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Studies of lesser black-backed gulls in northern Norway in 2009

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In the 1970s and 1980s, there was a large decline in the population of lesser black-backed gulls *Larus fuscus fuscus* breeding in northern Norway, possibly due to the collapse in the stock of Norwegian spring spawning herring. However, very little was known about the ecology of lesser black-backed gulls in the region except for the annual monitoring of breeding birds in a few colonies in Helgeland organized by the National Seabird Monitoring Program. These counts documented a dramatic drop in the colony sizes in the 1980s, followed by a stabilization and a slight increase in some colonies from the early 1990s (Lorentsen & Christensen-Dalsgaard 2009). However, in the 1980s a greyish-mantled subspecies was found breeding alongside with the original black-mantled *L. f. fuscus* (Strann & Vader 1992, Figure 1) suggesting that the gap left by the dwindling *L. f. fuscus* population was being filled by birds from southern areas where the lesser black-backed gull populations increased in the 1980s and 1990s. However, the origin of these birds is unknown, and interestingly they are only found in the northern parts of the *L. f. fuscus* distribution area (from Lofoten and northwards), but not in the southern parts of Nordland county.

Figure 1
A greyish-mantled lesser black-backed gull photographed in Troms. These birds have been observed in northern Norway since the 1980s (© Trond Johnsen).

It soon became clear that there was a great need for more detailed population data on these gulls and since 2000 studies have been conducted in the Helgeland area in southern Nordland. In 2005, a study that was started in the Horsvær archipelago provided data on a whole range of population parameters, including feeding ecology. In 2008, we also made a preliminary visit to Hortavær, an archipelago south of Horsvær where about 200 pairs of lesser black-backed gulls breed.

Several approaches are being used to study lesser black-backed gulls in northern Norway within SEAPOP, including studies of migration patterns, pollution levels, feeding ecology and population dynamics. The previous report presented recent results and publications concerning migration patterns (Helberg et al. 2009), levels and effects of contaminants (Bustnes et al. 2006, 2008a,b, Erikstad et al. 2009) and climate effects on breeding numbers (Bustnes et al. 2010a), as well as data

on reproduction and recruitment rates. This report gives an update of the breeding results from 2009 at Horsvær, and presents a recent analysis of the feeding ecology of lesser black-backed gulls in northern Norway (Bustnes et al. 2010b).

Demography and feeding ecology

The coast of Helgeland is today an important area for *L. f. fuscus*, and Horsvær in Sømna municipality was selected as a study colony. Horsvær is the largest known colony of *L. f. fuscus* in Norway, and surveys have been conducted there since 1980. The project focuses specifically on factors important for population growth and the following parameters are being monitored:

- *Reproduction*, as monitored annually by the number of nests, egg size, clutch size and breeding success. Data on sex ratio among chicks in different years have also been collected.
- *Recruitment*, as measured by monitoring the return and establishment of young, native birds previously banded with colour rings as chicks (ringed annually since 2005).
- *Adult survival*, as monitored annually by using standard capture-mark-recapture procedures based on the re-sighting of marked adult birds.
- *Feeding ecology*, as measured by monitoring diet composition of chicks and adults.

Demography

In 2009, there were only 103 nests at Horsvær, which is about a quarter of the 2006 level and a drop of 65% compared to 2008 (Table 1, Figure 2). In addition, the production of young per nest was very low (ca. 0.4 large chick per nest), possibly due to poor feeding conditions during most of the breeding season. The breeding success has steadily dropped since 2005 (Figure 2) and poor feeding conditions were confirmed through an analysis of diets in 2009 (Bustnes et al. 2010). Recruitment seems to be good.

Table 1 *Results from the population study of northern lesser black-backed gull* Larus fuscus fuscus *in the Horsvær Archipelago 2005-2009.*

Parameter	2005	2006	2007	2008	2009	Total
Number of nests	378	385	135	288	103	
Number of adults with colour rings	83	42	13	16	8	162
Number of young ringed	371	226	52	94	21	764
Number of young with colour rings	246	218	46	94	18	622
Number of young in late July	400-500	350-400	150	150-180	30-40	1080-1220
Number of young banded 2005 returned	–	–	9	25	32	50
Number of young banded 2006 returned	–	–	–	2	20	21

In 2007, the first nine birds marked as fledglings in 2005 appeared at Horsvær. In 2009, 50 birds marked in 2005 (20.3% of marked fledglings) and 21 from 2006 (9.3%), were seen in the colony. Based on sex determination in 2005, 70% of the returning birds were males. Adult survival seems to be very high at Horsvær, and was estimated at 90.1% between 2005 and 2006 (Anker-Nilssen et al. 2008). So far no survival rate calculation has been made for later years, but it seems that the winter survival of these birds is high and the population decline is probably not caused by poor adult survival.

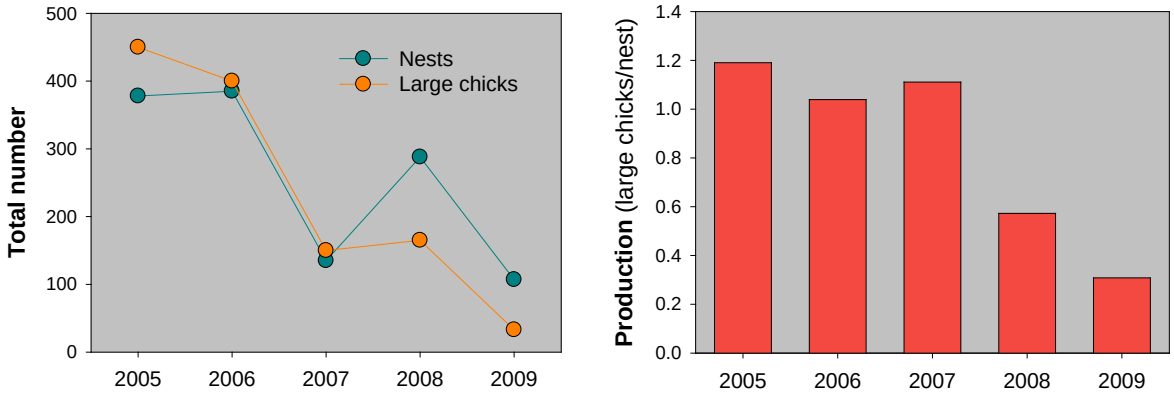

Figure 2 *Numbers of nests and breeding success of lesser black-backed gulls in Horsvær in 2005-2009. The annual production (right) was calculated as the total number of large chicks counted in the colony late in the season divided by the total number of nests (left).*

Feeding ecology

We have collected both regurgitated pellets from adults and regurgitates from chicks when handled for ringing in all years. This material has now been analyzed and the results are presented in Bustnes et al. (2010). In the study we assess the diet of gulls breeding in two coastal regions of northern Norway over five years (2005-2009). In the southern region (Horsvær and Hortavær), chicks (*n*=58) were fed predominantly gadoids (ca. 75% ABP [aggregated percentage of prey biomass] and ca. 80% by frequency; 70-130 mm length), probably saithe *Pollachius virens*, whereas 0-group herring *Clupea harengus* (40-50 mm in length) accounted for ca. 20 % ABP, and were fed to ca. 20% of the chicks. In the northern region (Troms) (*n*=23), slightly larger 0-group herring comprised ca. 60% of the prey mass and was fed to 65% of the chicks. In this area, gadoids and sandeels *Ammodytes* spp. each accounted for ca. 17% ABP of prey, and were fed to 20% and 30% of the chicks, respectively. Other species made up smaller proportions of the chick diets. For adults, only regurgitated pellets (*n*=28 in the southern region) were available. Of 23 pellets from 2006 and 2007, 17 (74%) contained pipefish (probably snake pipefish *Entelurus aequoreus*), whereas three contained herring, two gadoids, and one sandeels. In the poor breeding season of 2009, adult gulls also fed on blue mussels *Mytilus edulis*, crabs (Brachyura), sea urchins (Echinoidea) and seabird eggs. Northern lesser black-backed gulls are thus probably mainly piscivorous during breeding, and other preys are probably exploited only when fish are not readily available. Furthermore, herring seems to be less important for *L. f. fuscus* than previously thought (Bustnes et al. 2010a, 2010b).

References

Anker-Nilssen, T., Barrett, R.T., Bustnes, J.O., Erikstad, K.E., Fauchald, P., Lorentsen, S.-H., Steen, H., Strøm, H., Systad, G.H. & Tveraa, T. 2008. SEAPOP studies in the Barents and Norwegian Seas in 2007. **NINA Report 363**, 92 pp.

Bustnes, J. O., Helberg, M., Strann, K. B. & Skaare, J. U. 2006. Environmental pollutants in endangered vs. increasing subspecies of lesser black-backed gulls along the Norwegian Coast. **Environmental Pollution 144**: 893-901.

Bustnes, J. O., Erikstad, K. E., Lorentsen, S. H. & Herzke, D. 2008a. Perfluorinated and chlorinated contaminants as predictors of demographic parameters in an endangered seabird. **Environmental Pollution 156**: 417-424.

Bustnes, J. O., Borgå, K., Erikstad, K. E., Lorentsen, S. H. & Herzke, D. 2008b. Perfluorinated, brominated and chlorinated compounds in a population of lesser black-backed gulls (*Larus fuscus*). **Environmental Toxicology and Chemistry 27**: 1383-1392.

Bustnes, J. O., Anker-Nilssen, T. & Lorentsen, S. H. 2010a. Local and large-scale climatic variables as predictors of the breeding numbers of endangered Lesser Black-backed Gulls on the Norwegian Coast. **Journal of Ornithology 151**: 19-26.

Bustnes, J. O., Barrett, R. T. & Helberg, M. 2010b. Northern lesser black-backed gulls; what do they eat? **Waterbirds 33:** 534-540.

Erikstad, K. E., Bustnes, J. O., Lorentsen, S. H. & Reinertsen, T. K. 2009. Sex ratio modification in lesser black-backed gull exposed to environmental pollutants. **Behavioural Ecology and Sociobiology 63**: 931-938.

Helberg, M., Systad, G. H., Birkeland, I., Lorentzen, N. H. & Bustnes, J. O. 2009. Migration patterns of adult and juvenile lesser black-backed gulls *Larus fuscus* from Northern Norway. **Ardea 97**: 281-286.

Lorentsen, S.-H. & Christensen-Dalsgaard, S. 2009. Det nasjonale overvåkingsprogrammet for sjøfugl. Resultater til og med hekkesesongen 2008. **NINA Rapport 439**, 53 pp. (In Norwegian with English summary)

Strann, K. –B., Vader, W., 1992. The nominate lesser black-backed gull *Larus fuscus fuscus*, a gull with a tern-like feeding biology, and its recent decrease in northern Norway. **Ardea** 80, 133-142.

Cover photo:
Pair of lesser black-backed gulls at a breeding site in Vesterålen (© Trond Johnsen).

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