

A new appreciation of the ecology-evolution dynamic

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(PhysOrg.com) -- Ecology drives evolution. In today's issue of the journal *Science*, UC Davis expert Thomas Schoener describes growing evidence that the reverse is also true, and explores what that might mean to our understanding of how environmental change affects species and vice-versa.

A classic example of [ecology](#) influencing [evolution](#) is seen in a Galápagos ground finch, *Geospiza fortis*. In this species, larger beaks dominated the population after dry years when large seeds were more abundant. After wet years, the direction of natural selection reversed, favoring smaller beaks that better handled the small seeds produced in the wet environment.

Environmental factors had given birds with certain genes a survival advantage.

But does evolution affect ecology over similar time scales? Scientists are increasingly thinking that the answer is yes, says Schoener, who points toward numerous examples of organisms evolving rapidly. This sets the stage for the possibility that evolutionary dynamics routinely interact with ecological dynamics.

Schoener writes: "If ecology affects evolution (long supported) and evolution affects ecology (becoming increasingly supported), then what? The transformed ecology might affect evolution, and so on, back and forth in a feedback loop."

Still to be discovered in this emerging field of "eco-evolutionary dynamics," he concludes, is just how much evolutionary changes substantially affect ecological traits such as species populations and community structure. Schoener calls for a major research effort to find out.

The study, titled "The Newest Synthesis: Understanding the Interplay of Evolutionary and Ecological Dynamics," was supported by grants from the National Science Foundation.

In an unusual occurrence, [Schoener is a co-author of a second paper](#) in the same issue of *Science*. His former doctoral student, Jonah Piovia-Scott, is that paper's lead author.

Provided by University of California - Davis

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