

## Zusammenfassung

Obwohl der Weißstorch in der Türkei weit verbreitet ist, wurden bisher wenige Aktivitäten zu dieser Art durchgeführt, mit Ausnahme von einigen lokalen Schutz- und Monitoringstudien. Mit dem 6. Internationalen Weißstorchzensus 2004/2005 beteiligte sich die Türkei erstmals am Weißstorchzensus. Für den Zensus wurde im Wesentlichen ein Fragebogen für Weißstorchbeobachtungen genutzt. Jedoch handelt es sich um eine Pilotstudie, die nur etwa die Hälfte des Landes abdeckte und nicht die gebräuchlichen Zählmethoden nutzte. So ist es nicht verwunderlich, dass das Ergebnis von 6.195 Paaren (HPa) nicht den realen Bestand wiedergibt. Entsprechend den Ergebnissen lokaler Monitoringstudien, die in vier unterschiedlichen Teilen der Türkei durchgeführt wurden, kann ein Rückgang des Reproduktionserfolges in Jahren mit langen Wintern, wie 2005 festgestellt werden. Obwohl der derzeitige Bestandstrend der türkischen Weißstorchpopulation nicht untersucht wurde, ist ein Rückgang der Anzahl der Brutpaare offensichtlich. Deshalb sollten die regionale Monitoringstudien und Schutzprojekte in einigen Teilen des Landes zu einer landesweiten Zensusstudie ausgeweitet werden. Sie sollte in einer Kooperation von Vereinen, Institutionen und der Öffentlichkeit organisiert werden.

## Summary

Although the White Stork is widespread throughout Turkey, not much work has been done on this species with the exception of some local inventories and conservation studies. The 6<sup>th</sup> International White Stork Census 2004/2005 was the first international census in which Turkey has participated. The main method used for the census was a questionnaire with a White Stork Observation Form. However, being a pilot study the census was implemented in only about half the area of the country. The methods used differed slightly from the census methods used in other European countries. Therefore it is clear that the resulting number of 6,195 pairs (HPa) does not reflect the real population size of the country. According to the results of local studies conducted in four different parts of Turkey, it can be said that there is a decline in the breeding success values (which is given here as number of pairs with successful broods (JZm)) during bad years with harsh winter conditions as it occurred in 2005 over all four sample localities. Although the recent trend of the Turkish White Stork population

has not been established during the count, it is likely that there is a decrease in the number of breeding pairs. Therefore, the studies on breeding parameters and conservation studies conducted in some parts of the country should be extended to countrywide inventories and studies and should be organised in cooperation with the relevant organisations, institutions and the local public.

## Introduction

The White Stork is a breeding bird and passage migrant in Turkey. The species breeds throughout the country, except for the eastern and the western parts of the Black Sea region. Some individuals may winter in southern and western coastal parts of Turkey (KASPAREK & BILGIN 1996). In Europe, the number of breeding pairs of White Stork has been monitored since the beginning of the 20<sup>th</sup> century. Data were collected especially in 1934, 1958, 1974, 1984 and 1994/1995 (SCHULZ 1994, 1999; SCHÜZ 1936, 1940, 1979; SCHÜZ & SZIJJ 1962). Turkey has not been included in any international census until the present 2004/2005 census. According to PARR *et al.*, (1997) and as cited in the IUCN red list (2001) the population is estimated to be around 15,000-35,000 pairs, and is considered to have declined by more than 50% between 1970 and 1990. Parr *et al.* (1997) also state that, based on historical data on distribution and abundance of the White Storks in Turkey, a widespread decline probably occurred from the 1950s onwards. KUMERLOEVE (1989) undertook three long distance transects (> 10,000 km) across Turkey. He counted White Storks and the number of occupied nests. However, none of the routes taken were the same as in this study and consequently comparisons were impossible. KASPAREK & KILIÇ (1989) provided an inventory of sites checked within Turkey, and suggested that numbers have declined because of a reduction in the mean number of occupied nests within settlements between 1958 and 1986.

## Method

The National Stork Census in Turkey in 2004 and 2005 was conducted with the collaboration of the Nature Society (DD) and the Nature Research Society. Observations in 2004 and 2005 were mainly made by volunteer bird watchers. The International White Stork Census methodology was not used in this pilot study. Instead, all observations of the storks were noted in the field (*e.g.* storks seen while feeding, resting or flying either during migration or in the breeding seasons) and summed to give a grand total. The census study includes observations from 40 out of 81 provin-

ces in Turkey, almost half the country. The White Stork Observation Form, designed by Nature Research Society in 2003, was revised and used in the census study. The form was published on the websites of both societies. Observers completed the forms and forwarded them to the societies via internet or by post. The forms were collected during two years (2004 and 2005) in the archives of both Nature Research Society and DD. Finally all the data was gathered, analysed and sent to NABU.

## Results

According to the stork census results, a total of 430 stork observation forms were sent out, of which 414 were completed and forwarded to the relevant organizations by volunteer birdwatchers, 295 in 2004 and 119 in 2005. A total of 13,402 White Storks were counted. 231 of the 430 Stork observation forms included nest information. According to these, 56% of the nests were located on electricity poles, 16% on roofs, and 12% on top of mosques.

Given the scope of this census, not all nests throughout Turkey were observed, and so the census result of a total of 6,195 breeding pairs (HPa) will be an underestimate. Because of methodological differences and the restricted census area, this study is regarded as a pilot census study. Nevertheless it is significant, since it represents a starting point for further census studies that will be carried out on the Turkish breeding White Stork population.

In this report, the breeding parameters were given in Table 1 - 4 separately for four areas. Due to the lack of data for some years for some areas, it is not always possible to compare the breeding parameters in Turkey for full five years. According to the results given in Table 5, 2005 was the worst year for four study areas with a sharp decrease in breeding performance (given as productivity "JZa" and mean fledged brood size "JZm" values).

## Discussion

Although a countrywide survey of White Storks was not carried out in Turkey, it is known from field visits and interviews with local people that the species has abandoned some of its former breeding areas and that the number of storks returning to Turkey from the spring migration has declined. The most likely reason for this may be a sharp decline in the quality and quantity of wetland habitats, especially in last 15-20 years, mainly due to drainage projects. This has negative impacts on food availability and consequently on breeding performance, not only for Turkish breeding pairs, but also for storks that migrate through Turkey to breeding grounds in Europe.

White Storks in Turkey use man made structures more frequently now than in the past, a common phenomenon that has occurred across most of the species' breeding range. A loss of natural nest sites has exacerbated this situation. Electricity pylons and transmission lines are the main problem for White Storks in Turkey. To date, Turkish law does not protect birds from electrocution or collision with powerlines. Therefore, it is almost impossible to implement mitigation measures on mid-voltage lines between and within villages. Appropriate legislation is needed to force and to permit utilities companies to spend more money solving this problem.

## Conservation studies in Turkey

Conservation studies in Turkey, such as some local White Stork nest censuses, have been conducted by individuals, institutions and NGOs. These studies include not only biological research, but also work to improve White Stork habitats, environmental education for schoolchildren, and raising the awareness of the local public.

The examples given here are the most active local White Stork conservation studies being conducted in Turkey. These study areas are as follows: Ankara-Kizilcahamam district, Bursa-Villages of Lake Uluabat and Lake Iznik, Izmir-Gediz Delta, some districts of Corum and Mugla-Gokova-Akcapinar Village.

### Ankara (Kizilcahamam)

The Nature Research Society started a pilot project in 2003, the "White Stork Research and Ringing Study", aimed at addressing a lack of knowledge on breeding and migration of the Turkish population of White Storks. Since 2003, the White Stork colony in the central part of Kizilcahamam, in the district of Ankara, has been regularly observed over a five-year period. Ringing studies were undertaken in Ankara-Kizilcahamam and Bursa-Uluabat. So far, 123 White Stork nestlings have been ringed with Turkish rings. Within the context of this project, the White Stork Observation Form was designed and published on Nature Research Society's and DD's websites, and elsewhere.

In addition, an MSc thesis was prepared by Cagri Gocek between 2004-2006, titled "*Breeding Success and Reproductive Behaviors of Kizilcahamam White Stork Colony*" and some field surveys were conducted with the help of Nature Research Society members (GÖCEK 2006). In this study, for the first time in Turkey, a White Stork colony was monitored for three years. The results indicate significant annual variation between best and worst years of the study. Possible reasons for this are thought to be differences in temperature and rainfall between years. In 2005, clutch size was reduced (from 5 to 2), and chick mortality increased (from 0% to 100%), when breeding was delayed. 2005 differed from 2004, in that the adults arrived and started to incubate about 10 days later (GöCEK 2006).

The main threats for the White Stork population of Kizilcahamam that are connected with the breeding site can be listed as:

- Nest disturbance by people (particularly for nests on roofs and chimneys),
- Electrocution or collision with electricity cables,
- Collision with vehicles,
- Pollution of nearby wetlands.

Nature Research Society also executed some projects in cooperation with Polish Society of Wildlife Friends "pro Natura", which were aimed at: setting up a communication network among the Turkish White Stork volunteers; increasing awareness on the importance of the conservation of the species; organizing know-how and experience exchange meetings; and constituting a sustainable country-wide education programme based on the White Stork. The projects were funded by the European Commission DG Environment and the Dutch Embassy. In addition, in 2005 and 2006, with the help of local branches of Ministry of Forestry and Water

Affairs, in order to prevent White Stork losses, some nest platforms were constructed in Kizilcahamam, outside of the industrial estate, though they have so far not been occupied by storks.

### **Bursa (Villages of Lake Uluabat and Lake Iznik)**

The “Stork-friendly villages around Lake Uluabat Project” has been carried out since 2003, mainly by Franziska Arıcı, assisted by the Uludag University Bird Watching Club (ULUKUS). The project has been supported by the Provincial Directorate for Environment and Forestry, the Municipality of Nilufer and the municipalities of districts around the lake, some NGOs such as the Yildirim Bayezid Rotary Club and the Local Agenda 21 Nilüfer, the environmental Group of RBTR Bosch, and many private individuals.

The main aim of the project is to reduce the number of White Stork deaths in the villages around the lake. For this purpose, every year since 2004, training has been carried out, the White Stork population is counted, an annual White Stork Festival is organised, and alternative income sources for the villagers are provided. In addition, some improvement works have been carried out on electricity pylons, and nest platforms are set up in appropriate locations. The villages belonging to the project area are: Uluabat, Golkiyi, Eskikaraagac, Yenikaraagac, İkizce, Golyazi, Catalagil, Karacaoba, Baskoy, Akcalar, Fadilli, Akcapinar, Onac, Dorak, Karaoglan, Ayaz, Incirlipinar, Doganci, Yamanli, Ovaazatli, Tepecik, Yesilova, Ormankadi, Kumkadi, and Yolagzi.

Lake Uluabat is a large shallow lake of 13,500 ha in northwestern Turkey. It is situated very near to the eastern migrating flyway of the White Stork in a large basin with wide, partially irrigated farmland and several rivers with temporarily flooded areas alongside. The lake was listed as a Ramsar site in 1998, and afterwards was also declared as a member of the “Living Lakes” network. The steering committee of the management plan was established in 2003. But protection of the lake is very difficult to achieve, due to its close proximity to Bursa, one of the largest cities in Turkey.

The most obvious threat to the stork population in the villages around the lake comes from open powerlines with upright isolators. Generally, villagers report up to a 10% decrease in the numbers of nesting pairs in their villages soon after the powerlines became widespread over the area. In cooperation with the local directory of TEDAS, the Turkish Electricity Distribution Company, the low voltage lines inside 8 villages have been insulated and 75 platforms fixed on pylons and roofs since the winter of 2003/2004. In 2007, insulation of powerlines in two more villages has been completed, and a further 25 platforms were erected to replace old nests.

As a result, in the villages around Uluabat, where the electricity improvements studies were done, the number of breeding pairs has increased, and the number of White Stork deaths has reduced significantly especially for young birds.

Lake Iznik is a very deep lake, 298 km<sup>2</sup> in area, and mostly surrounded by fruit and olive groves. There is little annual variation in water levels. There are some rice fields on the south-west edge of the lake. To date, nobody living around the lake has been engaged in observation and/or conservation studies of the storks.

Observations are voluntarily made by students of the Bursa Bird Watching Club and take place only once a year due to logistical problems. There are some unpleasant attitudes of the villagers towards White Storks. For instance, storks are frightened of the ricefields, because the birds damage young plants when landing and taking off there.

Most importantly, storks are at risk from the electricity transmission and distribution system. Nests are destroyed by villagers and shortcircuit fires result in stork losses, while it is also clear that the feeding area is very limited for the storks. On the north-west shore of the lake, the sky is full of electricity cables and therefore almost no storks breed there. This area is also highly risky for migrating storks.

### **Izmir (Gediz delta)**

The Gediz delta lies close to the city of Izmir, and is one of the most important wetlands in the Mediterranean. It is 40,000 ha in area, and includes a range of habitats including fishponds, salt and freshwater marshes, arable fields, etc.

Previously, Prof. Mehmet Siki from Izmir Aegean University has made an important individual attempt to protect White Storks from electrocution. He constructed the first White Stork nest platform in Sasali Village in 1999. He also gave some seminars on the importance of the White Storks in the villages around Izmir. In 2006 an M.Sc. thesis study was prepared by Aysegul Ciftci on the “Breeding biology of White Stork (*Ciconia ciconia*) in some villages of Izmir”.

A “White Stork Conservation Project” has been carried out since March 2005 by the Association of Protecting and Improving Izmir Bird Paradise in Gediz Delta. The study area covers 14 residential areas and 54 White Stork nests. Since most of the nests were located on electricity pylons, the intention is to encourage White Stork to move to safer nest platforms, to construct extra nest platforms for likely future breeding pairs, and to insulate all the electricity lines in order to protect White Storks from electrocution and collision with the cables. Following the occupation of platforms that have already been set up, it is planned to construct more platforms in the area.

### **Corum (some districts of the city)**

The “White Stork Observation and Census Project” has been coordinated by Sonmez Yanardag with the help of the Corum Bird Watching Club (CoKGT) since March 2004. The aim of the Project is to carry out surveys, especially on White Storks breeding in the villages in Corum province, and to increase the awareness of local farmers of the importance of the White Stork for sustainable agriculture. For this purpose, the White Stork census study is conducted every year between March and October. The Corum Bird Watching Club cooperates with Nature Research Society, DD and the local branches of Ministry of Forestry and Water Affairs on White Stork census studies being conducted in the Kizilirmak and Yesilirmak basins. Some interviews have been conducted with local farmers and villagers.

So far, the species of the Corum district have been documented, the breeding numbers of White Storks have almost been deter-

mined and the prejudices of the villagers regarding the potential for White Storks to spread bird flu have been allayed.

### Mugla (Gokova- Akcapinar Village)

The “Akcapinar White Stork Village Project” has been carried out by Bahar Suseven in the name of Gökova- Society of Lovers of Akyaka. Some of the project is funded by GEF-SGP as a part of the “Bio-Gokova Project”. It started in 2001 and is still partly ongoing. The aim of the project is to protect the existing White Stork population and introduce eco-tourism practices. Accordingly, meetings with local people and field visits for White Stork counts have been organised, and leaflets have been prepared and distributed to villagers.

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**Tab. 1. Development of the breeding population and breeding performance of the White Stork on Lake Uluabat 2004 – 2007. () = with estimated numbers of Yolagzi and Ovaazat; (\*) = with numbers for Ovaazatli, but without Yolagzi; \*\* = HPo inclusive pairs without nests; \*\*\* area without waterbodies.**

**Entwicklung des Brutbestandes und des Bruterfolges des Weißstorchs am Uluabat See 2004 – 2007.**

**() = incl. geschätzte Anzahl für die Dörfer Yolagzi und Ovaazat; (\*) = incl. Anzahl für das Dorf Ovaazati, aber ohne Yolagzi; \*\* = HPo incl. Paare ohne Nester; \*\*\* Fläche ohne Gewässer.**

Year	HPa	HPm	HPo	%HPo	HPx	JZG	JZa	JZm	StD***
2004	112 (124)	0	0	10.0	0	ca 280	2.5	2.8	20.7
2005	99 (103*)	68	24	24.2	6	172	1.7	2.5	17.2
2006	109	91	17	15.6	1	235	2.2	2.6	18.2
2007	123	102	18	14.6	3	292	2.4	2.9	20.5

Tab. 2. Development of the breeding population and breeding performance of the White Stork on Lake Iznik 2004 – 2006.

Entwicklung des Brutbestandes und des Bruterfolges des Weißstorks am Iznik See 2004 - 2006.

Year	HPa	HPm	HPo	%HPo	HPx	JZG	JZa	JZm	StD
2004	28	24	1	3,6	3	76	2.7	3.2	11.2
2005	20	14	6	30.0	1	29	1.5	2.1	8.0
2006	21	20	1	4.7	0	52	2.5	2.6	8.4

Tab. 3. Development of the breeding population and breeding performance of the White Stork in Izmir Gediz Delta 2005 – 2007.

Entwicklung des Brutbestandes und des Bruterfolges des Weißstorks im Izmir Gediz Delta 2005 – 2007.

Year	HPa	HPm	HPo	%HPo	JZG	JZa	JZm
2005	15	13	2	13.3	34	2.3	2.6
2006	22	22	0	0	61	2.8	2.8
2007	36	32	4	11.2	79	2.2	2.5

Tab. 4. Development of the breeding population and breeding performance of the White Stork in the colonie of Ankara Kizilcahamam 2003 – 2007.

Entwicklung des Brutbestandes und des Bruterfolges des Weißstorks in der Kolonie von Ankara Kizilcahamam 2003 – 2007.

Year	HPa	HPm	HPo	%HPo	JZG	JZa	JZm
2003	9	7	2	22.2	21	2.3	3.0
2004	15	10	5	33.3	42	2.8	4.2
2005	15	7	8	53.3	17	1.1	2.4
2006	15	14	1	6.7	47	3.1	3.4
2007	15	15	0	0	48	3.2	3.2

Tab. 5. Development of mean fledged brood size (JZm) in four regions 2003 – 2007.

Entwicklung des Teilbruterfolges (JZm) in vier Regionen 2003 – 2007.

Years/Locations	Ankara (Kizilcahamam)	Bursa(Uluabat)	Bursa (Iznik)	Izmir (Gediz)
2003	3.0	unknown	unknown	unknown
2004	4.2	2.8	3.2	unknown
2005	2.4	2.5	2.1	2.6
2006	3.4	2.6	2.6	2.8
2007	3.2	2.9	unknown	2.5

## Imprint

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