Ecology and Conservation of European Forest-Dwelling Raptors

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Estudios Medioambientales Icarus S.L.

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"Vulturnet" Connectivity of the European populations of cinereous vulture: a programme to reintroduce the species into Catalonia

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http://blackvulture-pyrenees.org/

Introduction

The European distribution of cinereous vulture *(Aegypius monachus)* was reduced in the middle of the XX century to two disjointed sectors in the extreme west and east of the continent (Iberian Peninsula and the Balkan Peninsula; Heredia, 1997). Being a threatened species which follows a typical *K* strategy, with a much reduced population and singularly low demographic parameters, its natural recolonisation capacity is slow and ineffectual (Donázar, 1993). For this reason, the Catalonian government in conjunction with the Caixa Catalunya and collaboration of GREFA, the "Los Hornos" Recovery Centre and Red Eléctrica de España, are carrying out a reintroduction programme which will not only bring back to Catalonia a recently disappeared species but will also foment its gradual recolonisation of both sides of the Pyrenees following its successful reintroduction in French territory, thus contributing to the possible reconnection of both European populations.

Objectives

The main aim is to create in as short a time as possible a viable colony of cinereous vulture in the mountains of the Boumort Hunting Reserve and the Espai Natural of Alinyà. This will hopefully provide a bridgehead or demographics interchange that will encourage connections between the Iberian and French populations, accelerating the connectivity with the Balkan population.

Description of the reintroduction area

The project is being carried out in two areas of the pre-Pyrenees in Lérida: the Boumort Hunting Reserve (13,097 ha.) and the Espai Natural d'Alinyà (5,350 ha), both chosen for their potential to host colonies of cinereous vulture. The two sites are 30 km apart and half way between the Spanish and French breeding grounds of Valle del Lozoya and Cévennes (Fig. 99). Most of the area is legally protected in the form of National Hunting Reserve, Natura 2000 Network and Areas of Special Natural Interest. The climatic characteristics straddle the humid Mediterranean and subhumid EuroSiberian with Atlantic influences. The Scots pines (*Pinus sylvestris*) and black pines *(Pinus uncinata)* of the summits, with large trees clinging to steep slopes that are difficult to reach, constitute an ideal nesting site for cinereous vulture (Moreno-Opo & Guil, 2007). Such pines cover 4,150 ha in Boumort (Armet & Torras, 2005) and 2,010 ha in Alinyà (Tewes *et al.*, 2005). The area hold substancial populations of wild ungulates, including red deer *(Cervus elaphus),* wild boar *(Sus scrofa),* roe deer *(Capreolus capreolus)* and Pyrenean chamois *(Rupicapra pyrenaica),* together with large flocks of sheep and cattle herds. Due to the importance of European rabbit *(Oryctolagus cuniculus)* in the cinereous vulture diet (Donázar, 1993) and the fact that this prey shows very lo levels in the area, stops are being taken to reinforce their numbers in Alinyà and soon will be taken in Boumort.

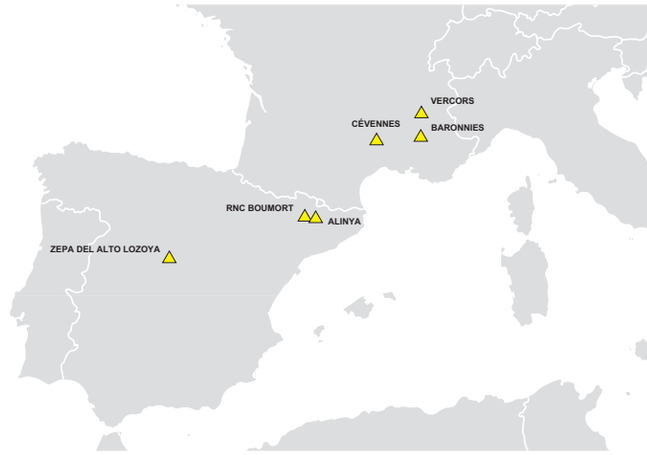

***Figure 99**. Map of the project to reintroduce cinereous vulture into the Catalonian Pyrenees (Boumort and Alinyà), the nearest Iberian breeding area (Alto Lozoya) and the projected sites of its introduction in French territory Cévennes, Verdon and Baronnies).*

Methodology

Following the successful reintroduction of the cinereous vulture in Cévennes, Massif Central, and ongoing attempts in Baronnies and Verdon (Western Pre-Alps), various studies concluded that its reintroduction in Spain would be feasible in the Boumort Hunting Reserve and Espai Natural d'Alinyà (Armet & Torras, 2005: Tewes *et al.*, 2005) and that reintroducing the species in two sites at the same time would improve the overall results of the programme.

After constructing the corresponding acclimation enclosures in both areas and setting up Feeding Points (FP) the first two releases (five birds in total) took place in the second half of 2007, followed by a third in 2008 (9 birds) and three more in 29 (13 birds). The 27 cinereous vulture released up to September 2009 are mostly (82.6%) individuals from Spanish recovery centres (17 from Los Hornos, 8 from GREFA and one from Buitrago) generally admitted because of malnutrition in their fist year of life. The rest (two birds) were born in captivity, one in Planckendael Zoo (Belgium) in 2007 and the other in the GREFA recovery centre 2009.

As regards release techniques, the birds from recovery centres were kept in acclimation enclosures for at least one year while the chicks born in captivity were released by hacking.

Monitoring of the individual birds was carried out using individual identification techniques (decolouration of wing feathers by hydrogen peroxide and yellow plastic rings with an alphanumerical code which can be read at a distance), complemented by thirteen terrestrial radio tracking devices and nine satellite emitters strapped to the backs of birds by harnesses with breaking points.

After release, the birds were monitored or tracked, especially close to the supplementary feeding points which were kept well provided with food. Given the presence in the area of many griffon vultures *(Gyps fulvus),* a species that competes for the same resources, food was supplied frequently (at least twice a week) but in low quantities and widely dispersed in an tempt to minimise the attraction of griffon vultures.

Survival

Of the 27 cinereous vulture reintroduced to date, 16 (59%) have remained in the reintroduction zone (Boumort-Alinyà), 5 (18.5%) have dispersed, 4 (14.8%) were found dead and 2 (7.5%) have disappeared.

Per sector, of the 18 cinereous vulture released in 2008 and 2009 in Boumort, 11 (four males and seven females) individuals are considered to be stable, while of the nine cinereous vulture released in Alinyà between 2007 and 2009, five (two males and three females) have become established.

Griffon, cinereous and bearded vultures together. This is one of the few European sites where it is possible to see this image. Marc Galvez.

Releasing area. Mario Álvarez.

Dispersion movements

The results show that the movements of the reintroduced population spread from SW Spain to the Alps, the most distant passage points being Torrejón el Rubio (Extremadura, Spain) and Rivera (Ticino Canton, Switzerland), which are separated by 1,500 km (Fig. 100).

The actual dispersion tendencies seem to depend on individual choice. Some of the released birds immedi-

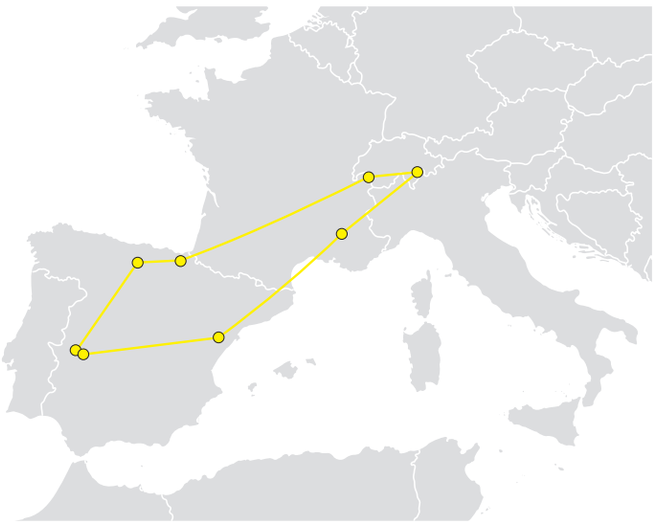

Figure 100. *Most distant localisations of cinereous vultures re-introduced to the Catalonian Pyrenees (Boumort and Alinyà) between 2007 and 2009 and minimum convex polygon that unites them. Source of localisations: satellite emitters and direct observation.*

ately abandoned the release area, while others installed themselves in the same and have hardly abandoned it since. The vultures, therefore, have covered areas that vary between 100 and 3,000 km^2 as in the case of two males (aged six and seven, respectively) released in October 2008 in Boumort. However, these two individuals represent two extremes, which are both sex and age independent.

Six individuals have crossed the divide represented by the Pyrenees, even reaching the Alpine areas of France and Switzerland. Of these one has remained in the Pre-Alps (close to the reintroduction project of baronies). Another, after a 15 month stay in the same French zone returned to the Pyrenees in October 2009. Three vultures have returned to the acclimation zone of Boumort. The last one bird released in Alinyà in2007 by "hacking", with no emitter, was last detected in Haute Savoie, France.

There seems, then, to be a SW-NE two-directional corridor linking these incipient French and Catalonian cinereous vulture populations. The route would cross the Pyrenees by the natural pass at de Puigcerdà, the most direct and convenient crossing, as we have observed by satellite tracking of the birds so equipped. In contrast, two cinereous vulture released in Alinyà and Boumort in autumn 2007 were localised on the outskirts of the Monfragüe National Park (Extremadura) in October 2008. One was identified from the ring it bore (Javier Zalba and Carlos Dávila, *pers.com.*) and the other was found dead. One example equipped with satellite GPS transmitter and released from Boumort in 2009 first crossed the whole of the northern plateau to reach the colony in Lozoya Valley before retuning to the Pyrenees, which suggests that the corridor pushes

southwest to connect with the traditional nuclei of Iberian cinereous vulture.

Monitoring vultures from other populations

Between April and December 2008, an immature individual born in captivity in Cévennes (France) was observed in Boumort, and between January and August of 2009 three juveniles from the same colony were observed.

In an inverse SW-NE direction, it seems evident that individuals with no identification tags are reaching the reintroduction area, probably from Iberian colonies. For example, an individual released by GREFA in Madrid in 1996 established itself as a breeder in Cévennes in 1997. Two vultures ringed by ZEPA in Alto Lozoya were observed, one in Boumort in 2004 (Martijn de Jonge *pers. com.*) and the other in an SEP in Huesca in 2009 (Gonzalo Gil *pers. com.*, Fig. 101).

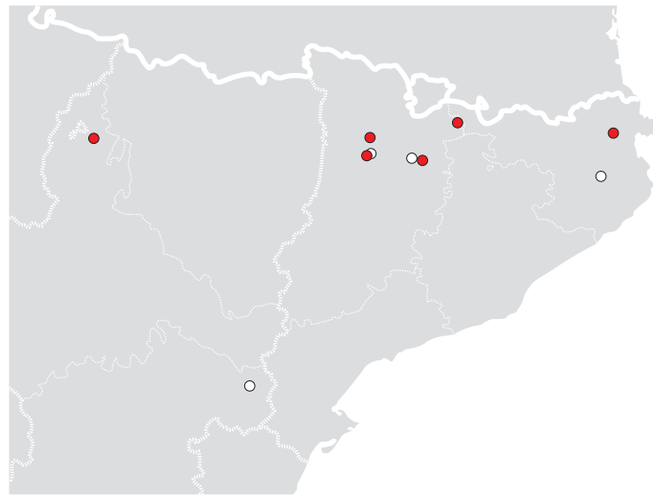

***Figure 101**. Map showing observations of outside cinereous vulture in the reintroduction area in the Catalonian Pyrenees and nearby zones. White dots correspond to French cinereous vulture born in Cévennes and identified from the rings they bore and the red dots to unringed juveniles probably from Iberian populations.*

First conclusions of the monitoring results

During the first two years of the project we have confirmed the existence of a transPyrenees corridor connecting the vultures in Spain and France. At the same time, this corridor may be joined to the arco Alpine ecological corridor that would reach the Balkans. If this is the case, it would obviously have an enormous effect on the evolution dynamics and management of the species.

The reintroduction programme in progress would play an essential role in this scenario since the presence of cinereous vulture individuals in acclimation enclosures or, more importantly, as residents in a wider area would attract "wanderers" so that their appearance should become more and more common. Indeed, this seems to be happening.

Feeding and use of space

The supplementary feeding programme for reintroduced cinereous vulture involves the frequent provision of food in low quantities and spread out at specific sites (SFP). This reduces the occasional use of rubbish dumps by the birds, seven of which have been observed in such dumps in Barcelona and Lérida. Between April 2008

***Table 68.** Percentage and type of food provided in Feeding Points: 31,824 kg at Boumort (April 2008-August 2009) and 34,874 kg at Alinyà (November 2007-October 2009).*

Type of food	Boumort		Alinyà	
	Kg	Percentage	Kg	Percentage
Pig and cow lungs	-	-	17,897	51%
Rabbit	2,864.16	9%	1,583	4.5%
Sheep	2,864.16	9%	3,877	11.1%
Goat	-	-	2,581	7.4%
Cattle/young cows	-	-	420	1.2%
Lamb and goat legs	-	-	2,450	7%
Entrails	5,091.84	16%	5,798	17%
Deer and confiscated game	1272.96	4%	268	0.80%
Horses and cows	954.72	3%	-	-
Pigs	18,776.16	59%	-	-
TOTAL	**31,824**	**100%**	**34,874**	**100%**

Lot of individual controls are obtained thanks to the alphanumeric rings, such as the case of this ringed cinereous vulture. Marc Galvez.

and August 2009 a monthly average of 1,800 kg of food was left in Boumort, and (between November 2007 and October 2009) 1,500 kg per month in Alinyà. The food consisted of whole carcasses of pigs, sheep, rabbits an, remains from abattoirs and ungulate legs (Table 68).

Conclusions

After two years, the project to reintroduce cinereous vulture to Catalonia is well under way. It can count on 16 cinereous vulture individuals in the release area and enjoys good coordination between the various bodies behind the programme. If things go to plan, 2010 should see the first chicks born of released birds and the programme can be wound down in the following two to three years. The Catalonian Pyrenees will then be the first European region to host as nesting birds the four scanvengers species bearded vulture *(Gypaetus barbatus),* cinereous vulture, griffon vulture and Egyptian vulture *(Neophron percnopterus).* There should be healthy interchange between the colonies either side of the French-Spanish natural border and good prospects for a wider link with the more eastern nucleus of the Balkans, thus improving the long-term perspectives of survival.

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