SEAPOP Short Report 2-2011

Key-site monitoring on Spitsbergen in 2010

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Breeding performance and population trends

In 2010, we collected demographic data from the Brünnich's guillemot *Uria lomvia* colonies at Diabasodden (78°22'N 16°08'E) in Isfjorden and at Ossian Sars (79°01'N 12°23'E) in Kongsfjorden. We also collected demographic data from the little auk *Alle alle* colonies in Bjørndalen (78°14'N 15°19'N), close to Longyearbyen, and in Feiringfjellet (78°56'N 12°27'E) in Kongsfjorden. Capture/recapture of individuals and nest success monitoring was initiated in the latter colony in 2006 (J. Welcker and G.W. Gabrielsen, NPI) and will now continue as part of SEAPOP. Data on kittiwakes *Rissa tridactyla* were collected at Ossian Sars (counts of the number of breeding individuals in monitoring plots) and Grumantbyen (78°10'N 15°09'E) in Isfjorden (capture/recapture and breeding success monitoring). Data on fulmar *Fulmarus glacialis* (count of breeding pairs in monitoring plots) are from the Nøisdalen colony (78°21'N 17°00'E).

The size of the Ossian Sars kittiwake colony increased in 2010 as compared to 2009 (Table 1), but the colony was relatively stable over the long-term (2000-2010). Numbers of Brünnich's guillemots on Diabasodden and Ossian Sars were relatively stable in 2010 as compared to 2009, but the long-term trend indicates a significant 5% annual decline since the late 1990s (Figure 1). Fulmars seem to decline in the Nøisdalen colony based on previous counts from 2001 and 2005. The colony declined by 43% since 2005, and by 52% since 2001.

Table 1. *Key population parameters (SE, n) of seabirds on Spitsbergen in 2010. Except for fulmar (cf. footnote) population change is the numeric change in size of the breeding population registered between 2009 and 2010 on the basis of plot counts (p) or total censuses (t). For each species, the listed survival estimate was derived from the basic CJS model(s) that fitted the data set best (i.e. that/those with ΔQAICc < 2 when adjusting for median c-hat). Note that for populations with a variable survival from year to year (Brünnich's guillemot on Ossian Sars and both little auk colonies) only the latest possible estimate (2008-09) is given, while for the other populations no such variation was found and the estimate applies for the whole sampling period, as indicated.*

Species		**Population**	**Annual adult survival**		**Reproductive performance**	
	Colony name	**change**	Period (yrs)	Estimate %	Sampling unit	Estimate
Fulmar	*Nøisdalen*	– 43.3% [p 1]	*No data*		*No data*	
Kittiwake	*Ossian Sars*	+ 46.0% [p]	*No data*		*No data*	
	Grumantbyen	*No data*	2008-10 (2)	81.3 (18.8, 57)	Large chicks/nest [2]	0.82 (*n*=34)
Brünnich's	*Ossian Sars*	+ 6.5% [p]	2008-09 (1)	90.2 (13.8, 47)	*No estimate available yet*	
guillemot	*Diabasodden*	– 0.2% [t]	2005-10 (5)	84.5 (2.5, 119)	*No estimate available yet*	
Little auk	*Bjørndalen*	*No data*	2008-09 (1)	73.1 (4.9, 333)	Chicks ≥20d/egg	0.86 (*n*=44)
	Feiringfjellet	*No data*	2008-09 (1)	74.2 (3.0, 425)	*No data*	

1) *Total change from 2005 to 2010 (no data for intermediate years);* ***2)*** *Average number of chicks observed in the last week before fledging per active nest. An active nest is defined as a nest with 1 or 2 eggs at first visit (in end of June)*

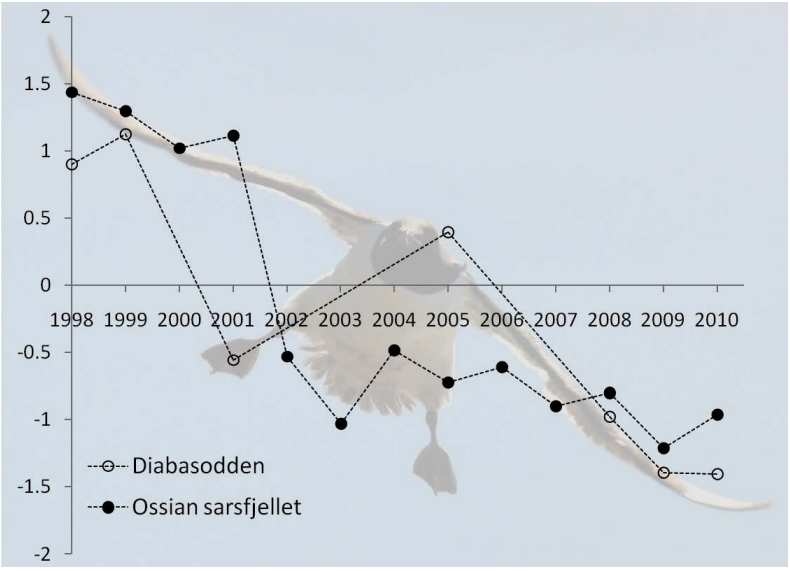

Figure 1
Standardized number (deviation from mean divided by SD) of individuals in two Brünnich's guillemot colonies on Spitsbergen over the last 12 years.

The 2010 breeding season on Spitsbergen was a good one for Brünnich's guillemots, little auks and kittiwakes (Table 1). Breeding success of little auk at Bjørndalen (measured as the probability for an egg to result in a chick surviving the first 20 days) was clearly higher in 2010 (0.86, Table 1) than in 2009 (0.40). However, diet was similar in both years (Figure 2) and clearly dominated by copepods *Calanus glacialis* (85% in 2010 and 89% in 2009) and *C. finmarchicus* (4% in 2010 and 5% in 2009), and amphipod *Themisto abyssorum* (5% in 2010 and 1% in 2009).

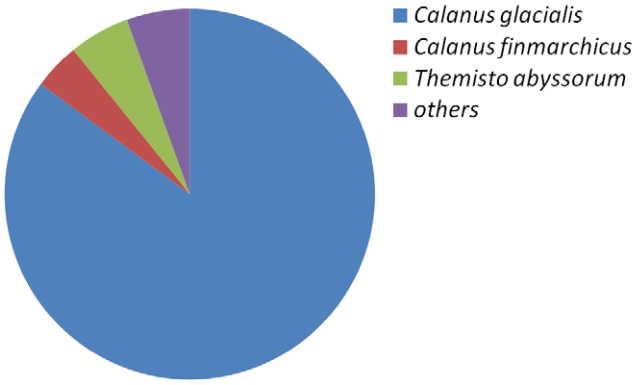

Figure 2
Composition of the food brought back to chicks by little auks breeding in Bjørndalen in 2010.

Band reading in the Brünnich's guillemot colony at Diabasodden. (© S. Descamps)

Survival rates

Survival of Brünnich's guillemots remained constant in period 2005-2010 for the Diabasodden colony (average annual survival of 84.5 %, *SE*=2.5; Table 1). In Ossian Sars, survival of Brünnich's guillemots seems more variable, but sample size is too small to draw robust conclusions (Table 1). Annual survival of kittiwakes was estimated at 81.3% (*SE*=18.8) in the Grumantbyen colony, which lies in the lower end of survival estimates for kittiwakes in the NE Atlantic (see e.g. Frederiksen et al. 2005). In Feiringfjellet, little auk survival was lower in 2008-09 (74.2%, *SE*=3.0; Table 1) as compared to previous years (2006-08: 85.1%, *SE*=1.5). In Bjørndalen, survival seems to have declined too but further analyses are needed. Because of time-dependency, little auk survival can't be estimated for period 2009-10 yet.

References

Frederiksen, M., Harris, M.P. & Wanless, S. 2005. Inter-population variation in demographic parameters: a neglected subject? **Oikos 111**: 209-214.

Cover photo: Little auks in Bjørndalen, Spitsbergen. (© S. Descamps)

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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 ISNN/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, including an up-to-date list of associated publications from which all reports can be freely downloaded as pdf documents.

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