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Conservation Measures for the Black Stork (*Ciconia nigra*) in Hungary, particularly in the Gemenc Region of the Danube-Drava National Park, 1996-2000.

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ABSTRACT - *This paper describes practical Black Stork conservation measures designed to solve problems with nest loss or nesting sites becoming unsuitable or difficult to reoccupy. In 1996 we started trials to solve these problems through nest restoration and artificial nest-building. After five years we can state that our method can successfully be applied to keep Black Storks nesting in disturbance-free places and to improve breeding success.*

Preliminaries

The goal of the Hungarian Ornithological and Nature Protection Society is to provide in co-operation with the Authorities, conditions for successful breeding of every pairs of Black Storks (*Ciconia nigra*) and to stabilize the population. Long-term protection of the forests providing nesting places is extremely important. Maintenance of the population is only possible if feeding places and wetlands are conserved as well. Legal conditions are almost established. In this presentation we would like to report on our practical conservation measures, particularly artificial nestbuilding.

Introduction

Based on our surveys starting in 1992 in Gemenc we know that Black Storks choose natural, old, diverse forests free of disturbance for nesting. They most frequently build their nest on the oldest, biggest tree, often on a horizontal branch-fork.

During our work we experienced that the Black Storks' nests often fall down. This can be a severe loss, particularly when, during the breeding season, young storks are still in the nest. Black Storks then do not have time to build a new nest and attempt to breed again in the same season. Nests frequently fall down because of the small size of the supporting branch or the rotting or drying out of the supporting fork. Furthermore, in some forests where nesting occurred in the past, there are no trees suitable for nesting any more. In some cases Black Storks choose a nesting site in forests that isn't the best places because human disturbance is frequent during the breeding season.

A practical answer to the above-mentioned problems - to our opinion - may be artificial nest-building. In 1996 we started to renovate nests found to be in bad condition, as well as to build artificial nests or nest-bases at places that we thought would be ideal, based on our observations and experiences. Sometimes we even renovated nests that had not been in use the year before (this means we knew the pair was nesting somewhere near), because at the moment we could not predict which nest the pair would choose the following year.

Methods

Artificial nestbuilding (method no. 1)

A suitable branch - fork was chosen on which strong 10 cm diameter branches were put next to each other, thus forming an approximately horizontal, 1-1,5 m^2 surface. On it, as we have seen at nests built by storks themselves, a nest was build out of 1-2 cm diameter, 1-1,5 m long branches that would rise to approx. 20-30 cm height. Finally, we put soft mosses into it, as storks would (Picture 1).

Nest base building (method no. 2)

We found in several cases that storks put their nest onto a V-shaped horizontal fork if there's a branch lying across it (∀). Furthermore, if there is no branch closing the V, the nest as it is getting bigger, may fall into it. We tried to induce storks to build their nest on V-shaped horizontal forks by putting stable rods across, sometimes in place of a fallen nest (Pictures 2 and 3).

Fig. 1 - *Method no. 1.* (photo: KALOCSA Bela) - *Méthode n° 1.*

Results

Our nestbuilding activities during five years are summarized in table 1. The most interesting cases include the following.

- Nests no. 10 and 61 both fell down after being unused for years (both were built in branch-forks). In 1998 we placed single supporting rods across the forks on both places, and storks rebuilt their nests the following spring and both pairs had successful breeding.

- Nest no. 84 also fell down. We built a new nest in its place in 1997, that wasn't occupied the following two years. But, in 1999 and in 2000 successful breeding occurred in it.

- Nest no. 100 was built on a very unstable branch that has fallen across the supporting branch. We put two base rods on the same tree very near to the original place in spring 2000. But the pair choose to occupy their former nest that had been empty for four years.

- Successful breeding occurred in 1999 in nest no. 121. In winter, when we examined the nest we saw that one of the supporting branches was very weak and dry. So we put a new base approximately 3m from the original place, on another branch of the same tree. The storks have built their nest on the artificial base in 2000 and bred successfully, though we had renovated their other nest as well (that was approximately 200 m away from this one).

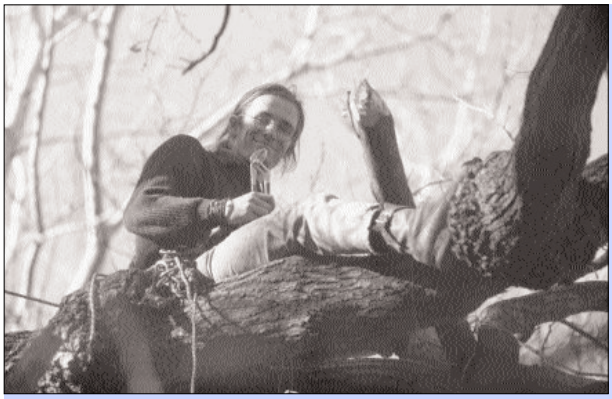

Fig. 2 - *Method no. 2.* (photo: KALOCSA Bela) - *Méthode n° 2.*

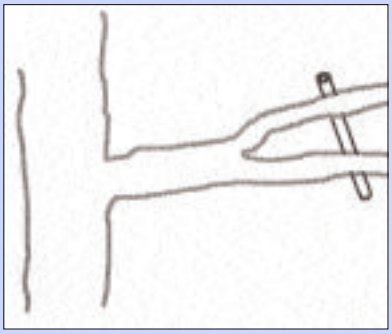

Fig. 3 - *A rod across a branch-fork (schematic drawing of method no. 2.) - Une perche en travers d'une fourche (dessin schématique de la méthode n° 2).*

Table 1 - *Human intervention at Black Stork nests in Gemenc, 1996-2000 - Interventions humaines sur les nids de Cigogne noire à Gemenc, 1996-2000.*

N°	nest id.	type of action	year	method	succes
1	97	new, 8 m from the old, fallen down nest	1996	1	Y
2	49	new, 60 m from the old, fallen down nest	1996	1	
3	47	in place of the old, fallen down nest	1997	1	Y
4	8	in place of the old, fallen down nest	1997	1	P, X
5	93	in place of the old, fallen down nest	1998	2	Y
6	84	in place of the old, fallen down nest (1997) corrections 1998	1998	1	Y
7	61	in place of the old, fallen down nest	1998	2	Y
8	10	in place of the old, fallen down nest	1998	2	Y
9	121	near the old nest	1999	2	Y
10	57	in place of the old, fallen down nest	1999	2	X
11	100	new, 1,5 m from the old, fallen down nest	1999	2	X
12	73	removal a big branch that has fallen onto the nest	2000		Y
13	101	basement in place of the fallen down nest (1997) new place very near (1998) corrections 2000		2000	Y
14	39	in place of the old, twice fallen down nest	2000	2	X
15	-	new	2000	2	
16	128	new, 50 m from the old, fallen down nest	2000	2	

Method : 1 = a whole new nest / nid entièrement nouveau; 2 = a rod across the fork / une branche à travers une fourche
Success :
Y : the stork accepted the new nest and there was at least one breeding in it / la cigogne a accepté le nouveau nid et il y a eu au moins une nidification dans celui-ci.
P : partial success : the stork vivited the nest and built it further, but there was no breeding so far / la cigogne a visité le nid et l'a rechargé mais n'y a pas niché par la suite.
X : the pair has a known other nest, hasn't occupied the artificial nest yet / le couple a un autre nid connu et n'a pas encore utilisé le nid artificiel.

Fig. 4 - *Nest no. 101.* (photo: KALOCSA Bela) - *Le nid n° 101.*

In two cases different actions had to be taken that don't fit the above-mentioned two categories (nests number 73 and 101).

- At nest no. 73 in the early spring of the year 2000 a large dry branch fell across the nest and prevented the stork to fly on it. The branch was removed and the stork could go back to its nest.

- At nest no. 101 (Picture 4) we had to take action 3 times so far. This breeding pair had a nest on a big oak (*Quercus robur*) tree that they used from 1992 to 1995. But the tree dried out and died, and the pair built a new nest on a weak and thin American ash (*Fraxinus pennsylvanica*) tree. This nest fell down and the youngs died in 1996. In the same year the pair built a nest again, 8-10 m from the fallen one, on a white poplar (*Populus alba*). As this was placed on a fork, and one of the supporting branches was dry and weak, we were afraid it would not be able to hold the nest when the storks would rebuild it in the spring. Next year this pair arrived very early, as the nest was huge and white already on 15th of March. We decided to make a strong base for it anyway, because it would have fallen down anyway. Thus a base was established near the trunk (2 m from the nest), and the whole nest was pulled onto it. The operation took 1,5 hours while the Black Storks were flying above all the time. They accepted the nest and had a successful breeding that year. But, as they built the nest further, it became asymmetric and in winter 1997-98 it was totally unstable and had to be fixed again. In 1998 there was a successful breeding again. In winter 1999-2000 one of the supports we had put up was broken. As the storks were faithful to the place and there was no other suitable tree for nestbuilding in the vicinity (at least 300 m), we finally decided to put an iron tube 5 cm in diameter under the nest, fixing it for hopefully a longer period. In 2000 there was a successful breeding again. The nest is now in good condition.

Conclusion

Except for one case on a total of 16, we have only built nests or bases at former or present nesting places, achieving what was planned in general, since it can be concluded that artificial nestbuilding or base building can be useful in two ways :

1. Black Storks can be kept nesting at places that are already protected as breeding sites.
2. The breeding success of Black Storks improves as more nests are stabilized and risks of fall are lessened.

Fig. 5 - *Typical Black Stork nest built "naturally" by Black Storks in Gemenc* (photo: TAMAS Eniko) - *Nid typique de Cigogne noire, bâti naturellement, dans la région de Gemenc.*

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Résumé

Mesures de conservation en faveur de la Cigogne noire (*Ciconia nigra*) en Hongrie, particulièrement dans la région de Gemenc, Parc National du Danube-Drava, en 1996-2000

Nous savons, sur la base d'un programme de surveillance ayant débuté en 1992 dans la région de Gemenc, que les Cigognes noires choisissent pour nicher des forêts anciennes, diversifiées et tranquilles. Elles construisent leur nid le plus souvent sur les arbres les plus vieux et les plus gros, souvent sur une branche horizontale ayant la forme d'une fourche. Il arrive que ces nids tombent, ce qui peut conduire à une perte sèche surtout lorsque les oeufs sont éclos. Les Cigognes n'ont alors plus le temps de reconstruire un nouveau nid et de tenter une nichée de remplacement. Les causes les plus fréquentes de la chute des nids sont la taille trop petite, la pourriture ou l'assèchement du support. D'autre part, dans certaines forêts où l'espèce a niché dans le passé, il n'y a plus d'arbres convenables. Les cigognes choisissent alors parfois un site dans des forêts où la perturbation humaine est plus grande.

Une solution à ces problèmes peut être la construction de nids artificiels. En 1996, nous avons commencé à rénover les nids mal en point ainsi qu'à construire des nids artificiels ou des bases de nid en des endroits que, sur la base de nos observations et de notre expérience, nous trouvions idéaux. Parfois aussi, nous avons rénové des nids non utilisés l'année précédente car on ne pouvait pas prévoir quel site le couple local, que nous savions présent, choisirait l'année suivante.

Pour la construction de nouveaux nids, nous avons choisi une branche fourchue adéquate sur laquelle nous avons déposé des branches d'un diamètre de 10 cm afin de former une plateforme de 1 à 1,5 m². Ensuite, comme nous l'avons vu lors de la construction par les cigognes elles-mêmes, nous avons bâti un nid avec des branches de 1 à 2 cm de diamètre et de 1 à 1,5 m de long sur une hauteur de 20 à 30 cm. Cette assise a ensuite été recouverte de mousses, comme les cigognes le font (méthode 1 - Fig. 1).

Dans plusieurs cas, nous avons noté que les cigognes construisent leur nid sur des branches en forme de V quand une branche transversale formant une assise triangulaire est également présente. En l'absence de cette dernière, le nid peut tomber lorsque sa taille augmente. Nous avons essayé d'inciter les cigognes à construire leur nid sur de telles branches en V en posant des baguettes stables en travers, parfois à l'emplacement d'un nid tombé (méthode 2 - Figs 2 & 3).

Les résultats de notre activité de construction de nids sont résumés dans le Tableau 1. En cinq ans, nous avons construit ou restauré 16 nids ou bases de nid, tous situés, à une exception près, sur des sites de nidification actuels ou passés. Beaucoup de ces nids ont été utilisés par les Cigognes noires, ce qui a permis de les maintenir en des sites où la perturbation humaine est faible et d'améliorer le taux de réussite des nichées par la diminution des risques de chute des nids.