Barn Owl *Tyto alba*: On the circumstances of mate change for a second brood.[1]

by Kniprath E & Stier-Kniprath S

Introduction

Starting 1996 the authors studied a barn owl population in South-Lower-Saxonia by ringing all nestlings and on average about 80% of the adult birds. We used a nest box population in an area of about 500 km^2 around the city of Einbeck (9.86680 E, 51.81788 N, 110 a sl). The results to be presented here exclusively base on the controls of ringed birds. Instead of apostrophing the birds by ring numbers we use names we gave them with year wise changing initials at their first record as breeders. Among the owls barn owls are the species with the most numerous incidents of second broods. In an earlier paper (KNIPRATH & STIER 2008) second broods, among them also those with mate change (divorce-second-broods) as well as replacement broods have intensely been described in their frequency and other parameters. In the papers of different authors on the breeding biology of the barn owl (BUNN et al. 1977, 1992; EPPLE 1985; MEBS & SCHERZINGER 2000; KNIPRATH & STIER-KNIPRATH 2011) some results and suppositions in connection with second broods have been presented, to which we now offer affirmations, completions, respectively corrections.

Results

The events to be presented base on three second broods in 2010, a year with a very low number of breeding pairs and a very high supply of voles. Two of these second broods were divorce-second-broods, the third one at first sight a very normal second brood of a pair. In all six broods all parent birds were ringed.

The first of these broods is that of Urtica, who layed the first egg of her second brood 85 days after egg-laying of her first brood (with Obelix). At that time her oldest young (counting two days laying interval and 30 days incubation) was 55, the youngest (of seven) 43 days old, yet still far from those 60-70 days of independence. At the second brood Traugott was caught, who during that season not yet had been recorded but had a brood with a different ♀ the year before 3.7 km apart. Urtica was our recruit of the preceding year, Traugott had immigrated the year before. The second brood took place only about 40 m apart from the site of the first one. The two ♂ thus should have perceived each other night by night for at least four weeks long if not even met. The brood which after the desertion of Urtica was exclusively under the care of Obelix resulted in six fledglings.

The second case is that of Urte, who only 61 days after egg-laying of her first brood (with Uwe) was met with the hitherto unknown Umberto at 3.7 km without brood. At that time she still showed a brood patch. The oldest young then was 31, the youngest one (of 6) 21 days old. We guessed that Urte was looking for a mate for a divorce-second-brood and perhaps had found him. Possibly she was still testing him.

This estimate some weeks later proved as appropriate. We controlled her on four eggs and four pulli with Umberto as mate. Egg-laying of this brood was only 17 days after the “hour for lovers” with Umberto. Different from known cases she didn’t make this divorce second-brood at the site of the new mate but he had followed her! Indeed this brood was found at the place of the first brood of Urte in an other box only 300 m apart. In the

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first brood the oldest young on egg-laying of the second brood arithmetically was at an age of 48, the youngest one 38 days old, yet still far from the 60-70 days of independence. That also means that Urte returned into the area, where her first brood still was furnished by Uwe.
Urte was own recruit of the year 2009, Uwe unknown immigrant, as well as Umberto. In this case the interval during which the two ♂ could have knowledge of each other and during which they eventually occasionally met, equally lasted about three weeks.
The six hatchlings of Urtes first brood all fledged.
The third case, an at first sight regular second brood of a couple, is that of Ute and Tobias. Their second brood (with 9 young) took place only 20 m apart from the first brood (with six young). Ute had been controlled with her young on June 4th. Already fife days later we fond her 11 km apart, together with an ♂ unknown until then. At that time the oldest young of her first brood was 31, the youngest almost 15 days old. This new mate obviously seemed to her to be inappropriate for a divorce-second-brood, as 44 days later (106 days after egg-laying of her first brood) was egg-laying of her second brood with Tobias. It seems also possible that the second ♂ had died. Without the interim control we certainly had supposed a normal second brood.

Discussion
In some points these three broods contribute to a better knowledge of the breeding biology of the barn owl. The hitherto opinion (in italics) will be set against a newer interpretation as resulting from the observations.
Barn owls don't defend a home range but merely the real breeding site (MEBS & SCHERZINGER 2000).
The distance, within which a further ♂ was tolerated as breeder by the ♂ of the first brood, in the first case was about 300 m and in the second only 40 m. As seen from the human point of view that is the more astonishing as both new ♂ had "taken over" for their broods the mate of the ♂ already present.
2. *The ♂ occupy a breeding site and mostly stay there until a ♀ appears* (MEBS & SCHERZINGER 2000).
At first Umberto behaved exactly that way but then followed Urte. As to Urtica and Traugott the procedure could have been likewise. Perhaps the ♂, which, following KNIPRATH & STIER-KNIPRATH (2011), had moved after the loss of their mates had not done so immediately but only on the initiative of their new mate.
3. *The special advantage of divorce-second-broods, which take place in a greater distance from the respective first broods, is that so the economical base of the first broods is not narrowed by the needs the second ones (naturally also vice versa)* (W. SCHERZINGER per E-mail).
Here one of the ♀ stayed at her site for the divorce-second-brood, the other one even returned there. But perhaps there had been such quantities of voles that this reason didn't play any role.
4. *The ♀ associate a ♂ with a breeding site and then breed there* (EPPLE 1985; GLUTZ & BAUER 1994: 251; MEBS & SCHERZINGER 2000).
Both ♀ had their divorce-second-broods close to the site of their first broods. As has been shown, one of the ♀ had returned together with the ♂ "found" elsewhere to here former breeding site. Thus by all means it seems to be possible that a couple might move to a breeding site after the choice of the ♀ even after pairing.
5. ♀ *choose their ♂ because of their resources (breeding site, hunting range*).
It might be doubted that Urte chosed Umberto because of his resources. Indeed after choosing Umberto she left his site, went back to here former site, and he followed her.

Moreover it is known that at the site (box as well as village) selected by Umberto during the 20 years before there had been no brood. Vice versa in the village of Urte broods had taken place every year, especially at here site about every second year. Yet in this good vole year we might guess that the conditions at the site selected by Urte had been much better than at the site of Umberto. To the second case: By all means Urtica stayed at that place, where until then barn owls bread every year. At the former breeding place of Traugott this happened only every second year. Thus the quality of the sites chosen by the ♀ in both cases was better.

6. *For their second broods as pair the partners stay at the site of their first broods* (KNIPRATH & STIER 2008).

Nevertheless the ♀ are not hindered to look for a better possibility before (better option hypothesis: Ens et al. 1993, Black 1996a: 23). Probably the decision is made only after examination – as far as present – of several alternatives.

7. *Whether there will be a second brood especially is dependant from the reaction of the ♂. In most cases the ♀ is capable to have a second brood* (BUNN et al. 1977, 1992).

The active role of the ♀ in initiating a second brood generally is confirmed by all divorce-second-broods, as here it is always her to abandon her first brood (KNIPRATH & STIER 2008). That also fits for the second brood of Ute. She tried to initiate a second brood without Tobias. She failed by not really known reasons. Her second brood with Tobias followed only when he had to furnish his first brood no more totally (about 76 after hatching of the first pullus there). Only then he took charge of the burden of one more brood. Insofar the supposition of BUNN et al. (1977, 1992) is confirmed.

To the active role of the ♀ the observation of Epple (1985: 42) is fitting best: “With ongoing brooding and elevation at the nest the clear dominance of the ♀ is restituted.”

Summary

Obviously barn owl ♀ regularly examine before a decision for a second brood with their mate, whether there is a better possibility (better option hypothesis). She then may decide for or against a new partnership. Divorce-second-broods may well take place very close to the first breeding site of the ♀ (ca. 40 m distant). Occasionally the new mate of a divorce-second-brood follows his ♀ to the vicinity of her first breeding site. The active role of the ♀ in the initiation of a second brood is confirmed.

Literature

Black JM 1996a: Pair bonds and partnerships. 3-20 In: Black JM 1996b

Black JM (Ed.) 1996b: Partnerships in birds. The study of monogamy. Oxford University Press, Oxford

Bunn DS & Warburton AB 1977: Observations on breeding Barn Owls. Brit. Birds 70: 246-256

Bunn DS, Warburton AB & Wilson RDS 1982: The Barn Owl. Poyser, Calton

Ens BJ, Safriel UN & Harries MP 1993: Divorce in the long-lived and monogamous oystercatcher, *Haematopus ostralegus*: incompatibility or choosing the better option? Anim. Behav. 45: 1199-1217

Epple W 1985: Ethologische Anpassungen im Fortpflanzungssystem der Schleiereule (*Tyto alba* Scop., 1769). Ökol. Vögel 7: 1-95

GLUTZ VON BLOTZHEIM UN & BAUER KM 1994: Handbuch der Vögel Mitteleuropas 9, 2. Aufl. Aula Wiesbaden

Kniprath E & Stier S 2008: Schleiereule *Tyto alba*: Mehrfachbruten in Südniedersachsen. Eulen-Rundblick 58: 41-54

Kniprath E & Stier-Kniprath S 2011: Scheidung und Partnertreue bei der Schleiereule *Tyto alba.* Eulen-Rundblick 61: 76-86