-autonomic Consortium for the coordinated management of the Picos de Europa**

National Park; SEO/BirdLife and Tragsa and Tragsatec, and it has received **funding from the National Parks Autonomous Organisation and the Iberdrola Spain Foundation.** It is the first time that the public administrations involved in the conservation of this species, an NGO representing civil society, and companies such as Iberdrola (through its Foundation) have been co-ordinated.

The project, although initially designed to be executed over four years, has lasted six years from **October 2010 to December 2016.**

The LIFE + Cantabrian Capercaillie Project has had a budget of **5.9 million euros**, co-financed by the LIFE + programme of the European Commission for 50%, and the rest by the project partners themselves, as well as with the financing of the Iberdrola Spain Foundation and the Autonomous National Parks Authority.

This document addresses the requirement of the LIFE + projects to identify a series of activities that will continue to be carried out when the project ends. In this way, the continuity of the measures and programmes that have been put in place during the project is ensured, and a series of activities to be continued over time by the partners involved is defined. In addition, this document recommends putting into practice and always respecting the indications and requirements contemplated in the regulations for the conservation of the Cantabrian Capercaillie currently in force.

2. The Cantabrian capercaillie

The capercaillie is a forest bird of Boreal Palearctic distribution, which extends from the Iberian Peninsula to the east of Siberia. At present, 12 subspecies are recognised, two of which are geographically isolated from the rest: *Tetrao urogallus aquitanicus*, distributed throughout the Spanish and French Pyrenees, and *Tetrao urogallus cantabricus*, which occupies the south-western limit of the species and is distributed in the Cantabrian Mountains. The capercaillie is not globally threatened, given its wide area of distribution and the wide extension of suitable forest habitats in the Palearctic. However, it is suffering significant declines in its western range and in central Europe, where numerous local extinctions cause the isolation of populations. The Cantabrian subspecies is the only one of the 12 subspecies recognised today which is seriously threatened, and it therefore has the highest priority for conservation purposes.

The Cantabrian Capercaillie subspecies

The subspecies *Tetrao urogallus cantabricus*, the Cantabrian capercaillie, described by Castroviejo in 1967, occupies an approximate area of 2,000 km2 of the Cantabrian Mountains, from Ancares in León to the westernmost forests of Cantabria. This subspecies presents a series of peculiarities that differentiate it ecologically from the rest of the populations of this species. The most striking characteristic is that the forest habitat in the Cantabrian Mountains consists of deciduous forests, although recently it has been observed that it frequently uses reforested pine forests that reach the age of maturity. In fact, the Scots pine (*Pinus sylvestris*), a species with which the

capercaillie is associated in its worldwide distribution, is practically absent from the Cantabrian mountain range, where the winter diet of the capercaillie is based on ferns (mainly *Pteridium aquilinum*), heathers (*Erica* spp.), holly leaves (*Ilex aquifolium*) and especially beech buds (*Fagus sylvatica*). The typical Cantabrian capercaillie habitat is mature deciduous forest, both birch trees (*Betula pubescens*), beech groves, oak groves (*Quercus petraea*) and Pyrenean oaks (*Quercus pyrenaica*), always with an open structure that allows the development of undergrowth in which the blueberry (*Vaccinium myrtillus*) turns out to be a key although not essential species in some areas of the Cantabrian Mountains, as is also the case throughout the species´ distribution area. The blueberry is a resource commonly used by the Cantabrian capercaillie, which in summer and autumn consumes leaves and fruits, while during oestrus it incorporates many of this plant`s stems in its diet. In summer, chickens and offspring rely heavily on insects, especially the caterpillars that live on cranberry plants.

Although the capercaillie is considered to be a forest specialist that selects mature forest plots, the key domain of this subspecies can also incorporate other types of habitat, especially grasslands, heaths and brooms, with a frequency higher than expected depending on the availability of these habitats in the Cantabrian landscape.

Causes of its decline

The Cantabrian capercaillie has suffered a continuous decline over the last decades and its distribution area is increasingly reduced and fragmented. It has been separated into two population centres isolated from each other, the exchange rates of individuals between both Cantabrian nuclei are unknown, and

the practical disappearance of the subspecies in the peripheral areas of the distribution area has been confirmed. The eastern subpopulation is in a much more delicate situation of conservation. The population counts carried out by public administrations have revealed the serious situation that the Cantabrian capercaillie population is going through. In just three decades, it has been reduced by more than half. The population estimated during the 2000s, between 500 and 600 adults, has been significantly reduced, although the fact of not having updated estimates of the individual numbers makes it impossible to know exact population development.

In general, the decline is due to a combination of global factors (climate change), regional (competition with domestic and wild herbivores, predation, optimal habitat reduction) and local (livestock enclosures, power lines, tourism, opening of tracks, mining , etc.), closely related to each other and with synergistic effects. The most important threat factors are climate change, loss of favourable habitat, fragmentation of the population and isolation of specimens, predation, competition with other herbivores, discomfort derived from activities or human presence, collision with lines and livestock enclosures. All this is reflected in a low rate of reproduction and survival of new individuals. The serious situation of the Cantabrian capercaillie, in danger of extinction and suffering a continued decline, calls for the implementation of urgent and exceptional activities. For this reason, the LIFE + Cantabrian Capercaillie project has emerged to act jointly on all the threat factors in order to reverse this situation.

Protection figures of the Cantabrian capercaillie

The Cantabrian capercaillie has some type of protection figure in the regions where it is present. The autonomous catalogues of endangered species in Cantabria (Decree 120/2008, of 4 December), Galicia (Decree 88/2007, of 19 April) and the Principality of Asturias (Agreement of 28 July, 2005, approving the change of category of the species in Decree 32/1990, of 8 March), consider it an "**Endangered Species**". The Spanish Catalogue of Endangered Species, enacted by Royal Decree 139/2011, of 4 February, includes the Cantabrian Capercaillie among the "**Endangered Species**" It is also included in **Annex I of the Birds Directive 2009/147 / EC and in Annex II of the Berne Convention** for the Protection of Wildlife in Europe (for the Cantabrian subspecies).

The legal framework for the protection of the Cantabrian Capercaillie currently in force is as follows:

Nationwide:

- Strategy for the conservation of the Cantabrian capercaillie (*Tetrao urogallus cantabricus*) in Spain.

Inter-Autonomous Communities:

- Master Plan for the Use and Management of the Picos de Europa National Park.

In Autonomous Communities:

- Principality of Asturias:

  - Decree 162/2014, of 29 December, instituting the Special Conservation Area Networks (ES 1200008) and approving the I Integrated Management Measure for various protected areas in the councils of Caso and Sobrescobio.

  - Decree 163/2014, of 29 December, instituting the Ponga-Amieva Special Conservation Area (ES1200009) and approving the I Integrated Management Measure for various protected areas in the councils of Ponga and Amieva.

  - Decree 169/2014, of 29 December, instituting the Special Somiedo Conservation Area (ES 0000054) and approving the I Integrated Management Measure for various protected areas in Somiedo council

  - Decree 14/2015, of 18 March, instituting the Picos de Europa Special Conservation Area (ES1200001) and approving its Basic Management and Conservation Plan.

- Castilla and León Regional Government:

  - Agreement 15/2015, of 19 March, of the Castilla y León Regional Government, approving the Master Plan for the Implementation and Management of the Natura 2000 Network in Castilla y León. It is the framework measure through which are approved all administrative, legal and technical issues considered

necessary to develop in order to complete the implantation and consolidation of the Natura 2000 Network. To this end, the Master Plan incorporates a hierarchical programming of the measures to be carried out in a short- and medium-term time frame.

- Decree 4/2009, of 15 January, approving the Recovery Plan for the Cantabrian Capercaillie (*Tetrao urogallus cantabricus*) and stipulating measures for its protection in the Autonomous Community of Castilla y León.

- Correction of errors of Decree 4/2009, of 15 January, approving the Recovery Plan for the Cantabrian Capercaillie (*Tetrao urogallus cantabricus*) and stipulating measures for its protection in the Castilla y León Community.

- Order FYM / 775/2015, of 15 September, approving the Basic Management and Conservation Plans for the Natura 2000 Network in the Autonomous Community of Castilla y León:
  - Birds – A108- *Tetrao urogallus*
  - SPA – ES0000364 – Omaña
  - SAC and SPA – ES0000003 - Picos de Europa
  - SAC and SPA– ES0000210 – Alto Sil
  - SAC and SPA – ES4130003 - Picos de Europa León
  - SAC and SPA – ES4130010 – Sierra de Ancares

Decree 57/2015, of 10 September, stating the special conservation areas and special

protection areas for birds, and regulating the basic management and conservation planning for the Natura 2000 Network in the Autonomous Community of Castilla y León.

- Cantabria Regional Government:

  - Cantabrian Law 4/2006, of 19 May, for the Nature Conservation of Cantabria in which the spaces of the Natura 2000 Network are declared Protected Natural Spaces of Cantabria.

  - Decree 25/1988, of 2 May, by which the Saja-Besaya Natural Park is created.

  - Decree 91/2000, of 4 December, approving the 2nd Plan for the Use and Management of the Saja-Besaya Natural Park.

- Xunta de Galicia (Galician Government):

  - Decree 37/2014, of 27 March, by which special places of conservation are declared the sites of community importance for Galicia and the Master Plan of the Natura 2000 Network of Galicia is approved.

3. Results obtained from the LIFE + Cantabrian Capercaillie project

Environmental indicators

- **Seven technical documents have been prepared** which have served as the basis for the implementation of all conservation activities.
- Action has been taken on **408.4 ha**, 254.2 ha of woodland and 163.2 of scrub.
- The **density of deer in the areas with capercaillie** has been reduced (3,776 deer killed), **34 martens have been captured and translocated** as support for the release of three females from the captive breeding centre and to favour the survival of adult specimens and increase reproductive success, and the **livestock load of the bovine hut has been controlled** in the areas with the presence of capercaillie. **351 days of monitoring of hunting activities** have been carried out.
- 60.5 km of **dangerous enclosures have been signposted**. The **impact (electrocution and noise) of the Collado la Vieja electrical substation has been corrected. A transport line (LAT) that runs through the Picos de Europa SPA has been signposted.**
- At present, the captive breeding and genetic reserve programme has **23 specimens** (22 in the Sobrescobio Centre and 1 in the Cantabria Recovery Centre): 15 adult specimens (five males and ten females) and eight sub-adult specimens (three males and five females).
- The operating protocols of the Cantabrian Capercaillie Breeding Centre have been elaborated and the facilities have been improved with the incorporation of a protected aviary where the specimens that are going to be released in the natural environment are housed.
- **13 Cantabrian capercaillies** (six males and seven females) **have been captured. The partial removal of one nest (two eggs) has allowed the genetic variability**

of the captive stock to increase. At present, there are **seven specimens with an active emitter** (five males and two females).

- Two releases of specimens into the natural environment have been carried out: **one of three female specimens (sub-adults) in 2014, and another of two female specimens (adults) in 2016.**
- **29 custody agreements and two collaboration agreements** have been signed **with UNAC and FEDENCA**. **19 projects** have been carried out **with the co-operation of 13 custodial bodies** that have enabled habitat improvements to be carried out in **148.60 ha** (clearing and silvicultural treatments), the establishment of 7 pollination stations (2 fixed and 5 mobile) and the developed of an advisory and assistential project to support the custody programme.
- **34 planning**, 13 forest planning and 21 pastoral planning tools for the promotion of traditional uses by the Government of Cantabria have been **drafted and approved.** Furthermore,

  40 example activities that have affected **332 ha of the territory** have been performed.

Communication indicators

- Creation and updating of the **www.lifeurogallo.es webpage** (more than a million and a half visits) and dissemination in the social networks of the Biodiversity Foundation.
- Publication of more than **150 news items** on the web and dissemination in the media.
- Issuing of **24 press releases.**
- Participation of **1,952 students in workshops held in 40 schools** visited in Cantabria, Asturias and Castilla y León during three school campaigns.

- Participation of **72 volunteers** in the three environmental volunteer campaigns.
- Preparation and **edition of informative materials** aimed at the local population, schoolchildren and the socio-economic sectors: 2,000 badges, 1,000 T-shirts, 20,000 stickers, 2,000 stories, 5,000 informative manuals, 3,000 quadriptichs aimed at farmers, hunters and tourist entrepreneurs, 100 personalised notebooks, 600 brochures on the land custody programme and 1,000 copies of the teaching unit.
- **Eight informative sessions** directed at the livestock, hunting and the tourism sectors with the participation of 167 people.
- **15 workshops on land custody** and capercaillie with the attendance of 235 people.
- **Session aimed at the mass media** in which 15 journalists participated. Impact: 39 information items published / issued related to the day and project.
- **Four briefing seminars** open to the public with the participation of an average of 70 people per seminar.
- The travelling exhibition has reached 120,000 visits in the more than 50 municipalities it has visited.
- Installation of **19 informative panels** in the Cantabrian mountain range on the species and the project..
- Publishing of **four information bulletins**.
- Publication of a **special supplement** about the project in Quercus magazine.
- Attendance at **eight technical meetings** with specialists in the conservation of the capercaillie in Scotland, Poland, France and Pyrenees that have contributed a greater knowledge on the species and its management in

other territories, and participation in **six meetings of the Ministry Working Group**.

- Publication of **three promotional videos** for the project. 2 videos-interview about the technical day dedicated to the blueberry (Villablino, 06-17-2014).
- Preparation of the project **documentary** (37') and a shorter version (6'). Publication on the project website and on YouTube, where it has exceeded 5,100 views. Distribution of 1,000 copies to schools, interpretation centres, seminars and conferences.

Management indicators

- 13 meetings of the Management Committee held.
- Seven meetings of the Scientific and Breeding Committee held.

Socio-economic indicators

- 20 new hires equivalent to 4.5 direct annual work posts (equivalent annual shift).
- 1,350 invoices and other documents accrediting expenses with third parties reviewed.

4. Actions to keep pursuing over time

The suggested actions are organized in the following lines of work:

Line 1: habitat management

The improvement of forest areas as a habitat for capercaillie is a priority action to achieve the recovery of this species. The success of the recovery of the Cantabrian capercaillie depends on the possibility for the species to find an environment as beneficial as possible in order to recover and reoccupy the areas it has recently abandoned.

General guidelines:

As a general recommendation, the future actions will consider the fulfillment of the requirements included in the Technical Document for the conservation and improvement of the capercaillie's habitat (*Tetrao urogallus cantabricus*) in the Cantabrian mountain range, and the forestry Diagnosis of the habitat management actions of the LIFE + Cantabrian capercaillie project regarding:

- Basic requirements for the capercaillie:
  - Passability to access food, detect predator and flee in case of attack.
  - Food availability.
  - Welfare and safety.
  - Peace against various annoyances

- Use of the following strategies:
  - Increase in specific diversity
  - Increase in aerial structural diversity.
  - Structural and specific improvements at shrub and sub-shrub level.
  - Reduction of tree density.
  - Increase of the forested surface, improvement of the shape of the forest patches and of the connectivity.
  - Elimination of disturbing elements for the capercaillie.

- Possible actions:
    - At the landscape level.
        - Afforestation of connectivity
        - Actions aimed at achieving a diversity of habitats
        - Continuous Forest Cover

    - At the microhabitat level.
        - Actions on the arboreal stratum:
            - Clearings, open spaces, tree trimmings or clearings opening
            - Pruning
            - Scattering of pruning and trimming waste
            - Piling of pruning and trimming waste
        - Actions on the shrub layer:
            - Internal slashing in the forest
            - Slashing in the canopy to improve breeding habitat
            - Slashing in the edges of the forest mass to boost its expansion through natural generation
            - Slashing for herbivory concentration
        - Plantations:
            - Enrichment afforestation
        - Fire prevention actions:
            - Auxiliary belts

- Firebreak area

- Timely actions:
  - Cutting of trees with roots
  - Tree felling with cuts at different heights
  - Treetops opening
  - Banding
  - Wet areas creation
  - Removing, marking or constructing hunting fences compatible with the capercaillie
  - Trails closure

- Compatibility and minimization of the impact of other uses and actions on the habitat of the Cantabrian capercaillie.
  - Agricultural and livestock activities
  - Forestry activities
  - Tourism and leisure activities
  - Linear infrastructures
  - Hunting activities
  - Other leverages and uses of the land

Suggested actions:

1. The PAs will continue to carry out improvements in the SPABs including Cantabrian capercaillie habitat following the guidelines of the SPAs' management plans, the approved recovery and conservation plans, as well as the National Strategy.

2. The goal will be to prioritize the most needed actions in each mountain, on the shrub, both in the canopy and under and on trees.

3. A subsequent monitoring of habitat management actions will be carried out to evaluate the effectiveness of the measures and the possible occupation rate by new specimens of the subspecies of the covered areas. It is suggested to continue using the internationally agreed principles of forestry in capercaillie habitat, as well as the terminology and standardization proposed in the LIFE + technical documentation, to allow a later evaluation of the results and their comparison with other projects carried out in other Autonomous Regions.

Line 2: Reduction of threats and causes of death

The reduction of threats and causes of death is a priority action for the recovery of the species. The small number of specimens in the population and the regressive trend of this latter requires the execution of direct measures to prevent the continuous decline of the population size.

General guidelines:

Causes of death can be divided as follow:

2.1. Causes of natural death

- Linked to competitors. All potential species of competitors will have this effect through two mechanisms:
    - The direct impact on the tetraonid's food (especially in situations of high density and with a low medium load capacity).
    - The interference associated with the modification of the vegetation structure and the cascading effect it may cause, affecting even the other species of a community.

According to this definition, the primary competing species of the Cantabrian capercaillie are deer and cattle.

As a general recommendation, future actions will take into account compliance with the requirements included in the Technical Document, establishing the main measures to be taken to determine the competitors' situation for the capercaillie (*Tetrao urogallus cantabricus*) regarding the following:

- Increase the level of knowledge about the issue of the capercaillie's competition, especially in relation to the effect of different species of competitors on the evolution of capercaillie clusters and the determination of ungulates density thresholds compatible with the conservation of the species.

- Reduce the level of competition between primary competitors (deer and cattle) and the capercaillie, both in the presence areas of the species and in future areas of reintroduction.

- Determine the effect of the reduction of competitors on the capercaillie's demographic parameters.

- Linked to predators. The main species of Cantabrian capercaillie predators are marten, goshawk and fox.

As a general recommendation, future actions will take into account compliance with the requirements included in the Technical Document, establishing the main measures to be taken to determine the competitors' situation and its impact on the capercaillie (*Tetrao urogallus cantabricus*) population, and the study on the Impact of predation on Cantabrian capercaillie populations regarding the following:

- Reduce the effect of predation in specific areas prior to the release of capercaillie specimens from captive breeding and during nesting and early stages of the chicks' growth. It is recommended to continue monitoring predators prior to the release of capercaillies bred in captivity, reducing the period to two or three weeks before the capercaillies are taken to the release cage; monitor while they are in the cage to reduce the likelihood of predators entering the cage and when releasing the capercaillies, intensively monitor during the first three days after release.

- Reduce the effect of predation through hunting activity, habitat and food resources improvement, or control of the fox and wild boar population in the area of distribution of the capercaillie in duly justified and assessed cases.

- Use as criteria to select areas of action to reduce the effect of predation through hunting and population control, on the one hand, areas where the capercaillie remains stable and, on the other hand, areas in which the species shows an important regressive

tendency.

- Control predators in areas where the species is present. In the western zone, it is advisable to carry out the usual wild boar hunts in the area where the capercaillie maintains its presence. In specific areas of a few square kilometers with a high concentration of breeding females, this type of action can be considered during the breeding season. It is advisable to perform a sufficiently intense control, and maintain the measures over time.

- Control the predators on a trial basis only when there are clear objectives and a scientific direction applying appropriate criteria and methodologies.

2.2. Causes of non-natural death

In this case, the main causes of death are linked to:

- Hazardous enclosures.
- Dangerous electrical infrastructures

Suggested actions:

1. Ensure densities of cattle so that they decrease the pressure exerted on the capercaillie.

2. Manage deer populations to maintain the recovery of blueberries and holly.

3. Establish a protocol for monitoring the abundance of capercaillie in the areas where the actions to reduce predation are carried out. Perform controls on capercaillies' predators in the areas where this type of action is considered necessary based on priority criteria for the conservation of this species in relation to others.

4. Evaluate the effect of competitors on the capercaillie by indirect methods: Monitoring of herbivory pressure. The herbivory exclusion plots located in the Picos de Europa SPA will be maintained, in collaboration with the University of León.

5. Establish a protocol to monitor the abundance of the different species of selected ungulates.

6. Establish a relationship between herbivory pressure and indirect estimates of ungulates abundances.

7. Increase the level of knowledge about the interaction "cattle management/change in the landscape-capercaillie".

8. Manage the cattle numbers. Small-scale pastureland planning plans will be revised (for example, at the parish or MUP level) taking into account the presence of the tetraonid.

9. Establish a protocol for monitoring the demographic parameters of the capercaillie, reproductive success (number of females with chicks compared to the total number of females in a given area) and average females productivity (average number of chicks with the females that have bred).

10. Periodically review all the fences marked during the LIFE + Cantabrian Capercaillie project in order to continue avoiding the death of capercaillie by collision.

11. Mark those fences in the areas of presence or dispersion of the species detected after the LIFE + Cantabrian Capercaillie project.

12. Maintain the marking of the power line that has been carried out during the LIFE + Cantabrian Capercaillie project.

13. Mark new power lines that could be a potential threat to the capercaillie.

Line 3: exsitu conservation actions

Captive breeding is part of a general subspecies conservation plan especially based on the conservation and improvement of its habitat, and of the wild populations that are currently maintained. It is also supported by the Tetraonides Conservation Action Plan prepared by IUCN and the Technical Guide for the Management of Exsitu Populations for Conservation (IUCN, 2002), and the Captive Breeding Program of the Cantabrian Capercaillie, created within the Working Group of Cantabrian Capercaillie and approved by the National Commission for the Protection of Nature on October 18, 2005 and endorsed by the Sectoral Conference on the Environment in its session of November 7, 2005.

General guidelines:

In 2007, the breeding and genetic reserve center of the Cantabrian capercaillie of Sobrescobio (Redes Natural Park, Asturias) was built. It became operational in July 2009. This center has housed the majority of the genetic and captive stock of existing Cantabrian capercaillie, and all the breeding campaigns in captivity have been carried out there. The number of housed specimens has gone from the two specimens that formed the founding couple in 2009, to the current 22 specimens.

During the project, the facilities of the wildlife recovery center of Cantabria, which opened its doors in 2010 to cure, rehabilitate and reintroduce animals in their habitat as well as carry out other conservation tasks, were also used. This center currently houses a female from the captive genetic stock of Cantabrian capercaillie.

Finally, within the framework of the LIFE + Cantabrian Capercaillie project, a new aviary has been built in the wild animal recovery center of Burgos. This facility will serve as host site for specimens from the Cantabrian capercaillie breeding center of Sobrescobio. The specimens that will be transferred to this new facility will fulfill the function of a genetic reservoir and might be incorporated into the breeding program if necessary.

Within this line of work, the capture, marking and removal of laying, as well as the program of reinforcement of the population in the Cantabrian mountain range, are equally important. The capture and radiolabeling of specimens is the most effective method to supply the breeding center and genetic reserve of specimens with breeding or captive stock. The small number of free animals, together with the fragmentation of the population, make the reinforcement of the population through the release of specimens bred in captivity essential to reverse the decline of the subspecies.

As a general recommendation, future actions will take into account compliance with the requirements included in the Operation Protocol of the breeding and genetic reserve center of the Cantabrian capercaillie, in the genetic Characterization of the Cantabrian capercaillie (*Tetrao urogallus cantabricus*) population and in the reinforcement of the Cantabrian capercaillie (*Tetrao urogallus cantabricus*) population.

Suggested actions:

1. The breeding and genetic reserve center of the Cantabrian capercaillie of Sobrescobio will continue to house the genetic and captive stock of Cantabrian capercaillie. Annual breeding campaigns will continue to be carried out with the aim of obtaining a high number of specimens to renew the stock itself, and reinforce the population in the natural environment. The wildlife recovery center of Cantabria will continue to be available to support the captive breeding program. Also, the wild animal recovery center of Burgos is a support facility to house specimens of the captive genetic stock.

2. The Autonomous Regions will carry out capture and radiolabeling campaigns in order to be able to remove future laying used to increase the genetic stock of the exsitu Cantabrian capercaillie conservation program.

3. The CCAA will continue to periodically monitor the radiolabeled capercaillie. The extracted data will serve to draw conclusions leading to a better management of the species.

4. Whenever an optimum number of captive-bred specimens is reached, and the involved Autonomous Regions consider it as such, a release of these specimens to the natural environment will be carried out using a pre-release cage. Likewise, the direct release of specimens to the natural environment is considered. In both cases, the requirements set out in the Cantabrian Capercaillie (*Tetrao urogallus cantabricus*) reinforcement program will be followed, as well as the action protocols described and implemented during the LIFE + Cantabrian Capercaillie project.

5. In the event that the involved Autonomous Regions considerate it appropriate, the eggs of the radio-labeled females will be removed, always following the requirements established in the study on the Impact of the extraction of laying on the viability of the Cantabrian capercaillie wild population set out in the framework of the LIFE + Cantabrian Capercaillie project.

Line 4: interaction with other industries. Continuity of the program of land custody in the biosphere reserves and promotion of traditional uses compatible with the conservation of the Cantabrian capercaillie and its habitat.

The collaboration with private property is key in the conservation of species and habitats and in the implementation of the Natura 2000 Network. For this reason, the land custody is presented as a very useful tool, since it allows compatibility between the traditional uses of the land and the conservation needs, with a new aspect, voluntariness. Likewise, the writing of planning tools and documents of good sectoral practices for habitat management in the Autonomous Community of Cantabria have been implemented.

General guidelines:

As a general recommendation, the future actions will take into account compliance with the requirements included in the Program of land custody in Biosphere Reserves of the Cantabrian mountain range, the Bases of the land custody program within the framework of the LIFE + Cantabrian Capercaillie project and the outlined measures in the forest and pastoral management plans approved by the Government of Cantabria.

Suggested actions:

1. The FB (Biodiversity Foundation) will try to motivate and raise awareness among the custody entities belonging to its land custody platform to implement custody measures related to the conservation of the capercaillie.

2. The FB will maintain over time the commitments acquired with UNAC (National Union of Hunting Associations) and FEDENCA (Foundation for the Study and Defense of Nature and Hunting) in the framework of the collaboration agreements signed during the project. The suggested actions are the following:
   a. Spread the characteristics and benefits of the land custody among hunting societies, and the importance of these as custody entities, and the Network that brings them together.
   b. Boost and promote good hunting practices that favor the recovery and conservation of the Cantabrian capercaillie.
   c. Promote and facilitate the signing of custody agreements between hunters' societies and landowners in the Cantabrian mountain range whose purpose is the conservation of the Cantabrian capercaillie.

d. Encourage collaboration and coordination with the different regional and local administrations as well as with other industries such as agriculture, forestry, livestock or tourism, in terms of conservation of the Cantabrian capercaillie.

3. The FB will encourage the execution of projects combining the conservation of the Cantabrian Capercaillie and the land custody within the framework of its annual call for grants, provided that the proposals presented meet the technical and economic requirements established in the call for grants and with minimum quality standards.

4. The Autonomous Regions will regulate and supervise the activities related to leisure (public use) and natural environment management, in order to avoid the disturbances caused by human presence, with special attention to critical periods and areas for the capercaillie.

Line 5: communication and awareness actions

The communication and awareness actions are considered as key to continue giving visibility to the achievements made within the framework of the LIFE + Cantabrian Capercaillie project and to the support provided by the LIFE financial instrument.

General guidelines:

As a general recommendation, future actions will take into account compliance with the requirements included in the communication plan developed within the framework of the project.

Suggested actions:

1. The website will remain active and updated for the next five years after the end of the project. The contact email will also remain active as a possible communication channel.

2. The materials produced during the project will continue to be distributed, such as the Layman report, DVD, information brochures for various industries, capercaillie conservation manual, Quercus supplement, and educational unit. The distribution channels will be the project and FB's website, and its paper version in the deemed appropriate forums.

3. The FB and the project partners will answer the media requesting information related to the Cantabrian Capercaillie.

4. The exhibition will be donated to the CIGPNPE or a non-profit association dedicated to the conservation of the Cantabrian capercaillie or with the aim of continuing to spread the knowledge of the species and the actions developed for its conservation.

5. The conservation of the Cantabrian capercaillie will be a key aspect in the awareness and outreach campaigns, as well as in possible volunteer programs of the Autonomous Regions involved as well as conservation organizations.

6. All project partners will try to attend meetings where they can share the results of the project, as well as continue to build networks of contacts that help enhance and multiply the results obtained. These meetings include the meetings of the Cantabrian Capercaillie Working Group organized by MAPAMA (Ministry of Agriculture and Fisheries, Food and Environment).

7. Funding

The Autonomous Regions involved, as well as the rest of the project partners, will finance the suggested actions based on their annual budgets and possible funding by the European Union in the framework of other LIFE projects or other subsidies aimed at the conservation of endangered species, as through the call for grants from the Biodiversity Foundation and the Ministry of Agriculture and Fisheries, Food and Environment. Concretely, the Autonomous Region have already approved the following budgets:

- Regional Government of Castilla y León: The EAFRD funding will allow to monitor the species, the forestry actions that have been carried out and will be carried out in the habitat, and reduce threats of non-natural death to specimens in livestock enclosures with the proposal of annual review of the same. An estimated budget of around € 10,000/year is estimated for 2017 and 2018.

Any action that takes place within the area of distribution of the capercaillie in Castilla y León and with a potential impact on the species (however small it may be) will be communicated by the Regional Government of Castilla y León through the reports of impact to the Natura 2000 network values, and this report will always include a constrain to ensure that the impact on the species is nonexistent or minimal. This will be carried out by the department's staff and its cost is included in the general budgets of the Regional Government.

- CIGPNPE: The Park Management Commission has approved an allocation of minimum € 45,000.00/year for actions related to the improvement of the capercaillie habitat. The Conservation Area will be responsible for promoting the corresponding annual expenditure proposal.

- Principality of Asturias: The annual operating costs of the Sobrescobio Breeding Center will be financed.