

**Action Plan for the Spanish Imperial Eagle  
(*Aquila adalberti*) in the European Union**



**Prepared by:**



**On behalf of the European Commission**



## **Species action plan for the Spanish Imperial Eagle *Aquila adalberti* in the European Union**

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### **International Species Working Group**

n/a

### **Reviews**

This is the first revision of the action plan since 1996 and the second review of its implementation. It should be reviewed and updated every ten years. An emergency review will be undertaken if sudden major environmental changes, liable to affect the population, occur within the species' range.

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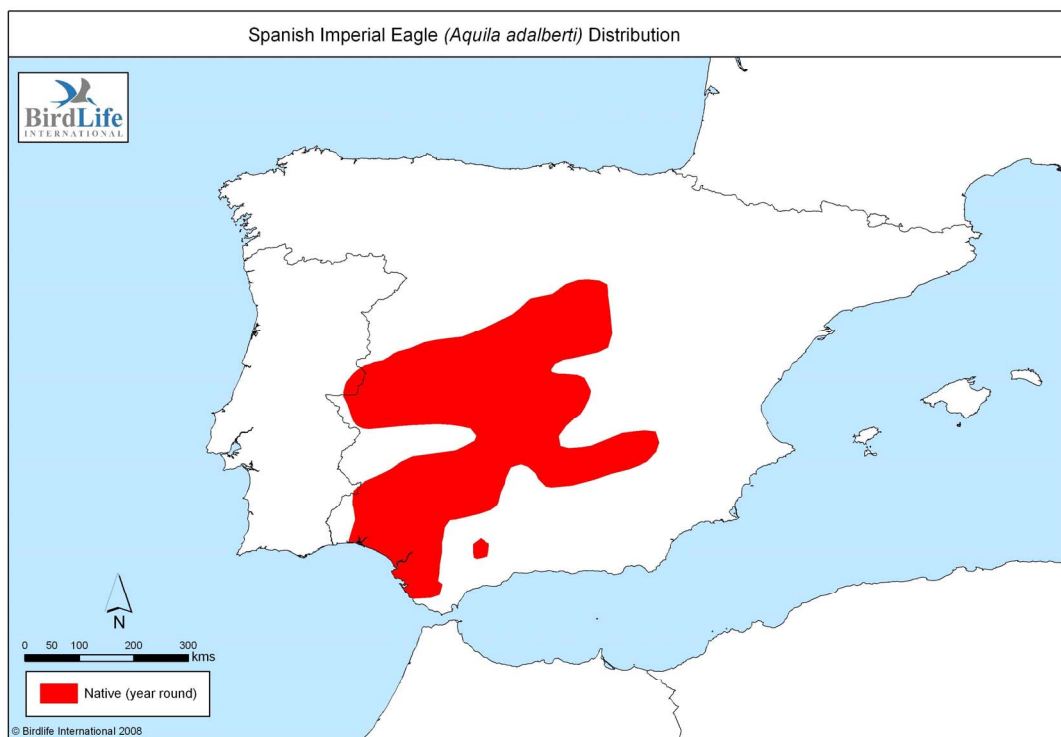
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### Geographical scope of the Action Plan

The plan covers Spain, the only country with a stable breeding population and Portugal, where a small population has recently re-established. Some recommendations for Morocco have been included although the breeding status of the species in that country has not been confirmed recently.

#### 1. Map Global distribution of the Spanish Imperial Eagle *Aquila adalberti*



**Table 1 Range states for which this Action Plan is relevant**

Resident  
*Spain, Portugal, Morocco*



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## 0 - EXECUTIVE SUMMARY

The Spanish Imperial Eagle *Aquila adalberti* is one of the rarest birds of prey in the world and is endemic to the west Mediterranean region.

Due to its small population it is currently classified as Vulnerable in the IUCN Red List (BirdLife International, 2008; IUCN, 2008). Its European threat status is SPEC1 and Endangered (BirdLife International, 2004).

In Spain it is classified as Endangered in the National Red Data Book (Madroño, A., González, C. & Atienza, J. C. 2004) and in the National Catalogue of Threatened Species (Royal Decree 439/90). It is also listed in Annex I of the EU Wild Birds Directive and in the Habitats Directive, and in Appendix II of the Bern Convention, the Bonn Convention and CITES. In Portugal it is classified as Critically Endangered according to the National Red Data Book (Cabral *et al.* 2005).

Since 1986, an intensive species conservation programme has been underway with the participation of DGN (Directorate-General for Nature Conservation) and the regional governments of Andalusia, Castilla-La Mancha, Castilla y León, Extremadura and Madrid. There is a National Strategy for the Conservation of the Spanish Imperial Eagle approved in 2001 and three regional recovery plans (in Castilla-La Mancha, Castilla y León & Extremadura). Since 1992, the species conservation programme has received financial support from the European Union within the framework of the LIFE programme.

The current population numbers 235 breeding pairs in Spain and in Portugal. Dispersing or nomadic juveniles regularly appear in Morocco. In Morocco it has disappeared as a breeding species (Bergier, 1987).

The goal of this action plan is the restoration of the population of the Spanish Imperial Eagle to a favourable conservation status.

The objective to be achieved by 2018 is to remove the Spanish Imperial Eagle from the list of globally threatened species. The target for such down listing is to ensure a stable or increasing population of at least 1000 mature individuals.

The following results must be achieved to underpin this objective:

1. The current recovery of the population continues with the same or higher rate.
  - Improved habitat quality and increased habitat availability.
  - Improved food availability for the species throughout the year.
  - Increased annual productivity of the breeding population.
2. Human-induced mortality is reduced significantly as evidenced by regional monitoring programmes.

- Reduced number of deaths from electrocution.
- Reduced mortality due to poisoning.
- Increased level of information and awareness among the public.

### **Priority actions**

- Protect the eagle's habitats through the natural resource management plans.
- Strengthen the implementation of environmental impact assessment in view of Spanish Imperial Eagle habitats in the nesting, dispersal and re-colonisation areas
- Establish agreements with private landowners and provide advise on habitat management; include non-monetary compensation and improvements for properties that cooperate in protecting the species
- Maintain a suitable area of protected habitat for the species – including nesting, dispersal and re-colonisation areas.
- Include in the network of protected natural areas all known nesting sites and draw up natural resource management plans in accordance with Law 42/2007.
- Establish suitable conservation regimes and implement natural resource management (Law 4/89) in the juvenile dispersal and re-colonisation areas.
- Carry out regular inventory and mapping of breeding, dispersal areas and re-colonisation areas.
- Study the ecology of juvenile dispersal.
- Restrict quarrying and rural activities near nests.
- Eliminate human disturbance in the nest area during the breeding season.
- Provide supplementary feeding when appropriate.
- Rehabilitate and return fallen chicks to the wild.
- Carry out annual monitoring of the breeding population.
- Increase rabbit populations through active management (e.g. protection or restoration of favourable microhabitats and epizootic surveillance).
- Improve the scientific basis and quality of technical plans for management of hunting grounds including a formal commitment to conserve the eagles.
- Identification of cost effective techniques and methods for rabbit recovery.

## 1 - BIOLOGICAL ASSESSMENT

### Taxonomy and bio geographic populations

Class: Aves

Order: Accipitriformes

Family: Accipitridae

Genus: *Aquila*

Species: *adalberti* (Brehm, 1861)

The Spanish Imperial Eagle *Aquila adalberti* is a monotypic species endemic to the Western Mediterranean and breeding only in Europe where its entire range is restricted to the Iberian peninsula.

### Distribution throughout the annual cycle

A sedentary and territorial species, adult pairs occupy their territories year-round and they defend them from intrusion by other raptors.

The current range of the species is estimated at 117,000 km<sup>2</sup> (BirdLife, 2008) confined to the southwestern quadrant of the Iberian Peninsula (Spain and Portugal) and is composed of five subpopulations:

- *Northern* (Guadarrama, Gredos and Tiétar Valley);
- *Central* (Montes de Toledo, Sierra de Guadalupe, Sierra de Almadén and Valley of Guadiana);
- *Western* (Sierra de San Pedro, Sierra de Coria and Monfragüe-Trujillo and Tejo Internacional),
- *Southern* (Sierras in the south of Badajoz, Eastern Sierra Morena, Sierra Morena of Córdoba and Sierra Morena of Córdoba-Sevilla);
- *Doñana* (Guadalquivir marshlands and Coto de Doñana nucleus) and Algarve-Alentejo in Portugal.

After leaving the nest territory, juveniles disperse to temporary staging areas, which are located within the breeding range (González et al, 2008).

During dispersal, the young tend to concentrate in a few specific localities with an extraordinary abundance of rabbits, moving between the various sites. These focal areas are very important for the survival of the species and generally coincide with areas that suffer a great degree of human exploitation and where the presence of electrical power lines is high, and that's why young eagles are more likely to die electrocuted than adults.

### Habitat requirements

The Spanish Imperial Eagle uses a great variety of landscapes: alluvial plains and dunes in the Guadalquivir marshes, plains and hills in central Spain and high mountain slopes in the

Sistema Central (González, 1991). However, the majority of breeding birds inhabit plains and mountain ranges with patches of Mediterranean forest and *dehesa* (González et al, 1990).

Previously widespread, the species retreated to the mountainous forest areas during the time of population decrease, possibly due to persecution. In recent years, coinciding with the species' recovery, the number of nests in plains and river valleys has increased and many recently colonised territories are in marginal areas that are not very suitable (González et al. 2008).

Nesting is generally in trees that stand out in the landscape, most frequently using cork oak *Quercus suber* and stone pine *Pinus pinea* as nesting trees. A few nests in electricity pylons have also been recorded (González 1991). Nests tend to be located in areas where access is difficult: abrupt relief, away from roads, tracks, towns and power lines. However, new territories appear mainly in low quality habitats on the periphery of the breeding nuclei (González et al. 2008). In Portugal, nesting occurs mainly in *Pinus pinaster*, *Quercus rotundifolia*, *Pinus halepensis* and Eucalyptus trees (Nunes et al. 2008)

The size of the breeding areas seems to vary depending on the quality of habitat, represented by the abundance of rabbits and the absence of humans. The median home range size of eight individuals provided with transmitter was 28,008 ha during the breeding period and 10,504 ha in the non-breeding season. The median size of the core area was between 4,115 ha in the breeding period and 1,989 ha in the non-breeding period and home range size varied with rabbit density: the lower the rabbit density, the larger the home range size (Fernández et al. in press).

The rabbit is the main prey of Spanish Imperial Eagle both in the breeding and non-breeding season, followed by pigeons and partridges. Variations in the diet detected among regions suggest that when rabbit is scarce, eagles shift to alternative prey such as pigeons or carrion. In Doñana, the most important prey items apart from rabbits are aquatic birds.

### **Survival and productivity**

The Spanish Imperial Eagle is a long-lived raptor with a maximum lifespan of 31 years (González, 2008). The estimated generation length is 16.4 years (Ferrer & Calderón, 1990).

The average age at first breeding is 4.5 years and the earliest known age of breeding is two years (González et al. 2006c). Clutches are laid from the beginning of February to the beginning of May, mainly concentrated in the month of March. Incubation period varies from 39 to 42 days. Juveniles leave their natal area once the post-fledging period has ended, generally at 69–83 days old, and remain 3–6 weeks in a small area near the nest, dependent on their parents to provide food. Parental negligence and aggression determine the move to independence and the start of juvenile dispersal. Once independent, the juveniles leave the area in which they were reared and make ever-greater dispersal movements.

Clutch size varies from one to four eggs, average 2.2 eggs per pair. Average productivity was estimated to be 1.23 chicks per territory (Margalida et al. 2007).

Of the total number of birds that attempted to breed, 83 % bred successfully. More frequent causes of failure were nest collapse and human disturbance, sibling aggression, disease and malnutrition. Cainism (aggression between siblings) is common in Spanish Imperial Eagles and frequently leads to the death of the youngest chick.

Numbers of rabbits *Oryctolagus cuniculus* and the age of the paired birds are the factors that most affect breeding success. Success is greater in areas with more rabbits, and in adult pairs compared with sub adults. The degree of human activity and influence in the nesting territories and the associated disturbance may affect breeding performance. A decrease in breeding success has been noted with increasing proximity to roads and people.

An increase in non-adult breeders in parallel with the population growth has been detected. The pairs formed by two adults have a significantly higher proportion of breeding attempts and the size of clutches and broods are significantly larger (Margalida et al. 2007).

### **Population size and trend**

The breeding population of the Spanish Imperial Eagle experienced an almost constant growth between 1974 and 2004, rising from 38 to 198 breeding pairs, with an average growth rate of 5.4 pairs/year (Ortega et al. *in press*). In 2007 there were 232 breeding pairs in Spain and three in Portugal.

In the 1970s, only around 30 pairs remained, but recovery began in the early 1980s at a rate of five new breeding pairs per year up to 1994. Since 1994, the population again started to decline from 148 pairs to 131 pairs in 1998, and breeding success in important areas such as the Guadalquivir marshes declined dramatically in the late 1990s. The estimated population size has increased annually in Spain since 2000, and the species has recently re-colonised Portugal. Some of these increases can be attributed to more thorough searches within its range, but it seems that the spectacular increase of the species breeding population during the last two decades is probably related to an increase in adult survival (Ortega et al. *in press*), which can to a certain extent be attributed to successful conservation actions addressing key threats.

**Table 2 Population size and trend by country**

Country	Breeding No. (pairs)	Quality	Year(s) of the estimate	Breeding Population trend in the last 10 years (or 3 generations)	Quality	Maximum size of migrating or non breeding populations in the last 10 years (or 3 generations)	Quality	Year(s) of the estimate
Spain	232	Good	2007	Large increase	Good	n/a		
Portugal	3	Medium	2007	New breeding	Good	n/a		
<b>Totals</b>	<b>235</b>							

## **2 - THREATS**

### **General overview of threats**

The greatest population decline of the Spanish Imperial Eagle must have taken place at the end of the 19<sup>th</sup> century, probably due to the use of poison and shooting for the elimination of predators and also due to the demand for specimens by museums. During the 20<sup>th</sup> century, persecution of the Spanish Imperial Eagle continued with officially established incentives, until it became legally protected in 1973. Throughout most of the 20<sup>th</sup> century and until the early 1970s, its breeding area was severely fragmented due to changes of land use, deforestation for agriculture and logging and opening of irrigation programmes. These pressures have resulted in the loss and fragmentation of Imperial Eagle habitat to four isolated areas.

Another important cause of population decline was the catastrophic drop of rabbit populations as a result of Myxomatosis (in the 1950ies) and viral haemorrhagic disease (last decade of the 20<sup>th</sup> century), which affected the breeding success.

Nowadays, the main threats for the species, apart from shortage of prey, are of human-origin, mainly electrocution in power lines and poisoning. Poisoning is thought to be the primary cause of declines in the late 1990s. Between 1989-2004, 74 birds were found dead from this cause and 115 from electrocution. Juveniles become victims more often and an increase in electrocution cases in the last few years was reported.

In recent years, changes in management of sport-hunting estates to favour larger quarry species (deer and wild boar instead of rabbits and partridges), urban development, wind farms and solar plants are causing habitat loss.

A revised list of threats was assessed and evaluated in 2008 at an expert workshop. To a large extent the already well known threats were confirmed. Some new aspects in their prioritization and understanding of their effects on the population were added.

### **List of critical and important threats**

#### **1. Habitat loss/degradation (human induced)**

##### **1.1. Shortage of key prey species**

Myxomatosis is a viral disease that has caused massive falls in rabbit numbers throughout Spain since 1957 and has had catastrophic consequences for the Spanish Imperial Eagle, which had to change its diet. In places where substitute prey existed, such as Doñana, the eagles shifted diet to aquatic birds instead of rabbits. There are no data for the rest of Spain, but it is thought that many pairs stopped breeding when

suddenly deprived of their main food item while not having access to any abundant substitute prey.

Rabbit haemorrhagic disease (RHD) arrived in the Spanish Imperial Eagle's distribution range in 1989 and affected most of the breeding areas from 1991 onwards (Margalida *et al.* 2007), causing high mortality. This, added to the existing myxomatosis, has brought about a very big drop in rabbit numbers over wide areas where the Spanish Imperial Eagle is found. Although no accurate large scale data is available on the magnitude of the rabbit decline, studies in Doñana and Navarra indicate a decrease of ca. 80%. The reduction in the percentage of high quality territories in the last three censuses could be related to the drastic rabbit population decrease in Spain provoked by RHD (González *et al.* 2008).

In territories occupied by adults, habitat quality in terms of the abundance of rabbits, had a significant effect on productivity, breeding success or fledging rates (Margalida *et al.* 2007).

### **Importance: critical**

#### 1.2. Habitat alterations

The species needs habitat with considerable tree cover in order to breed and the number of birds depends on the extent of woodland and the presence of rabbits.

In the past most of the habitat alterations to the species were caused by deforestation and opening of new arable areas for irrigation farming.

In recent years, most important habitat alterations are caused by infrastructures such as urbanizations, highways, roads, electrical power lines, wind farms, dams, forest tracks, etc. The fragmentation of the habitats that follows such developments increases the exposure to human disturbance, which negatively affects the species.

Although the negative impact of many major projects in critical areas for the species have been avoided thanks to Environmental Impact Assessment, the experience gained during the past years shows that the potential negative impacts on dispersal and re-colonization areas are not adequately evaluated. In many cases evaluations are not correctly done (for example, fragmentation of projects), so the evaluation procedures do not always guarantee the protection of the species.

### **Importance: high**

## **2. Direct mortality**

### 2.1. Electrocutation

Electrocutation is the primary cause of non-natural mortality for the Spanish Imperial

Eagle recently, causing 50% of deaths according to recent studies (González et al. 2007). Between 1989 and 2004, 115 birds were found electrocuted and nearly 60% of them were below breeding age.

During the period 1995-2001 there was a drop in mortality by electrocution, clearly associated with the bird safety corrections on power lines carried out by the Autonomous Communities and the Environment Ministry in the framework of several LIFE Projects. However, an increase in the number of cases of electrocution associated with inadequate safety correction measures has also been recorded. For example eight cases of mortality occurred because the insulating tape had worn away (González et al. 2007).

Lines near roads and tracks cause far fewer deaths than those sited away from them, probably because they are avoided. A strong positive correlation was found between the number of rabbits near a power line and the number of eagles electrocuted there. The greatest number of deaths by electrocution are among juveniles because (1) their greater difficulty in perching due to lack of flying experience, (2) lower selectivity in their choice of perch, and (3) more frequent use of populated areas.

In Portugal, electrocution might be a risk for the species in several places, although so far it has not been confirmed. Due to the very low abundance of the species in Portugal, the probability of discovering any collision casualties is low.

**Importance: critical**

## 2.2. Poisoning

The second most important cause of death in the Spanish Imperial Eagle at present is poisoning. Between 1989-2004, at least 74 birds died from poisoning (González et al. 2007). Poisoning cases occur in areas with intensive game breeding which are mostly flat and open.

In recent years, deaths by poisoning have risen considerably, not only among the Spanish Imperial Eagle but also among other raptors. It seems obvious that there is an increase in the use of poisons to control predators in the countryside. Moreover, problems of attacks on livestock by carrion-breeding species provoked by the reduction of food availability in the wild have caused raise in the use of poison for livestock protection. The death of several Spanish Imperial Eagles in recent years has been attributed to this threat.

**Importance: critical**

## 2.3. Human disturbance during breeding

Every year a certain number of breeding failures are recorded due to disturbance by people near the nest. Forestry work going on nearby during incubation was the most

common cause of such failures; however it is likely that many more cases must have gone undetected (Margalida et al. 2007). In a focal study involving intense monitoring of 10 nests (González et al. 2006a), human disturbance around the nests was found to be the most frequent cause of birds temporarily leaving the nest. Local studies of the Doñana eagle subpopulation (Calderón et al. 1987) suggested that human disturbance during incubation was the cause of the decrease in the hatching rate of this population during the months with the greatest rainfall due to the fast cooling of the eggs. Breeding failure in 2005 of one of the two breeding pairs in Portugal at the time was also caused by direct disturbance caused by forest works during incubation.

**Importance: medium**

#### 2.4. Illegal shooting

Only 6.6% of 267 birds found dead and/or injured from 1989-2004 were shot (González et al. 2007). However, a higher proportion of cases of death by shooting in radio-tagged individuals was registered, which may indicate that deliberate persecution with shotguns could be more frequent than what data reflect. The exact magnitude of this threat could not be evaluated due insufficient data.

**Importance: unknown**

#### 2.5. Chemical contamination

Infertile Spanish Imperial Eagle eggs that have been analysed to date contain a wide range of chemical pollutants, but especially heavy metals (copper, zinc, mercury, lead and cadmium) and organochlorine compounds (DDT, DDE, aldrin, heptachlor and PCBs). Comparison of eggshells from the last century with recent ones, and fertile and infertile eggs, revealed that shell thickness has decreased by 12.6% in the first comparison and the degree of shell crystallisation has decreased in both. This is associated with the presence of abnormal quantities of chlorine, potassium, magnesium and copper, and the increase in the percentage of phosphorous and sulphur in the shells of recent eggs. A big increase in the amount of phosphorous in the egg contents and a deficiency in the degree of crystallisation in infertile eggs was also detected. These results explain why the shells of contaminated eggs are more fragile and breakable, and there are more often malformations that make the eggs unviable.

A recently published study on the influence of contamination by pollutants based on eggs collected between 1972 and 2003 concluded that contamination by organochlorines could explain at least in part the low productivity of Spanish Imperial Eagles in Doñana National Park (Hernández et al. 2008).

**Importance: low**

## 2.6. Lead intoxication

Lead pellets have been found often in the digestive systems of raptors that feed on aquatic birds.

A study on lead poisoning in wild birds from southern Spain (Mateo et al. 2007) lead shot was detected in 2.8% of the pellets of the Spanish Imperial Eagle which specialize on hunting geese. It was found that the prevalence of ingested Pb shot in geese and in Spanish Imperial Eagles has significantly decreased in recent years (from 11% to 3%), possibly due to restrictions on hunting activity, efforts to remove shot from a sand dune used by geese to obtain grit, and to the high rainfall in Doñana during the last years that permitted waterfowl to stay more within the protected areas, away from shooting.

**Importance: low**

## 2.7. Nest robbery

Nest robbery has been the cause of breeding failure in 8.2% of cases in a long-term study of the breeding biology of the Spanish Imperial Eagle (Margalida et al. 2007). Between 1988-2007, 11 chicks were robbed in 7 monitored nests. It is considered however that this threat is decreasing.

**Importance: low**

## 2.8. Nest collapse

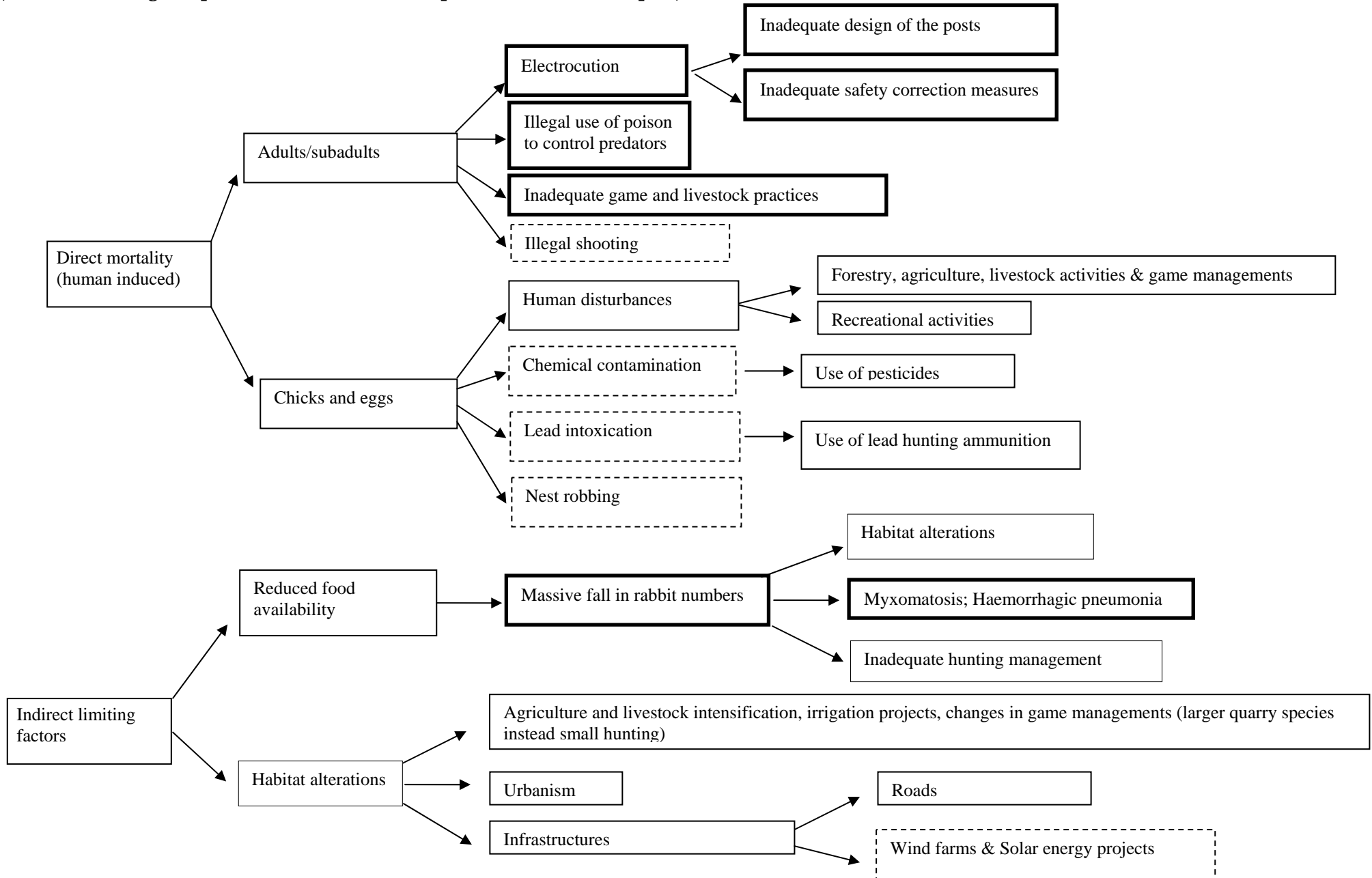
One of the main known causes of breeding failure during incubation and chick rearing is nest collapse. Some pairs that seek to nest in the highest branches, or use unstable branches simply because they are the only ones available, select flimsy trees such as *Eucalyptus* and poplar *Populus* in which their nests easily overturn or collapse in high winds. The collapse of the whole or part of a nest has been the cause of breeding failure in 34.7 % of cases in 17 years study on the breeding biology of the Spanish Imperial Eagle (Margalida et al. 2007). Nest collapse was the cause of breeding failure of one of the three breeding pairs in Portugal in 2007.

Although it appears to be the most important known cause of breeding failure, it might be overestimated because this cause is easier to detect than others (Margalida et al. 2007).

**Importance: low**

**Problem Tree**

(solid frame - high impact; normal - medium impact; dashed - low impact)



## **Population Viability Analysis (PVA)**

Nowadays there are two different models of population viability analyses, which are contradictory. One of them (Madero & Ferrer, 2002), predicts that the Spanish Imperial Eagle will become extinct within less than 200 years.

The other one (Ortega, et al. *in press*) gained better acceptance by scientific community and predicts no probability of extinction if there are no changes in the actual demographic parameters. For the construction of this demographic model, spatial and temporal variation of the demographic parameters of the 95% of the population for the period 1981-2004 was analysed. Considering the demographic parameters corresponding to the period 2000-2004, the probability of extinction for the whole population studied in the next 50 and 100 years (2054 and 2104) was estimated as nil. It was also nil for all the subpopulations when considered alone, except for the North. All of them experience a progressive population increase in this period, while the North subpopulation would experience a progressive drop. In this case, the probability of extinction is also nil in 50 years, but increases to 25% in 60 years and to 100% in 100 years.

### 3 - POLICIES AND LEGISLATION RELEVANT FOR MANAGEMENT.

#### International conservation and legal status of the species

The Spanish Imperial Eagle benefits from complete legal protection in Spain and Portugal.

Global status <sup>1</sup>	European status <sup>2</sup>	SPEC category <sup>2</sup>	EU Bird Directive Annex <sup>3</sup>	Bern Convention Annex <sup>4</sup>	Bonn Convention Annex <sup>5</sup>	Regulation (CE) 338/97 CITES
Vulnerable	Endangered	SPEC 1	Annex I	Annex II	Annex I	Annex I

<sup>1</sup> IUCN Red List, 2007.

<sup>2</sup> BirdLife International (2004) *Birds in Europe: population estimates, trends and conservation status. Second edition.* Wageningen, The Netherlands: BirdLife International. (BirdLife Conservation Series No. 12).

<sup>3</sup> The species shall be subjected to special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution.

<sup>4</sup> Give special attention to the protection of areas that are of importance (Article 4) and ensure the special protection of the species (Article 6). For more details see the Convention text.

<sup>5</sup> Species that have been categorized as being in danger of extinction throughout all or a significant proportion of their range. States strive towards strictly protecting these animals, conserving or restoring the habitats in which they live, mitigating obstacles to migration and controlling other factors that might endanger them.

#### International legislation and policies

##### EU Birds Directive (Council of Europe, 1979b)

Category: Annex I

EU Council Directive on the Conservation of Wild Birds (79/409/EEC, 'Birds Directive')

Aim: to protect wild birds and their habitats, e.g. through the designation of Special Protection Areas (SPA). This appendix incorporates all amendments to the Annexes of the Council Directive up to 23 September 2003. *Annex I* - The directive requires that species listed in Annex I 'shall be subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution' and that 'Member States shall classify in particular the most suitable territories in number and size as special protection areas for the conservation of these species, taking into account their protection requirements in the geographical sea and land area where this Directive applies'.

**Bern Convention** (Council of Europe, 1979a)

Category: Appendix II

Aim: to maintain populations of wild flora and fauna with particular emphasis on endangered and vulnerable species, including migratory species. Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II.

**Bonn Convention - Convention on the Conservation of Migratory Species of Wild Animals** (CMS, 1979)

Category: Appendix II

Aim: Appendix II refers to migratory species that have an unfavourable conservation status or would benefit significantly from international co-operation organised by tailored agreements. The Convention encourages the Range States to conclude global or regional Agreements for the conservation and management of individual species or, more often, of a group of species listed in Appendix II.

**Regulation (CE) 338/97 CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora**

Category: Appendix I

Aim: Appendix I lists species that are threatened with extinction and CITES prohibits international trade in specimens of these species except when the purpose of the import is not commercial, for instance for scientific research.

The species is affected by the European policies on agriculture. The CAP Pillar II measures related to sustainable land management (LFA payments, agri-environmental measures and support for diversification of economic activities in rural areas and forestry) can play a key role in addressing the threats affecting the species habitats, their availability and quality.

The significant increase in renewable energy projects promoted by EU policies, as wind farms and solar energy projects has lead to increase the destruction of habitat available for the species. Infrastructure development planning and impact assessment is another policy area affecting the species and its habitats.

**National legislation and policies**

**1. Spain**

- National Catalogue of Threatened Species (Royal Decree 439/1990).
- National Strategy for the Conservation of Spanish Imperial Eagle.
- Law 42/2007 on Natural Heritage and Biodiversity.
- National Red Data Book (Madroño, et al. 2004).
- Royal Decree 1432/2008 for the protection of birds from power lines.

- National Strategy on the illegal use of poison in the natural environment.

On regional level:

#### **Andalusia**

- Law 8/2003, of Animals and Plants in Andalusia.
- Andalusian Strategy on Biodiversity.
- Strategy for the eradication of the illegal use of poison in Andalusia.
- Decree 194/90 for the protection of birds from power lines in Andalusia.

#### **Castilla-La Mancha**

- Recovery Plan for the Spanish Imperial Eagle in Castilla-La Mancha (Decree 275/2005).
- Ley 9/1999, de 26 de mayo, de conservación de la naturaleza en Castilla-La Mancha.
- Regional Plan on the illegal use of poison in the natural environment in Castilla-La Mancha (Order 02-08-05).
- Decree 2/1999 for the protection of birds from power lines in Castilla-La Mancha.

#### **Castilla y León**

- Recovery Plan for the Spanish Imperial Eagle in Castilla y León (Decree 114/2003).

#### **Extremadura**

- Recovery Plan for the Spanish Imperial Eagle in Extremadura (Order 06-06-05).
- Law 8/1998 on Nature Conservation and protected areas in Extremadura.
- Decree 73/1996 for the protection of birds from power lines in Extremadura.

#### **Madrid**

- Law 2/91 on the protection of wildlife in the Madrid Region.
- Decree 40/1998 for the protection of birds from power lines in Madrid.

## **2. Portugal**

- National Strategy for Nature and Biodiversity Conservation (Resolution of Council of Ministers n.º 152/2001).
- Decreto-Lei n.º 142/2008, which establishes the legal regime of nature and biodiversity conservation.
- National Red Data Book (Cabral et al. 2005)

In 2008, the Regional planning on Rural Development for 2007-2013 was approved. Only the programmes of Castilla-La Mancha and Extremadura have specific measures for the Spanish Imperial Eagle. In Castilla-La Mancha there are measures to support the recovery of endangered species through the construction of beetle banks in the breeding, dispersal and important zones of the Recovery Plan of the species. The Rural Development Programme in Extremadura establishes annual financial grants to enterprises situated in Natura 2000 or protected areas or priority habitat to pay for measures for improvement of the conditions for endangered species or their prey and for direct conservation measures as the correction of electro pylons.

The Programme for Andalusia establishes grants for non productive investments as the elimination of obstacles (e.g. fencing) for the fauna.

In Castilla y León Programme the Spanish Imperial Eagle is used as an indicator of the inversion of the tendency of biodiversity loss, but it doesn't establish specific measures for conservation of the species. However, the Forestry Plan of this region considers the promotion of forest-environmental schemes in relation with the conservation of endangered species.

The Madrid Programme provides financing of some general measures which contribute to conservation of biodiversity such as the environmental fallows.

In Portugal, the natural protected areas develop specific land planning measures (Parque Natural do Tejo Internacional) and as well as management plans (Parque Natural do Vale do Guadiana) which include measures to promote protection of the breeding sites and / or feeding grounds. Some specific forestry and agriculture schemes for two Special Protected Areas where the imperial eagle breeds (Tejo Internacional and Castro Verde) under the National Rural Development Programme include some measures and incentives that favour indirectly the breeding and feeding habitats of big raptors (promotion of key prey species and holm oak plantation, for example). These measures are still in an early phase.

### **Recent conservation measures**

Since 1987 the Ministry of Environment and the Madrid, Castilla y León, Castilla-La Mancha, Extremadura and Andalusia Regional Governments have been carrying out a Coordinated Plan of Action for Imperial Eagle Conservation which provides for monitoring of the nesting population, identification of limiting factors and causes of mortality, promotion of measures to improve the status of the species and coordination of the bodies and groups involved in its study and conservation. In 2001, a National Strategy for the Conservation of the Spanish Imperial Eagle was approved in Spain.

A Working Group for the Spanish Imperial Eagle has been operating since 1994. It has elaborated annual summaries for the distribution and census of the species,

assessment of conservation problems, evaluation of the results of conservation actions undertaken and the level of implementation of the National Strategy.

Since 2007, there is also a Portuguese working group that coordinates monitoring, conservation and management actions in Portugal and it represents Portugal in the Working Group for the Spanish Imperial Eagle, based in Spain.

## **4 - FRAMEWORK FOR ACTION**

### **Goal**

The goal of this action plan is to restore the population of the Spanish Imperial Eagle to a favourable conservation status.

### **Objectives of the plan**

The objectives of the action plan are to remove the Spanish Imperial Eagle from the IUCN list of globally threatened species in 10 years. The target for such down listing is to ensure a stable or increasing population of at least 1000 mature individuals.

The following results must underpin this objective

### **Results**

- 1. The current recovery of the population continues with the same or higher rate.**
  - 1.1. Improved habitat quality and increased habitat availability.
  - 1.2. Increased annual productivity of the breeding population.
  - 1.3. Improved food availability for the species throughout the year.
  
- 2. Human-induced mortality is reduced significantly as evidenced by regional monitoring programmes.**
  - 2.1. Reduced number of deaths from electrocution.
  - 2.2. Reduced mortality due to poisoning.
  - 2.3. Increased level of information and awareness among the public.

## Actions

**Table 3** Actions corresponding to the results and ranked according to their importance, following from the problem tree.

<i>Objective:</i> Increase the population of the species to at least 1000 mature individuals				
<i>Result</i>	<i>Action</i>	<i>Priority</i>	<i>Time scale</i>	<i>Organisations responsible</i>
1.1. Improve habitat quality and availability.	1.1.1. The habitat requirements of the Spanish Imperial Eagle should be included in management and utilisation plans for natural protected areas, forestry and agriculture, in management plans for protected areas, public utility land or countryside administered by the state, and in the natural resource management plans.	High	Ongoing	National and regional environmental public administrations, protected areas managers
	1.1.2. Promote the regeneration of forest cover with native species, especially Holm oak, cork Oak and stone pine, within the eagle's distributional range where the local ecology, soil and climate are suitable.	Medium	Ongoing	National and regional environmental public administrations, protected areas managers
	1.1.3. Prepare an environmental impact assessment for any work or project that might alter or have a negative effect on the Spanish Imperial Eagle or its habitat in the nesting, dispersal and re-colonisation areas	High	Ongoing	Public administrations
	1.1.4. Establish agreements with private landowners on whose land the Spanish Imperial Eagle occurs in order to advise on habitat management; include non-monetary compensation and improvements for properties that cooperate in protecting the species	High	Ongoing	Public administrations, NGOs, private owners

1.1. Improve habitat quality and availability (continued)	1.1.5. Maintain a suitable area of protected habitat for the species - including nesting, dispersal and re-colonisation areas - in order to improve the quality of the habitat through appropriate management	High	Ongoing	National and regional administrations
	1.1.6. Include in the network of protected natural areas all known nesting sites and draw up natural resource management plans in accordance with Law 42/2007.	High	Medium	Regional and national administrations, protected areas managers
	1.1.7. Establish suitable conservation regimes and implement natural resource management (Law 4/89) in the juvenile dispersal and re-colonisation areas.	High	Short	Regional and national administrations, protected areas managers
	1.1.8. Inventory and mapping of breeding areas and dispersal areas and regularly updated	High	Ongoing	Regional and national administrations
	1.1.9. Inventory and mapping of potential re-colonisation areas	High	Ongoing	Public administrations, research institutes, scientists, NGOs
	1.1.10. Research the use of space and energy budget of breeding adults	Medium	Ongoing	Public administrations, research institutes, scientists, NGOs
	1.1.11. Study the ecology of juvenile dispersal	High	Ongoing	Public administrations, research institutes, scientists, NGOs
	1.1.12. Evaluation of population regulating factors and minimum viable population	Medium	Completed	Scientists
1.2. Increase of annual productivity.	1.2.1. Restrict quarrying and rural activities near nests	High	Ongoing	Regional and national administrations and protected area managers
	1.2.2. Eliminate human disturbance in the breeding season	High	Ongoing	Regional administrations, protected areas managers
	1.2.3. Provide supplementary feeding when appropriate	High	Ongoing	Regional administrations, protected areas managers
	1.2.4. Reduce chick mortality by active management	Medium	Ongoing	Regional administrations, protected areas managers

1.2. Increase of annual productivity (continued)	1.2.5. Return chicks to the wild	High	Ongoing	Regional administrations
	1.2.6. Reinforce and prop-up precarious nests	Medium	Ongoing	Regional administrations, protected areas managers
	1.2.7. Install artificial nests	Low	Ongoing	Regional and national administrations, protected areas managers
	1.2.8. Captive breeding programme	Low	Ongoing	National and regional administrations
	1.2.9. Carrying out of annual surveys of the breeding population	High	Ongoing	Regional and national administration, NGOs
	1.2.10. Monitoring of breeding pairs during breeding period	High	Ongoing	Regional and national administrations
	1.2.11. Tracking and monitoring of individuals	Medium	Ongoing	Public administrations
	1.2.12. Monitoring of chemical pollutants in eggs	Medium	Ongoing	Public administrations, research institutes, scientists
	1.2.13. Monitoring of effect of supplementary feeding	Medium	Ongoing	Public administrations, research institutes, scientists
1.3. Improve food availability for the species throughout the year.	1.3.1. Increase rabbit populations through active management (e.g. protection or restoration of micro habitats and epizootic surveillance).	High	Ongoing	Public administrations, NGOs, landowners
	1.3.2. Scientifically correct technical plans for hunting exploitation which include the species nesting and dispersal areas required. These plans must include a section about the protected species, expressing a formal commitment to conserve them	High	Ongoing	Public administrations, landowners
	1.3.3. Establish, where necessary, spatial and temporal restrictions on rabbit hunting	Medium	Ongoing	Regional and national administrations
	1.3.4. Identification of cost effective techniques and methods for rabbit recovery	High	Ongoing	Public administrations, research institutes, landowners

<i>Objective:</i> Increase the population of the species to at least 1000 mature individuals				
2.1. Reduce the number of deaths from electrocution.	2.1.1. Modify technical regulations concerning the installation of high-voltage power lines	High	Completed	Public administrations
	2.1.2. Avoided the construction of new power lines in breeding, dispersal and re-colonisation zones	High	Short	Public administrations
	2.1.3. Location, description and upgrading of power lines those are potentially dangerous or have been proved to cause deaths	Essential	Ongoing	Public administrations, electric enterprises
	2.1.4. Apply corrective measures to pylons	Essential	Ongoing	Public administrations, electric enterprises
	2.1.5. Design of harmless electricity pylons	Essential	Ongoing	Public administrations, electric enterprises, research institutes
	2.1.6. Monitoring of efficiency of modified power lines	Essential	Ongoing	Public administrations, electric enterprises
2.2. Reduce mortality due to illegal shooting and poisoning.	2.2.1. Strict application of hunting legislation, applying sanctions with those who kill eagles	High	Ongoing	Regional authorities and national, judges
	2.2.2. According the hunting laws withdraw the game licence in game reserves when is proved that poison has been put down	High	Ongoing	Regional authorities
	2.2.3. Surveillance in hunting reserves and specialization of equipments	High	Ongoing	Regional authorities
	2.2.4. Control of substances used as poison	High	Short	Regional authorities
	2.2.5. Monitoring of the use of poison	High	Ongoing	Regional authorities
2.3. Increase the level of information and awareness among the public.	2.3.1. Develop of awareness-raising and publicity campaigns for schoolchildren and land-users	Medium	Ongoing	National and regional authorities, NGOs
	2.3.2. Prepare educational materials	Medium	Ongoing	National and regional authorities, NGOs
	2.3.3. Production and use of a travelling exposition	Medium	Ongoing	National and regional authorities, NGOs

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ANNEX 1

Threats importance at population/group of countries level

Type of threat		Spain	Portugal
<b>1. Habitat loss/degradation (human induced)</b>		<i>Threat score</i>	<i>Threat score</i>
	1.1. Reduced food availability by rabbit diseases and inadequate land management	High	High
	1.2. Habitat alterations by urbanism, infrastructures, etc.	High	Medium
<b>2. Direct mortality</b>			
	2.1. Electrocution	Critical	Critical
	2.2. Poisoning	Critical	Critical
	2.3. Human disturbance during breeding	High	Medium
	2.4. Illegal shooting	High	Unknown
	2.5. Chemical contamination	Low	Low
	2.6. Lead intoxication	Low	Low
	2.7. Nest robbing	Medium	Low
	2.8. Nest collapse	Low	Low

ANNEX 2

Important Bird Areas for the species and their status

Country	IBA Code	IBA Site name	IBA size (km <sup>2</sup> )	SPA Code	SPA Site Name	SPA Area (km <sup>2</sup> )	SPA are within IBA (km <sup>2</sup> )	% Overlap	
<b>Portugal</b>	PT027	Mourão, Moura e Barrancos	896.32	PTZPE0045	Mourão/Moura/Barrancos	849.16			
	PT029	Castro Verde	835.72	PTZPE0046	Castro Verde	853.45			
				PTZPE0047	Vale Do Gadiana	765.71	0.03	0.00	
<b>Spain</b>	ES056	Umbría de Guadarrama	652.62	ES0000010	Sierra De Guadarrama	691.3	461.0	70.64	
				ES0000057	Alto Lozoya	78.7	0.2	0.04	
				ES0000188	Valles Del Voltoya Y El Zorita	494.0	155.9	23.89	
		ES067	Sierras de Gredos y Candelario	1741.49	ES0000184	Valle Del Tiétar	641.3	0.0	0
				ES0000427	Rio Y Pinares Del Tietar	98.6	3.6	0.21	
				ES4110002	Sierra De Gredos	863.6	827.9	47.54	
				ES4150006	Candelario	70.7	66.6	3.83	
		ES068	Valle del Tiétar	871.18	ES0000056	Encinares Del Río Alberche Y Río Cofio	831.9	0.9	0.1
				ES0000089	Valle Del Tietar Y Embalses De Rosarito Y Navalcan	685.5	1.9	0.22	
				ES0000116	Valle De Iruelas	86.2	2.7	0.31	
				ES0000184	Valle Del Tiétar	641.3	637.1	73.13	
				ES0000427	Rio Y Pinares Del Tietar	98.6	0.0	0	
			ES4110002	Sierra De Gredos	863.6	17.8	2.04		

Country	IBA Code	IBA Site name	IBA size (km <sup>2</sup> )	SPA Code	SPA Site Name	SPA Area (km <sup>2</sup> )	SPA are within IBA (km <sup>2</sup> )	% Overlap
	ES070	El Escorial-San Martín de Valdeiglesias	1812.11	ES0000010	Sierra De Guadarrama	691.3	0.0	0
				ES0000056	Encinares Del Río Alberche Y Río Cofio	831.9	715.5	39.49
				ES0000116	Valle De Iruelas	86.2	0.0	0
				ES0000184	Valle Del Tiétar	641.3	0.1	0
				ES0000185	Cerro De Guisando	36.5	0.2	0.01
				ES0000186	Pinares Del Bajo Alberche	502.7	204.6	11.29
				ES0000189	Campo Azálvaro-Pinares De Peguerinos	283.9	250.1	13.8
				ES0000391	Pinar De Almorox	14.9	6.0	0.33
	ES071	El Pardo-Viñuelas	354.05	ES0000011	Monte De El Pardo	153.0	148.4	41.91
				ES0000012	Soto De Viñuelas	29.8	29.5	8.33
	ES201	Embalses de Rosarito y Navalcán-La Iglesuela (Valle del Tiétar)	695.73	ES0000089	Valle Del Tietar Y Embalses De Rosarito Y Navalkan	685.5	515.0	74.02
				ES0000184	Valle Del Tiétar	641.3	1.1	0.16
				ES0000427	Rio Y Pinares Del Tietar	98.6	0.0	0.01
	ES205	Sierra de los Canalizos (Saceruela)	1,003.45	ES0000088	Sierra De Los Canalizos	257.9	252.0	25.11
	ES207	Valle y Sierra de Alcudia	2,282.69	ES0000155	Sierras De Almadén-Chillón-Guadalmez	75.1	75.0	3.29
				ES0000371	Sierra De Moraleja Y Piedra Santa	29.1	0.1	0
				ES0000397	Embalse De La Serena	159.0	0.1	0.01

Country	IBA Code	IBA Site name	IBA size (km <sup>2</sup> )	SPA Code	SPA Site Name	SPA Area (km <sup>2</sup> )	SPA are within IBA (km <sup>2</sup> )	% Overlap
				ES6130001	Sierra De Cardeña Y Montoro	384.1	0.0	0
				ES6160006	Sierras De Andujar	741.4	0.8	0.03
	ES208	Sierra Madrona-Sierra de Andújar	2,158.03	ES6130001	Sierra De Cardeña Y Montoro	384.1	382.8	17.74
				ES6160005	Despeñaperros	75.9	28.3	1.31
				ES6160006	Sierras De Andujar	741.4	689.0	31.93
	ES209	Aldeaquemada-Dañador	501.25	ES6160003	Cascada De Cimbarra	5.3	5.3	1.07
	ES235	Sierra Morena de Córdoba	1,190.89	ES0000050	Sierra De Hornachuelos	598.0	592.2	49.73
				ES0000053	Sierra Norte	1,772.6	0.5	0.04
	ES236	Sierra Morena de Sevilla	1,694.65	ES0000050	Sierra De Hornachuelos	598.0	0.6	0.03
				ES0000051	Sierra De Aracena Y Picos De Aroche	1,866.3	0.2	0.01
				ES0000053	Sierra Norte	1,772.6	1667.5	98.4
	ES252	Laguna de Medina y de Puerto Real	50.06	ES0000027	Laguna De Medina	3.6	7.0	14
				ES0000030	Complejo Endoreico De Puerto Real	8.6	17.2	34.43
				ES6120014	Laguna De Las Canteras Y El Tejon	2.0	4.0	7.98
	ES258	Lagunas de Lebrija, Las Cabezas y Espera	91.20	ES0000026	Complejo Endorreico De Espera	5.1	10.3	11.28
				ES0000275	Complejo Endorreico Lebrija-Las Cabezas	7.9	15.8	17.36
	ES259	Marismas del Guadalquivir	2,448.19	ES0000024	Doñana	1,121.6	2,228.0	91.01

Country	IBA Code	IBA Site name	IBA size (km <sup>2</sup> )	SPA Code	SPA Site Name	SPA Area (km <sup>2</sup> )	SPA are within IBA (km <sup>2</sup> )	% Overlap
				ES0000272	Brazo Del Este	13.4	26.8	1.1
	ES270	Sierras Centrales de Badajoz	892.12	ES0000072	Sierra Grande De Hornachos	121.8	121.5	13.62
				ES0000325	Campaña Sur - Embalse De Arroyo Conejos	448.9	11.9	1.34
				ES0000334	Sierras Centrales Y Embalse De Alange	165.5	27.7	3.1
	ES283	Embalse de Puerto Peña-Valdecaballeros	973.35	ES0000068	Embalse De Orellana Y Sierra De Pela	426.0	4.5	0.46
				ES0000367	La Serena Y Sierras Periféricas	1,534.7	0.1	0.01
				ES4310009	Puerto Peña - Los Golondrinos	330.3	204.2	20.98
				ES4320039	Sierra De Las Villuercas Y Valle Del Guadarranque	762.2	0.0	0
	ES291	Sierra de San Pedro	3,070.94	ES0000069	Embalse De Cornalvo Y Sierra Bermeja	131.3	0.0	0
				ES0000070	Sierra De San Pedro	1,148.2	2,296.2	74.77
				ES0000071	Llanos De Cáceres Y Sierra De Fuentes	695.8	0.1	0
				ES0000368	Rio Tajo Internacional Y Riberos	202.2	37.8	1.23
				ES0000396	Embalse De Horno-Tejero	2.6	5.3	0.17
				ES0000407	Nacimiento Del Rio Gevora	199.7	398.9	12.99

Country	IBA Code	IBA Site name	IBA size (km <sup>2</sup> )	SPA Code	SPA Site Name	SPA Area (km <sup>2</sup> )	SPA are within IBA (km <sup>2</sup> )	% Overlap
				ES0000424	Colonias De Cernicalo Primilla De San Vicente De Alcantara	0.0	0.1	0
				ES0000430	Colonias De Cernicalo Primilla De Alburquerque	0.4	0.8	0.03
	ES297	Sierras de las Villuercas	2,158.62	ES0000014	Monfragüe Y Las Dehesas Del Entorno	1,160.5	119.0	5.51
				ES0000329	Embalse De Valdecañas	74.5	9.6	0.45
				ES0000356	Riberos Del Almonte	82.7	8.3	0.39
				ES0000394	Colonias De Cernicalo Primilla De Saucedilla	0.0	0.1	0
				ES0000433	Colonias De Cernicalo Primilla De Belvis De Monroy	0.0	0.0	0
				ES4310009	Puerto Peña - Los Golondrinos	330.3	6.4	0.3
				ES4320039	Sierra De Las Villuercas Y Valle Del Guadarranque	762.2	1522.2	70.52
	ES298	Monfragüe	1,542.62	ES0000014	Monfragüe Y Las Dehesas Del Entorno	1,160.5	1,946.2	126.16
				ES0000324	Embalse De Arrocampo	6.9	13.7	0.89
				ES0000356	Riberos Del Almonte	82.7	11.0	0.71
	ES299	Embalse de Alcántara-Cuatro Lugares	1,220.12	ES0000014	Monfragüe Y Las Dehesas Del Entorno	1,160.5	218.7	17.92
				ES0000356	Riberos Del Almonte	82.7	14.0	1.15

Country	IBA Code	IBA Site name	IBA size (km <sup>2</sup> )	SPA Code	SPA Site Name	SPA Area (km <sup>2</sup> )	SPA are within IBA (km <sup>2</sup> )	% Overlap
				ES0000415	Embalse De Alcantara	76.4	152.8	12.52
				ES0000418	Embalse De Talavan	72.9	145.9	11.95
				ES0000423	Colonias De Cernicalo Primilla De Garrovillas	0.4	0.8	0.06
				ES0000426	Pinares De Garrovillas	25.7	10.9	0.89
				ES0000434	Canchos De Ramiro Y Ladronera	230.8	100.6	8.24
				ES4320001	Canchos De Ramiro	69.2	0.0	0
				PTZPE0042	Tejo Internacional, Erges E Põnsul	244.0	2.5	0.21
	ES300	Sierras de Coria	756.40	ES0000415	Embalse De Alcantara	76.4	0.0	0
				ES0000434	Canchos De Ramiro Y Ladronera	230.8	180.5	23.87
				ES4320001	Canchos De Ramiro	69.2	69.2	9.15
			<b>29,893.80</b>			<b>38,341.8</b>	<b>20,079.7</b>	<b>67.17</b>

## ANNEX 3

### National legal status

Country	Legal protection	For game species, give opening/closing dates of hunting season
<i>Spain</i>	Full	n/a
<i>Portugal</i>	Full	n/a

### Recent conservation measures

Country	Is there a national action plan for the species?	Is there a national Spanish Imperial Eagleworking group?
<i>Spain</i>	<i>Yes</i>	<i>Yes</i>
<i>Portugal</i>	<i>No</i>	<i>No</i>

### Ongoing monitoring schemes for the species

Country	Is there a national survey / monitoring programme?	Is there a monitoring programme in protected areas?
<i>Spain</i>	<i>Yes</i>	<i>Yes</i>
<i>Portugal</i>	<i>Yes</i>	<i>No</i>

### Overview of the coverage of the species in networks of sites with legal protection status

Country	Percentage of national population included in IBAs	Percentage of population included in Ramsar sites	Percentage of population included in SPAs <sup>1</sup>	Percentage of population included in protected areas under national law
<i>Spain</i>	<i>all</i>	<i>n/a</i>	<i>70%</i>	
<i>Portugal</i>	<i>all</i>	<i>n/a</i>	<i>100%</i>	

0-10% (*almost none*), 10-50% (*less than half*), 50-90% (*more than half*), 90-100% (*all*)

<sup>1</sup> This is relevant only for European Union member states. Any other regional (legal) protection should be mentioned in next column.

