

# Short- and long-term consequences of reproductive decisions: an experimental study in the puffin

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## Abstract

The purpose of the present study was to inspect the response of the Atlantic Puffin (*Fratercula arctica*) to an experimental manipulation of the investment needed to successfully raise an offspring. We achieved this by replacing an old offspring with a younger chick, and vice versa, thereby prolonging and shortening the chick-rearing period. To examine any costs of reproduction we then followed the breeding success, the recruitment of young to the population, and the survival of parents for 11 years following the manipulation. Parents in the prolonged and shortened category had a lower breeding success than controls mainly because parents deserted their chick shortly after swapping. Among those that raised their chick, the age and body mass of foster chicks at fledging were the same in all three categories even though the parents had raised chicks for different lengths of time. The recruitment of young to the breeding population was high and independent of treatment. Likewise, the survival of adults was independent of treatment. For the 11 years after the experiment, however, the resighting rate of those that deserted their chick was clearly lower than among those that accepted their foster chick. For parents that raised their foster chick, the survival to the following year was positively related to their body mass. The results support the hypothesis that puffins have a highly flexible parental investment, which they adjust according to their own individual quality and the survival prospects of the chick.

*Key words:* Atlantic Puffin; cost of reproduction; *Fratercula arctica*; Hornøya, Norway; individual quality; manipulation experiment; parental effort; state-dependent breeding investment.