

ADOPTION IN THE COMMON GUILLEMOT *URIA AALGE*

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*Wilson L.J. & Birkhead T.R. 2001. Adoption in the Common Guillemot *Uria aalge*. Atlantic Seabirds 3(3): 137-140: On Skomer Island, Pembrokeshire, a pair of Common Guillemots *Uria aalge* with a newly hatched chick, was observed to adopt a second chick of the same age, which had been displaced from its natal site. Both chicks were successfully reared to fledging age. This is the second report of adoption for the Common Guillemot.*

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Guillemots *Uria* spp. breed in dense colonies on sea-cliffs and incubate their single egg on the cliff ledge, without construction of a nest. Birds often breed shoulder to shoulder, and this close proximity of breeding sites creates selection pressure for the development of parent-offspring recognition abilities. Parent-chick recognition is well developed in the Common Guillemot *Uria aalge*, and adults can recognize their chick's call even before the chick has emerged from the egg (Tschanz 1968).

Guillemot chicks are rarely left alone by their parents as they are vulnerable to chilling and are dependent on adults for the provision of warmth, food and protection from predators. However, adults occasionally desert their chicks temporarily during periods of food shortage or colony disturbance (Gaston & Nettleship 1981; Birkhead & Nettleship 1984). In addition, the close proximity of nest sites leads to the possibility that unattended chicks will intermingle with other chicks or accidentally fall to ledges below. When chicks are abandoned or displaced from their natal site, they usually seek shelter from adult strangers (Birkhead & Nettleship 1984). Alloparental care is unusual in seabirds and most species ignore each other's offspring or are aggressive towards them. The response of adult Common Guillemots to foreign chicks varies and has been found to depend on their own status. Birds brooding their own chick usually ignore or attack foreign chicks, while failed breeders, or birds whose own chicks have fledged, usually brood foreign chicks (Birkhead & Nettleship 1984).

Alloparental care, such as brooding another pair's chick, is not uncommon in guillemots. Birkhead & Nettleship (1984) found that 8% of Common Guillemot chicks that fledged successfully from a colony in Labrador

received some alloparental care. Common Guillemots have also been observed sheltering other pairs' chicks that had been temporarily deserted by their parents during a period of food shortage (Tschanz 1959, 1979; Birkhead & Nettleship 1984) and during colony disturbance (Tuck 1961). Wanless & Harris (1985) observed a chick being jointly raised (brooded and fed) by two pairs on two occasions.

Gaston *et al.* (1995) were the first to report the complete fostering (rather than temporary alloparental care or joint raising) of chicks in guillemots. They described four cases of adoption in Brunnich's Guillemots (*U. lomvia*): two pairs adopted and reared a chick to fledging age after they had lost their own egg, and two pairs adopted and reared a foreign chick in addition to their own chick. The first case of chick adoption in the Common Guillemot was recently reported by Harris *et al.* (2000). Here, we describe a further case of adoption in the Common Guillemot, which covered the entire period from hatching to fledging. Observations were made at Skomer Island, Pembrokeshire, Wales in 2000, where the colony was visited daily during the breeding season to monitor breeding success. Our observations were made using a 20-45x Nikon telescope and caused no disturbance to the breeding birds.

On 11 June at site A, an egg that had been incubated for 32 days was due to hatch, but was not present on 12 June. There were some eggshell remains on the ledge, indicating that the egg had hatched, but no chick was seen on the ledge. At site B, approximately 1.5m directly below site A, the resident pair's egg had been incubated for 31 days by 11 June, and was also due to hatch. Two newly hatched chicks were observed on this site on 12 June. We concluded that the chick at site A had hatched and fallen to site B, where the resident pair's chick had also just hatched. Both pairs involved were unmarked and were the sole occupiers of their ledge and daily monitoring of all other neighbouring sites indicated that no other individuals were involved. It is not unusual to observe young chicks falling from their natal site to ledges below and parents have been observed actively searching for lost chicks (Tschanz 1959; pers. obs.). Pair A were observed to show some searching behaviour, primarily directed to site B, which was within hearing range of the chick's call, but no attempt to retrieve the chick was observed and no interactions between the two pairs were observed.

The pair at site B brooded both chicks, and although no feeds were observed, the growth in size of both chicks clearly indicated that they were both being fed. No aggressive interactions between the two chicks were observed. It is not known if pair A was involved in brooding/feeding, but at least one member of pair A was present on its original site on most occasions. Both chicks reached fledging age but neither chick was seen departing from the colony. One chick had gone by 4 July and the other had gone by 8 July. Between 4 and 8 July, only one of the adults was ever seen at the site but it is unknown if

this was the male or female or if both parents visited the site. Even if both chicks departed successfully, their fledging strategy makes it unlikely that both survived. Guillemot chicks are semi-precocial, fledging at one quarter of adult body mass (Gaston & Jones 1998), and need to be accompanied by the male who continues to feed the chick at sea for up to a month (Varoujean *et al.* 1979; Scott 1990).

Our observations support existing evidence of alloparental care in guillemots. Adoption is an extreme case of alloparental care and we believe this report to be only the second to describe a case of adoption in the Common Guillemot. Previously, one case has been reported in the literature for the Common Guillemot (Harris *et al.* 2000) and four cases have been reported for the closely related Brunnich's Guillemot (Gaston *et al.* 1995). This evidence, although limited, indicates that guillemots are capable of adopting and rearing foreign chicks under natural conditions.

Gaston *et al.* (1995) suggested that chick age at adoption might be a factor in their acceptance, as all of the chicks in their study were less than 10 days old. In the case reported by Harris *et al.* (2000), the biological chick was 2 days old and the adopted chick was 8 days old at the time of adoption. In our case, both the biological and adopted chick involved were only 1 day old. Cross-fostering experiments with Brunnich's Guillemots show that the likelihood of adoption declines with the age of the chick. Chicks aged 1-5 days old had a 92% chance of being accepted by foster parents, but this declined to 36% at 6-13 days old (Lefevre *et al.* 1998). Lefevre *et al.* (1998) suggested that adult Brunnich's Guillemots probably learn their chick's call in the first few days after hatching and that it was possible that parents are unable to discriminate between their own chick and foreign chicks at a very early age. However, given the evidence of mutual recognition between parents and offspring in Common Guillemots demonstrated by Tschanz (1968), it seems unlikely that chick adoption in this species could occur due a pair being unable to recognize their own chick.

Gaston *et al.* (1995) considered that the four adoptions in Brunnich's Guillemots that they witnessed may not have been unusual and that adoption might in fact be a regular occurrence at that particular colony. However, with only two reports of adoption occurring in the Common Guillemot, it seems unlikely that this is a widespread behaviour. Certainly, any further information on its occurrence is likely to improve our understanding of this interesting phenomenon.

ADOPTIE BIJ DE ZEEKOET *URIA AALGE*

Zeekoeten Uria aalge broeden in dichtbezette kolonies op kliffen aan zee en bebroeden één enkel ei dat zo maar op de kale rotsen wordt gedeponeerd, zonder dat een nest wordt geconstrueerd.

Zeekoetenouders en hun jongen zijn goed in staat om elkaar te herkennen en ouders kunnen nog voordat het kuiken uit het ei gekropen is het geluid van hun eigen jong onderscheiden van dat van de buren. Het is duidelijk dat de volle kolonies waarin Zeekoeten broeden om een dergelijk mechanisme vragen. Het enkele jong van een paar Zeekoeten wordt zeker kort na het uitkomen hoogst zelden door de ouders alleen gelaten, ter bescherming (tegen bijvoorbeeld meeuwen en Raven), maar ook ter voorkoming van afkoeling. Toch verlaten de ouders soms beiden het jong voor een korte periode en het komt dan nogal eens voor dat het kuiken tussen andere broedvogels en kuikens 'verdwaald' raakt, of dat een jong één of meer richels omlaag tuimelt. De op die manier feitelijk 'verweesde' kuikens zoeken instinctief bescherming bij andere adulte Zeekoeten. De reactie van die vogels wisselt en hangt in feite af van hun eigen status op de kolonie (broedvogel of bezoeker). Zeekoeten met een eigen kuiken of ei negeren zo'n verloren jong meestal of benaderen het agressief. Broedvogels waarvan het eigen jong de kolonie inmiddels heeft verlaten of waarvan het legsel verloren is gegaan bejegenen zo'n jong vaak wat vriendelijker en er zijn verschillende gevallen bekend van zeekoetenkuikens die door zo'n vreemde adulte vogel op zijn minst warm werd gehouden, maar in sommige gevallen ook werd gevoerd en tenslotte succesvol de kolonie kon verlaten. Ook komt het af en toe voor dat een individueel kuiken broedzorg en voedsel geniet van twee paren tegelijk, de eigen ouders en een stiefouderpaar. Volledige adoptie is echter zeldzaam, zowel bij de Zeekoet als bij de nauw verwante Dikbekzeekoet *Uria lomvia*. Harris et al. (2000) waren de eerste die zo'n geval voor de Zeekoet beschreven en in deze korte bijdrage wordt een tweede geval gedocumenteerd. Bij de Dikbekzeekoeten werden inmiddels vier gevallen gedocumenteerd en daarbij werd gesuggereerd dat adoptie misschien wel veel vaker voorkomt dan tot dusverre werd verondersteld. Dat er tot op heden slechts twee gevallen gevonden zijn bij de intensief bestudeerde Zeekoeten van de Britse Eilanden suggereert echter dat dit een zeldzaam verschijnsel is.

- Birkhead T.R. & Nettleship D.N. 1984. Alloparental care in the Common Murre (*Uria aalge*). Can. J. Zool. 62: 2121-2124.
- Gaston A.J., Eberl C., Hipfner M. & Lefevre K. 1995. Adoption of chicks among thick-billed murre. Auk 112: 508-510.
- Gaston A.J. & Jones I.L. (eds) 1998. The auks. Oxford University Press, Oxford.
- Gaston A.J. & Nettleship D.N. 1981. The thick-billed murre of Prince Leopold Island. Can. Wildl. Service Monogr. 6.
- Harris M.P., Bull J. & Wanless S. 2000. Common Guillemots *Uria aalge* successfully feed two chicks. Atlantic Seabirds 2: 92-94.
- Lefevre K., Montgomerie R. & Gaston A.J. 1998. Parent-offspring recognition in thick-billed murre (Aves: Alcidae). Anim. Behav. 55: 925-938.
- Scott J.M. 1990. Offshore distribution patterns, feeding habits and adult-chick interactions of the Common Murre in Oregon. Stud. Avian Biol. 14: 103-8.
- Tschanz B. 1959. Zur Brutbiologie der Trottellumme (*Uria aalge aalge*, Pont.). Behaviour 14:1-100.
- Tschanz B. 1968. Trottellummen. Z. Tierpsychol. Suppl. No. 4: 1-103.
- Tschanz B. 1979. Helfer-Beziehungen bei Trottellummen. Z. Tierpsychol. 49: 10-34.
- Tuck L.M. 1961. The murre; their distribution, populations and biology – a study of the genus *Uria*. The Queens Printer, Ottawa.
- Varoujean D.H., Sander S.D., Graybill M.R. & Spear L. 1979. Aspects of Common Murre breeding biology. Pac. Seabird Gr. Bull. 6: 28.
- Wanless S. & Harris M.P. 1985. Two cases of Guillemots *Uria aalge* helping to rear neighbour's chicks on the Isle of May. Seabird 8: 5-8