

VHF radio telemetry monitoring of satellite marked migrating Black Storks (*Ciconia nigra*) across the Straits of Gibraltar

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SUMMARY: This report consists of various years doing counts of Black Storks through the Straits of Gibraltar. During 1998 we had Czech birds with VHF and ARGOS satellite tracking. In 1999 we also tracked both Czech and “Cigognes sans Frontieres” programmes Black Storks. Other tagged birds were also tracked. The Straits of Gibraltar is the most important migration route for the population of Western European birds.

Keywords: Black Stork, Straits of Gibraltar, telemetry tracking.

INTRODUCTION

The migration of birds. has always remained a great mystery to mankind. It has only been in recent years, due to the ringing and recuperation of rings, that we have gained more knowledge about their movements, migration, wintering areas, lifespan... Due to latest techniques of tagging or fitting birds with satellite transmitters and VHF, we now have very accurate information not only about their migratory patterns and behaviour but about their exact wintering areas and breeding grounds after their long and precarious journey. Added information from the satellite shows us the length of their journey, stopovers for resting and the distances traveled daily.

Black Storks from western Europe use the Straits of Gibraltar for their crossing, the being the stretch of water which divides the continents of Europe and Africa, which makes it one of the most important migration routes, together with the Bosphorus for the Eastern population.

A small group of ornithologists have, since 1994, been continuing the work started by Cesar San Segundo, collecting data and counting the number of Black Storks crossing the Straits of Gibraltar during the postnuptial migration from August to October. (See table 1)

During the 1995 count, we managed to spot two birds with transmitter on their backs. After contacting several organizations -specially ADENEX- we traced these birds' country origin. One was a juvenile Belgian bird (which perished near Fez, Morocco), and another one was a female adult from Czech Republic. They belonged to two projects “Cigognes Sans Frontieres” from France, Belgium and Luxembourg and “Africka Odysea” from Czech Republic, whose veteran stork “Krystina” made the crossing as far as we can establish, over eight times before meeting her end in Senegal in 1999. During the 1998 we managed to track two birds with transmitters.

Table 1. Postnuptial Black Stork migration across the Straits of Gibraltar. Crossed birds.

Year	Year	Year	Year
1993	943	1997*	1469
1994	986	1998*	1141
1995	1358	1999	986
1996	1707		

* Data from MIGRES Project

METHODOLOGY

Observers waited in two traditional stations for sighting passing birds. When a black stork was observed then a manual scan between the preset frequencies was taken.

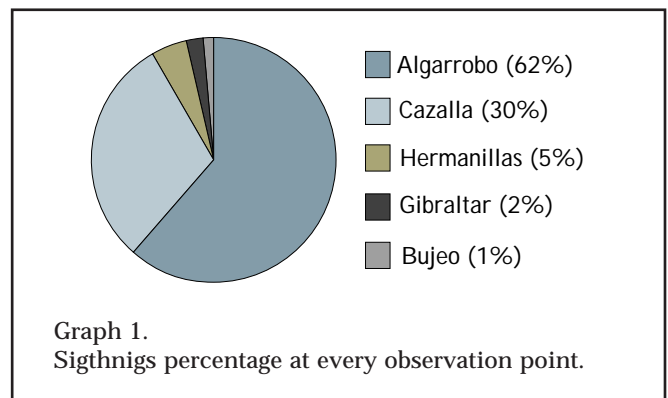
Receiving equipment include a fixed antenna (Diamond 2.7m 5/8CP22E), two scanners (AOR 8000), and two car antennae.

The duration of the study was of 18 days, from September 13 to October 4. There was a total of 102 hours coverage at an average of ten hours per day.

RESULTS

In 1999, due to improved equipment and support from volunteers, we were able to track fourteen storks (see table 3). Out of six Czech birds two crossed the Straits and twelve of the “Cigognes Sans Frontieres” made the crossing. Each bird had to be scanned through all the frequencies as some birds, like those from Belgium, had problems with the Argos satellite transmitters and no location was received. Only VHF devices worked correctly.

The stations used were: *Algarrobo* in the eastern sector and *Cazalla* in the Western sector. Depending on the prevailing winds (see table 4) and climatic conditions, one or other were used (see graph 1). There was also a station at the top of the Rock of Gibraltar and *Hermanillas*. They were used on several occasions.



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Also noted were the meteorological conditions, single and bird groups, routes taken, time and duration of signals. The total numbers of storks seen was 986. (see table 2).

The strength and the direction of winds are the main factor on, how, where and when the birds decide to set off to their journey towards Africa.

Over the numbers of years that we have been involved with counts through the Straits of Gibraltar, we have observed when the wind and weather conditions are adverse and very unstable, the birds try through the day to make the crossing. Suddenly, a spell of improved weather conditions sets in, and they make their crossing over the stretch of water to the Moroccan coast. If the attempts of the crossing fails, they usually make for the hinterland, having exhausted that day's possibilities and usually wait until the following morning before trying again.

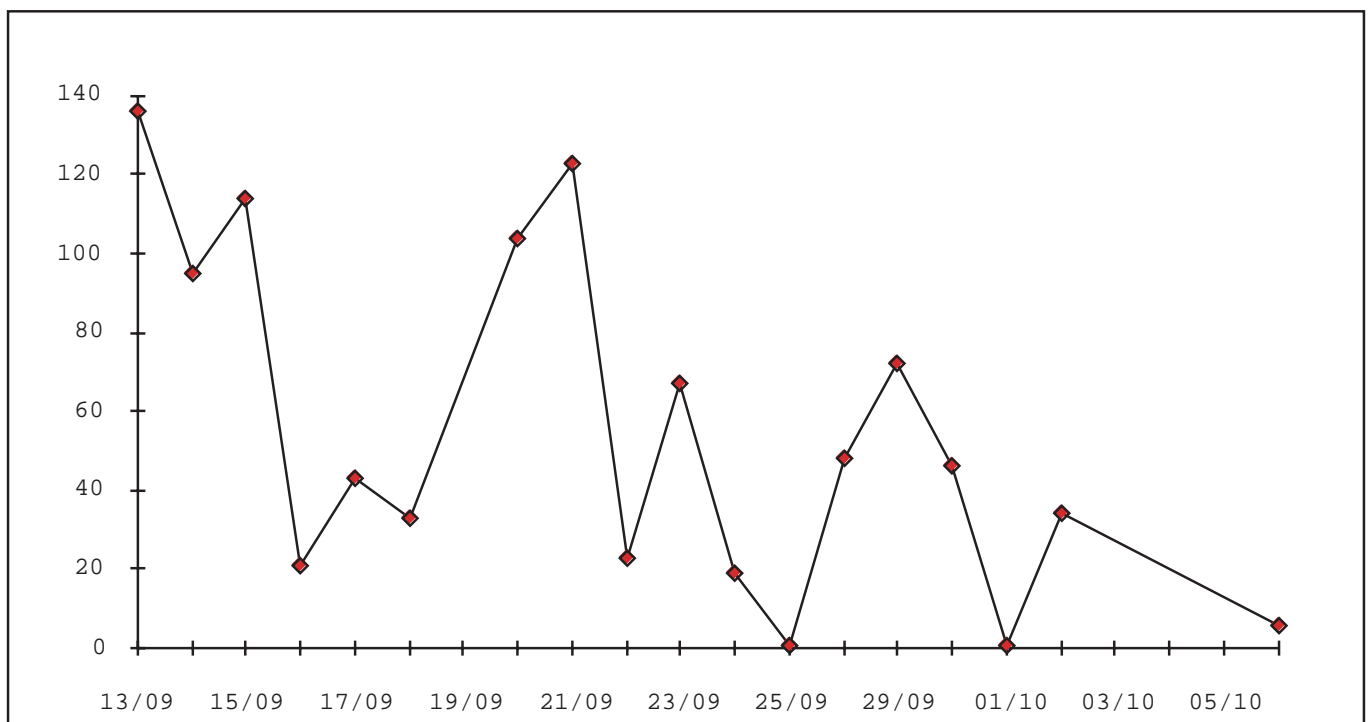
Conclusions

The birds are in greatest danger from poison, electrical power line and, of course, illegal hunting specially in France, Italy and Spain. Birds with transmitters give us the information on how and where these birds meet their sad end.

Tabla 2. Sight birds at every observatory

	Algarrobo	Cazalla	Gibraltar	Hermanillas	Bujeo	Sum day
13/9/99	27	109				136
14/9/99	17	78				95
15/9/99	110	4				114
16/9/99			21*			21
17/9/99	41*	2*				43
18/9/99	33*					33
20/9/99	104*					104
21/9/99	123*					123
22/9/99	23					23
23/9/99	67					67
24/9/99	19					19
25/9/99	1					1
26/9/99				48		48
27/9/99	8	51			13	72
28/9/99		46*				46
29/9/99	1*					1
30/9/99	34*					34
4/10/99		6				6
Sum	608	296	21	48	13	986

* Black stork with transmitter (see table 3)



Graph 2. Daily evolution of birds crossing .

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Table 3. Date when black storks with transmitter crossed.

	Black Stork	Observatory	Hour	Remarks
16/9/99	Dominika ¹	Gibraltar	13:30-13:45	
17/9/99	Maria ²	Algarrobo	09:30-09:40	Signal also at Cazalla from 9:30 to 10:24
	Valerie ²	Algarrobo	09:30-10:24	Signal also at Cazalla from 9:30 to 10:24
18/9/99	Naussica ²	Algarrobo	09:55-10:03	Randomly signals until 15:36
			10:35-12:07	
20/9/99	Martha ²	Algarrobo	15:30-15:50	
21/9/99	Julien ²	Algarrobo	08:35-08:45	
	Marie ²	Algarrobo	09:15-09:40	
	Aube ²	Algarrobo	09:35-09:51	
28/9/99	Luis ²	Cazalla	14:44-15:05	
29/9/99	Carol ²	Algarrobo	08:40-11:00	
	Krystof ¹	Algarrobo	13:38-14:10	Probably crossed thru Gibraltar.
30/9/99	Johanna ²	Algarrobo	11:45-14:40	
	Lisa ²	Algarrobo	15:45-14:40	

¹ Belongs to *Africka Odysea* Project; ² Belongs to *Cigognes san Frontiers* Project

Table 4. Number of birds crossed at every observatory depending wind direction.

	Algarrobo	Cazalla	Gibraltar	Sum
Easterly	175	6		181
Westernly	374	2	21	397