

Multiple double broods within a lifetime associated with higher quality Cassin's Auklets

Mike Johns

mjohns@pointblue.org

A common way for birds to increase reproductive output is to attempt two broods in a single season, known as double brooding. Cassin's auklets are the only species of Alcid known to double brood; a behavior that has been well documented on the Farallon Islands, where roughly 30% of the breeding population will attempt a second brood in a given year.

We hypothesized that double-brooded pairs would show higher mortality rates as they aged, given an expected tradeoff between investment in offspring and self-maintenance.

Using a 32-year dataset on the breeding performance of Cassin's auklets on SEFI, multistate mark-recapture modeling revealed that double brooding was strongly positively associated with higher annual survival and longevity. Survival to the next year was substantially higher for individuals that attempted a double brood compared to those that did not.

Our models indicated birds that attempted multiple double broods throughout their lives produced on average seven times as many chicks and lived six years longer than birds that only ever attempted a single brood.

Double brooding is a unique behavior only used by the most successful auklets. Our results show that repeat double brooders actually increased reproductive output and success without risking future survival. This highlights the value of long-term datasets for revealing nuances in life-history theory, and for refining predictions of population trajectories of marine predators in response to environmental change.

Main Points

Double brooding in Cassin's auklets is a unique behavior among Alcids.

Survival was significantly higher for birds that attempted multiple double broods throughout their lives, compared to those that did not.

Birds that double brood represent high quality individuals that live longer and produce more offspring compared to single brooders.

Long-term monitoring reveals nuances of seabird life history which can be used to refine future population trajectory estimates and inform management

Michael Johns, Pete Warzybok, Russell Bradley, Jaime Jahncke, Mark Lindberg, Greg Breed. 2018. Increased reproductive investment associated with greater survival and longevity in Cassin's auklets. *Proc. R. Soc. B.* 285: 20181464. <http://dx.doi.org/10.1098/rspb.2018.1464>