

Breeding site competition between barn owl (*Tyto alba*) and kestrel (*Falco tinnunculus*) - A product of bird protection?

Summary

From published data and recent observations it is assumed that the installation of nesting boxes for barn owls, as far as these are not inside the building without direct access, in fact leads to more numerous interactions between this species and kestrels. The author describes and analyses course and results of these alterations.

1. Introduction

In central Europe barn owls preferably nest in buildings in places as dark as possible (MEBS & SCHERZINGER 2000). Kestrels in contrast do not like dark sites within buildings but breed at a variety of sites ranging from old nests in trees, tree cavities to crevices in buildings (GLUTZ VON BLOTZHEIM & BAUER 1989). The latter may extend up to 1 m in depth.

So nest site competition naturally can only rarely occur in situations where a niche is very deep and if there is a place sufficiently dark at its end. In these cases the kestrels are interested only in the entrance of the niche or hole. Several cases of close breeding neighbourhood have already been described (BAUDVIN 1975, BEAUD, M. ET AL. 1991, JOUGLET 1979, MICHALAT & GANZER 1986, MINDER 1999). However (in steeples), the real sites had longer distances, the birds could not even see each other. In two cases the barn owls had to pass the breeding site of the kestrels within only a few cm. In one additional case, both broods were even situated within a single box, but separated by a partition and each species had its own entrance. In none of these cases any direct interaction between the species could be observed.

2. The situation in nesting boxes

In the past 30 years the deep niche or hole has been copied increasingly by the human made nesting boxes. In Germany they are mostly installed at the inner side of the exterior wall of a higher building and most successful examples have an interior vertical separation of about 2/3 of the depth of the box, separating an entrance area from a dark breeding site behind. The experiences of the barn owl working group in Lower Saxony prove that these boxes attract barn owls. Soon after being installed these boxes are quickly adopted by the barn owls. In comparison, kestrels themselves discovered the boxes, but as expected, in most cases they use the lighter entrance part, some times even the anterior part of the breeding area.

Many farm owners report that in springtime barn owls and kestrels regularly fight for the boxes. During later controls it becomes clear that it is not generally the greater barn owl that win these conflicts.

It is interesting that the humans clearly show their sympathies for the owls! In one case – the kestrel had not yet laid the first egg - that went so far that the house owner installed a drawbridge inside the box which was closed during the day by a rope and opened at night for the owls: successfully, the owls breed.

Some examples for nesting site competition from the study area of the author will be documented by records: (BO = barn owl, KE = kestrel)

2.1 Kestrel eggs in BO-clutches

1A	
27.05.01	BO incubating 7 own and 1 KE-eggs
04.06.01	unaltered
15.07.01	besides young BO one more KE-egg
1B	
31.07.01	BO incubates 7 own and 2 KE-eggs
1C	
27.05.02	together with her 5 eggs BO incubates 2 KE-eggs
13.06.02	6 BO-eggs and the 2 KE-eggs
02.07.02	caps of both KE-eggs present (thus hatched), KE pulli lacking; hitherto 3 BO hatched
1D	
19.06.02	among 5 BO- eggs one KE-pullus of ca. 3 days. It is active and begging intensely (in the afternoon) (fig. 1)
02.07.02	no more trace of the KE-pullus, 5 BO-pulli
1E	
18.06.02	in the entrance area BO incubating 3 own and 5 KE-eggs; 4 of them removed and deposited in a distance of ca. 20 cm within the box.
17.07.02	7 BO-eggs, 1 KE-pullus of 1-2 days and 2 of the KE-eggs rolled back; the two remaining ones laying closely. 1 KE-egg left, removed the remaining ones out of the box. The BO had removed her clutch for ca. 16 cm to the inner side of the separation wall.
28.08.02	KE-pullus and egg disappeared, the latte obviously hatched; 5 BO- juv. On cleaning the box, the carcass of the KE is found. Concluding it had reached an age of 14 days.

2.2. BO-eggs within KE-clutches

2A	
01.06.02	together with its own 5 eggs KE is incubating 1 BO-egg
25.06.02	only 2 cold KE-eggs left

2B	
without exact data Spring 2001	BO and KE fighting for a box. The house owner immediately installs one more box at a distance of about 3 m, which is accepted by the BO. They here raise a brood of 10 young. Already before the deposition of this clutch they must have laid a first egg into the box they originally had fought for. Anyhow, now there is a BO-egg within the KE-clutch. It is incubated and the young BO is elevated. However, the young KE fledge distinctly before the BO which is left in the box. Obviously some days later it is no longer sufficiently fed. It is fostered. (after H. MEINECKE, Langenholtensen)

2.3. An uncertain case

3A	
07.05.01	In the entrance 3 BO- and 5 KE-eggs, cold.
27.05.01	in the breeding area (hence far from the original ones) two more, cold BO-eggs are found. The dung is heaped up laterally and in the entrance area. Obviously there had been a struggle inside the nesting box, leaving no victor.

2.4. A compromise?

There is not always a victor but occasionally compromises happen. Both species lay their eggs in the space preferred. Judging from the different activity periods, collisions were rarely to be expected. Nevertheless they are inevitable because of the narrowness of the entrance area of the box. Finally the ♂ of the owl pair, arriving with prey has to mount over the breeding kestrel and later over the young of the latter to reach his own brood. But even now the result cannot be foreseen.

4A	
25.05.01	KE incubates 3 eggs in the entrance, BO 5 eggs in the background.
09.06.01	The BO-clutch is deserted, 2 BO-eggs are decayed, remnants of 2 more are lying around. Probably at most 3 BO hatched. KE is sitting on 2 eggs.
autumn	These eggs are still present when cleaning the box, so probably no KE has fledged either.

2.5. Cases of KE which moved in subsequently

5A	
31.05.00	8 BO-eggs in the box are incubated, both parents present. A few days later severe attacks of KE occur. The BO-brood is deserted, the KE do not breed here.

5B	
10.06.01	1 BO-juv (out of 7) is lying dead beneath the entrance opening of the box. BO- ♀ has traces of blood on her wings, but no visible violation. A KE- ♀ is sitting in the entrance area on 3 dirty, warm eggs lying scattered around. To catch the BO- ♂ a trap is installed inside the box. At about 23.30 hours the approaching BO- ♂ is severely attacked by the KE- ♂ and persued for some time. At his third approach the BO escapes into the nesting box, where it is protected against the KE by the now closed trap.

(For about 8 days the box is then closed during the day by a drawbridge. Thereafter the KE do not come back. The 6 remaining BO fledge.) From the fact, that the KE-eggs were dirty, the question rises, whether they really belonged to the actual KE-pair, or to an earlier attempt of this pair or to an earlier attempt of a different one. A different, not too rare an observation of attentive human neighbours does not fit totally to the image of the rich in conflict relation between the two species: Again and again, also for longer periods, KE are perched in the entrance of a box in which BO are breeding. As nothing happens from the side of the BO – at least the ♀ is present permanently – the observers normally guess, the BO were not (no more) present.

3. Discussion

Even if there might have been some competition between kestrels and barn owls for nesting sites already earlier, it has become obviously more frequent now due to the installation of nest boxes – in so far as these are not fixed inside a building without direct access from the outside (so also MECKEL 2002). Also the descriptions of RAVUSSIN (1994) of 15 cases and of ROULIN (1996) of 3 cases, in which the two species used the same breeding site, deals with boxes. The observations above, as well as the data of RAVUSSIN, ROULIN, and also MECKEL, demonstrate that the result of the competition is not clear in advance, but that mostly the BO predominate. ROULIN (1996) found a destroyed KE-egg in a box containing a fresh BO-pellet, and attributed the destruction to the BO. According to the same author a young KE, whose feathers were found in a box, had become the victim of the BO, which made a breeding attempt after the KE. The data communicated above and those from the literature first say little about how each competition situation took place. If a certain number of eggs of one species are found at some distance from an incubated clutch of the second species, two explanations are possible:

1. When moving into the box, species B found eggs of species A which were no longer cared for. Its own eggs were deposited some distance away and incubated.
2. Species B takes over an already occupied box, in which there were still eggs of species A. Further events as before.

If there are alien eggs **among** the incubated clutch, the following development can be imagined:

1. When moving into the box species B finds eggs of species A no longer cared for. Its own eggs are deposited some distance away and incubated. One or more alien eggs are rolled in and incubated together with its own ones. If the former ones were not too old, the embryo might develop (further).
 2. Species B takes over an already occupied box, in which there were still eggs of species A. Further events as before.
 3. Starting point as in 1.; species B adopts the eggs found, incubates and adds own eggs.
 4. Starting point as in 2.; Further events as in 3.
- The example 1A (s. chap. 2.1.), in which at a second control an additional egg of the KE was found, although the BO was breeding there, makes one guess that a hostile take over with changing success may continue for a longer time. Moreover it is thinkable that in one or both species the individuals are not identical with the original ones. As BO mostly start their breeding later than KE, they might rather be the party to take over. The cases described above simply by their accumulation support this assumption. RAVUSSIN (1994) describes a case in which at each end of a building there was a nesting box. Owls and falcons occupied one box each and then changed twice before they really breed. Even if objectively not a case of nest site competition, in an occurrence described by HOLFTER (2002, per e-mail) the situation was estimated by the KE as if it had been so.: A BO flushed from its brood, flew into a nearby box with an incubating KE and was immediately killed by him. In most of the cases described here and also in those stated by Ravussin KE did not hatch in composed clutches, probably because the distance in time between the laying date and the beginning of incubation by the BO was too long (RAVUSSIN 1994). Yet occasionally they hatched and then nearly always disappeared. RAVUSSIN (1994) describes an exception: Here BO reared a KE-chick up to fledging. It is unknown whether in the other cases the KE-chicks already hatched were not fed and died, or fell a prey to when still alive and eaten. The case communicated by ROULIN (1996) (in a box with a BO-brood feathers of an immature KE were found) could prove that chicks found at the take over become prey. Except in the hitherto singular case (s. 2B in chap. 2.2.) no chicks hatched from BO-eggs in KE-clutches. ROULIN (1996) guesses that young BO, which were still being fed by their parents could have expelled young KE of the same age from their nesting box about 3 m apart. The former chicks were found there sleeping.

The boxes not only mean a general gain of breeding possibilities for both species but also a special one as they easily may be made safe from martens. At the same time this protection activity produces a situation of competition. To de-escalate the situation in the study area of H. Seeler close to those boxes which from experience were the most attractive to both species smaller ones especially for the KE were attached to the outer side of the buildings wall and accepted voluntarily by them. Nevertheless the BO-boxes are preferred (pers. comm.).

Owl protectors of course are pleased about the sympathy-rate of the owls. The justification for this preference is interesting: The falcons are noisy. This

estimation probably originates from the fact that often the nocturnal cries of the owls are not recognized as such, but attributed to cats. Farmers who occasionally expect the banders also to be enraged about the falcons and therefore hope to receive suggestions for measures against them, are later convinced by the argument in saving the KE: They too feed on mice and voles.

4. Literature

- BAUDVIN, H. (1975): Biologie de reproduction de la Chouette effraie (*Tyto alba*) en Côte d'Or: Premiers résultats. Le Jean le Blanc 14: 1-51
- FELLOWS, E.C. (1967): Kestrel and Barn Owl sharing entrance to nest-sites. British Birds 60: 522
- GLUTZ VON BLOTZHEIM, U. & K. BAUER (1989): Handbuch der Vögel Mitteleuropas 8, 2. Aufl. Aula Verl. Wiesbaden
- JOUGLET, R. (1979): A propos de la nidification de la Chouette effraie et du Faucon crécerelle dans le même clocher. Le Héron 1: 68-69
- MEBS, T. & W. SCHERZINGER (2000): Die Eulen Europas. Franckh - Kosmos
- MECKEL, D.-P. (2002): Jahresbericht Schleiereule 2001. Eulenwelt: 10-15
- MICHELAT, D. & M. GANZER (1986): Nidification rapprochée de la Chouette effraie (*Tyto alba*) et du Faucon crécerelle (*Falco tinnunculus*). Falco 20: 73-74
- MINDER, H. (1999): Schleiereule *Tyto alba* und Turmfalke *Falco tinnunculus* brüten Wand an Wand. Ornithol. Beob. 96: 293
- RAVUSSIN, P.-A. (1994): La compétition pour les sites de nidification entre la Chouette effraie (*Tyto alba*) et le Faucon crécerelle (*Falco tinnunculus*): pontes mixtes et adoption. Nos Oiseaux 42: 356-357
- ROULIN, A. (1996): Nouveaux cas de compétition pour les sites de nidification entre la Chouette effraie (*Tyto alba*) et le Faucon crécerelle (*Falco tinnunculus*). Nos Oiseaux 43: 527-529