

Studying the journey, not the destination, provides new insight into songbird migrations

August 14 2024



A Cape May Warbler and a Swainson's Thrush at a birdbath. Credit: Richard Hall, University of Georgia

Migration is an adaptive phenomenon, typically triggered by a change of season, that is vital to ecosystem health. Animals may journey thousands of miles, in some cases, in search of food, better living conditions, or to find a mate. Conversely, human migration, though less common, is typically triggered by economic, or social reasons. But what if animal migration included a social element, too? Specifically, bird migration.

Joely DeSimone, a postdoctoral research scientist with the Animal Migration Research Group at the University of Maryland Center for Environmental Science' (UMCES) Appalachian Laboratory, and Emily Cohen, an associate professor at UMCES, collaborated with four North American bird observatories on a project that indicated consistent social relationships among songbird species during [migration](#).

The findings are [published](#) in the *Proceedings of the National Academy of Sciences*.

Although interactions among animals that migrate together are difficult to study, the results of this analysis demonstrate that interspecific relationships can help shape the ecology of animal migration. The occurrence of various species migrating simultaneously is influenced by the habitats they prefer and the timing of their movements, but this study finds that such co-occurrence is also influenced by consistent social relationships across species.

"We found evidence of meaningful social relationships among migrating songbirds that have generally been thought to undertake solitary, independent journeys," said DeSimone. "Interactions among these animals—like harmful competition for food or beneficial information sharing about habitat and predators—could affect the success of their migrations.

"Interestingly, we found the species relationships to be largely positive, suggesting they don't avoid each other and may actually benefit from social interactions during migration."

Bird banding stations, like the ones that provided the data for this study, capture thousands of birds that stop to rest and refuel in between migratory flights each spring and fall. These stations collect a wealth of long-term information about the migratory movements of many bird

species. The research team uncovered species relationships by applying social [network](#) analysis to more than half a million banding records of 50 bird species collected over two decades.

"We found support for communities on the move—considering migrating birds as part of interacting communities rather than random gatherings of independently migrating species," said Cohen. "This work could change the way we study and conserve animal migrations."

Human activity and climate change are threatening animal migrations worldwide. Migratory animals around the globe are declining and shifting the timing of their movements. DeSimone and Cohen propose that species-specific processes may reverberate throughout entire migrating communities in ways that have yet to be explored.

"Learning that migrating birds are characterized by persistent, non-random assemblages of interacting species opens the door to myriad questions at the intersection between networks, migration, and the environment," said Steve Dudgeon, a program director at the NSF.

"Further research can help answer whether successful migrations depend on these networks, if some relationships are more important than others to migration, and whether key links in these networks are more vulnerable to [environmental changes](#) en route."

This study may usher in a new field of research—the community ecology of migration—with the goal of encouraging future research about the nature and consequences of species interactions among migrating animals.

The banding stations, which provide data such as the identification and tracking of individual bird [species](#), that assisted with this research include Braddock Bay Bird Observatory, Michigan State Bird

Observatory, Long Point Bird Observatory, and Powdermill Avian Research Center.

More information: Joely G. DeSimone et al, Persistent species relationships characterize migrating bird communities across stopover sites and seasons, *Proceedings of the National Academy of Sciences* (2024). [DOI: 10.1073/pnas.2322063121](https://doi.org/10.1073/pnas.2322063121)

Provided by University of Maryland

Citation: Studying the journey, not the destination, provides new insight into songbird migrations (2024, August 14) retrieved 14 August 2024 from <https://phys.org/news/2024-08-journey-destination-insight-songbird-migrations.html>

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