Phenology and productivity in a montane bird assemblage: Trends and responses to elevation and climate variation.

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) 5 10 15 km



Background.

Climate is an important driver of phenology. In birds, timing of migration and breeding initiation are generally linked to resources such as insect emergence or habitat availability. Climate change may result in mismatches between the phenologies of birds and the resources they rely on.

> 600 m 1,200 m 2,400 m 3,000 m 3,600 m 4,100 m

We analyzed capture data from 6 Monitoring Avian Productivity and Survivorship (MAPS) stations in the montane zone of Yosemite National Park from 1993 to 2017.

We characterized climate patterns in terms of annual snowfall and spring temperature. We used multi-species hierarchical models to relate avian breeding phenology and productivity to climate variation and elevation.

Results: Climate trends.



Snowfall decreased at high elevations, and temperature increased.

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Results: Breeding phenology.



Breeding advanced ~5d over the 25 yrs. Birds at low elevations nested 12d earlier than at high elevations.

Juveniles were captured up to 12d earlier in years with less snowfall, and up to 6d earlier in years with warmer springs.

Results: Productivity.





With less snow and warmer springs, productivity has tended to increase.



Not all species may be as adaptable to change; species with higher productivity at upper edge of montane zone have shown recent elevation range retractions.