

# Parent birds protect young from climate change

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Juvenile survival – survival from hatching to first breeding – is poorly studied, but it can have strong effects on wildlife populations. Therefore, understanding how populations respond to environmental change, including climate change, requires studying juvenile survival. We combined 30 years of nest monitoring and mist-netting data collected at the Palomarin Field Station to study juvenile survival in Song Sparrows, a year-round resident songbird. Each year at the field station, Song Sparrow nests are searched for, and nestlings are banded just prior to fledging. Many of the fledglings are later seen or recaptured in the study area, allowing us to estimate survival rates. Juvenile Song Sparrows are dependent on their parents for food and help avoiding predators for about a month after fledging, after which they are on their own, or independent.

In previous work we found that juvenile survival was higher in the year after a cold, wet winter (see Publication Brief ‘Young and adult Song Sparrows will respond differently to climate change’). We re-examined the data to determine whether there was a difference in the effects of weather

on dependent and independent juveniles. We hypothesized that parental care would shield dependent juveniles from poor conditions, while independent juveniles would be more vulnerable to these conditions.

We found that the survival of independent juveniles was higher if the prior winter had been wet and cold (conditions projected to be less common in the future due to climate change). In contrast, adult and dependent juvenile survival did not vary with prior winter weather conditions. In the Mediterranean climate of coastal California, wet winters promote plant growth and insect abundance during the following summer, when young, independent juveniles are still learning to forage, making it easier for them to survive. Adult birds seem to have skills and experience required to cope with some variability in environmental conditions, and these skills benefit their dependent young.

Few studies of juvenile survival have considered whether the environmental factors affecting juvenile survival can change as juveniles transition from dependence to independence, but we found strong differences between

these stages. We expect the survival of independent juveniles to have a strong effect on population responses to environmental change, including climate change.

## Main Points

Juvenile survival is more sensitive to environmental conditions than adult survival, but is poorly studied.

We found that adult Song Sparrows can shield their fledglings from changing environmental conditions – conditions that can kill the young after they leave their parents’ care.

Climate change is projected to bring more challenging conditions for young Song Sparrows in the future.

Dybala, K.E., T. Gardali, J.M. Eadie. 2013. Dependent vs. independent juvenile survival: contrasting drivers of variation and the buffering effect of parental care. *Ecology* 94:1584-1593.

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