

**Can invasive species replace native species as a resource for
birds under climate change? A case study on bird-fruit interactions**
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Amanda S.Gallinat, Utah State University, Department of Biology and Ecology Center, Logan, UT, 84322, USA
Richard B.Primack, Boston University, Department of Biology, Boston, MA, 02215, USA
Trevor L.Lloyd-Evans, Manomet, Plymouth, MA, 02360, USA

Highlights

- Fruits are important for migratory bird nutrition, and birds disperse seeds.
- Bird-fruit interactions may be altered by climate change and invasive plants.
- Invasive plants fruit later than native plants and are more abundant in late-autumn.
- Birds consume more native fruits throughout the autumn, even when they are rare.

Abstract

Wild fruits are an important food source for many north temperate-breeding landbirds during autumn migration and, in turn, birds provide the service of seed dispersal. Despite the importance of these autumn interactions, their potential to shift with climate change and species invasions remains poorly understood. As invasive fleshy-fruited shrubs spread across the Northeast USA and many landbird species pass through stopover sites later with warming temperatures, the potential for changes in bird-fruit interactions depends on the phenology and availability of native and invasive wild fruits, and bird preferences across the autumn season.

We observed the fruiting phenology of 25 native and invasive fleshy-fruited wild plant species at Manomet, a migratory stopover site on the coast of Massachusetts, USA, during the autumn migration season (August to November) in 2014 and 2015. We also monitored fruit availability across Manomet in 2015. To determine whether fruit consumption reflected phenology and availability, we identified seeds from 469 fecal samples collected from songbirds captured during the 2014 and 2015 autumn banding seasons.

We found that while invasive shrubs fruited later, on average, than native plants, and comprised a large proportion of the total available fruits in late-autumn, birds primarily consumed the fruits of native species throughout the autumn season. Our results demonstrate that native fruits are an important food resource for birds during the autumn migration season and are unlikely to be replaced by abundant fruits of late-season invasive species under climate change.

<https://www.sciencedirect.com/science/article/abs/pii/S0006320719314946>

AMANDA S. GALLINAT

PhD in Ecology & Evolutionary Biology

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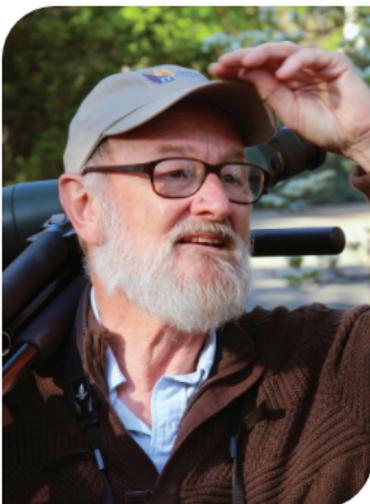
As a community ecologist, I study how evolutionary and ecological processes shape when, where, and how species interact. In 2018, I earned my PhD in Biology, with a certificate in Terrestrial Biogeosciences, in **Richard Primack's lab** at Boston University. I am currently a postdoctoral researcher working with **Mark Schwartz** at the University of Wisconsin-Milwaukee and colleagues at the **USA National Phenology Network**. You can learn more about my projects, publications, and history by clicking the links above, and feel free to contact me with questions!

Current Research

Our lab focuses on how climate change affects the flowering, leafing out, fruiting, and leaf senescence times of plants, the migration times of birds and the flight times of insects in Massachusetts. We consider the potential for ecological mismatches among species caused by changes in timing, especially the differences in the sensitivity of trees and wildflowers to spring warming. Our main focus is Concord, Massachusetts



Richard B. Primack,
Boston University



DIRECTOR, LANDBIRD CONSERVATION PROGRAM



Trevor L. Lloyd-Evans

From my first two-year stint at the (then) Manomet Bird Observatory in the 1970's, I was immensely comfortable with the wide range of scientific work we do and the emphasis on conservation biology. Over the years, our long-term data and the ecological studies they inform have led to an ideal combination of research, conservation science and education at all levels. Science is not a goal in itself, but at Manomet it leads to communicating our results directly through teaching, publication and the current media. This philosophy is supported by unified staff, boards and members, so "Why not Manomet?"

Manomet is a science-based organization which allows us to engage any audience with the facts about conservation biology. Our bird research uses changes in migration ecology to showcase birds as sensitive indicators of environmental change that alert us to both local and international conservation and climate change effects. We communicate these concepts through direct programs at the banding lab, lectures, publications, web sites and especially through providing curriculum and field techniques to teachers at middle and high school levels.