

Nature Conservation in Europe: Approaches and Lessons

Annex ES.1. Examples of Species Reintroductions and Reinforcement Projects in Spain

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The **Iberian Lynx** (*Lynx pardinus*) recovery from less than 100 individuals in 2002 to 1 365 in 2021 (MITECO, 2022) has been achieved in part thanks to an ambitious captive breeding project followed by reinforcement of populations and reintroduction of lynxes. A captive breeding centre was built in Doñana National Park, which was followed by four other centres in different areas of Spain and Portugal, which in combination produced sufficient young animals to carry out the reintroduction programme. From the late 2000s until 2019 247 lynxes were reintroduced in the wild (Garrote 2019), most of them born in captivity. Until 2018, 40 of the 124 females released (almost 30%) bred in the wild producing 235 young (Junta de Andalucía, 2019).

The reintroductions have been carried out in areas of Sierra Morena and Montes de Toledo (Andalusia and Castilla-La Mancha regions), in one area in Extremadura and another in Portugal where they had become extinct. In addition, a few were also translocated from Sierra Morena to Doñana National Park to increase the genetic diversity of the population, which was genetically depauperate. As a consequence, the average heterozygosity (a measure of genetic variation) of animals born in Doñana over 2008–2012 was 46% higher than those born during 1998–2007. Captive breeding aimed to maximise genetic diversity, which is essential in a population that has been reduced to minimum levels (Vargas *et al.*, 2008; Casas-Marce *et al.*, 2017). The survival rate one year after the release of the reintroduced lynx (which were born and remained in captivity during their first year of life) was 70%, only slightly lower than the survival rates of lynx born in the wild in the natural populations of Doñana (76%) and Andújar-Cardena (85%).

The plan for the future is to create new populations through reintroductions in their former range and restore connections among them. A recently published habitat suitability model for the Iberian Lynx has predicted an environmentally suitable area of 87 747 km², which is 14% of the whole Iberian peninsula (Garrote *et al.*, 2020).

The recovery of **Bearded Vulture** (*Gypaetus barbatus*) populations is particularly difficult because they do not become breeders until they are at least seven years old, and they have very low productivity. Nowadays there are two ongoing projects for the reintroduction of Bearded Vultures in areas where they had become extinct. One of them has been carried out by Fundación para la Conservación del Quebrantahuesos (FCQ)¹ in Picos de Europa National Park, in the Cantabrian Mountains, where the species disappeared in 1956 mainly because of human persecution and poisoning. During a project that was supported with LIFE funds from 2013 to 2018, the FCQ released 21 individuals which have shown an annual mortality rate of 9.5%. By December 2018, five individuals had died: two poisoned, two from natural causes and one from unknown causes.

The individuals released in Picos de Europa came from eggs collected in the Pyrenees. The eggs were incubated and the chicks raised in Ordesa National Park (Pyrenees) by hacking (a technique that allows people to feed them without being seen). Subsequently the individuals were kept for 30 days in cages in Picos de Europa to enable them to become familiar with the territory, which they will look for when they attempt to breed. In total, 29 individuals were released in the Picos de Europa between 2010 and 2019, of which 20 survived (FCQ, 2019).

After more than 60 years of absence, in 2017 the first breeding attempt of a Bearded Vulture pair was recorded in Picos de Europa. A female released in 2010 during the reintroduction project and a wild male from the Pyrenees formed the first breeding pair and a chick fledged successfully for the first time in 2020.

¹ <https://liferedquebrantahuesos.quebrantahuesos.org/htm/es/red/red.htm>

Another reintroduction project of Bearded Vultures is ongoing in Andalusia. The species disappeared from Andalusia in 1986 and a few years later the regional government started a reintroduction project. The vultures have come from two sources: the European Endangered Species Programme (an international consortium of zoos and captive breeding centres) and Cazorla's Bearded Vulture captive breeding centre, managed by the regional government.

From 2006 to 2021, 79 bred birds equipped with GPS transmitters were released, of which 23 died whilst 47 remained alive in 2021 (Junta de Andalucía, 2021). The average mortality of the birds released from the project has been 28%, mostly from poisoning. In fact, the project had to stop in 2011 to solve an acute poisoning problem in Sierra de Castril that raised the mortality up to 47%. When the incidence dropped, the releases were restarted in 2012. Despite the high mortality rate, a breeding population is slowly establishing in Cazorla. In 2015 the first breeding pair formed by two released birds raised a chick. In 2021 five breeding territories were occupied by released individuals and three of the pairs bred successfully, making a total of eleven Bearded Vultures born in the wild since 2015 (Junta de Andalucía, 2021).

The project to recover the population of **Brown Bears** (*Ursus arctos*) in the Pyrenees was also a challenge because large carnivores have certain characteristics that make their conservation more difficult. They occupy large areas, so the reintroduction has affected several regions and two countries (three, if we also consider Andorra). Bears attack livestock, causing important social conflicts. And bears can sometimes attack humans, causing fear amongst local people and tourists. Because of this, the reintroduction of bears takes place in the middle of a controversy and an important social conflict, contrasting to what has happened with the reintroduction projects of Bearded Vulture and Iberian Lynx.

Like other populations in western Europe, the Pyrenean Bears were declining both in France and in Spain due to persecution, and at the end of the twentieth century only a few males and a single female survived in the western Pyrenees (Palazón *et al.* 2011). At that time, the French authorities, with the agreement of Spain, decided to reinforce the virtually extinct Pyrenean population with Slovenian bears. Eventually, they decided to release the bears in the central Pyrenees, where they were already absent, and not in the western Pyrenees. At present, the Pyrenean population is formed by the Slovenian bears released in four reintroduction/reinforcement campaigns and by their offspring.

The first release was in Upper Garonne (France) in 1996 and 1997, where two females and one male were released. In 2006, four other females and one male were released in the French central sector (Boitani *et al.*, 2013). In 2016, a large adult male (Goiat) was released in the Aran Valley (Spain), in an attempt to increase genetic diversity and replace the old male (Pyros), who at that time was 28 years old. The Slovenian bears released in the Pyrenees adapted and reproduced very well, but they were divided into two areas: the large central nucleus (about 3 500 km²), where almost all individuals were located, and the western nucleus (1 300 km²), where only two males were living. Following the recommendations of the scientific advisory team (Boitani *et al.*, 2013), in October 2018 the French government released two Slovenian adult females in the western nucleus. One of them emerged from the hibernation in spring 2019 with two cubs, but they died, most likely killed by a male.

From a biological point of view, the reintroduction/reinforcement of bears in the Pyrenees has been a success. The population monitoring is carried out by an international team of scientists. In 2016, five litters with 10 cubs and a total of 39 bears were identified. In 2021, 70 bears were detected.²

From a social point of view, the project remains controversial (Piédallu *et al.*, 2016). In the Pyrenees, where large carnivores were extinct, livestock are insufficiently protected, so damage is high in some areas. Although these losses are generously compensated by the authorities, the bear conflict brings to the surface hidden problems typical in rural mountain societies. As stated by Madden and MacQuinn (2014), conservation conflicts often serve as proxies for more fundamental conflicts: non-material, social and psychological unmet needs—including status and recognition, dignity and respect, empowerment, freedom, voice and control, meaning and personal fulfilment, identity (one's sense of

² PyrosLife webpage: <https://piroslife.cat/en>

self in relation to the outside world), belonging and connectedness, social, emotional, cultural, and spiritual security — which are not always addressed by the technical fixes. In any case, coordination and information exchange between French and Spanish authorities should be enhanced.

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