

The White Stork in the Netherlands in 2004 - 2005

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Zusammenfassung

Die Ergebnisse des 6. Internationalen Weißstorchzensus 2004/2005 werden präsentiert und mit den Ergebnissen des Zensus von 1995 verglichen. Der Weißstorchbestand in den Niederlanden hat sich von 282 Paaren (HPa) 1995 auf 523 Brutpaare (HPa) im Jahr 2005 fast verdoppelt. Damit ist der Bestand höher als 1910. Jedoch ist der Bruterfolg (JZa) sehr gering und liegt bei ca. 1.5 Jungen pro Brutpaar. Die Brutpaare haben sich mittlerweile auch außerhalb der Auswilderungsstationen angesiedelt. Der Schwerpunkt des Auswilderungsprojektes ist heute nicht mehr die Auswilderung von Gefangenschaftsvögeln, sondern eine Unterstützung der frei lebenden Population.

Summary

The results of the 6th White Stork Census 2004/2005 are presented and compared with the results of the census in 1995. The population has almost doubled (from 282 in 1995 to 523 breeding pairs in 2005) and numbers are now higher than in 1910. However, productivity is low, averaging around 1.5 young per breeding pair. The breeding range is expanding around the stations of the reintroduction project. The emphasis of the reintroduction project has changed from releasing captive-bred storks, to helping them to survive on their own.

Methods and amount data obtained

Since the beginning of the 20th century, the breeding population of the White Stork in the Netherlands has been followed almost every year by counting occupied nests. This Dutch monitoring program over a period of almost a century is unique in the world.

The first count took place in 1910, when Jan P. Strijbos together with his brother famously counted all 500 pairs by bike. In subsequent surveys the information was obtained by mail. Since 1995 the *Werkgroep Ooievaarstelling*, a part of the reintroduction program, has organized annual counts. The information is obtained by reintroduction "satellite-stations" and owners or contacts of nests.

Keepers of satellite-stations gather data about nesting storks at their station and the immediately surrounding area. Data consist

of over-wintering, sex and ring details of adults; number of eggs, number of hatchlings and number of fledged young; ring details and time of migration of fledged young.

The observations of storks at nests in the rest of the Netherlands are gathered by sending (in May) pre-printed questionnaires to owners or contacts of all known existing nests. Each questionnaire contains its own location data to prevent double counting. In addition to the data gathered by the satellite stations, further information is asked for on the questionnaires. In this way, information is obtained about the condition of the nest, use of the nest by storks (visits or permanent occupation), timing of arrival, all kinds of behaviour (fighting, building on the nest, mating, breeding etc.), and the degree of dependence on food supplied by people. When the questionnaires are returned in early June, we have an impression of the current situation. In September, a second form is sent for nests that were recorded as occupied on May 25th, in order to get information about the final breeding results.

The criteria we use are:

- a pair (HPa) or a single bird (HE) is counted when it has occupied a nest day and night for a period of 28 days;
- a pair with eggs is always counted, even when it has occupied a nest for a shorter period.

Nesting pairs (HPa) are categorised using international codes (HPo(o), HPo(g), HPo(m) and HPm). In situations where we are not sure if the pair had eggs or hatchlings, instead of HPx, the following notation is used:

- unknown if eggs were laid = HPo(o), number of eggs 0 (unknown)
- unknown if there have been hatchlings = HPo(g), number of hatchlings 0 (unknown)

The code HPx is only used when a breeding pair is reported, but not confirmed.

The number of eggs and hatchlings is based on:

- the number of fledged young;
- including eggs and dead chicks found under or on the nest;
- behavior (e.g. breeding = at least 1 egg, bringing food to the nest = at least 1 hatchling)
- other observations.



All this data is put on a database for listing breeding results, making distribution maps and further research. Every nest has its own record with a unique number, the exact location and contact data. Sub-records with the year's breeding results are attached to this nest record annually. In combination with the data on ring recoveries, the breeding database means that the stork population in the Netherlands is almost completely covered.

Results of the census 2004/2005

The *Werkgroep Ooievaarstelling* has chosen to use the results in both years of the census. This was possible because we have the data, but also because there are differences between the two years. In both years, the total number of nesting pairs (2004: 562 HPa; 2005: 563 HPa) was almost the same, but much higher than 2003. The factor which made using both years very interesting is the breeding results. 2004 was by far the best breeding season we had ever recorded, with more than 900 fledged young, compared to the 600 or so generally recorded in the preceding years. This success was due to two main causes:

- good weather conditions in the critical phases of the breeding season;
- an abundance of food because of very high numbers of voles

The breeding season 2005 was more normal, with a period of rainy and cold weather when the eggs were just hatched, followed by heavy rainfall around the end of the first week in June. Heavy losses because of bad weather between early May and early June are common in the Netherlands. The death of nestlings at an early age, before they are clearly visible, affects the numbers in the tables. (see "Methods")

For the White Stork censuses, the Netherlands is traditionally divided into regions based on five concentrations around satellite stations of the reintroduction project (Fig. 1). As shown in Table 1, breeding numbers in three regions decreased, while numbers increased slightly in the northern part of the Netherlands. There was also a decline in the number of captive breeding pairs. The reason for retaining birds in captivity is that they are often productive and in this way contribute to the results. These pairs consist of two birds that are both unable to fly, or a free-flying stork White Stork mated with a bird that is not able to fly.

Although the main aim of the census was to get information about the number of breeding pairs along with the outcome of breeding attempts, a population also contains pairs that occupy nests without breeding activity. In particular, where a population includes some very old birds, they often skip a year breeding, but nevertheless occupy a nest. Including these birds in the census allows a more complete view on the situation to be obtained.

Table 2 gives a better impression about the situation in each region. The number of nesting pairs and their results differs between regions, caused by factors such as urbanization, landscape, habitat and supply of supplementary food. Figure 1, shows clear concentrations around some of the former release stations in 1995, but in other places closure of the release stations and changes in the feeding program caused more spreading. Based on our knowledge of the breeding areas, the population performs best in areas with small, extensively used fields, surrounded with trees and hedges, and with a high water table. This partly explains the high densities and expansion in the north part of the Netherlands (regions 4 and

5). These relatively small regions have areas of habitat which are apparently suitable for the needs of the White Stork.

Development of the breeding population

The White Stork has been a characteristic breeding bird of the Netherlands since at least the Middle Ages, but declines began to be reported as early as the nineteenth century. According to the first survey in the Netherlands (in 1910), about 500 nests were occupied by (breeding) pairs. At that time, the population was already decreasing. In 1939, the number of occupied nests was 316. By the 1960s, it was clear that the White Stork would disappear as a breeding bird in the near future.

This motivated *Vogelbescherming Nederland* (BirdLife Netherlands) to start a reintroduction project in 1969. In that year, the breeding station in Groot-Ammers was opened. From 1979 till 1989 a total of 12 satellite stations were established. This has resulted in a substantial growth of breeding pairs from 1980 onwards, concentrated mainly around the breeding station and its satellite stations. Since 1990, more and more pairs have started to settle in other parts of the country. This was the first indication that the project was succeeding. In 1995, a concentration of breeding pairs around the satellite stations was clearly discernible (Fig. 1).

Since the previous census in 1994/1995, the population has increased enormously (Tab. 4; Fig. 1). In 1995, there were 297 nesting pairs (HPa), of which 282 were breeding, and in 2005 this had increased to 563 HPa (with 524 breeding) in 2005. The White Stork population is now larger than it was in 1910. This strong population increase and range expansion are attributable to a number of factors. Between 1995 and 2000, the first steps to a new phase in the reintroduction program were made:

- a reduction in the number of young kept in captivity at the breeding station to supply the satellite stations;
- gradual reduction in artificial feeding at some satellite stations;
- no further replacement of collapsed nests at the breeding and satellite stations ;
- reduction of nests and rearrangement of the layout of breeding and satellite stations, to reflect new ways of operation.

In many cases, this caused the storks to move away from the stations. At the same time, the increase in the breeding population meant increasing numbers of fledged young, which might return to Holland to breed.

After a lull between 1999 and 2001 when breeding numbers were more or less stable, the population began to grow again, even faster. In 2000, the keepers of the satellite stations in the northern part of the country were disappointed that hardly any new breeding pairs settled in their area. But after 2000, the population started to grow rapidly in that region. Old breeding grounds were repopulated, even in the far north, where two old sites from the 1950s were re-occupied. Region 4 witnessed a population explosion. Locally, the growth was so strong that territorial fights led to very low breeding results in this area in 2005. Further strong growth occurred alongside the main rivers and in the centre of the Netherlands. The Flevoland population originates from a local project.

Recording ring details of nesting birds shows that population growth is driven by the return of young Dutch birds (Fig. 2), as well as by immigration of young birds from abroad. They often start to nest further away from the breeding and satellite stations, and not on their grounds. Instead, they seem to fill the gaps left by old birds which have died. This is a good sign for the future.

Nest locations

In the middle of the 20th century, most nests were found on city halls, churches, castles, houses, barns or trees. These nests could be natural or artificial. But regrettably, nests on poles came to predominate as old nests decayed. Trees with nests were blown down in storms, or fell down because of old age, and were replaced with poles. The disappearance of nests from buildings was often due to the Dutch habit of tidiness. An occupied stork's nest on a house makes the house look shabby and dirty, and the object of uncomplimentary remarks. Also, the prevailing rumour that stork excrement would ruin roof materials and destroy metal guttering contributed to the change to nests on poles.

When the population of the stork decreased during the 1960s and 1970s, the abandoned old nests were neglected and often disappeared. In the areas where the reintroduction was initiated, pole nests were becoming the most common nest type (Fig. 3). People forgot that storks originally nested in trees and on buildings. When artificial nests are erected to help the storks, people often think that nests on poles are the only option. They are amazed, or even panic, if a stork chooses another place to build a nest on its own, because they think storks can only breed on a nest on pole and are unable to build a nest of their own.

But as the stork population has expanded to new areas (actually repopulating lost historical range), the number of natural nests has grown. Although much of the population uses artificial nests on poles, increasing numbers of natural nests can be found, on a variety of sites.

Nowadays in the Netherlands, stork nests can also be found on cranes, old mills for draining the land, a solar panel, high streetlights, telephone poles, old farms, castles, silos, flat roofs, overhead wires, cages of zoos, churches, city halls, high chimneys, private homes, trees and hedges (Fig. 4). This is a development enjoyed by many people.

Unfortunately, the myth that storks damage roofs and the Dutch habit of tidiness still combine to cause the disappearance of nests on buildings, sometimes even if they have been occupied for years with no problems.

Another interesting development is that old nests which were maintained since they were abandoned are now being re-occupied, including some nests that had been empty for more than 50 years, but which have been occupied once again for a number of years.

Conservation and reintroduction programs

Between 1995 and 2005, there were major changes in the reintroduction project. 1998 was the last year that young White Storks were held in captivity in the breeding station in Groot-Ammer as a reserve for the satellite stations. At the end of 1999, the breeding station was converted into an educational centre about White Storks. The feeding programme at the satellite stations was changed, so that generally less food was made available to storks so that they could become independent of the stations. Precise details varied from station to station.

The breeding phase came to an end, and the main focus of the reintroduction project was now to improve the quality of the foraging areas. Some projects attempting to create special White Stork habitat failed. But the White Storks seem to benefit from changes in the landscape aimed at general improvements to the natural heritage, as well as from special projects targeted at other animals or plants:

- measures to cope with problems from seasonal high water levels in the main rivers led to the creation of floodplains along the rivers that are wet in winter and spring;
- new projects aimed at improving biodiversity (raising the groundwater level, creation of side channels in the main rivers etc);
- an increase in the area of extensively managed grassland (because of greater uptake of agri-environmental schemes).

Table 5 illustrates the effect of these changes in 3 areas further away from the areas of the 1995 concentrations. In these new areas, White Storks settled spontaneously and their numbers increased more rapidly than in other parts of the Netherlands, because of the presence of wet grasslands or extensive grassland management.

Because of the success of the project, the White Stork is not included in the new Dutch Red List of threatened species. Time will tell if this success is long-lasting.

Discussion

We estimate that about 10% of breeding pairs are totally independent of artificial food, though not necessarily of people. The White Stork forages in fields, but also near human settlements. The White Stork is a very popular species and increasing numbers of people feed storks in order to retain birds on the nest in their garden, or to encourage more storks to settle in the vicinity.

The average productivity decreased from 2.5 young fledged per breeding pair in the early 1990s, to about 1.5 (Fig. 5) during the period 1996- 2005. This rate is too low to sustain a stable population. In spite of this, the population is increasing. About half of the adults overwinter in the Netherlands, so winter mortality of adults is very low. If low reproductive rates are more than compensated for by high adult survival, this might explain the current increasing population trend.

Acknowledgements

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Tab. 1. Results of the 6th International White Stork Census for the Netherlands.

Ergebnisse des 6. Internationalen Weißstorchzensus in den Niederlanden.

| Region | | Breeding pairs | | | | Eggs | | | | Nestlings | | | | | |
|--------------|--|----------------|------------|--------------|----------|--------------|-------------|-----------------|-------------|--------------|------------|-------------------|----------|-------------------|-------------|
| | | free-flying | | in captivity | | minimal laid | | minimal hatched | | fledged free | | held in captivity | | JZ / breedingpair | |
| | | (A) | | (B) | | | | | | (D) | | (E) | | (D+E) / (A+B) | |
| | | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 |
| 1. | Western part of The Netherlands Central part of The Netherlands Flevoland | 73 | 68 | 3 | 1 | 212 | 173 | 158 | 132 | 127 | 101 | 1 | 0 | 1,68 | 1,46 |
| 2. | Main rivers Southern part of The Netherlands | 162 | 156 | 2 | 0 | 442 | 368 | 358 | 276 | 217 | 160 | 0 | 0 | 1,32 | 1,03 |
| 3. | Northwestern part of the Veluwe Central part of the Veluwe Area around the IJssel-river Eastern part of The Netherlands | 58 | 56 | 0 | 0 | 160 | 152 | 137 | 131 | 93 | 73 | 0 | 0 | 1,60 | 1,30 |
| 4. | Northwestern part of Overijssel Friesland (area next to Overijssel) Southwestern part of Drenthe | 189 | 196 | 4 | 4 | 570 | 580 | 499 | 505 | 417 | 396 | 0 | 0 | 2,16 | 1,98 |
| 5. | North part of The Netherlands Northeastern part of The Netherlands | 40 | 43 | 0 | 0 | 127 | 128 | 100 | 91 | 75 | 55 | 0 | 0 | 1,88 | 1,28 |
| TOTAL | | 522 | 519 | 9 | 5 | 1511 | 1401 | 1252 | 1135 | 929 | 785 | 1 | 0 | 1,75 | 1,50 |

Tab. 2. Total number of nesting pairs of the White Stork, according to status (HPgroup* : One of the satellite stations in Region 4 provided only total numbers of pairs and fledged young, so it is not possible to subcategorise these results further).

Gesamtzahl der Nestpaare des Weißstorchs, aufgeteilt nach dem Status (HPgroup* : Eine Satellitenstation in der Region 4 meldete nur die Gesamtzahl der Paare und ausgeflogenen Jungen. So ist es nicht möglich diese Ergebnisse detaillierter zu unterteilen).

| Region | | HPa | | HPo(o) | | HPo(g) | | HPo(m) | | HPm | | HPgroup | |
|--------------|--|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|
| | | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 |
| 1. | Western part of The Netherlands Central part of The Netherlands Flevoland | 86 | 82 | 10 | 14 | 13 | 4 | 7 | 14 | 56 | 50 | 0 | 0 |
| 2. | Main rivers Southern part of The Netherlands | 173 | 163 | 11 | 7 | 23 | 30 | 27 | 39 | 112 | 87 | 0 | 0 |
| 3. | Northwestern part of the Veluwe Central part of the Veluwe Area around the IJssel-river Eastern part of The Netherlands | 60 | 62 | 2 | 6 | 7 | 2 | 9 | 17 | 42 | 37 | 0 | 0 |
| 4. | Northwestern part of Overijssel Friesland (area next to Overijssel) Southwestern part of Drenthe | 199 | 209 | 6 | 10 | 15 | 24 | 14 | 18 | 124 | 123 | 40 | 34 |
| 5. | North part of The Netherlands Northeastern part of The Netherlands | 44 | 47 | 4 | 4 | 3 | 8 | 3 | 6 | 34 | 29 | 0 | 0 |
| TOTAL | | 562 | 563 | 33 | 41 | 61 | 68 | 60 | 94 | 368 | 326 | 40 | 34 |

Tab. 3. Successful breeding pairs (HPm), by number of fledged young.
Anzahl erfolgreiche Brutpaare (HPm) unterteilt nach der Anzahl flügger Jungen.

| Region | | HPm1 | | HPm2 | | HPm3 | | HPm4 | | HPm5 | |
|--------------|--|-----------|-----------|------------|------------|------------|-----------|-----------|-----------|----------|----------|
| | | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 |
| 1. | Western part of The Netherlands Central part of The Netherlands Flevoland | 11 | 15 | 21 | 21 | 22 | 12 | 2 | 2 | 0 | 0 |
| 2. | Main rivers Southern part of The Netherlands | 34 | 31 | 54 | 39 | 21 | 17 | 3 | 0 | 0 | 0 |
| 3. | Northwestern part of the Veluwe Central part of the Veluwe Area around the IJssel-river Eastern part of The Netherlands | 9 | 12 | 20 | 15 | 8 | 9 | 5 | 1 | 0 | 0 |
| 4. | Northwestern part of Overijssel Friesland (area next to Overijssel) Southwestern part of Drenthe | 15 | 24 | 39 | 34 | 40 | 41 | 26 | 22 | 4 | 2 |
| 5. | North part of The Netherlands Northeastern part of The Netherlands | 5 | 13 | 18 | 6 | 10 | 10 | 1 | 0 | 0 | 0 |
| TOTAL | | 74 | 95 | 152 | 115 | 101 | 89 | 37 | 25 | 4 | 2 |

Tab. 4. The breeding population in 2005 compared to 1995 in numbers.
Vergleich der Populationsgrößen 1995 und 2005.

| Region | | Breeding pairs | | | | Nestlings | | | |
|--------------|--|-----------------|------------|------------------|----------|--------------|------------|-------------|-------------|
| | | free-flying (A) | | in captivity (B) | | fledged (JZ) | | JZ / (A+B) | |
| | | 1995 | 2005 | 1995 | 2005 | 1995 | 2005 | 1995 | 2005 |
| 1. | Western part of The Netherlands Central part of The Netherlands Flevoland | 28 | 68 | 3 | 1 | 41 | 101 | 1,32 | 1,46 |
| 2. | Main rivers Southern part of Netherlands | 127 | 156 | 9 | 0 | 132 | 160 | 0,97 | 1,03 |
| 3. | Northwestern part of the Veluwe Central part of the Veluwe Area around the IJssel-river Eastern part of The Netherlands | 20 | 56 | 0 | 0 | 30 | 73 | 1,50 | 1,30 |
| 4. | Northwestern part of Overijssel Friesland (area next to Overijssel) Southwestern part of Drenthe | 75 | 196 | 4 | 4 | 156 | 396 | 1,97 | 1,98 |
| 5. | North part of Holland Northeastern part of The Netherlands | 16 | 43 | 0 | 0 | 13 | 55 | 0,81 | 1,28 |
| TOTAL | | 266 | 519 | 16 | 5 | 372 | 785 | 1,32 | 1,50 |

| | Vechtplassen | Beetsterzwaag | Peize / Roden |
|------|--------------|---------------|---------------|
| 1995 | 1 | - | 2 |
| 1996 | 1 | - | 2 |
| 1997 | 1 | - | 2 |
| 1998 | 2 | 1-2 | 4 |
| 1999 | 3 | 2 | 4 |
| 2000 | 4 | 3 | 3 |
| 2001 | 5 | 4 | 3 |
| 2002 | 5 | 4 | 5 |
| 2003 | 8 | 6 | 6 |
| 2004 | 10 | 8 | 8 |
| 2005 | 9 | 9 | 8 |

Tab. 5. Change in numbers of nesting pairs (HPa) in 3 areas where White Storks benefit from changes in habitat.

Entwicklung der Anzahl der Nestpaare (HPa) in drei Regionen in denen Weißstörche von Habitatmanagementmaßnahmen profitieren.

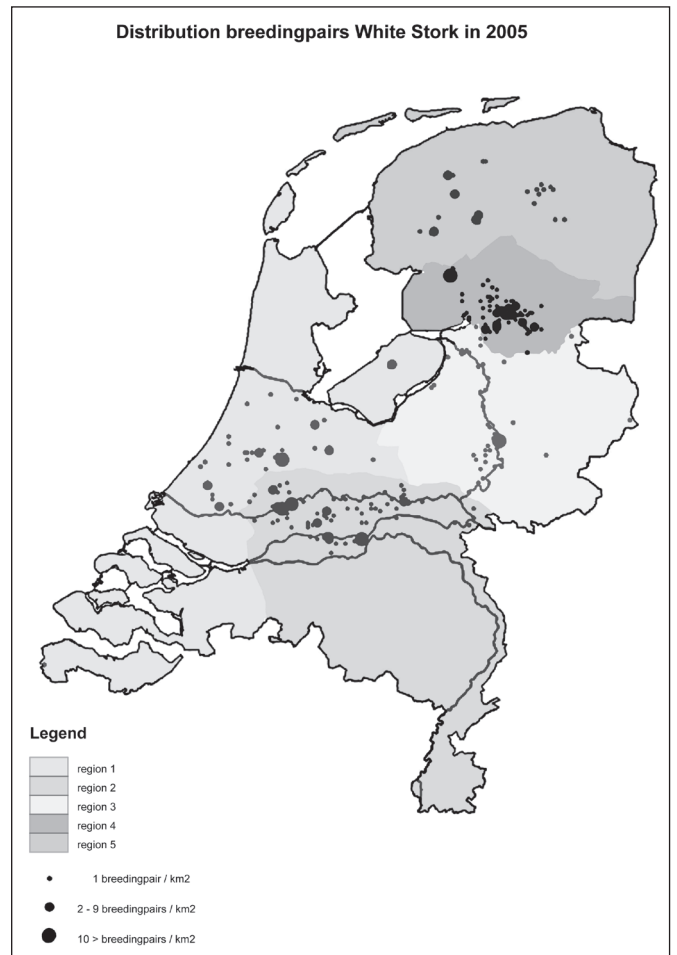
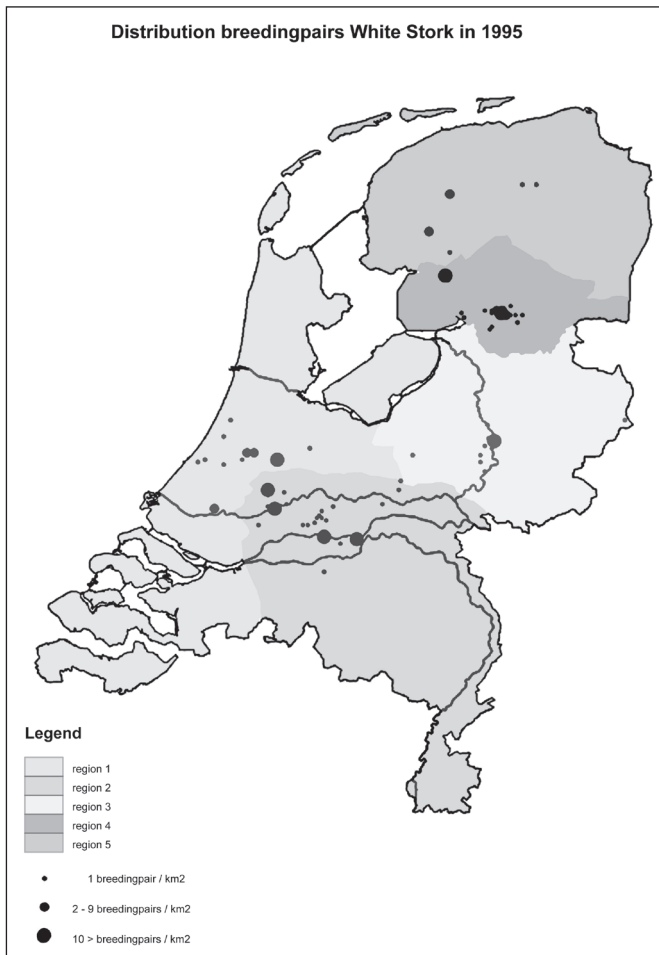


Fig. 1. Distribution of the White Stork in The Netherlands 1995 and 2005.
 Verbreitung des Weißstorchs in den Niederlanden 1995 und 2005.

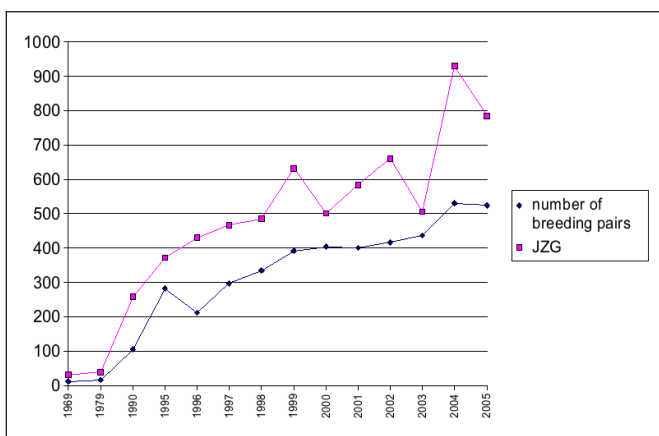


Fig. 2. Development of the breeding population (in 1996 the results of the breeding station in Groot-Ammerz were not available. This explains the decreasing numbers in the graphics.).

Entwicklung der Brutpopulation (für 1996 sind die Ergebnisse der Brutstation in Groot-Ammerz nicht verfügbar. Dies erklärt den Rückgang in der Grafik.).

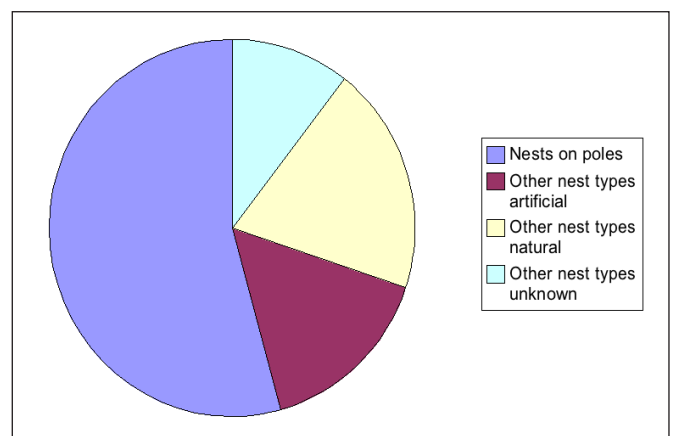


Fig. 3. Nests on poles in proportion to other nest types used by nesting pairs.
 Anteil der Nester auf Masten im Vergleich zu anderen Nestunterlagen.

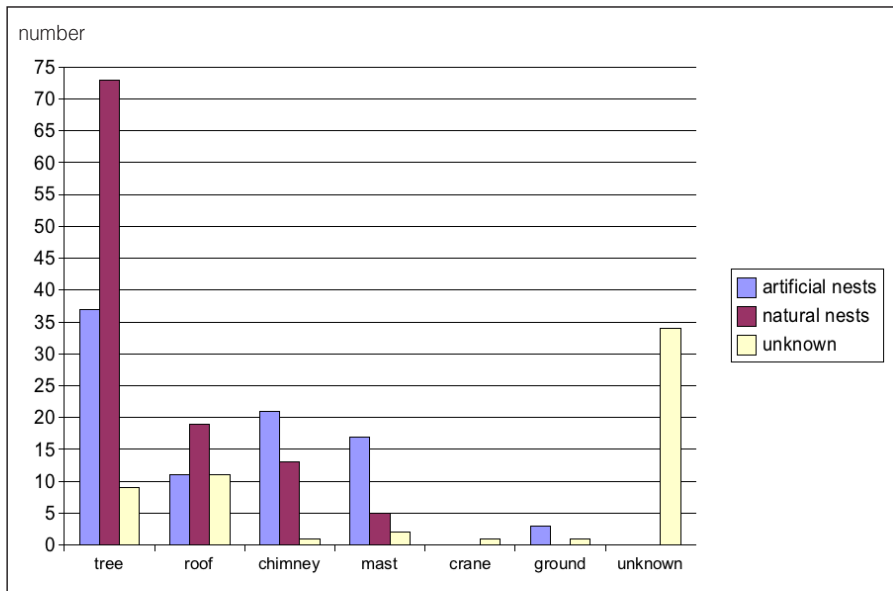


Fig. 4. Other nest types used by nesting storks
 Andere Nestunterlagen die von Weißstörchen genutzt wurden.

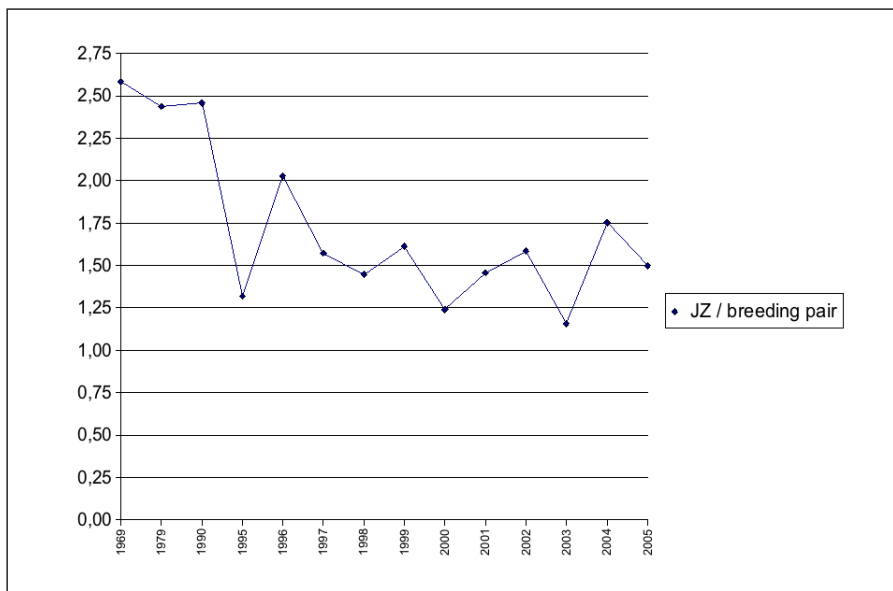


Fig. 5. Change in mean productivity.
 Entwicklung des Bruterfolges.

Imprint

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