

The White Stork breeding census in Algeria (2004 -2005)

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Zusammenfassung

Der Weißstorch ist ein Brutvogel des mediterranen Teils von Algerien. Die Brutpopulation ist von 2.679 Paaren (HPa) 1995 auf 6.601 Paare (HPa) im Jahr 2005 angewachsen. Die meisten Paare wurden in den östlichen (70% der Population) und den zentralen (25%) Regionen des Landes gefunden. Die Siedlungsdichte (StD) in den Regionen schwankte zwischen 0,27 und 152 Paaren/100 km². Der durchschnittliche Bruterfolg (JZm) betrug 2,25 Junge pro erfolgreiches Paar. Mehr als die Hälfte der Nester befanden sich auf Dächern und Strommasten.

Summary

The White Stork is a breeding bird in the Mediterranean part of Algeria. The breeding population has increased considerably from 2,679 breeding pairs (HPa) in 1995 to 6,601 breeding pairs (HPa) in 2005. The highest numbers of breeding pairs are found in the eastern (70 % of the population) and central (25 %) regions of the country. In 2005 the average population density (StD) ranged from 0.27 to 152 pairs/100 km², depending on the region. Mean fledged brood size was 2.25 young fledged per successful pair (JZm) in Algeria. More than half of the nests are located on buildings (roofs, poles etc.).

Introduction

The White Stork (*Ciconia ciconia*) is a breeding bird in the Mediterranean part of Algeria (i.e. from the northern coast to the Hauts-Plateaux in the south). In 1955, 8,844 breeding pairs were censused (BOUET 1956), while a second national census in 1993 showed the presence of only 1,195 pairs (MOALI-GRINE et al. 1995). Between these two censuses White Stork numbers declined by 86%. Following the recommendations outlined for the 5th International Census in 1994 and 1995, which was coordinated by the NABU Institute of Grassland Conservation and Research (Germany), five new national censuses have been organised in Algeria.

The censuses were carried out in close cooperation with the Departments of Forest Conservation of the different regions in the Algerian breeding range of the White Stork. A request for participation was sent out to each of the 36 "wilaya" or administrative

regions of the country, together with a questionnaire asking for the following information:

- number of occupied nest/breeding pairs in each town or city;
- location of nests (inside or outside urban areas);
- type of nest support;
- number of young per nest;
- all supplementary information available.

Two of the authors (Nadia Moali-Grine and Aissa Moali) carried out the census in the central part of the country where they had studied the White Stork since 1991 and in some other regions where the number of pairs was very important (MOALI et al. 1992, MOALI & MOALI-GRINE 1995, MOALI-GRINE et al. 1995, MOALI-GRINE et al. 2004, MOALI-GRINE 2007). The results show a considerable increase of the population from 2,679 pairs in 1995 to 6,601 in 2005. Half of the nests are on artificial structures; the other half are in trees. The breeding success remained poor, the mean fledged brood size being 2.25 young per successful pair (JZm).

Results

Number of breeding pairs

The total number of breeding pairs was found to be 6,601 in 2005 (Tab.1). In the eastern regions (from El-Tarf to Oum-El-Bouaghi), the census showed 1,855 occupied nests in 1995, and 4,411 in 2005 (70% of the total in both years). In the central regions (from Bejaia to Blida) 701 pairs (26%) and 1,817 pairs (27.5%) were counted in 1995 and 2005 respectively. In the western regions (from Tipasa to Ain-Temouchent), only 123 pairs (5%) were found in 1995, and 373 (5.7%) in 2005.

Population density

The mean population density (breeding pairs/100km²) was determined for 2005 (Fig. 1). The lowest densities were found in the western regions, the highest densities in the eastern regions (e.g., in the El-Tarf region with its large wetlands, and Annaba).

Nest locations

About 59% of the total population still breeds in cities, towns and small villages (Tab. 2), 63% of the birds of the eastern regions, 49%



of those of the central regions and 65% of the pairs of the western regions. Pairs nesting outside of human settlements often breed in colonies on trees. The types of nest support selected give a good indication of the changes that have occurred in terms of nest site preference. Although cities have increased in size and many houses have lost their suitability for Storks, some pairs have adopted new buildings for nesting and man-made structures (roofs of houses, electricity poles and pylons) still represent more than half of the total number of nest supports. There is, however, a trend for an increasing number of pairs to nest- on trees. It is expected that in the future trees will play an increasingly important role, as is already being observed in the central regions. The main tree species used for nesting is Eucalyptus (*Eucalyptus camaldensis*), a species that is large enough to allow the establishment of small colonies of storks.

Breeding success

Mean fledged brood size was estimated from the number of young per nest at an age of four weeks. In 2005, 6,318 pairs with known breeding success produced a total of 14,249 young. 283 pairs either failed to produce young, or the number of young was not known. The mean number of young per successful pair (JZm) at a national level was 2.25 (range: 1.5-3.74) in 2005 (Tab. 3).

Discussion

The results of the 1995 and 2005 census show that the Algerian White Stork population has increased considerably (MOALI-GRINE et al 2004). More complete coverage of the western regions in 1995 and 2005 compared with 1993 only accounts for a small part of the increase, because those regions are traditionally poor in White Stork breeding pairs. The eastern and the central regions, which traditionally hold high numbers of breeding White Storks, showed considerable increases between all census years.

The population boom is particularly striking in the eastern regions of El-Tarf and Mila, and in the central regions of Setif, where breeding numbers increased by 263 %, 137% and 312 % respectively, between 1995 and 2005 (Tab. 4). Reasons for this population growth, following a number of unfavourable years for the species, might include:

1. Current good wintering conditions in the Sahelian zone, with fairly good summer rainfalls (see KANYAMIBWA et al.1990, KANYAMIBWA et al.1993, L'HÔTE et al. 2002)
2. Wet springs during the last few years in Algeria (own observations).

Some other factors such as continuing urbanisation pressure and deterioration of habitat quality still have negative impacts on the White Stork population. Nevertheless, we estimate that the above mentioned climatic improvements and the adoption by storks of irrigated farmlands and garbage dumps for feeding in certain regions have largely contributed to the recent population increase. The species has recently also increased in Spain (SZABO 1997, FERNANDEZ-CRUZ 1999) and in France (MULLER & SCHIERER 2002) from 315 in 1995 to 641 in 2000; while in Tunisia (AZAFZAF 2002) the total number of nests counted increased from 213 nests in 1998 to 303 nests in 1999.

Conclusion

This increase in the breeding population of White Stork in Algeria (the number of nesting pairs more than doubled between 1995 and 2005) is linked to: an increase in annual survival rates, possibly caused by improved conditions at over-wintering sites in sub-Saharan Africa; and an increase in the use of irrigated farmland and refuse tips for feeding at some nesting sites.

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References

- AZAFZAF, H. (2002). Statut actuel de la population de la cigogne blanche *Ciconia ciconia* en Tunisie. *Alauda*.70 (3): 387-392.
- BOUET, G. (1956). Une mission ornithologique en Algérie en 1955. Nouvelles recherches sur les Cigognes. *L'Oiseau et R. F. O.* 26: 227-240.
- FERNANDEZ- CRUZ, M. (1999). La migracion post nupcial de la cigüena blanca (*Ciconia ciconia*) por el estrecho de Gibraltar en 1998. In : VARELA SIMO, J. M. (1999): Seguimiento de la migracion en el estrechootono 1998. *Programma Migres SEO-Birdlife.* 13-16.
- KANYAMIBWA, S., SCHIERER, A., PRADEL, R. & J.D. LEBRETON (1990). Changes in adult annual survival rates in a western European population of the white Stork (*Ciconia ciconia*).-*Ibis* 132:27-35.
- KANYAMIBWA, S., BAIRLEIN, F. & A. SCHIERER (1993). Comparison of survival rates between populations of the White Stork *C. ciconia* in Central Europe.- *Ornis Scand.*24:297-302.
- L'HÔTE, Y., MAHE, G., SOME, B. & J. P. TRIBOULET (2002). Analysis of a sahelian rainfall index from 1896 to 2000; the drought continues. *Hydrological Sciences- Journal- des Sciences Hydrologiques*, 47(4): 563-572.
- MOALI- GRINE, N., AKIL, M. & P. ISENMANN (1992). Decline of the White Stork (*Ciconia ciconia*) in area of Central Algeria. *Vogelwarte* 36:326-328.
- MOALI- GRINE, N., MOALI, A. & P. ISENMANN (1995). The White Stork (*Ciconia ciconia*) census 1993 in Algeria.- *Vogelwarte*.38: 35-40.
- MOALI- GRINE, N., MOALI, A. & P. ISENMANN (1995). Etat actuel de la population de Cigogne blanche en Algérie: effectifs et distribution.- In : BIBER, O., P.ENGIST, C.MARTI & T. SALATHE (Ed.) (1995). *Proceedings of the International Symposium on the White Stork (Western Population)*, Basel 1994: 89-90.
- MOALI- GRINE, N., MOALI, A. & P. ISENMANN (1999). The White Stork (*Ciconia ciconia*) breeding census in Algeria (1994-1995). In: SCHULZ, H. (Ed) (1999). *Weissstorch im Aufwind? - White Storks on the up? - Proceedings, Internat. Symp. On the White Stork, Hamburg 1996.- NABU (Naturschutzbund Deutschland e.V.), Bonn: 89-96.*
- MOALI- GRINE, N., MOALI, A. & P. ISENMANN (2004). L'essor démographique de la Cigogne blanche *Ciconia ciconia* en Algérie entre 1995 et 2005.-*Alauda* 72(1):47-52.
- MOALI- GRINE, N. (2007). Dynamique de la population de la Cigogne blanche (*Ciconia ciconia*) en Algérie depuis 1995.-*Ostrich*. 78(2): 291-293.
- MULLER, Y. & SCHIERER, A. (2002). La Cigogne blanche. Eds. *Eveil. Nature*. 72 p.
- SZABO, J. (1997). Migration in the strait of Gibraltar, 1996 autumn. *Madartanlat*: 7-8.

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Tab. 1. Number of breeding pairs (HPa) of the White Stork in the regions of Algeria in 2005.

Anzahl der Brutpaare (HPa) des Weißstorchs in den Regionen Algeriens.

Eastern regions		Central regions		Western regions	
Region	HPa	Region	HPa	Region	HPa
El-Tarf	1005	Bejaia	133	Tipasa	31
Annaba	530	Bouira	164	Tissemssilt	4
Guelma	413	Setif	742	Chlef	50
Skikda	415	M'sila	64	Mostaganem	10
Jijel	184	Batna	220	Mascara	52
Mila	988	Tizi-Ouzou	360	Tlemcen	120
Constantine	400	Boumerdès	78	Saida	13
Khenchla	80	Blida	56	Ain-Temouchent	38
Tebessa	50			Medea	55
Oum-El-Bouaghi	346				
Total	4411		1817		373

Tab. 2. Nest site selection (location and nest support) of the White Stork in Algeria in 2005 (HPa: Number of breeding pairs, CT: Number of pairs breeding in cities, OCT: Number of pairs breeding outside of cities, EPP: electricity poles and pylons, HR: House roofs).

Wahl des Nistplatzes (Orte und Nestunterlagen) des Weißstorchs in Algerien im Jahr 2005 (HPa: Anzahl der Brutpaare, CT: Anzahl in Ortschaften, OCT: Anzahl außerhalb von Ortschaften, EPP: Masten und elektrische Stromleitungen, HR: Hausdächer).

	HPa	CT	OCT	EPP	HR	Tree
Eastern regions	4411	63%	37%	41.3%	22.3%	36.3%
Central regions	1817	48.7%	51.3%	24.3%	22.5%	53.0%
Western regions	373	64.6%	35.4%	31.6%	35.6%	32.7%
Total	6601	59.1%	40.8%	36.1%	23.1%	40.7%

Tab. 3. Population and reproduction parameters of the White Stork in Algeria in 2005.

Populationsparameter und Reproduktionserfolg des Weißstorchs in Algerien 2005.

Regions	HPa	HPm	HPo+HPx	JZG	JZm
Eastern regions					
El-Tarf	1005	994	11	2701	2.71
Annaba	530	466	64	1075	2.30
Guelma	413	331	82	741	2.23
Jijel	184	178	06	667	3.74
Mila	988	986	02	2010	2.03
Constantine	400	390	10	842	2.16
Khenchla	80	75	05	165	2.20
Tebessa	50	50	00	95	1.90
Oum-El-Bouaghi	346	343	03	573	1.67
Total	4411	4213	198	9773	2.32
Central regions					
Bejaia	133	124	09	246	1.98
Bouira	164	161	03	348	2.16
Setif	742	731	11	1550	2.12
M'sila	64	64	00	156	2.43
Batna	220	215	05	519	2.41
Tizi-Ouzou	360	350	10	616	1.76
Boumerdès	78	78	00	156	02
Blida	56	56	00	112	02
Total	1817	1779	38	3703	2.08
Western regions					
Tipasa	31	31	00	58	1.87
Tissemssilt	04	04	00	06	1.50
Chlef	50	45	05	90	02
Mostaganem	10	08	02	16	02
Mascara	52	52	00	94	1.80
Tlemcen	120	80	40	240	2.98
Saida	13	13	00	44	3.38
Medea	55	55	00	146	2.65
Ain-Temouchent	38	38	00	79	2.07
Total	373	326	47	73	237
National Total	6601	6318	283	14249	2.25

Tab. 4. Population development (HPa) of the White Stork in 3 selected regions of Algeria.

Bestandsentwicklung (HPa) des Weißstorchs in drei ausgewählten Regionen Algeriens.

	1995	2001	2005	% of increase
El-Tarf	277	476	1005	263
Mila	417	859	988	137
Setif	180	680	742	312

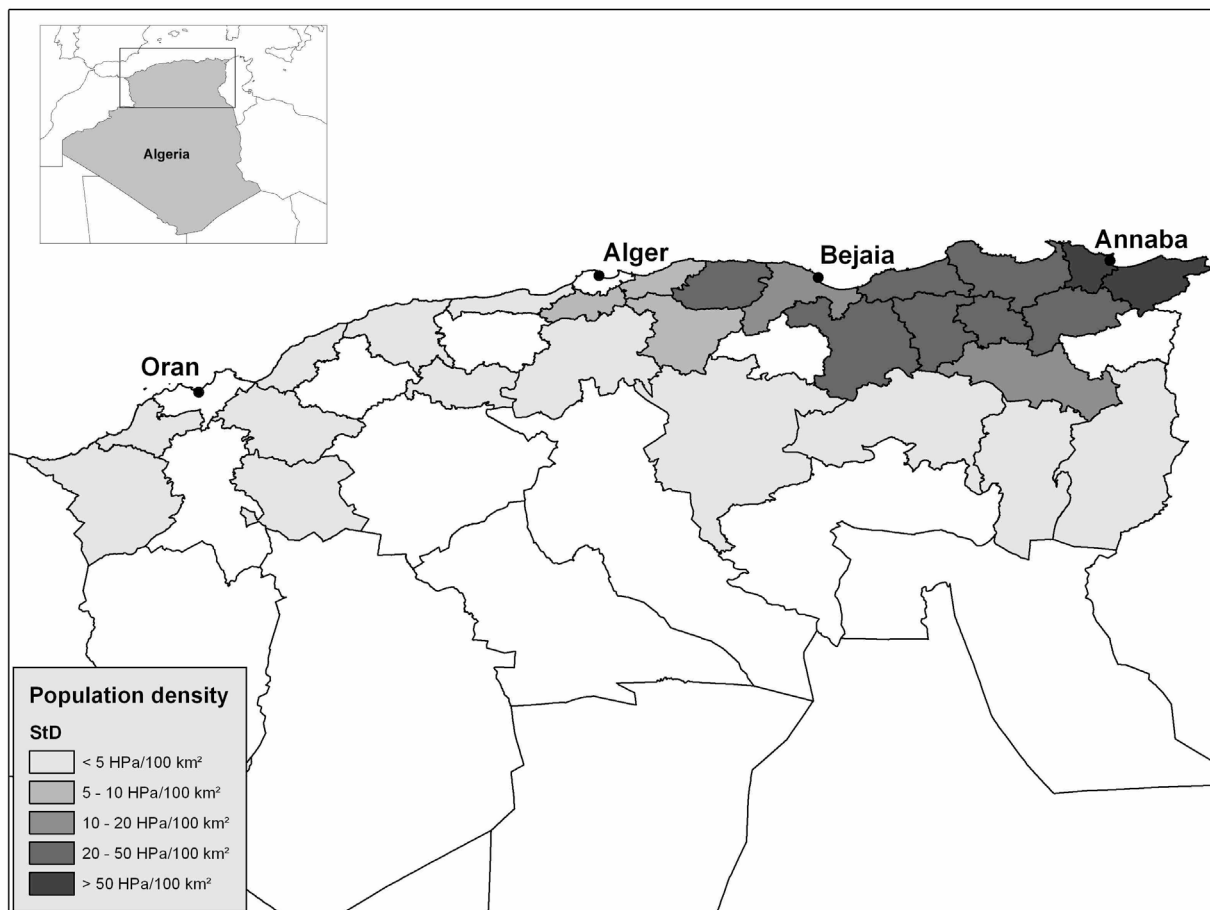


Fig. 1. Population density (StD= HPa/ 100km²) of the White Stork in Algeria.
Siedlungsdichte (StD = HPa/100 km²) des Weißstorchs in Algerien 2005.

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