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Simberloff D S & Wilson E O. Experimental zoogeography of islands. The colonization of empty islands. *Ecology* **50**:278-96, 1969.
[Biological Laboratories, Harvard University, Cambridge, MA]

Six small mangrove islands in the Florida Keys were censused for animals, then defaunated by methyl bromide fumigation. Recolonization, primarily by aerial transport, was monitored for a year. The number of species on each island tended to return to the pretreatment 'equilibrium.' [The *SCI*® indicates that this paper has been cited in over 160 publications since 1969.]

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"In 1967, publication of *The Theory of Island Biogeography*[1] fostered enthusiasm about the proposition that number of species on an oceanic or habitat island is a dynamic equilibrium between extinction of species already there and immigration of new species. The book struck a responsive chord by focusing on species number, a familiar statistic, and depicting a nature that is dynamic but comprehensible because it is divided into small, simple subunits. Many papers attempted to fit data on island communities into the equilibrium theory framework.[2]

"Edward O. Wilson was my graduate adviser then and we often discussed the book. My response was less enthusiastic than one probably expects from a graduate student: the math was fine, the concept of a balance between immigration and extinction was intriguing, but there was little direct evidence that islands actually behave that way. Most cited examples consisted of either natural and uncontrolled experiments (like Krakatoa) or demonstrations of a species-area relationship that is consistent with the equilibrium hypothesis but can be explained in other ways. There was little evidence of continuing immigration and extinction. What was needed was a replicated, controlled experiment. Wilson then made me an offer I couldn't refuse: do such an experiment as a dissertation, and he would finance the work as well as collaborate.

"Thus began an adventure that dominated our lives for two years. Our original notions of how to census and defaunate entire islands were naive in the extreme, but we learned how to census all animals on a mangrove island and then remove them. Even identifying the over 100 species that we found required us to enlist an army of systematists, and physical aspects of operating in the shallow, shark-infested waters of the Florida Keys put us one up on molecular biologists who always seemed engaged in momentous breakthroughs. And the experiment worked! Species number *did* return approximately to its original level, and there *was* a substantial change in composition from week to week, indicating extinction.

"We won the Mercer Award of the Ecological Society of America for this work in 1971 and the paper detailing results is often cited as the strongest support for the equilibrium theory. I think the main reason it is cited, however, and its lasting contribution, is *not* so much that it supports the theory, as that it reported a field experiment on ecological communities, and thus seemed dramatically different from the correlative approach that dominated this field. In retrospect, I feel the hypothesis of equilibrium as we defined it was unfalsifiable,[3] the 'extinction' was partly transient movement of individuals within meta-populations rather than the population phenomenon envisaged by the theory,[4] and the theory itself has limited application to natural systems.[5] However, critical testing of community theory and the gradual increase in field experimentation as a major tool in this testing may owe slight inspiration to this research and, if so, it was worthwhile."

1. **MacArthur R H & Wilson E O.** *The theory of island biogeography.* Princeton, NJ: Princeton University Press, 1967. 203 p.
2. **Simberloff D.** Equilibrium theory of island biogeography and ecology. *Annu. Rev. Ecol. Syst.* 5:161-82, 1974. (Cited 110 times.)
3. ----------. When is an island community in equilibrium? *Science* **220**:1275-7, 1983.
4. ----------. Species turnover and equilibrium biogeography. *Science* **194**:572-8, 1976.
5. **Gilbert F S.** The equilibrium theory of island biogeography: fact or fiction? *J. Biogeography* 7:209-35, 1980.

