

Brief report

“A helper” at the Mute Swan’s nest?

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The Mute Swan (*Cygnus olor*) is the representative of waterfowl species, which is increasing in number in nearly all European countries (Snow & Perrins 1998). Moreover, the Mute Swan is expanding its distribution range to the east and south (Wieloch 1991). In Poland, the Mute Swan’s population has been growing since the 1960s, when it was breeding only in the northeast part of the country. It colonised central Poland in the late 1970s and is now a common breeder mainly on fishponds, dam reservoirs and peat bogs (Włodarczyk 1999). Today, it is a solitary bird in central Poland even though it used to breed in colonies and still does so in other European countries (Wieloch 1984, Bacon & Andersen-Harild 1987). Its population in central Poland seems to be stable, so probably swans have already occupied all possible breeding habitats. This prediction can be supported by the observations of large flocks of non-breeding birds within the described area (Włodarczyk 1999). The behavioural changes caused the observed increase in the breeding population. The Mute Swan stopped avoiding urban areas so it benefited from a wider range of breeding grounds and additional food supplies (Wieloch 1984).

However, the Mute Swan reaches maturity in the second year of its life; the mean age of the first breeding is 3–4 years (Rees *et al.* 1996,

Coleman *et al.* 2000). This delayed reproduction is probably connected with the strong intraspecific competition among birds (Bacon 1980). The immature birds are not able to gain and defend a territory especially in populations with high breeding density (Conover *et al.* 1999, Reinchof 1984).

Mute Swans from migratory populations leave the breeding territory in October and join the non-breeding flocks for the winter period (Snow & Perrins 1998). The immature birds stay in these flocks to mature and find a mate (Minton 1968). In the early spring breeding pairs come back to the nesting site and they always chase away any offspring, which try to stay with them for the next year (Birkhead & Perrins 1986).

On 2 February 2000 one pair of Mute Swans with a second-year bird appeared on a small pond in the village of Swierczynsko, central Poland (51°18'N, 19°35'E). The pair and the additional bird stayed in that place for the rest of the winter. Unfortunately, it was not possible to ascertain whether the immature bird was the offspring of the observed pair or what sex this bird was. In April the adult birds started to build a nest. Surprisingly, the male was not aggressive towards the immature bird. Moreover, the young bird accompanied the female during nest building. Its contribution to the process of nest building was even higher than the male’s. However, the sec-

ond-year bird did not show any aggression towards any kind of disturbances within the territory, such as humans' or dogs' presence. This situation was still observed during the egg-laying period and incubation. Four days before hatching, the male started to be aggressive towards the young bird. The male tried to force it to fly away but not very decidedly. The male considerably increased its aggression a day before hatching, chasing the immature bird until it left the pond. The day after, seven cygnets were hatched.

The observation from Swierczynsko is unusual for the Mute Swan. The Mute Swan is considered to be a highly aggressive bird, especially within its territory during the breeding season (Cramp & Simmons 1978). When other swans are absent in the vicinity of the nest, the male's aggression is sometimes directed against other water birds such as geese or ducks (Stone & Masters 1970, Birkhead & Perrins 1986). Swans that establish their territories in urban areas can be more aggressive than birds breeding in non-urban areas, because of numerous encounters with people. The example from Swierczynsko when the male tolerated the presence of another swan within its territory seems to be an interesting exception. The territory was established in the village, where two factors boosted the male's level of aggression — the lack of other swans and the presence of humans. Although it is known that one-year-old cygnets can stay with their parents through the whole winter and early spring, there is no example in the literature of a juvenile bird staying within the territory until the middle of the breeding season (Birkhead & Perrins 1986, Rutschke 1992).

The observed situation might be explained in terms of the ecological theory about a helper at the nest (Emlen 1982). The theory predicts that it can be, in some cases, beneficial for the subadult bird to delay its breeding and stay with its parents during the next breeding season. The helping behaviour is forced by ecological constraints such as the lack of vacant territories and high population density (Krebs & Davis 1998, Komdeur 1992). In such a case, the subadult bird is not able to gain a territory due to strong competition among non-breeding birds. It is more valuable to help the parents to rear the young than not to breed at all. The helper increases its inclusive fitness by

rearing its siblings and gains breeding experience (Krebs & Davies 1998). Unfortunately, we could not be sure about the relatedness between the pair and the subadult bird. Also, the opportunity to obtain its own territory while assisting the breeding pair might be higher for a subadult bird. The assistance of immature birds during the breeding season is also important for adult birds, allowing them to increase breeding success and reduce costs of reproduction. In our case, the breeding pair got help only in nest building from the subadult bird.

The presence of helpers has been observed in a few bird species, for instance: Acorn Woodpecker (*Melanerpes formicivorus*) (Emlen 1984), Seychelles Warblers (*Acrocephalus sechellensis*) (Komdeur 1992) and Superb Fairy-wrens (*Malurus cyaneus*) (Pruett-Jones & Lewis 1990). In the Anatidae family, the prolonged parent-offspring association has been observed in the Barnacle Goose (*Branta bernicla*) (Black & Owen 1989). In this situation the goslings increase the competitiveness of the family and improve their own dominance status in wintering flocks (Black *et al.* 1996). Many factors necessary for development of cooperative breeding are fulfilled in the Mute Swan's population: 1) the breeding density is high so there is a shortage of free territories (Włodarczyk 1999); 2) the immature birds have less ability to defend their own territory from adults (Reichholf 1984); and 3) the experienced birds have higher breeding success (Rees *et al.* 1996).

Moreover, the immature swan can benefit from helping the adult birds. The following advantages for the helper may support the development of "helping" behaviour: 1) gaining of breeding experience; 2) reduction of intraspecific competition over food which can be intense in flocks of non-territorial birds; and 3) protection from predators by the territorial pair.

A more thorough explanation would be possible if the sex and relatedness of the immature bird to a pair were known. Unfortunately, it is difficult to ascertain the advantages for the adult birds. In this species it is the male who defends the family on wintering grounds. Additionally, the pair can behave aggressively towards immature birds from the beginning of winter, so the explanation that is applicable to the Barnacle Goose seems to be inapplicable in this situation. The only advantage for the pair in this situation is the reduction of

costs during nest building, as the immature bird did not perform any other activity such as defence behaviour or incubation. The presence of an immature bird can cause some disadvantage to the pair because of food competition or the risk of extra-pair copulation.

In conclusion it seems that only an immature bird can benefit from "helping" behaviour, because for the pair the costs of the offspring's presence outweigh the possible benefits. This is why the observed situation is exceptional and unique.

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Selostus: Avustaja mukana kyhmyjoutsenparin pesinnässä

Kirjoittajat havaitsivat helmikuussa vuonna 2000 eräässä Puolan keskiosassa sijaitsevassa pienessä kylälammessa kyhmyjoutsenparin, jonka seurassa oli nuori yksilö. Linnut viettivät koko lopputalven samalla alueella. Huhtikuussa aikuiset linnut aloittivat pesänsä rakentamisen. Yllättäen aikuinen koiraslintu ei osoittanut minkäänlaisia aggressioita nuorta lintua kohtaan pesän rakennusaikana. Nuori lintu osallistui aktiivisesti pesän rakentamiseen. Lintu sai olla alueella rauhassa munita-aikana sekä pääosan haudonta-ajastakin. Yleensä pesimäpaikalleen palaavat linnut karkoittavat edellisen kesän poikaset pois pesimäalueelta hyvissä ajoin ennen pesinnän aloitusta. Neljä päivää ennen poikasten kuoriutumista aikuinen koiras muuttui aggressiiviseksi nuorta lintua kohtaan. Päivää ennen poikasten kuoriutumista aikuisen koiraan aggressiivisuus lisääntyi entisestään ja koiras ajoi nuoren linnun pois lammelta. Seuraavana päivänä kuoriutui seitsemän kyhmyjoutsenpoikasta. Esitetty havainto on yllättävä, sillä kyhmyjoutsenta pidetään pesimäaikanaan hyvin aggressiivisena lintulajina. Kirjoittajat päättelivät, että pesäpaikan sijainti rauhallisella alueella, missä ei pesinyt muita joutsenia eikä ihmisten aiheuttama häirintä ollut suurta, on voinut vaikuttaa aikuisten lintujen nuorta lintua kohtaan osoittamaan aggressiivisuuden määrään. Havainto voi viitata myös ns. "helping"-käyttäytymisilmiöön, jossa pesivän parin edelliskesän poika-

nen jää emojensa reviirille seuraavaksi kesäksi. Valitettavasti kirjoittajat eivät pystyneet varmistamaan sitä, oliko nuori lintu pesivän parin oma poikanen. Pesivä pari hyötyi ainoastaan siitä, että nuori lintu osallistui pesän rakentamiseen. Pesivälle parille haitaksi voisi koitua esimerkiksi lisääntynyt ravintokilpailu. Nuori lintu voisi hyötyä avustamisesta tulevan oman reviirinsä valtaamisen helpottumisen kautta.

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