

An approach to wintering of Black Stork *Ciconia nigra* in the Iberian Peninsula

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Abstract

The Iberian Peninsula is one of the few places where Black Stork *Ciconia nigra* winter in Europe. The Black Stork wintering period in the Iberian Peninsula lasts from mid-November, when the post-fledging migration has finished, until mid-January, when the Black Stork begins the breeding season in some sites of the Peninsula. The number of concentration places and the number of individuals have increased since the nineties. The origin of these individuals is varied. There are individuals from Iberia (Portugal and Spain), but there are also individuals from others countries of Europe.

Key words: *Ciconia nigra*, wintering, Iberia

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INTRODUCTION

The Iberian Peninsula is situated at the western extreme of Europe; it is a biogeographical link between Europe and Africa, and it is the limit of Black Stork distribution in the western Palearctic. Moreover, the Iberian Peninsula is a part of the western Palearctic Black Stork migratory route.

This territory is one of the few places where Black Stork winter in Europe. Although the Black Stork wintering period has been studied in Africa, Israel and recently in the eastern Palearctic (Bobek et al. 2001, 2004, Van den Bossche 1996, 2001), its wintering in the Iberian Peninsula is still relatively unknown. Although the presence of Black Stork in the Iberian Peninsula in winter has long been known (Cramp & Simmons 1977, Hancock et al. 1992, Sansegundo 1992), there is only scattered information about this species in Iberia during this season.

The Black Stork wintering period in the Iberian Peninsula lasts from mid-November, when the post-fledging migration has finished, until mid-January, when some of the Black Storks begin to occupy breeding territories in different sites of the Peninsula.

METHOD

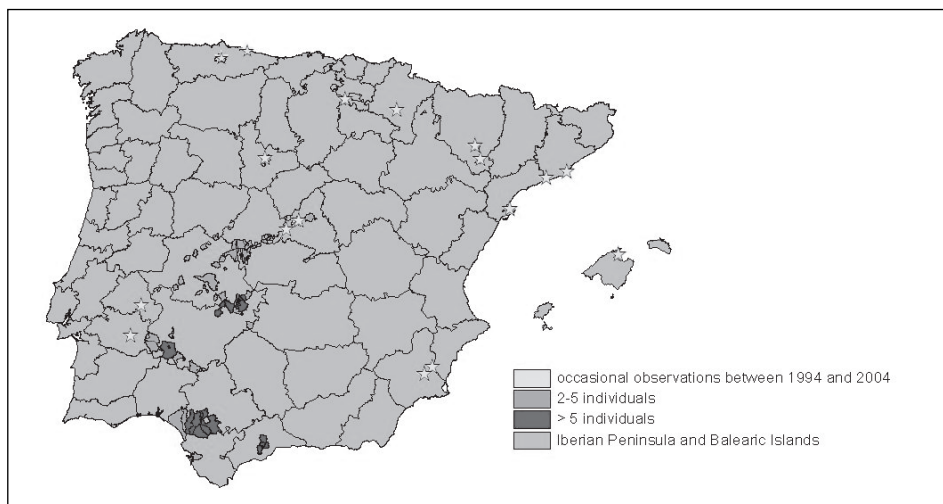
For this survey, I have been gathering available information about Black Storks in Iberia from November to January during the last decade. The sources of this information have been: my own data, regional ornithologist yearbooks, personal comments of Iberian ornithologist colleagues, and information gathered in internet forums. In addition, I have consulted the unique and still unpublished investigation of this theme in the Iberian Peninsula (Sansegundo 1992).

RESULTS AND DISCUSSION

In the early nineties, the greatest number of localities in Spain with a Black Stork presence was 15 (November 1991), and the largest Black Stork group watched was formed by 27 individuals in December 1991 (Sansegundo 1992).

This situation is different in the early 21st century. In 2004, the number of localities with a presence of Black Storks during the winter has risen above 25, and the largest Black Stork group watched in recent years was formed by 46 individuals (Parkes et al. 2001).

Figure 1. Types of Black Stork wintering places in Iberia and the Balearic Islands according to the number of individuals observed.



Main wintering places

Black Stork observations can be grouped in two types in the Iberian Peninsula during the winter season (see Figure 1). There are some observations of lone individuals (sometimes a couple) in the territory, on the northern coast, Mediterranean coast, southern coast, and interior of the peninsula. In this group two kinds of places must be distinguished:

There are wintering observations of lone Black Storks in breeding territories every year. There has not yet been any control of ringed individuals, but it is possible that these Black Storks are resident individuals. Moreover, there are lone Black Stork wintering observations outside the Iberian breeding area, only one single year in each place. In many cases, these places are anomalous sites (around cities, rubbish dumps, the northern coast). The origin of these individuals is unknown, but I suggest the possibility that these individuals could be extra-Iberian birds which don't complete the migratory route across the Strait of Gibraltar.

On the other hand, there are observations of concentrations of individuals between five and more than fifty birds in certain places in the southern half of the Iberian Peninsula.

Wintering places

The most important winter places in Iberia are the Marshes of the Guadalquivir River, in Andalusia (Southern Spain), and particularly the rice fields around the river. In the early nineties, the number of individuals varied between 16 and 32 (an average of 24 individuals) on the right river bank (Manez & Garrido 1996). In the last decade more information has been published about other Marshes of the Guadalquivir and the surrounding rice fields. Parkes et al. (2001) report 57 birds in the 1998-1999 winter period, 58 birds in 1999-2000 and 54 birds in 2000-2001 in a rice field near the left bank of Guadalquivir River. The

maximum number of birds in a group in this rice field was 46 individuals (Parkes et al. 2001). 101 birds were counted around the Guadalquivir river (marshes, rice fields, and river) in three days during the Second International Waterbirds census in 2002 (Equipo de seguimiento de procesos naturales-EBD-CSIC 2002). The exact number of individuals is unknown, but the number of birds has increased since 1991. The origin of these birds is partly known: there are birds from Portugal and Spain, but there are also birds from the Germany, Czech Republic, Luxembourg, France, and Belgium. There are other controls of ringed birds, but unfortunately the origin of these birds is still unknown, because the ring codes are unknown at this moment.

A new Black Stork detected in the nineties in the wintering place was detected in the nineteen nineties in the Guadalhorce Valley (Andalusia), about two hundred kilometres away from the Marshes of the Guadalquivir river to the southeast (Environmental agents of the Territorial Section from High and Middle Guadalhorce Valley-Junta de Andalucía & SEOBirdLife/Málaga local group). The habitat of this place is a collected river whose riverside has been transformed by agricultural activities. There are ring controls of Iberian and central European birds (Portugal and Luxembourg), which showed fidelity to this place in 2003 and 2004. The maximum number of individuals during the 2003/2004 wintering period was 17 birds, and at least 16 birds in the preceding period (SEO/Birdlife-Málaga; Environmental agents of the Territorial Section from High and Middle Guadalhorce Valley-Junta de Andalucía). This number seems to remain constant throughout the following years (2004/2006).

Other important places are located in Badajoz province, in the Southwest of Spain. In the middle of the nineties, there were four wintering places. The Orellana reservoir was the most important site in

Figure 2. Group of Black Storks in rice field (Seville, Spain). Photo: Alejandro Torés.



Badajoz, where up to 25 birds were found (Traverso & Galan 1996). At the moment, the number of birds in Orellana reservoir is approximately the same, but there are at least 14 wintering places in this province. The Black Stork wintering habitat is highly varied in this province, including reservoirs, rice fields, streams, ponds, even rubbish dumps. The bird density is low except on the Guadiana River. Around 50 individuals can be in this province during the winter. The origin of these birds is Iberia, but there are controls of Czech birds in this season (the same Czech individual was observed on November 1999 and 2003; Traverso, personal comment). In addition, there are other places in Iberia where Black Storks are seen every year, where one or two Black Storks can be observed, and the density of the storks is low.

Many of the individuals in the Iberian Peninsula in winter are adults (about 80%) (Parkes et al. 2001), which suggests that some local pairs remain over winter in the area, taking some benefits from this migratory strategy (Parejo et al. 1996).

Ecology

The most important Black Stork wintering

habitat in Iberia is the rice fields. Over 50% of observations take place in this habitat. Ponds and collected rivers are other important habitats. The trofic availability is high in all cases and the water depth remains low all winter. The Red Swamp Crayfish *Procambarus clarkia* is very important because it is the fundamental diet in many places during the winter. The abundance of this invertebrate is high in the rice fields and certain rivers, and it is a very easy prey for Black Storks.

There is a high fidelity for the wintering places of the Iberian birds and non-Iberian birds. For example, there are controls of a Portuguese bird born in 1996, in the Marshes of the Guadalquivir River from 1998 to 2003.

The movement of individuals during the winter appears reduced because there are controls of the same ringed birds in the same places during this season (data from Angulo; Lopez Huertas; Parkes; Reyes; Romero; Tamayo Torés; Traverso). This observation appears to be corroborated by satellite tracking of Black Storks in Iberia during the winter period (Pojer & Torés, personal comments).

The distribution of birds in wintering places

Figure 3. Juvenile of Black Stork wintering in a rubbish dump (Burgos, Spain). Winter 2002/2003. Photo: J. Eduardo Mateos.



is very important for the discovery of ecological aspects of the Black Storks in this season. There is some evidence that suggests that the ideal free distribution model (Fretwell & Lucas 1970) may explain the distribution of Black Storks in the Iberian Peninsula during the winter season.

Preliminary data of monitoring works (Parkes et al. 2001, Equipo de seguimiento de procesos naturales-EBD-CSIC, on the internet, Traverso, personal comment), suggest that the number of birds in places increases only to a certain limit, and then another wintering place is established by other birds.

The increase in the number of Black Storks in the Iberian Peninsula in winter seems clear throughout the last decade. There are several reasons that can help to explain this phenomenon. First, habitat suitability has been increased. For example, in Spain the surface of rice fields has been increased from an average of 74,760 hectares in the period 1985-1989 to an average of 113,400 hectares in the period 1997-2001 (from 32,900 hectares in 1996 to 40,000 hectares in 2000 in Andalusia MAPA, on the

internet). The number of reservoirs, ponds and collected rivers has also increased in Portugal and Spain in the past decade. Another reason could be the increase of the Iberian and central-European Black Stork population: More birds in general in this area mean more birds wintering in Spain.

It seems that the observed migratory strategy in Black Stork in the Iberian Peninsula in winter reassembles processes previously reported in White Stork (Tortosa et al. 2002). Unfortunately, a very important problem remains: several wintering Black Stork locations do not have any protection in Iberia.

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