

An Approach to Wintering of Black Stork in Iberian Peninsula

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The Iberian Peninsula is situated in the western extreme of Europe; it is a bio geographical link between Europe and Africa, and it is the limit of the Black Stork distribution in the western Palearctic. Moreover, the Iberian Peninsula is a part of the western Palearctic Black Stork migratory route (Figure 1).

Although the presence of Black Stork in the Iberian Peninsula in winter has been known for long, there is little information about this species in Iberia during this season.

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

In the early nineties, the maximum number of localities in Spain with presence of Black Storks was 15 (November), and the biggest Black Stork group watched was formed by 25 individuals.

I have been gathering information about Black Stork in Iberia from November to January over a decade (Figure 2).

The Black Stork observations in Iberian Peninsula in the wintering season could be grouped in two types:

Ø There are some observations of lonely individuals (sometimes a couple) in the whole territory: northern coast, Mediterranean coast, southern coast, and interior of the peninsula. In this group two kinds of places must be distinguished:

1. There are wintering observations of lonely Black Storks in breeding territories every year. There has not been any control of ringed individuals yet, but it is possible that these Black Storks are resident individuals.
 2. Moreover, there are lonely 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, northern coast) (Photo 1). 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.
- Ø 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. (Photo 2).



Photo 1 by J. Eduardo Mateos. Juvenile of Black Stork in rubbish dump (Burgos). Winter 2002/2003



Photo 2 by Daniel López Huertas. Marshes of the Guadalquivir (Seville). Winter 2003/2004



Figure 1. Western Palearctic and situation of the Iberian Peninsula. Powered by Map Server



Figure 2. Black Stork wintering places in the Iberian Peninsula and Balearics. Figure by Roberto Carbonell Alanís & Luis Santiago Cano.

I am very grateful to Javier Prieto, Alejandro Torés, Cristina Parkes, Daniel López Huertas, Antonio Tamayo, José Antonio Angulo Ferrán, Roberto Carbonell Alanís, Isidoro Carbonell Alanís, César Sansegundo, Francisco Chiclana, David González Ortega, J. Eduardo Mateos, Ricard Gutiérrez, Miguel Ángel Niñez, David Langlois, Marc Peris, Víctor Manuel Pizarro, José María Traverso Martínez, Rafael Romero, Eduardo Soto-Largo, Salvador Pacheco, Juan José Ramos Encalado, Javier Briz, José Manuel García Hernández for their contribution and participation in this project. They are co-authors of this communication. The support of Alicia Hernanzanz, Fina Alonso Martínez, Axel Maßbau and the company GeoNatura have been essential for the development of this communication.

Also, I should like to extend my grateful thanks to František Pojer, Carlos Pacheco, Wim van den Bossche and Gerard Jadoul for their help.

The number of concentration places and the total number of individuals have increased since the nineties.

The most important winter place 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 oscillated between 16 and 32 (an average of 24 individuals) on the right river bank. In the last decade more information has been published about other Marshes of the Guadalquivir and the rice fields around. Parkes *et al.* report 57 birds in the 1998-1999 winter period, 58 birds in 1999-2000 and 54 birds in 2000-01 in a rice field near the left bank of Guadalquivir River (Photo 3). The maximum number of birds in a group in this rice field was 46 individuals. 101 birds were counted only around the Guadalquivir river (marshes, rice fields, river) in three days during the Second International Waterbirds census in 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 birds from the Czech Republic, too. There are other controls of ringed birds, but unfortunately the origin of these birds is unknown yet, because the ring codes are unknown at this moment.



Photo 3 by Alejandro Torres. Black Storks in rice field (Seville). Winter 2003/2004



Photo 4 by Antonio Tamayo. Guadalquivir valley. Black Stork winter place in Malaga



Photo 5 by Luis Santiago Cano. Orellana reservoir. Black Stork winter place in Guadiana river (Badajoz)

A new Black Stork wintering place was detected in the last nineties in the Guadalquivir valley (Andalusia) (Photo 4), about two hundred kilometres away from the Marshes of the Guadalquivir, river to the southeast. The habitat of this place is a collected river whose riverside has been transformed by the agriculture activities. There are ring controls of Iberian and central-European birds (Portugal and Luxembourg), which show to 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 period before (SEO/Birdlife-Málaga; Environmental agents of the Territorial Section from High and Middle Guadalquivir Valley-Junta de Andalucía).

Other important places are located in Badajoz province, in the Southwest of Spain. In the middle of the nineties, there were 4 wintering places. The Orellana reservoir was the most important site in Badajoz where were found until 25 birds (Photo 5). At the moment, the number of birds in Orellana reservoir approximately is the same, but there are at least 14 wintering places where there are Black Storks in this province. The Black Stork wintering habitat is very varied in this province: reservoirs, rice fields, streams, ponds, even rubbish dump. The bird density is low except in Guadiana River. Around 50 individuals could be in this province during the winter. The origin of these birds is Iberia, but there are controls of Czech birds in this season (Traverso, personal comment).

In addition, there are other places in Iberia where the Black Storks are watched every year, where one or two Black Storks could be observed, but the density of the storks is low.

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

The most important Black Stork wintering habitat in Iberia are the rice fields. Over 50% of the 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 the winter. The Red Swamp Crayfish (*Procambarus clarkii*) 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 the Black Storks.

There is a high fidelity for the wintering places of the Iberian birds and none 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 the individuals during the winter appears reduced because there are controls of the same ringed birds in the same places during the winter (data from Angulo; Lopez Huertas; Parkes; Reyes; Romero; Tamayo Torés; Traverso). This sentence appears corroborated by satellite tracking of black storks (Torés, personal comments).

The increase of the Black Stork's number in the Iberian Peninsula in winter seems clear in 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 hectare in the period 1985-1989 to an average of 113.400 hectare in the period 1997-2001 (from 32.900 hectare in 1996 to 40.000 hectare in 2000 in Andalusia). 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 mean more birds wintering in Spain.