

SHORT COMMUNICATION

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Long-eared Owl *Asio otus* breeding in a Caspian Gull *Larus cachinnans* colony: Reversed roles in protective nesting association?

*Hornugglor Asio otus häckande i en koloni med
 kaspiska trutar Larus cachinnans:
 Omvända skyddsroller för samhäckare?*

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WE DESCRIBE the event of Long-eared Owls *Asio otus* nesting on an island within a colony of Caspian Gulls *Larus cachinnans* at the Mietków Reservoir (SW Poland). The owls nested in an old (possible corvid) nest in a willow and raised two owlets. They probably did not hunt gulls, neither adults nor chicks. We suggest that, in this case, the Long-eared Owls benefitted from breeding within a gull colony because of the added security against predators that the gulls provided.

Keywords: breeding association | breeding ecology | gull defense | nesting habitat | predator-free area

Introduction

The choice of a suitable habitat is presumably the result of integration of different habitat patches satisfying the different requirements of individuals (Orians & Wittenberger 1991). Bird nest-sites must meet the fun-

damental needs of breeding adults and young, including the protection from predators and weather, and also the proximity to food sources. Because a choice may enhance reproductive success, the behaviour involved

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in nest-site selection is thought to be adaptive (Collias & Collias 1984). Furthermore, nest-site selection might be related to protective nesting associations. They relate specifically to those in which one or more associate species benefit directly from the protection provided by the other associate. The latter forms a protective umbrella around its own nest, thereby excluding mutual predators from the area (Quinn & Ueta 2008).

The Long-eared Owl *Asio otus* is a relatively common typical owl of the family Strigidae, distributed over wide areas of North America, Europe, Middle East, and Asia (Snow & Perrins 1998, Mebs & Scherzinger 2000, Duncan 2003). Essential information on nesting habits of the Long-eared Owl has been collected in miscellaneous habitats, like deserts or agricultural landscapes in temperate areas (Rodríguez *et al.* 2006), and much is known about its breeding biology (Mikkola 1984, Cramp 1985, Tome 2007).

The Long-eared Owl usually lays its eggs in a large, old nest of another bird or in the drey of a squirrel *Sciurus* sp.; sometimes on the ground (Glue 1977). It also uses nest-boxes and nest-baskets. In Europe it most frequently uses nests of Eurasian Magpies *Pica pica*, Hooded Crows *Corvus cornix*, and Carrion Crows *C. corone*, but also nests of Rooks *C. frugilegus*, Northern Ravens *C. corax*, Eurasian Jays *Garrulus glandarius*, Common Wood Pigeons *Columba palumbus*, or Grey Herons *Ardea cinerea* (Glue 1977, Snow & Perrins 1998, Purger & Tepavcevic 1999; personal observations). Despite settling in many different habitats, tree species, and nests built by different species, we have not found any reports of Long-eared Owls nesting within gull colonies. Here we present the case of such nesting and discuss whether it could be regarded as protective nesting association.

Material and methods

While studying Caspian Gulls *Larus cachinnans* in their breeding colony in 2020, we found Long-eared Owls in a nest of unknown previous occupants. Due to its location, we decided not to visit the nest. During the following visits in the gull colony we tried to assess the breeding stage of the owls, using clues described in Sidensticker *et al.* (2006) and Hardey *et al.* (2013) to age the owlets. Determining the age of nestlings, we were able to estimate the date of clutch laying, as the incubat-

ing period in this species is 25–30 days (Glue 1977). On 11 May 2020 we collected 25 owl pellets under the nest and the adults' roosting site. The content of the pellets was analyzed by standard methods, following Marti (1974).

STUDY SITE

The gull colony is located on islands within the Mietków Reservoir, a ~9.2 km² dam reservoir in SW Poland (Litwiniak *et al.* 2020). Because of very low water level in 2020, the area of the islands was larger than in previous years, but this year there were only 190 breeding pairs (in 2019 more than 260 pairs). The surface of the islands is mostly covered by grass and willows. In addition to gulls—Caspian, Yellow-legged *Larus michahellis*, Mew *L. canus*, Black-headed *Chroicocephalus ridibundus*, and Mediterranean Gulls *Ichthyophaga melanocephalus*—we noted regularly breeding Mallards *Anas platyrhynchos*, Egyptian Geese *Alopochen aegyptiaca*, Greylag Geese *Anser anser*, Tufted Ducks *Aythya fuligula*, Mute Swans *Cygnus olor*, Common Terns *Sterna hirundo*, Common Wood Pigeons, Sand Martins *Riparia riparia*, and Eurasian Penduline Tits *Remiz pendulinus*. Owls had never been observed before to breed on islands at this site.

The population of Caspian Gulls at Mietków Reservoir was established in 1998 (Pola *et al.* 1998). In recent years the number of gull species and individuals breeding at Mietków Reservoir have been changing, e.g., Herring Gull *Larus argentatus* has previously bred there (Neubauer *et al.* 2006), but nowadays does not. There are usually eleven islands on which gulls might nest (their number depends on water level in reservoir). The breeding period usually starts at the end of March. In 2019 the first eggs were recorded on 29 March, in 2020 on 30 March. The peak of egg-laying was then observed 3–7 April (Przymencki 2020).

Results

On the morning of 24 April we observed a male Long-eared Owl for the first time on the island. Later the same day later we found the old nest in a willow *Salix* sp., occupied by a female owl that probably incubated eggs (Figure 1). It was alarmed by our presence but did not leave the nest. The male was flying around the nesting tree and was being attacked by gulls. On 30 April



FIGURE 1. A female Long-eared Owl *Asio otus* on the nest in a willow *Salix* sp. within a Caspian Gull *Larus cachinnans* colony at the Mietków Reservoir, Poland, on 24 April 2020.

— *En hornugglehona Asio otus på bo i en pil Salix sp. i en koloni av kaspiska trutar Larus cachinnans vid Mietków-reservoaren, Polen, 24 april 2020.*

we did not observe any difference in breeding stage, but probably nestlings had already hatched. On 11 May we observed the male, the female, and for the first time one ~10–14-day-old owlet near the nest. On 22 May we found two owlets, estimated about 21–25 days old, sitting in a willow about 15–20 meters from the nest (Figure 2).

The Long-eared Owls had chosen to breed on one of the outermost islands with an area of 0.52 ha. The shortest distance from their nest to the mainland was 570 m. The nest was located at 8 m height. On this island ten pairs of Caspian Gulls (8 to 65 on other islands), two pairs of Mallards and a pair of Common Wood Pigeon nested. Caspian Gulls started to lay eggs here on 2 or 3 April. We calculated that owls started to lay eggs on 29 March at the earliest.

In the owl pellets we found only bones and skulls of small rodents, mainly voles *Microtus* sp., with no remnants of gulls or other birds at all.

Discussion

Many authors have described situations where colonial birds nested close to owls. These were mainly wildfowl like Bean Geese *Anser fabalis*, Snow Geese *A. caerulescens*, Greater White-fronted Geese *A. albifrons*, Brent Geese *Branta bernicla*, or King Eiders *Somateria spectabilis* nesting in association with Snowy Owls *Bubo scandiacus* (Summers *et al.* 1994, Tremblay *et al.* 1997, Ebbinge & Spaans 2002, Quinn *et al.* 2003, van Kleef *et al.* 2007, Kharitonov *et al.* 2009, Kharitonov *et al.* 2013). This phenomenon often occurs in years of high lemming abundance, when the number of arctic foxes *Alopex lagopus* is high (Tremblay *et al.* 1997; Kharitonov *et al.* 2013). Such association with raptors, that maintain a predator-free area around their nests, affects the quality of clutches and breeding success in wildfowl (Tremblay *et al.* 1997; van Kleef *et al.* 2007). It has also been shown that Ural Owls *Strix uralensis* can protect ground nests of birds (Halme *et al.* 2004).



FIGURE 2. Two owlets of Long-eared Owl *Asio otus*, here in a willow *Salix* sp. on 22 May 2020, hatched within a Caspian Gull *Larus cachinnans* colony at the Mietków Reservoir, Poland.

— *Två hornuggleungar Asio otus, här i en pil Salix sp. 22 maj 2020, kläckta i ett bo beläget inom en koloni av kaspiska trutar Larus cachinnans vid Mietków-reservoaren, Polen.*

Ebbinge & Spaans (2002) pointed out that Brent Geese nesting inside Herring Gull colonies are able to get some advantages. We argue that the case described in the present study reflects a similar situation, because the owls chose to nest within a breeding or near-breeding gull colony. We found the first gull eggs on 30 March, but most likely eggs were laid even earlier in other parts of the colony. Thus, this Long-eared Owl pair settled at the edge of the existing (in this particular season) gull colony.

This pattern is opposite to that of the association between wildfowl and Snowy Owls. It is possible that here, the Long-eared Owls benefit from nesting within the Caspian Gull colony. Generally, coloniality reduces nest predation through communal mobbing of predators (Götmark & Andersson 1984). Thus, the owls can reduce nest predation risk by exploiting the nest defense behavior of more aggressive species. Long-eared Owls are smaller and not as aggressive as Caspian Gulls, and may be indirectly protected by them. In our opinion

such association may be adaptive and positively influence their fitness.

Breeding within a gull colony may have more advantages, for example it may serve as a potential food base. A few studies report Long-eared Owl and Short-eared Owl *Asio flammeus* predation on chicks of colonial birds, mainly Common Terns (Glue 1972, Becker *et al.* 1993, Holt 1994, Wendeln & Becker 1999, Ludwig & Becker 2008). We expected that the owls nesting within the gull colony would be hunting gull chicks, but we did not find any decapitated gull chicks inside the colony (cf. Glue 1972). Likewise, the analysis of pellets did not provide any evidence of such predation. One might also expect cases of predation on Common Terns nesting in the same area, but the terns only started to their egg-laying at the time of fledging for the owlets.

Because of the absence of nocturnal predator defense mechanisms among breeding gulls (Southern & Southern 1979), their chicks seem to be easy to capture. Many observations of owls hunting gulls have

been done, among others Great Horned Owls *Bubo virginianus* hunting Ring-billed Gulls *Larus delawarensis*, California Gulls *L. californicus*, and Franklin's Gulls *Leucophaeus pipixcan* (Southern *et al.* 1982); Barn Owls *Tyto alba* and Short-eared Owls hunting Laughing Gulls *Leucophaeus atricilla* (Montevicchi 1977); and Snowy Owls hunting Ring-billed Gulls (Southern *et al.* 1982). However, in the present case no owl predation on Caspian Gulls was noted.

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Svensk sammanfattning

Under studier av kaspiska trutar *Larus cachinnans* i en häckningskoloni i den ~9,2 km² stora Mietków-reservoaren i sydvästra Polen, upptäckte vi under häckningssäsongen 2020 ett par hornugglor *Asio otus*. De hade valt att häcka i ett gammalt fågelbo, troligen ursprungligen byggt av en kråkfågel, i en pil *Salix* sp. på en ö med tio par häckande kaspiska trutar.

På övriga öar i dammen häckade 8–65 par kaspiska trutar och utöver dessa fanns även häckande medelhavstrut *Larus michahellis*, fiskmåns *L. canus*, skratmåns *Chroicocephalus ridibundus*, svarthuvad mås *Ichthyetus melanocephalus*, gräsand *Anas platyrhynchos*, nilgås *Alopochen aegyptiaca*, grågås *Anser anser*, vigg *Aythya fuligula*, knölsvan *Cygnus olor*, fisktärna *Sterna hirundo*, ringduva *Columba palumbus*, backsvala *Riparia riparia* och pungmes *Remiz pendulinus*. Ugglor har aldrig tidigare observerats häcka på öarna trots att den kaspiska trutkolonin studerats sedan 1998.

Vi upptäckte hornugglorna 24 april, då honan redan låg på boet och troligen ruvade ägg (figur 1). Vid nästa besök 30 april låg honan fortfarande på boet, men ungar kan redan ha kläcks eftersom vi elva dagar senare observerade en uggleunge som var 10–14 dagar gammal nära boet. Två ungar som bestämdes till 21–25 dagars ålder observerades i en pil 15–20 meter från boet 22 maj (figur 2). Utifrån dessa observationer och hornugglans tämligen välkända häckningsbiologi kunde vi beräkna

att första ägget, som tidigast, bör ha lagts 29 mars. Vi hittade det första kaspiska trutägget på ön 30 mars, men trutarna kan ha startat äggläggningen något tidigare och fanns på plats en tid inför häckningen, således redan när hornugglorna startade sin häckning.

Flertalet tidigare studier har visat att kolonihäckande vattenfåglar ibland väljer att häcka nära häckande fjällugglor *Bubo scandiacus*, eftersom de sistnämnda håller stånd mot andra predatorer i reviret. Detta leder till högre häckningsframgång för kolonihäckarna. Samma mönster har funnits bland markhäckare som häckar nära slagugglebon *Strix uralensis*. På liknande sätt har prutgäss *Branta bernicla* påvisats åtnjuta fördelar av att häcka inne i gråtrutkolonier *Larus argentatus*. Således föreslår vi att hornugglorna i Mietków-reservoaren har kunnat dra fördelar av samma skydd, då kaspiska trutar är både större och mer aggressiva än ugglorna. Detta är, utifrån vår kännedom, första gången ett möjligt sådant samband noterats där ugglor åtnjuter skydd av, snarare än ger skydd åt, kolonihäckande fåglar.

Eftersom hornugglor kan jaga fåglar undersökte vi, genom att analysera 25 spybollar insamlade 11 maj, om ugglorna prederat trutungar i kolonin. Menyn bestod, emellertid, enbart av smågnagare och dominerades av sorkar *Microtus* sp.



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