



## Key-site monitoring on Hornøya in 2009

Rob Barrett & Kjell Einar Erikstad

© SEAPOP 2010

## Key-site monitoring on Hornøya in 2009

The 2009 breeding season was in general good for most species on Hornøya with a successful breeding season for all but the kittiwake. This is in contrast to 2008 when also the large gulls failed to raise many chicks. Of the species whose populations are monitored both the kittiwake and puffin declined since 2008, while the shag and common guillemot increased in numbers (Table 1).

Kittiwakes started to lay in early May and the mean clutch size was 1.61 eggs/nest, with 17% of the clutches containing 3 eggs. As in 2008, most eggs hatched normally, but chicks soon vanished from the nests and by the end of July, there were only 0.21 chicks/nest with 80% of the nests being empty. This is the fourth lowest breeding result ever recorded in 25 years of records, with similarly poor results in 2007 and 2008 adds to the downward trend in reproductive success since 1980. More concerning was the continued decline in the breeding population with numbers in the monitoring plots in 2009 dropping to ca. 30% of the numbers first recorded in the early 1980s. On the outset, the collection of 68 food samples from adults and chicks containing nearly 90% capelin (Figure 1) suggested reasonable feeding conditions for kittiwakes in 2009, but the mean mass of 10-12 g per food load retrieved was again smaller than recorded in earlier years. As in the three previous years, there was very little feeding activity among any of the gull species in the waters around Hornøya and a near complete absence of “feeding frenzies”, suggesting that fish near the surface were not as abundant as in most earlier years. The poor breeding success in 2009 was also attributed to serious disturbance by a gyrfalcon *Falco rusticolus* that was seen in the colony nearly every day in July causing the adult kittiwakes to leave their nests and the subsequent predation of eggs and chicks by the falcon, large gulls and ravens.

**Table 1** Key population parameters (SE, n) of seabirds in Hornøya in 2009. Pop. change is the numeric change in size of the breeding population registered between 2008 and 2009 on the basis of plot counts (p) or total censuses (t). For each species the listed survival estimate was derived from the basic model(s) that fitted the data set best (i.e. that (those) with  $\Delta QAI C_c < 2$  when adjusting for median c-hat).

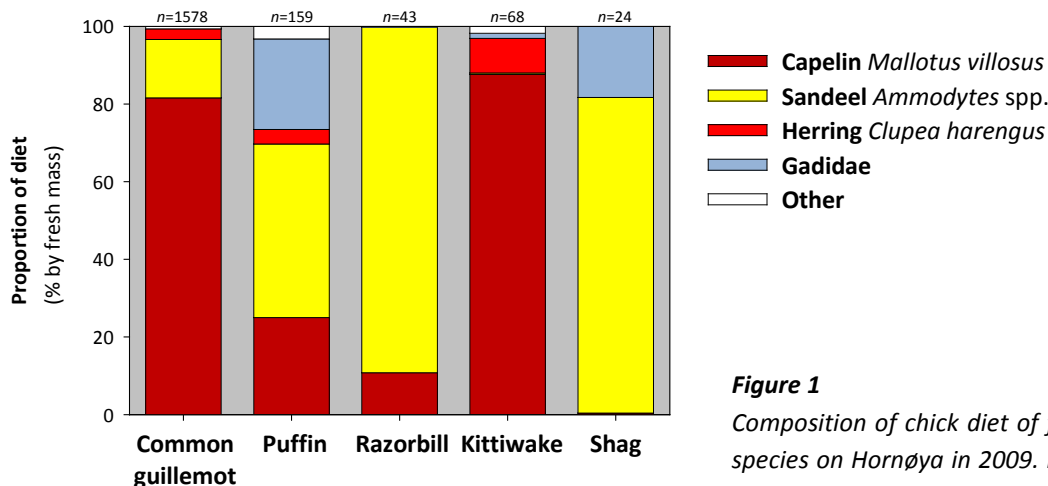
Species	Population change %	Annual adult survival		Reproductive performance	
		Period (yrs)	Estimate %	Sampling unit	Estimate
Shag	+ 11.7 <sup>P</sup>	2004-09 (5)	79.1 (2.5, 137)	Clutch size	2.43 (0.09, 137)
Herring gull	Probably negative	2005-09 (4)	Data not yet analysed	Clutch size	2.96 (0.02, 75) <sup>3</sup>
				Large chicks/nest	1.53 (0.11, 75) <sup>3</sup>
Great black-backed gull	Probably negative	2001-09 (8)	Data not yet analysed	Clutch size	2.96 (0.02, 75) <sup>3</sup>
				Large chicks/nest	1.63 (0.13, 75) <sup>3</sup>
Kittiwake	- 3.0 <sup>P</sup>	2007-08 (1)	82.5 (4.4, 1199)	Clutch size	1.61 (0.04, 715)
				Large chicks/nest	0.21 (0.01, 1822)
Common guillemot	+ 6.7 <sup>P</sup>	1988-09 (21)	96.0 (0.5, 195)	Fledging success <sup>1</sup>	0.89 (n=36) <sup>2</sup>
Razorbill	No data	1995-09 (14)	90.6 (0.9, 182)	Fledging success <sup>1</sup>	0.78 (n=60)
Puffin	- 14.0 <sup>P</sup>	2007-08 (1)	85.9 (5.2, 704)	Fledging success <sup>1</sup>	0.77 (n=52)

**1)** Medium-sized chicks/egg laid; **2)** Data from the master thesis by Ditte Lyngbo Kristensen; **3)** Data from Kvivesen et al. (in manuscript)

The breeding season for both herring gulls and for great black-backed gulls was very good in 2009 compared to previous years (2005-08). For both species the number of chicks surviving per nest until the age of 15 days was above 1.5, which is much higher than that for 2008 (0.14 for herring gulls and 0.26 for great black-backed gull). Data on the total breeding population of gulls was collected in 2008 using aerial photography and a study plot design as a basis to estimate population trends, and the plots were recounted in 2009, but these data are not yet analysed. The general impression is that numbers of both large gull species are declining.

After an increase in numbers of occupied Atlantic puffin burrows between 1980 and 2005, numbers have started to decrease, albeit with a short respite in 2007 and 2008, and numbers in 2009 were down 20% since the peak reached in 2005 and back to levels reached in the late 1990s. Based on a constant incubation period (for puffins = 39 d) and observations of hatching dates, the start of egg-laying was normal around 10 May and reached a peak ca. 10 days later. Again, puffin egg volumes calculated in 2009 corroborated the previously recorded near 5% decline in volume since 1980. Puffin chicks were fed a diet of 45% (by mass) sandeel, 25% capelin and 23% gadids (Figure 1 and 2). Broken down by number, nearly 50% of the food items were transparent, unidentified fish larvae (probably capelin) and 37% gadid fry, which as in recent years suggests that larger, more profitable food items were less accessible than the fewer but larger sandeels and capelin that constituted most of the diet by mass. Despite this, puffin chick growth rates were normal (ca. 10 g/d) as was their fledging success (0.77 medium-sized chicks/egg laid).

Razorbills laid their eggs at the normal time with a peak around 25 May, chicks grew at a normal rate of ca. 10 g/d during the period of maximum growth, and the fledging success of 0.78 chicks/egg laid was also normal. As in the preceding five years, razorbill chicks were fed mainly sandeels (89% by mass, 85% by number; Figure 1).



**Figure 1**

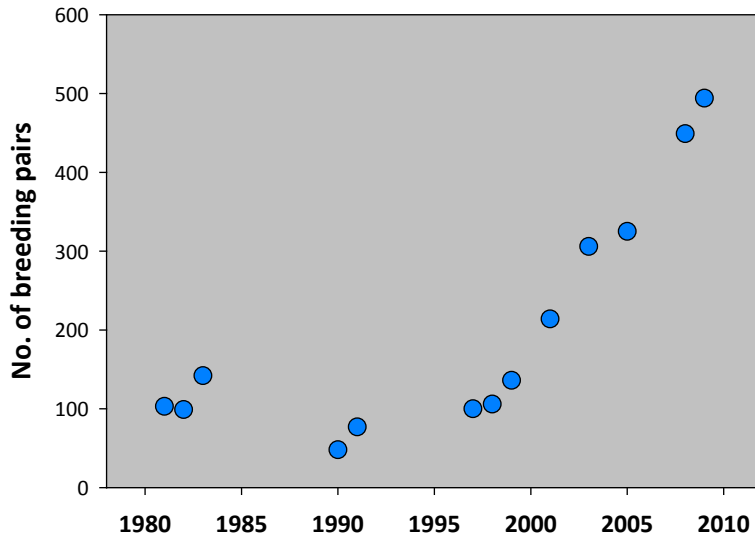
Composition of chick diet of five seabird species on Hornøya in 2009. Numbers of food loads (for shag, pellets) examined are indicated above each bar.



**Figure 2**  
*Sandeels made up much of the diet of Puffin chicks on Hornøya in 2009. (© R. Barrett)*

The common guillemot breeding population continued its steady increase since the collapse in 1986/87 and counts made in 2009 were higher than they were when monitoring started in the early 1980s. Hatching started around 10-15 June and the first chicks left the ledges ca. 6 July. However, as in 2008, the mean mass of common guillemot chicks as they left the colony in early July (ca. 230 g) was 40-50 g (ca. 15%) lower than normal (270-280 g), again suggesting that adults found it difficult to find sufficient food for normal chick growth. This was not evident from the quality of food fed to chicks being mainly capelin and sandeel (80% and 15% of the diet respectively; Figure 1) 110-140 mm in length.

The shag population on Hornøya decreased slightly between 1980 and 1995, but further monitoring has shown a steady and steep increase with numbers in 2009 nearly five times those in the early 1980s (Figure 3). The 2009 population seemed healthy as reflected in a clutch size of 2.4 eggs/nest and, although no count was made, the survival of eggs and chicks was high and the overall breeding success was good. Twenty four food pellets were collected and their contents showed that ca. 80% of their diet was ca. 100-120 mm sandeels (Figure 1). This apparent specialization on a single prey species was also evident in 2007 and 2008.



**Figure 3**  
*Population of shags (pairs) nesting on Hornøya, 1980-2009.*

The adult survival of shags, common guillemots and razorbills was high and constant over time and very similar to the estimates up to 2008. Both the kittiwake and puffin have a variable survival between years. The estimate for the puffin from 2007 to 2008 (85.9%) is only slightly higher than in the previous year (82.0%), and that for the kittiwake (82.5%) is within the middle range of that from previous years (66.4-94.6%). There are no clear signs of reduced adult survival for any of the species studied and most of the variation in their population sizes is therefore caused by other factors such as recruitment of young and/or emigration and immigration of young birds.

**Cover photo:** The shag population is increasing rapidly on Hornøya after several years of high breeding success. At the end of the breeding season chicks and adults gather in large flocks below the main breeding cliff. (© R. Barrett)

## Author contact information

R. Barrett, [rob.barrett@uit.no](mailto:rob.barrett@uit.no), Tromsø University Museum, NO-9037 Tromsø

K.E. Erikstad, [kjell.e.erikstad@nina.no](mailto:kjell.e.erikstad@nina.no), Norwegian Institute for Nature Research, Polar Environmental Centre, NO-9296 Tromsø

## Publication series information

*SEAPOP Short Report* (SSR) is published by the Norwegian Institute for Nature Research (NINA), the Norwegian Polar Institute (NP) and Tromsø University Museum (TMU) as a web-based newsletter presenting individual progress reports and analyses of projects within the *SEAPOP* programme. The individual SSRs have no ISSN/ISBN coding, but the reports for each year will be collated and published in the registered report series *NINA Report* as a *SEAPOP* annual report.

**SEAPOP** (SEAbird POPulations) is a long-term monitoring and mapping programme for Norwegian seabirds that was established in 2005 and implemented on the full national scale in Norway, Svalbard and adjacent sea areas in 2008. The programme is financed by the Ministry of the Environment, the Ministry of Petroleum and Energy and the Norwegian Oil Industry Association, and aims to provide and maintain the most important base-line knowledge of seabird distribution, demography and ecology needed for an improved management of these marine environments. More info about *SEAPOP* is found on the programme's web site [www.seapop.no](http://www.seapop.no), including an up-to-date list of associated publications from which all reports can be freely downloaded as pdf documents.

### Series editors

Tycho Anker-Nilssen, [tycho@nina.no](mailto:tycho@nina.no)

Robert T. Barrett, [rob.barrett@uit.no](mailto:rob.barrett@uit.no)

