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Low reproductive success in a colony of Black-headed Gulls *Larus ridibundus* – mass starvation of nestlings?

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Abstract

The Black-headed Gull *Larus ridibundus* has declined in Sweden during the last twenty years, locally with as much as 75 %. The factors causing this decline are unknown, and we lack data on reproductive success and mortality. In 1992, I recorded breeding success of a colony of 818 pairs on Lilla Karlsö in the Baltic Sea. Only 0.37 fledglings per pair were produced. No predation was observed. When the surviving young had left the colony a search revealed at least 151 dead young (>14 days old). Five of them were recently dead. They were very thin with atrophied pectoral muscles, indicating starvation as the cause of death. The reproductive rate that I observed is lower than in other European studies, but similar to the one found in a declining colony in Britain. May and June of 1992 were very dry, possibly making the main food, earth worms, unavailable. Hence, 0.37 young per pair may not be typical for an average weather situation. None the less, it is urgent to carry out further studies on the breeding success of the Black-headed Gull in the Nordic and Baltic countries in order to determine whether starvation or any other factor contributes to the population decline of the species.

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From 1970 onwards, the Black-headed Gull *Larus ridibundus* has decreased markedly in Sweden, possibly with as much as 75% in certain areas (Jönsson & Karlsson 1990, Lager 1992). Unfortunately, there exists no published information on the reproductive success of Black-headed Gulls in Sweden. This makes it difficult to evaluate whether the reason behind the decline is, for example, a lowered productivity of juveniles or a higher mortality among adults. The lack of data may be partly due to the colonial breeding habits of the Black-headed Gull and the fact that nestlings, when disturbed, leave the nest already when a few days old (Goodbody 1955). Thus, in most cases it is not possible to determine the number of fledglings produced by a certain pair. However, data on fledging success on the colony level might be equally valuable. Here, I report such data from a coastal breeding site off the island of Gotland in the mid-Baltic which might contribute to the understanding of the reasons behind the drastic decline of Swedish Black-headed Gulls.

Lilla Karlsö (5°20'N, 18°05'E) is a limestone island (158 ha) situated in the Baltic 3 km west of Gotland. Black-headed Gulls breed at Myren, a small bog (1.5 ha) covered with large tussocks of sedge (*Carex elata*) in which the gulls build their nests. In early spring there is always open water in the bog but in most years it has dried up by late June. Based on nest counts the annual number of breeding pairs has varied between 300 and 800 during the 1980s, with large differences between adjacent years (Hjernquist 1991).

The colony can easily be observed from the limestone plateau approximately 50 m above and 250 m away from the colony. The activities of the gulls were recorded during 13 observation periods of at least one hour each between 14 May and 21 June 1992. On 17 May all adults seemed to be incubating whereas some adults appeared to feed hatchlings on 23 May. A total of 818 pairs was counted on 25 May.

Juveniles are capable of flying at an age of 25 to 28 days (Goodbody 1955, Viksne & Janaus 1990). In order to estimate the reproductive success of the colony, newly fledged young were counted during July (Fig. 1). The young were easy to observe because the majority were resting in groups on the short-grazed meadows in

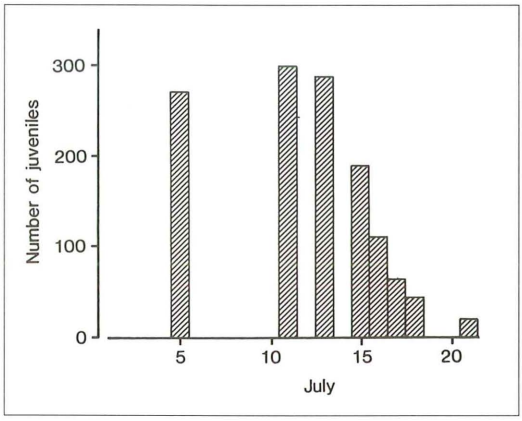

Fig. 1. Number of fledged juvenile Black-headed Gulls counted in the vicinity of the colony at Lilla Karlsö on different dates between 5 and 22 July 1992.

Antalet flygga juvenila skrattmåsar inräknade i Lilla Karlsö kolonins närhet under olika dagar mellan 5 och 22 juli 1992.

the immediate vicinity of the colony. However, those remaining in the bog might have been under-estimated because the tall sedge tussocks somewhat obstructed the view. I feel confident, though, that we saw most of the young (>90%). On 11 July, about 50 days after the earliest breeders had hatched, a maximum number of 300 was counted. Thus, the minimum productivity in the colony was 0.37 young per pair (300/818) assuming that most young remained in the vicinity of the colony

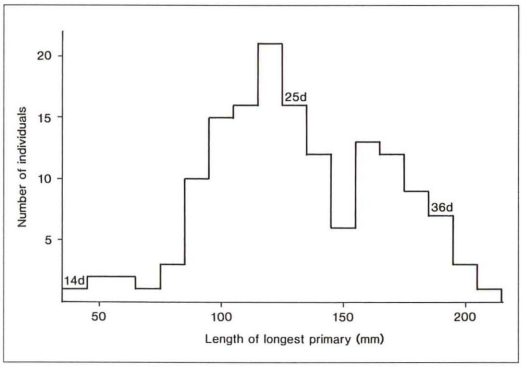

Fig. 2. The length of the longest primary of young Black-headed Gulls found dead in the colony. The approximate age corresponding to some primary lengths is indicated above the histogram.

Den längsta handpennans längd hos unga skrattmåsar som påträffats döda i kolonin. Den ungefärliga åldern motsvarande vissa "handpennelängder" har noterats i histogrammet.

up to the time of counting. Independent young were observed on the mainland of Gotland already from late June (Hjernquist *in litt.*) though it is not clear whether these originated from the Lilla Karlsö colony or from other nearby colonies with earlier fledging dates.

When most young had left the colony (10 remained) the bog was searched for dead gulls. A total of 151 was found on 19 July of which all were juveniles. The length of their longest primary was measured with a ruler inserted between primaries 9 and 10. The distribution of primary lengths of dead young is shown in Fig. 2. According to Heránová & Klíma (1963) the age of a young with primaries 40 mm long is 14 days, 130 mm 25 days and 190 mm 36 days. Full wing length is attained at an age of 42 days. We can therefore conclude that most of the found young died when they were between 18 and 36 days old. However, small young were difficult to find because those which had been long dead were partly buried in the mud. I think that this explains why we did not find any gull younger than 14 days. Patterson (1965) found among young disappearing before 25 days old, that 30% did so during their first day of life and few of these were actually found dead although the nesting area was searched almost daily. About five dead young had not yet started to smell and thus were recently dead. They were all very thin with the pectoral muscle atrophied, as seen from the very conspicuous ridge of the breast bone when the birds were handled.

The estimated productivity at Lilla Karlsö was 0.37 young per pair. This is much lower than the average figure from a long term study in Latvia where pairs produced a mean of 1.17 young (min 0.58, max 1.55; Viksne & Janaus 1990) and data from three German colonies where the mean production was 0.96 young per pair (Glutz & Bauer 1982). However, these figures were based on number of young 25 days old whereas the estimate of this study is based on young of mixed ages between 25 and 50 days. Using the same technique as reported here, Lager (1992) estimated the productivity of a colony at lake Kvismaren in South Central Sweden (in 1991) to be 0.57 young per pair. At a colony in England where the number of breeding pairs decreased by 10% per year over a five year study, the productivity was estimated at 0.31 young per pair (Patterson 1965). This estimate was based on observed proportions of ringed individuals in flocks of independent young on a beach beside the colony. To conclude, the productivity of young Black-headed Gulls at Lilla Karlsö during 1992 was poor compared to the majority of European studies.

What was the reason behind the low success of Black-headed Gulls at Lilla Karslö during 1992? As in most other years there was no mammalian predator on Lilla Karslö. During 13 hours of obsevation in May and June no attacks from potential bird predators were

recorded (e.g. from Raven *Corvus corax*, Crow *C. corone*, Herring Gull *Larus argentatus*, Great Black-backed Gull *L. marinus*). Thus, it is unlikely that the low breeding success was caused by predation of eggs or nestlings. Instead, the high numbers of juveniles found dead in the colony suggest that the low success might have been caused by low food availability. In order to obtain food for their nestlings parents appeared to fly to the mainland of Gotland. Although the Black-headed Gull is an opportunistic feeder it seems to rely to a great extent on earthworms (Glutz & Bauer 1982). The exceptionally dry weather conditions during May and June in 1992 possibly made earthworms inaccessible to the gulls. Therefore, the observed level of productivity may not correspond to the level in an average weather situation.

Black-headed Gulls start their southward migration during July (Edelstam 1972) apparently as soon as they have finished breeding activities at the colony. Thus, by counting migrating individuals and separate adults from juveniles one can get a rough estimate of the productivity in the area from where the migrating birds originate. However, this is only true if we assume that adults and juveniles leave the colony at the same time and if they migrate at the same speed. During seven days from 19 July in 1992 onwards I counted and aged all migrating Black-headed Gulls (Table 1). During this period the weather was fine with light winds between south and west. I made 185 registrations of migrating gulls mostly in the afternoons and evenings. The majority came in small groups (median=3; range=1-44) and there was no tendency for the proportion of juveniles to differ with the size of the migrating group (r_s=0.044, N=185, NS). However, single birds were more often juveniles than birds in groups (34% versus 21%; χ^2=20.0, $p<0.001$). The total counts resulted in 0.28 juveniles per adult which would indicate a production of 0.56 juveniles per pair. This is 50% higher than the estimate for the colony at Lilla Karlsö but still low compared with the productivity reported from Latvia (Viksne & Janaus 1990) or Germany (Glutz & Bauer 1982). Further studies on the breeding of the Black-headed Gull are requested from all parts of the Nordic and Baltic countries in order to elucidate whether starvation of chicks contributes to the population decline in Sweden.

Acknowledgements

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Table 1. Number of migrating juvenile and adult Black-headed Gulls *Larus ridibundus* at Lilla Karlsö during seven days in July 1992.

Antalet flyttande unga och gamla skrattmåsar observerade vid Lilla Karlsö under sju dagar i juli 1992.

Date in July *Datum i Juli*	Number of groups *Antal grupper*	Number of adults *Antal adulta*	Number of juveniles (%) *Antal juvenila (%)*	Total *Summa*
19	3	16	0 (0)	16
20	18	62	12 (16.2)	74
21	21	57	13 (18.6)	70
22	50	309	25 (7.5)	334
23	4	7	4 (36.4)	11
24	65	256	117 (31.4)	373
25	24	106	55 (34.2)	161
Total	185	813	226 (21.8)	1039

References

Edelstam, C. 1972. The visible migration of birds at Ottenby, Sweden. *Vår Fågelvärld* suppl. 7.

Glutz, U. N. & Bauer, K. M. 1982. *Handbuch der Vögel Mitteleuropas*. Bd 8. Akad. Verlagsgesellschaft, Wiesbaden.

Goodbody, I. M. 1955. The breeding of the black-headed gull. *Bird Study* 2:192-199.

Heránová, H. & Klíma, M. 1963. Comparison of postnatal development in the black-headed gull *(Larus ridibundus)* under natural conditions and in captivity. *Vest. Cs. Spol. Zool.* 27:74-84.

Hjernquist, B. 1991. *Verksamhetsberättelse 1991 för Naturskyddsföreningens fastighet, naturreservatet Lilla Karlsö.* Naturskyddsföreningen. Stockholm.

Jönsson, P.-E. & Karlsson, J. 1990. Skrattmåsen Larus ridibundus på stark tillbakagång i Skåne. *Anser* 29:284-285.

Lager, R. 1992. Skrattmåsen minskar i Kvismaren. *Fåglar i Kvismaren* 7:8-13.

Patterson, I. J. 1965. Timing and spacing of broods in the Black-headed Gull *Larus ridibundus*. *Ibis* 107:433-459.

Viksne, J. & Janaus, M. 1990. What is important for the survival of the Black-headed gull chicks? In: *Baltic Birds 5*, Vol 2. pp. 220-230. Eds. J. Viksne & I. Vilks. Zinatne Publishers, Riga.

Sammanfattning

Låg häckningsframgång i en koloni av skrattmås Larus ridibundus – *massvält bland ungarna?*

Under de senaste 20 åren har skrattmåsen minskat markant i Sverige, i vissa områden möjligen med så mycket som 75% (Jönsson & Karlsson 1990, Lager 1992). Eftersom uppgifter om häckningsframgång helt saknas ifrån svenska häckningsplatser är det idag omöjligt att avgöra huruvida nedgången är en följd av

minskad häckningsframgång, förhöjd adult mortalitet eller en kombination av dessa eller andra faktorer. I denna rapport sammanfattar jag uppgifter från Lilla Karlsö som antyder att skrattmåsen under 1992 års häckningssäsong hade ett mycket dåligt häckningsutfall.

På Lilla Karslö häckar skrattmåsarna i öns enda våtmark (Myren) och uppifrån en närliggande platå har man god överblick över kolonin. Antalet par har varierat mellan 300 och 800 under 1980-talet (Hjernquist 1991). Under 1992 observerades kolonin regelbundet från mitten av maj. Den 23 maj sågs vuxna fåglar för första gången mata ungar och 25 maj räknades 818 par. Från och med början av juli räknades antalet flygga ungfåglar som samlats i flockar i kolonins närhet (Fig. 1). Den 11 juli, ungefär 50 dagar efter de tidigaste häckningarnas kläckdag, inräknades ett högsta antal av 300 ungfåglar. Givet antagandet att flertalet ungfåglar fortfarande var i kolonins närhet kan produktiviteten uppskattas till 0.37 ungar per par (300/818). När flertalet ungar hade lämnat kolonin genomsöktes denna efter döda måsar. Totalt hittades 151 stycken varav samtliga juveniler. Utifrån den längsta handpennans längd kunde jag beräkna att flertalet ungar hade avlidit vid en ålder av 18 till 36 dagar (Fig. 2).

Den beräknade ungfågelproduktionen på 0.37 ungar per par för Lilla Karlsökolonin är en minimiuppskattning men den är samtidigt betydligt lägre än uppgifter från mångåriga studier i Lettland (1.17 ungar/par; Viksne & Janaus 1990) och Tyskland (0.96 ungar/par; Glutz & Bauer 1982). En koloni i England hade en produktion som var lika låg som den på Lilla Karlsö 1992. Den kolonin, som 1958 hyste över 10 000 par, minskade med 10% per år under de fem år studien pågick (Patterson 1965).

Vad var orsaken till den låga häckningsframgången på Lilla Karlsö under sommaren 1992? Däggdjurspredatorer saknas helt på Lilla Karlsö och potentiella fågelpredatorer sågs inte vid något tillfälle störa kolonin. Det är därför osannolikt att den låga häckningsframgången orsakades av predation på ägg och ungar. Istället antyder det anmärkningsvärt höga antalet döda ungar att den låga framgången kan ha orsakats av svält. För att skaffa mat till ungarna verkade de vuxna fåglarna bege sig till Gotland. Eftersom sommaren 1992 var exceptionellt torr är det möjligt att skrattmåsens viktigaste föda i jordbrukslandskapet, daggmaskar (Glutz & Bauer 1982) blev svåråtkomliga. Det är därför möjligt att reproduktionssiffran från 1992 inte är representativ för en mer normal vädersituation.

Skrattmåsen startar sin höstflyttning under juli (Edelstam 1972), så snart häckningsbestyren vid kolonin är över. Genom att räkna flyttande måsar och skilja årsungar från äldre kan man få en grov uppskattning på ungfågelproduktionen i det område varifrån de flyttande måsarna har sitt ursprung. Jag registrerade 185 flyttande flockar under sju dagar från och med 19 juli (Tabell 1). Totalt observerades 0.28 årsungar per adult vilket indikerar en produktion på 0.56 ungar per par. Detta värde är ungefär 50% högre än det uppskattade värdet från Lilla Karlsö men fortfarnde betydligt lägre än värden från Lettland (Viksne & Janaus 1990) och Tyskland (Glutz & Bauer 1982). För att kunna utreda huruvid svält av ungar är en bidragande orsak till skrattmåsens tillbakagång i Sverige är det är ytterst angeläget att studier av skrattmåsens häckningsframgång bedrivs också på andra platser inom Norden och i Baltikum.