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Conference Handbook and Book of Abstracts



Marine Biology & Ecology
Research Centre



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Book of Abstracts

Oral Presentations

Long-term Decrease in Egg Size Shared by Contrasting Populations of Atlantic Puffins *Fratercula arctica* in North Norway

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Optimal parental fitness is compromised by investment in reproduction and entails a trade-off between the production of a maximum number of independent offspring in any one season and the parents' self-maintenance and subsequent chances of future survival. Besides adjustments in brooding and feeding effort, offspring production in birds can be regulated through changes in clutch size or, for species that lay only a single egg, egg size.

Proximate factors determining egg size are largely unknown although food quality and availability during the egg-formation period is considered important. Results of studies addressing the effects of climate change on egg size are equivocal with two studies showing a decrease and two an increase with increasing spring temperatures. This anomaly may be partly explained by some populations being unable to adjust for changes in the phenology of the nesting environment resulting in a mismatch between food availability and breeding dates.

On this background, we address the last 30 years' trend in egg size of the Atlantic Puffin *Fratercula arctica* breeding on two colonies in North Norway with very different population histories: the relatively small colony on Hornøya, where breeding numbers doubled over the period to ca. 10 000 pairs in 2010, and the huge colony at Røst, where the population decreased by 73%, from 1.4 million pairs to

At these two colonies, Puffin egg volume declined by 0.13% and 0.10% p.a. respectively. Exploratory analyses have ruled out a corresponding decrease in adult body size or any change in laying date as the cause of these declines. Nor was there any evidence of changes in adult age structure of either population in the same time period. There were, however, significant negative correlations between egg volume and pre-breeding SSTs at Hornøya and Røst. Why egg volume should change with SST is discussed in the context of energetic constraints and prey stocks, but the results suggest it may be a response to climate change, most likely mediated through pre-laying food quantity and/or quality.