



Buffering climate-driven perturbation events through recruitment

Mike Johns

mjohns@pointblue.org

When considering the resiliency of seabird populations to the effects of climate change, most research is focused on the impacts to survival or breeding propensity of reproductively active individuals. But a substantial loss of breeding adults is not the only factor controlling population dynamics. The appearance of new mature individuals breeding for the first time (recruitment) can help curb the effects of infrequent perturbation events such as warm sea surface anomalies associated with El Niño or changing climatic norms.

In our paper published in the *Journal of Animal Ecology*, we explore the relative importance of competition, environmental conditions, and a behavior called ‘double brooding’, to population stability for Cassin’s auklets breeding on Southeast Farallon Island (SEFI).

Cassin’s auklets are the only member of the Alcidae family and the only seabird in the northern hemisphere known to regularly double brood, where a second breeding attempt is

made by the same pair in the same year following the success of their first attempt. This behavior allows pairs to maximize annual reproductive effort during years when their prey (namely krill) is abundant around SEFI, and is often attempted by older experienced individuals in the population. Double brooding is generally observed in shorter-lived bird species like most songbirds that only breed a few years, and rarely observed in longer-lived species like Cassin’s auklets with a potential reproductive lifespan of just over 20 years.

We found that periodic peaks in recruitment were explained by an increase in available nest sites in years when established pairs had either skipped breeding or had died, a higher proportion of the population double brooding 4 years prior, and spring upwelling conditions. Our results suggest double brooding has played a role in maintaining a stable population of Cassin’s auklets on SEFI over the past 30 years, attributable to a demographic class of sexually mature

individuals which quickly fill vacant sites following periods of low adult survival and breeding propensity. This work highlights the importance of recruitment in the population dynamics of a relatively long-lived seabird periodically impacted by adverse environmental conditions.

Learn more by clicking on the link to the article.

Main Points

Long-term studies are valuable for describing how infrequent events may impact population dynamics

Losses of breeding individuals were countered by spikes in the recruitment of new breeders, buffering this population from decline

The unusual ability of this species to double-brood helps to increase population stability for a colony exposed to stochastic climate anomalies

Johns, M., Warzybok, P., Jahncke, J., Doak, P., Lindberg, M., Breed, G. 2021. [Episodes of high recruitment buffer against climate-driven mass mortality events in a North Pacific seabird population](#). *Journal of Animal Ecology*. doi:10.1111/1365-2656.13630