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Recent trends of the Black-headed Gull *Larus ridibundus* population in Latvia

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Abstract

The Black-headed Gull population in Latvia increased from 10,000 pairs in the early 1940s to 110,000 pairs in 1986, then decreased to about 40,000 pairs in 1994 and continues declining. The population changes have been more pronounced at coastal sites than at inland ones. Simultaneous changes in breeding success (a significant decline of average number of fledglings/pair since 1974), diet and feeding flights have taken place. Changes in the availability of anthropogenic food, appearance of new predators (mainly the American mink *Mustela vison*) and decrease of suitable nesting habitat are considered local reasons for the recent population decline.

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Introduction

The Black-headed Gull *Larus ridibundus* population in Europe has undergone significant changes during the last 50-60 years: a remarkable increase in numbers in many countries, which allowed the term "superabundance" to be used (Isenmann et al. 1991), then a gradual decrease of breeding populations which spread from west to east and recently has included even the central part of European Russia (S. Kharitonov pers. comm.). The general reasons for these numerical changes seem to be clear but the history of each particular population's growth and decline adds some new evidence to established ideas as well as raise some doubts about the completeness of our knowledge. The case history of the Latvian Black-headed Gull population described here is no exception; we hope it will add some new information.

Methods and study areas

The present paper deals with nest counts and estimates of colony sizes of the Black-headed Gull in Latvia and presents data about breeding success as well as feeding habits of Latvian Black-headed Gulls.

During country-wide censuses, both previously known and newly discovered (mainly through questionnaires and mass media) colonies were checked, as a rule by ornithologists (the main nesting sites usually being checked by the most experienced ones). To estimate the size of colonies, different methods were used. These included: (1) total counts of nests in a colony; (2) total counts of nests in part of the colony with subsequent extrapolation to the entire colony area; (3) estimation of number of nesting pairs from the number of adults flying above the colony when disturbed.

Studies on breeding success were carried out mainly at Lake Engure in 1974–1985, were then resumed in 1990, and have continued from 1993 until present. The "fenced area" method was used to estimate the average number of fledglings raised per pair (for details of the method, see Viksne & Janaus 1980).

Information on feeding habits is based mainly on collections of food samples regurgitated by handled chicks (% occurrence of different food items was calculated) as well as on results from a special study of the feeding flights of picrid acid dyed birds (Viksne & Janaus 1986).

Results

Trends in the Latvian Black-headed Gull population

The first information on Black-headed Gull num-

Table 1. Estimated size of the breeding population of Black-headed Gulls in Latvia from the late 1930s to 1994.

Den uppskattade häckande skrattmåspopulationens storlek i Lettland från slutet av 1930-talet till 1994.

Years *År*	No. of pairs *Antal par*	Source *Källa*
Late 1930s–early 1940s	10,000	Berzins 1946
Late 1940s–early 1950*	some decrease *viss minskning*	
1964–1966	30,000	Viksne 1978
1972–1975	80,000	Viksne 1978
Late 1970s	97,000	Viksne et al. 1981
1986**	110,000	Viksne & Janaus 1989
1994	40,000	This study

*Judging from numbers at some of the main nesting places
Enligt data från några av de viktigaste kolonierna
**The increase between the late 1970s and 1986 can probably be partly explained by more precise counts at the main nesting sites, therefore population size likely changed very slightly during this period
Ökningen under denna period förklaras troligen delvis av exaktare räkningar av de stora kolonierna, varför beståndets storlek sannolikt ändrades mycket litet under denna period

bers in Latvia deals with the late 1930s-early 1940s. Changes in the total breeding population are shown in Table 1. The census made in 1994 covered those sites which contained about 90% of the breeding population in 1986; the unsurveyed sites were mainly comparatively small inland colonies. The census results allow us to estimate the total Latvian population in 1994 at about 40,000 pairs which constitutes some 36% of the number estimated for 1986 (Table 1).

During censuses in the late 1970s and in 1986 about 90% of the total population was found nesting in the coastal zone, less than 20 km from the sea, mainly at large coastal lakes. Special attention has been paid to these sites since 1992 when we noticed a serious decline of the Black-headed Gull population at several lakes (Table 2). As seen from that table, in 1994 we counted only 33% of the number recorded on the coastal waterbodies in 1986.

The decline of the Black-headed Gull population on inland waterbodies has been less pronounced than that on the coastal ones. Comparison of Black-headed Gull numbers at inland sites which were surveyed in both 1986 and 1994 shows that in 1994 54% of the 1986 population still remained. Inland colonies located at fish ponds (two fish-pond areas, the Saldus district in the western and Nagli in the eastern part of the country) suffered less than other inland colonies: in 1994 their Black-headed Gull population was 59% of the 1986 population.

Population changes at Lake Engure

The growth of the breeding population and changes in related biological parameters were monitored more carefully at Lake Engure (ca 35 km^2, near the western coast of the Gulf of Riga). The number of breeding pairs there changed as follows: early 1940s – 1000 (Berzins 1946), 1949 – 170-230, 1958 – 600–700 (Mihelsons 1960), 1962 – 4,100, 1965 – 6,000, 1972 – 26,000, 1979 – ca 20,000 (no precise counts, a very rough estimate), 1986 – 34,000, 1992 – 22,000, 1993 – 16,000, 1994 – 14,000 and 1995 – 13,000.

The growth of the breeding population at Lake Engure coincided with changes in diet and foraging area of the gulls. The occurrence of anthropogenic

Table 2. Number of breeding pairs of Black-headed Gull at the main coastal nesting sites in Latvia.
Antal häckande skrattmåspar på de viktigaste kustnära lokalerna i Lettland.

Site *Lokal*	1970s	1986	1992	1993	1994
Lake Engure	26,000	34,000	22,000	16,000	14,000
Lake Kanieris	4,040	5,500	2,550	2,000	1,300
Lake Babite	28,000	5,020	10,000	8,000	3,300
Lake Liepaja	10,000	23,300	12,000	5,000	7,120
Mouth of Daugava	7,600	14,600	10,000	8,200	2,000
Upesciems	?	100	0	0	0
Oxbow Darzini	250	700	?	250	150
Ponds in Ventspils	?	1,500	?	?	80
Total		84,720			27,950

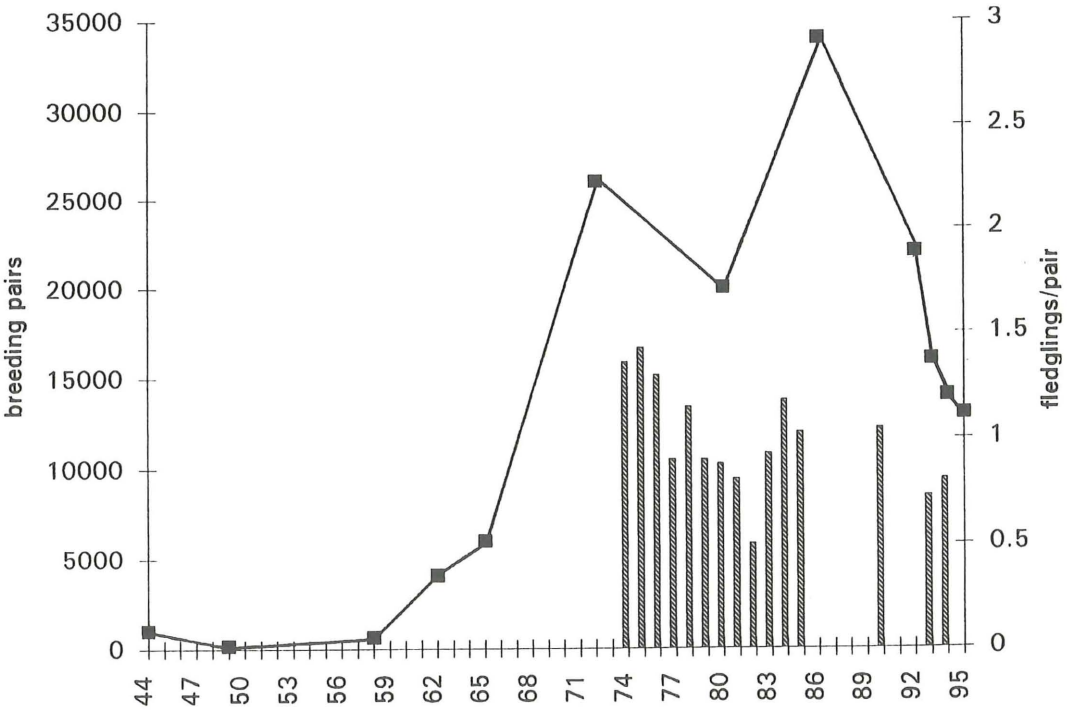

Fig. 1. Changes in the size of the breeding population (curve, left Y-axis) and breeding success (bars, right Y-axis) of Black-headed Gulls at Lake Engure, Latvia.

Förändringar i antalet häckande par (kurvan, vänstra Y-axeln) och antalet flygga ungar per par (staplar, högra Y-axeln) av skrattmås i Engure, Lettland

food (mink food, smoked fish, other human food waste; fresh fish not included) increased from 0% in 1959 to 4% in 1962, 27% in 1963 and 53% in 1971 (Viksne 1975), and fluctuated during the period 1974-1994 in the range 31-62% (on average 43%). Feeding flight distances increased from some 20 km, mainly along the coast, to 30-40 km (this increase evidently beginning in the early 1970s).

Breeding success at Lake Engure

The mid-1970s brought some unpleasant changes to the coastal Black-headed Gull colonies. The fishing fleet became concentrated in several bigger harbours and the use of small fishing boats decreased dramatically. This diminished the opportunities for Black-headed Gulls to obtain fish, as the number of points where fish used to be landed decreased dramatically. Also some limitations of fishing were introduced. This caused significant changes in the Black-headed Gulls' feeding flights - the gulls began to fly inland more often, flights up to 40 km became mass-scale, and maximum distances of 70 km were recorded (Viksne & Janaus 1986).

The number of young fledged per pair (Fig.1) decreased from 1.36 in 1974 to 0.50 in 1982 ($n=9$, $r_s = -0.93$, $p<0.001$; Spearman rank correlation). Although breeding success has later increased slightly, the general trend of a decrease between 1974 (1.36 fledged young per pair) and 1994 (0.81 fledged young per pair) is also significant ($n=15$, $r_s = -0.55$, $p<0.05$). In 1993 we studied the breeding success of Black-headed Gulls also at two other lakes; in one dispersed colony (ca 800 pairs) at Lake Kanieris and in one dense colony (ca 1800 pairs) at Lake Babite no young at all fledged!

Discussion

The causes of the increase of the Black-headed Gull population in a large part of the species' breeding range in 1950-1980 have been discussed by many authors (e.g. Lebreton & Isenmann 1976, Viksne et al. 1981, Zubakin 1981, Glutz von Blotzheim &

Bauer 1982, Isenmann et al. 1991). There is no doubt that the species' extensive use of the feeding opportunities created by human activities (agriculture, fisheries, mink and fox farming, open garbage dumps) has played an important role in the growth of the gull populations. Among local factors that promoted Black-headed Gull population growth in Latvia some should be pointed out: (1) The establishment of nature protection areas at several important nesting sites (1957 - Lake Engure, Lake Babite, 1964 - Lake Kanieris, 1977 - Lake Liepaja) which significantly decreased human disturbance during the breeding season; (2) The practically unlimited feeding opportunities provided by the country's socialistic economy and attitude to natural resources. Gulls had unlimited access to fish near numerous trawling vessels at sea, at fishing harbours and at numerous fish-canneries where boxes with fish used to stay uncovered for hours. They also had access to waste from the fish processing industry. There were also huge and numerous mink farms where gulls could obtain nutrient-rich and abundant food independent of weather conditions and week day (when cleaning cages, mink tenders just used to throw the unconsumed food on the ground). Also garbage dumps near cities and towns played an important role in the growth of the Black-headed Gull population.

The causes of the population decline that has been observed recently in much of the gulls' breeding range evidently should be divided into two parts, i.e. (1) those related to changes on the wintering grounds and (2) those related to changes in the breeding areas.

The wintering range of the Black-headed Gulls nesting in Northern Europe, including the countries surrounding the Baltic, overlaps considerably and thus birds nesting in this area are affected by changes in the wintering conditions in a number of European countries, such as Denmark, Germany, Switzerland, Italy, France, The Netherlands, Belgium, Great Britain, etc. Increased winter mortality of Black-headed Gulls wintering in this region could be the common reason explaining the decline of the breeding populations in different countries. Unfortunately, our ringing material does not allow us to demonstrate an increase in winter mortality because different types of rings (differing in durability) have been used at different times. But general information from Western Europe on the replacement of open garbage dumps by closed garbage processing plants and a decrease in the number of mink farms, suggests that feeding opportunities for Black-headed Gulls have become worse during the last decades.

Local reasons for the Black-headed Gulls' population decline in Latvia are clearer and generally can be related to changes in food availability. The gradual decline in overall breeding success since the mid-1970s that we have observed at Lake Engure coincided with limitations of fisheries on the Gulf of Riga and some restrictions that made access to fish remains at fish-canneries more difficult for the gulls. The gulls at Engure responded to these changes by increasing the distances of foraging flights and by expanding the area used for feeding. After some decrease in the 1970s Engure's Black-headed Gull population continued growing and reached its highest level in 1986 (Fig.1). The change of political and economic system in Latvia since 1990-1991 has been connected with significant changes also in the life of Black-headed Gulls, especially in the coastal zone. After privatization of fishing and fish-canneries, people's attitude changed completely and the feeding opportunities fisheries offered to Black-headed Gulls decreased considerably.

Another important feeding place for gulls nesting at Engure were mink farms which were also located mainly relatively close to the coast (because fish offal was used as a component of mink food). The Black-headed Gulls' opportunities to get food at mink farms evidently have decreased gradually since the mid-1980s as farmers started feeding the animals once a day instead of earlier twice a day. But the number of animals (minks and foxes) in farms continued increasing until 1991 and this probably partly compensated for the decrease in food availability caused by the switch to one-time feeding. Significant changes in this field occurred between 1992 and 1993: the total number of fur animals in farms decreased by 40%, and several farms were closed including some which were very important as feeding places for Black-headed Gulls. Consequently, the opportunities to obtain food at mink farms also decreased markedly.

Apparently, the above-mentioned changes influenced Black-headed Gull numbers less on inland waterbodies. The changed situation on the sea coast (at fishing harbours and fish-canneries) do not influence inland gulls, and mink farms play a less important role in their feeding as well. This could explain the less pronounced downward trend of inland colonies than coastal ones.

The appearance of some new predators has played a certain role in the redistribution and decrease of the Black-headed Gull populations. We would like to mention two of them. In the 1970s, American mink *Mustela vison* started occupying our bird-lakes and

recently the mink has become the most serious problem for nearly all waterbirds. According to our observations at Lake Engure and Lake Kanieris the settling of mink on islands (or floating "rafts" of emergent vegetation) normally results in the abandoning of this site by the gulls. For example, in Lake Kanieris a small island (0.4 ha) held a colony of ca 2,000 pairs of Black-headed Gulls. After two years' coexistence with mink, the gulls abandoned this site. Presence of mink, especially of a female with cubs, results in the killing of a great number of birds by far exceeding the number necessary to support the mink. For instance, about 40 adult Black-headed Gulls, three female ducks and one Grey-lag Goose *Anser anser* gosling were killed by mink in some 10 days; the killing stopped after trapping of the female and destruction of the nest containing blind cubs.

Also the Herring Gull *Larus argentatus* started occupying our coastal lakes in the early 1970s. Its influence on the Black-headed Gull population is more difficult to evaluate, but we would like to point out that (1) on some lakes (Lake Kanieris, Lake Babite), numbers of Herring Gulls in the late 1980s-early 1990s were high enough to influence the breeding success of the Black-headed Gulls through predation on chicks, and (2) that the increase of Herring Gulls forced Black-headed Gulls to move from good to less favourable nesting sites.

Finally, among possible causes of the Black-headed Gull population decline, a decrease of suitable breeding habitat should be mentioned as well. It is likely that the series of mild winters in 1988-1992 promoted the destruction of the most suitable kind of emergent vegetation used by Black-headed Gulls for nesting, viz. stands of partly floating cattail, especially when mixed with other species typical of later stages of succession, *Rumex* spp., *Solanum dulcamara*, etc. During mild winters when lakes remain unfrozen or the period of ice-cover is very short, stands of emergent vegetation are exposed to strong winter storms under conditions of high water level. Big waves then destroy mainly floating cattail sloughs. Also a lack of snow which normally brakes and compresses stems of the previous summer's vegetation thus creating surfaces suitable for Black-headed Gulls to nest on, does not promote the formation of good nesting surfaces for gulls. These factors have probably also played a role in the decrease of the populations of Black-headed Gull at the large coastal lakes, such as Engure, Liepaja and Babite.

A decrease or even cessation of cattle grazing and hay-making apparently have also led to a decrease of areas potentially suitable for nesting by Black-headed Gulls on some islands and peninsulas which have gradually become overgrown with bushes and reeds.

Thus, in our opinion, the Black-headed Gull population decline could be explained by the simultaneous action of several unfavourable factors including: (1) changes in food availability during both the breeding and wintering seasons; (2) increased predation in breeding colonies due to the appearance of new predators; (3) decreased areas of suitable nesting habitat.

Unfortunately, enough quantitative data on these factors are not always available and it is difficult to demonstrate the role of each of them. Therefore our explanations should be regarded as speculations which hopefully will stimulate more detailed studies.

The changes in numbers of the Black-headed Gull population in Europe which have been observed during the last 50 years have attracted the attention of ornithologists in many countries, but until now these studies have suffered from insufficient international coordination. To achieve a better understanding of Black-headed Gull population dynamics, coordinated international efforts would be necessary.

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Sammanfattning

Den lettiska skrattmåspopulationens utveckling under senare tid

Skrattmåsens populationsutveckling i Lettland följer i stora drag det mönster som registrerats i flera andra länder, inklusive Sverige. I slutet av 1930-talet och början av 1940-talet uppgick landets totalbestånd till cirka 10000 par. Därpå följde en kraftig ökning av antalet skrattmåsar, en ökning som uppenbarligen fortgick in på 1980-talet (Tabell 1). Skrattmåsbeståndets utveckling i Engure, Lettlands kanske viktigaste våtmark, speglar väl trenden för landet som helhet. I början av 1940-talet häckade cirka 1000 par skrattmåsar i sjön, 1949 och 1958 var antalen litet lägre, men sedan visar de en uppåtgående trend: 1962 4100 par, 1965 6000 par, 1972 26000 par och 1986 34000 par.

Någon gång i slutet av 1980-talet tycks arten dock ha börjat att minska i antal i Lettland, och vid en omfattande taxering 1994 inräknades blott 36% av det antal som registrerats åtta år tidigare (Tabell 1). Även denna sentida trend speglas väl i siffrorna från de viktigaste lokalerna: Engure, Kanieris, Liepaja och Daugavas mynning (Tabell 2; för Engure, se också Fig.2).

Den stora skrattmåskolonin i Engure har under många år varit föremål för detaljerade studier av såväl de gamla fåglarnas provianteringsturer som av ungproduktion och ungtillväxt. Kolonins tillväxt sammanfaller med förändringar i måsarnas diet och val av provianteringsplatser. Medan avfall och minkföda utgjorde några få procent av ungarnas föda i början av 1960-talet, ökade denna andel till 27% 1963 och 53% 1971 (Viksne 1975). Samtidigt ökade provianteringsturernas längd från cirka 20 till 30-40 km. I mitten av 1970-talet koncentrerades Lettlands fiskeflotta till några få hamnar och kustfisket med småbåtar minskade dramatiskt. Detta ledde till att Engures skrattmåsar, i stället för att som tidigare proviantera vid kusten, började flyga inåt landet, i stor skala så långt som 40 km och undantagsvis hela 70 km (Viksne & Janaus 1986). Samtidigt minskade ungproduktionen i Engure från cirka 1,4 flygga ungar per par under 1970-talets första hälft till 0,5 1982. Därefter har produktionen varit högre, men en vikande trend under perioden 1974-1994 är ändå statistiskt signifikant (Fig. 1).

Såväl skrattmåspopulationens tidigare tillväxt som sentida minskning i Lettland kan främst tillskrivas uppkomsten, och sedermera försvinnandet, av födokällor skapade av mänsklig aktivitet (jordbruk, fiske, pälsdjursavel, öppna soptippar). Medan måsarna tidigare hade nära obegränsad tillgång till fisk och fiskrens, samt inte minst minkfoder, infördes i mitten av 1970-talet restriktioner i fisket och fiskhanteringen, vilka i tid sammanfaller med den försämrade reproduktionen i Engure-kolonin. Tillgängligheten till minkfoder tycks ha minskat gradvis under 1980-talet, med en mycket drastisk minskning i början av 1990-talet. I överensstämmelse med dessa förändringar har de kustnära kolonierna, vilka varit mer beroende av fisk, fiskrens och minkfoder, minskat kraftigare än inlandskolonierna.

Även predationen har på senare tid ökat i kolonierna, framför allt predationen från mink, som uppenbarligen bl.a. fått en koloni om 2000 par att överge sjön Kanieris. Möjligen kan också igenväxning och andra biotopförändringar ha påverkat det lettiska skrattmåsbeståndet negativt.