Results of the White Stork Census in Hungary in 2004

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Zusammenfassung

Im Jahr 2004 wurde in Ungarn im Rahmen des internationalen Weißstorchzensus eine nationale Erfassung durchgeführt, die 73% des Landes umfasste. Der Zensus wurde durch MME/BirdLife Ungarn organisiert. Der Gesamtbestand konnte auf 5.200 Paare (HPa) hochgerechnet werden. Der Bestand ist in Ungarn in den vergangenen drei Dekaden stabil geblieben. 80.0% aller Nester befanden sich auf Strommasten, 9.9% auf Gebäuden, 8.5% auf Nistmasten, 0.9% auf Bäumen und 0.7% auf anderen Nistunterlagen. Derzeit sind die Gefährdung durch Stromtod und die Änderung der Standards für Stromleitungen die größten Probleme für den Schutz des Weißstorchs in Ungarn. Aufgrund dieser Gefährdungen könnte der Bestand des Weißstorchs in den nächsten Dekaden drastisch zurückgehen, sofern Schutzmaßnahmen nicht erfolgreich sind.

Summary

As a part of the international census, a national White Stork census was carried out in Hungary in 2004, covering 73% of the country. The census was organised by MME/BirdLife Hungary. The population was estimated to be 5,200 breeding pairs (HPa). The population has been stable in Hungary over the last 3 decades. 80.0% of nests are built on electricity pylons, 9.9% on buildings, 8.5% on special poles for storks, 0.9% on trees and 0.7% on other types of support. At present, the main conservation problem is electrocution and change of electricity transmission wire standards. Because of these factors, the population in Hungary could decrease dramatically over the next few decades, if conservation efforts are not effective.

Former censuses and census methods in Hungary

Following censuses in 1941 (HOMONNAY 1964), 1958 (MARIÁN 1962), 1963 (MARIÁN 1968), 1968 (MARIÁN 1971), 1974 (JAKAB 1978), 1979 (JAKAB 1985), 1984 (JAKAB 1987), 1989 (JAKAB 1991a), 1994 (LOVÁSZI 1999) and 1999 (LOVÁSZI 2004), the 11th national White Stork census was carried out in Hungary in 2004. The census was organised by MME/BirdLife Hungary and involved local branches of the society, birdfriends and several national park directorates.

The 1941 census was carried out by rural teachers, and was organised by Hungarian Ornithological Institute. Between 1958 and 1989, data came from two sources: postmen working for the Hungarian Post Office and interested volunteers (birdfriends, forest rangers, hunters, students etc.). Since the 1980s, MME/BirdLife Hungary has organised regional nest counts in "non-census" years, covering 30-70% of the territory of the country. For the national surveys of 1994, 1999 and 2004, the data were collected by experts, and excluded anecdotal data from postmen and other laymen.

In 2004 as in 1994 and 1999, each participant completed a detailed questionnaire for each stork nest, giving: location of nest; geographical coordinates (if possible); nest support; age of nest; occupancy; number of adult birds and hatchlings; mortality and dangerous electric pylons around the nest. If the nest was located on an electricity pylon, information was also recorded about the type of pylon.

Questionnaires were collected and checked by regional co-ordinators, and processed by MME Monitoring Centre, but volunteers also could use an on-line internet database to upload their observation data (www.golya.mme.hu).

Hungary has 19 administrative regions ("*megye*" – counties). The 2004 survey covered ca. 60-100% of the territory of each county. Altogether, we have data from 73% of the land area of Hungary. Comparison with data from the almost complete 1999 census allowed an estimate to be made of population size in 2004.

Results of the census in 2004

Data were returned from a total of around 5,650 potential and actual nesting places. At 982 sites there was no nest material on previously mounted artificial nest platforms. We have data from a total of 4,668 nests, 788 of which were unoccupied, with single birds (HE) at 84 nests. 3,796 nests were occupied by pairs of storks (HPa). 369 pairs were unsuccessful (HPo), and 3,427 pairs bred successfully (HPm) (Tab. 1). A total of 9,223 fledged young (JZG) were reported. The mean number of fledged young was 2.67 for all breeding pairs (productivity, JZa), and 2.97 for successful nests (mean fledged brood size, JZm), which is the third best result since 1958 (Tab. 2. Fig. 1.).

NABU

As the national census in 1999 covered almost the whole country, by comparing data from the villages which were counted in both 1999 and 2004 it was possible to estimate the total number of breeding pairs of White Stork in Hungary in 2004. In this way, we estimated the size of the breeding population to be 5,200 pairs (HPa) in 2004. Average population density (StD) was 5.48 breeding pairs/100 km^2. The highest density was reported from the northeast hills and western region (>9 pairs/100 km^2), probably due to the greater extent here of open water and mosaic-like land-use. The lowest density was reported from central Hungary (1.24 pairs/100 km^2), where large scale agricultural fields, forested hills and the conurbation of Budapest can be found. Density is also high in the Great Hungarian Plain, where natron salt lakes provide good habitat for storks (Fig 2.). The Carpathian basin is influenced by more than one climatic region in the breeding season: dry-hot continental or cool-wet Atlantic. Because of this, the Carpathian basin is a "hot spot" at the meeting point of different biogeographical regions. In some years, the above mentioned salt lakes can be real lakes holding many amphibians and fish, but at other times the lakes can become dry grasslands with huge amount of insects. As the food spectrum of storks is very wide, the birds can find suitable prey regardless of climatic period. Jakab hypothesised a relationship between stork density and soil type (JAKAB 1991b).

Nest locations

Hungary probably has the highest percentage of nests located on electricity transmission poles anywhere in Europe (see SCHULZ 1999). The first nests on pylons were reported during the 1968 census. Only a decade later, 34% of nests were built on electricity poles, and so in the early 1980s, nature conservation organisations and electric power companies developed a stork nest platform for electricity poles. 2,900 platforms were installed during the 1980s, and another 2,750 in the years since 1996. Because of this, and the loss at the same time of traditional nesting places (like haystacks, thatched roofs, old trees, wide chimneys), 88.5 % of stork nests are now located on poles: 80.0% on electricity pylons and 8.5% on poles specially built for storks. Only 9.9 % of storks breed on buildings and 0.9 % on trees. The diversity of nest supports is very low in Hungary (Fig. 3).

Development of the breeding population

The 1941 total of ca. 15,000-16,000 breeding pairs had halved by the 1950s, probably due to the loss of feeding habitats and traditional breeding places. The population continued to decline until the 1970s. Since then, an estimated 4,800-5,600 pairs of White Storks have bred in Hungary, probably varying according to weather conditions, and the population has been stable over the last three decades (Fig. 4.).

Conservation issues – overhead electricity wires

Because a very high proportion of all White Stork nests are built on electricity transmission poles, stork conservation is largely dependant on co-operation of electric power companies.

In Hungary, the insulators of 10-20 kV pylons are installed upright, which presents a high risk of electrocution to large birds. Dangerous pylon types were reported from within a 100 m radius of 1,444 stork nests (26.8% of all nests). As not all census participants collected data on these, a larger proportion of nests (probably at least 40%) are at risk by electrocution. Electrocution by the transmission network accounted for 87.8% of mortality in young and adult storks (Tab. 3).

MME/BirdLife Hungary has successfully developed a special insulator for 20 kV horizontal cantilevers used on the most widespread type of pylon in Hungary. It is not suitable for all pylons, and unfortunately in particular not for the most dangerous types. Although the nature conservation authorities are involved in the approval process for new overhead lines, the old ones will kill birds for several years to come. MME/BirdLife Hungary is working on a change of technical standards.

More than 4,000 nests are built on electricity pylons, and so any intervention (rescue of injured birds, thinning of nest material, removal of dangerous objects etc.) is impossible without the support of electric power providers. On a number of occasions, electricity companies have required compensation of their costs (!).

About 500 nests have been moved to poles specially put up for storks. Several hundred nests have also been moved from their original location, rather than simply raised on to a new nest platform. Storks often abandon these relocated nests, usually moving back to their nest original nest site. We analysed data from pylons with nests. 65.5% of pylons were made of concrete, 32.3% of wood, 2.2% of metal (n=2354). Fewer nests were supported by simple pylons (36.1%) than propped or A-type pylons (59.4%) (n=2268). The number of wire directions were: 1 (end-pylon) - 18.7%; 2 (normal) - 49.5%; 3 - 30.0%; more than 3 - 9.8% (n=1,914). Storks favour stable A-type pylons, concrete pylons and pylons with more wires. End-pylons are also favoured because of their higher stability. Nests that are moved to less stable simple pylons are usually abandoned.

These later findings are very important for the future of the White Stork population in the Carpathian Basin. Currently the 220-380 V electric overhead line network consists of 3 or 4 independent, uninsulated wires. Wires are installed on 100-120 cm wide horizontal metal arms, which are suitable for storks to build their nest on. In the near future these systems will be changed to multi-conductor insulated wires (only one cable for each line). Within 10-20 years, most pylons will support only one cable and these will not be suitable for stork nests. The only possibility for storks will be artificial nest platforms, which have to be accepted by storks.

The above-mentioned research of nest site selection will be continued, along with the ELSA colour ringing project, started in 2005.

Internet database

MME/BirdLife Hungary established an internet White Stork database. Volunteers can upload basic nest data, data on daily observations, and nest photographs. Members have to sign in with their full name to allow the data to be checked. Basic statistics and maps can be calculated on-line. The database is connected to Google Earth, and visitors can check the locality of nests using aerial photographs.

Public Relations

The White Stork is one of the flagship species of MME/BirdLife Hungary. MME organised a "Year of the Storks" event in 1999, publishing a number of leaflets, booklets and posters.

An international project, 'White Stork Protection in the Carpathian Basin', ran from 1998 to 2000, co-ordinated by a Romanian NGO the 'Milvus Group', and involving the Bird Study and Protection Society at Vojvodina, Serbia and MME. The project was funded by the REC – Regional Environmental Fund for Central and East Europe. Besides PR, census and conservation activities, a successful drawing competition about storks was organised for children. Almost 9,000 children took part, from Serbia, Romania, Slovakia and Hungary.

In spite of the fact that the white stork is a 'national bird', in many cases human disturbance drives birds away from their nests.

Acknowledgements

We would like to dedicate this article to the memory of late Béla Jakab, former national White Stork census co-ordinator. He died in an accident in 2006, at an age of 88 years.

As hundreds of bird friends participated in White Stork censuses, it is impossible to list their names. Nevertheless, we thank all of them for their help.

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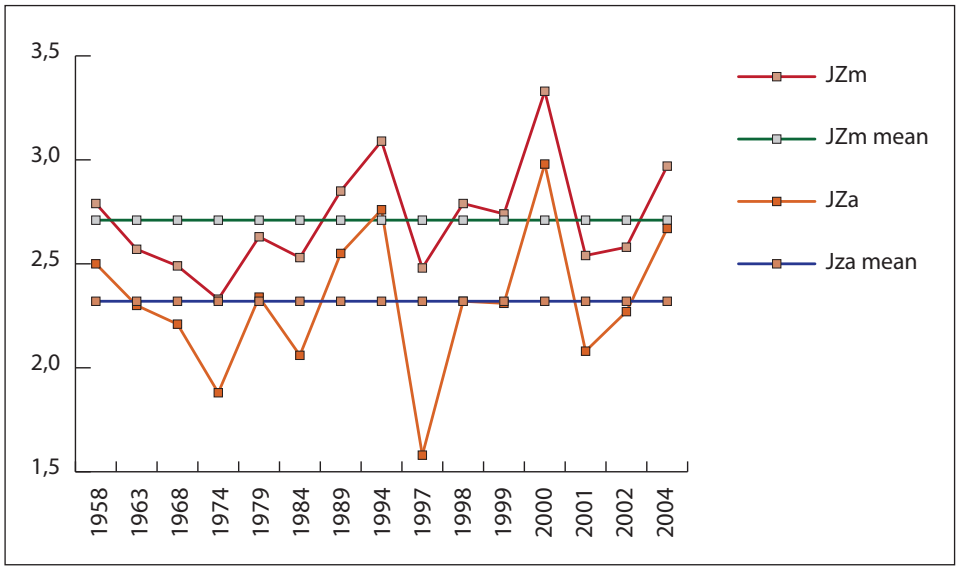

Fig. 1. Mean fledged brood size (JZa) in Hungary between 1958 and 2004.
Gesamtbruterfolg (JZa) in Ungarn zwischen 1958 und 2004.

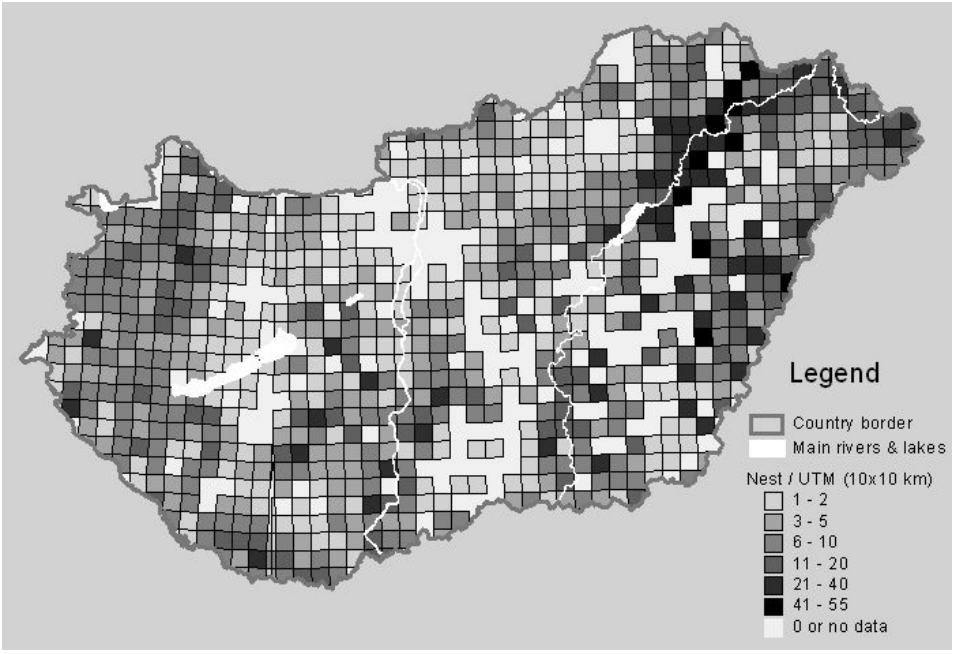

Fig. 2. Population density (pairs per 100 km²) of the White Stork in Hungary 2004 per UTM Square (10 x10 km).
Siedlungsdichte (Paare pro 100 km²) des Weißstorch in Ungarn 2004 pro UTM Quadrant (10 x 10 km).

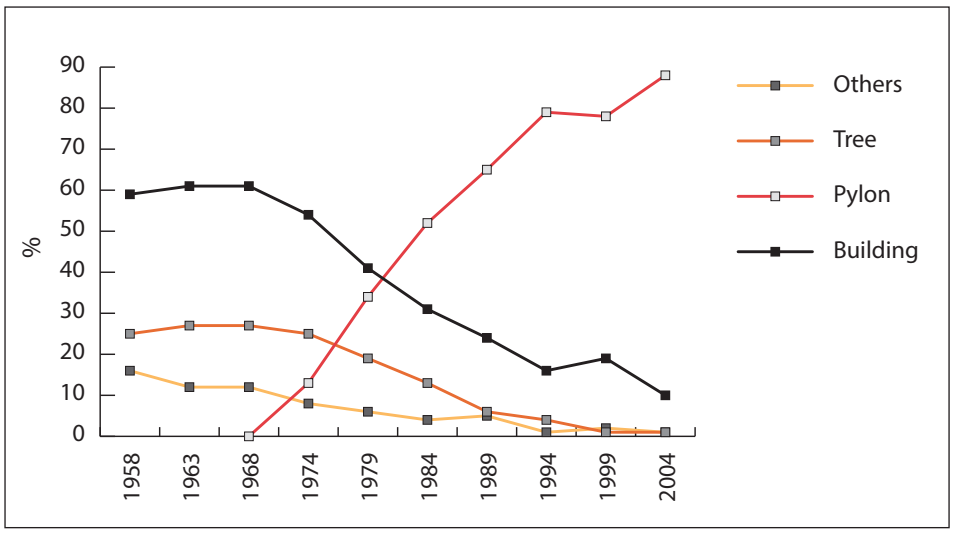

Fig. 3. Changes in nest site selection of the White Stork in Hungary, 1958-2004.
Veränderungen der Nistplatzwahl des Weißstorch in Ungarn zwischen 1958 und 2004.

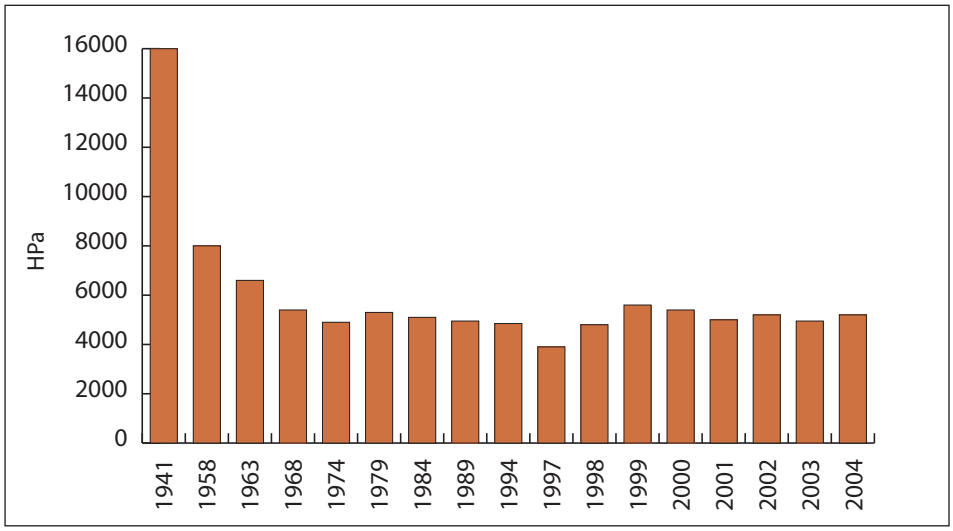

Fig. 4. Population development of the White Stork in Hungary, 1941-2004.
Populationsentwicklung des Weißstorch in Ungarn zwischen 1941 und 2004.

Tab. 1. Results of the International White Stork Census in Hungary, 2004.
Abbrevations: HE: number of nests occupied by lonely stork, HO: number of unoccupied nests, HPm: number of breeding pairs raising youngs, HPo: number of breeding pairs without fledeged youngs, HPa: HPo+HPm, H: total number of nests
Ergebnisse des Internationalen Weißstorchzensus in Ungarn 2004.

Administrative region	Reported data						Calculated data	
	HE	HO	HPm	HPo	HPa	H	HPa estimated total, 2004	HPa estimated total, 1999
Bács-Kiskun	2	31	196	9	205	238	312	360
Baranya	2	28	208	41	249	279	267	268
Békés	8	59	316	21	337	404	337	353
Borsod-Abaúj-Zemplén	10	126	441	47	488	624	746	660
Csongrád	3	35	168	14	182	220	273	267
Fejér		24	106	20	126	150	179	145
Gy□r-Moson-Sopron	5	53	176	43	219	277	219	233
Hajdú-Bihar	2	30	183	9	192	224	488	550
Heves	6	6	59	6	65	77	113	140
Jász-Nagykun-Szolnok	2	32	161	10	171	205	355	440
Komárom-Esztergom	3	18	20	8	28	49	28	34
Nógrád	6	16	70	10	80	102	90	83
Pest	3	18	88	4	92	113	163	217
Somogy		41	127	11	138	179	263	368
Szabolcs-Szatmár-Bereg	11	112	489	17	506	629	506	567
Tolna	5	32	159	27	186	223	186	180
Vas	6	41	138	36	174	221	248	319
Veszprém	7	31	134	17	151	189	151	165
Zala	3	55	188	19	207	265	259	300
Total Hungary	**84**	**788**	**3427**	**369**	**3796**	**4668**	**5183**	**5649**

Table 2. Number of hatchlings per nest in Hungary, 2004.
Anzahl der Jungvögel pro Nest in Ungarn 2004.

No. of hatchlings / nest	No. of nests	%
1	197	6.4
2	697	22.5
3	1302	42.0
4	805	26.0
5	100	3.2
6	1	0.0
Total	**3102**	**100.0**

Table 3. Tab. Reported mortality cases in Hungary 2004.
Mortalitätsursachen für Weißstörche in Ungarn 2004.

Cause of mortality	Hatchling	Fledged 1st year	Adult
Chronism/threwed out	106 (55.5)		
Bad weather	31 (16.2)		
Fall of nest	24 (12.6)		
Parent's accident	11 (5.8)		
Parents' fight	10 (5.2)		2 (13.3)
Poisoned	4 (2.1)		
Bolt	2 (1.0)		
Choked	2 (1.0)		
Hanged	1 (0.5)		
Electrocution		25 (96.2)	8 (53.3)
Collision to wire		1 (3.8)	2 (13.1)
Car accident			2 (3.1)
Shooting			1 (6.7)
Known, total	191 (100)	26 (100)	15 (100)
Unknown	26	3	15
Total	**217**	**29**	**30**

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