



Range-wide salamander densities reveal a key component of terrestrial vertebrate biomass in eastern North American forests

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Characterizing the population density of species is a central interest in ecology. Eastern North America is the global hotspot for biodiversity of plethodontid salamanders, an inconspicuous component of terrestrial vertebrate communities, and among the most widespread is the eastern red-backed salamander, *Plethodon cinereus*. Previous work suggests population densities are high with significant geographic variation, but comparisons among locations are challenged by lack of standardization of methods and failure to accommodate imperfect detection. We present results from a large-scale research network that accounts for detection uncertainty using systematic survey protocols and robust statistical models. We analysed mark-recapture data from 18 study areas across much of the species range. Estimated salamander densities ranged from 1950 to 34 300 salamanders ha⁻¹, with a median of 9965 salamanders ha⁻¹. We compared these results to previous estimates for *P. cinereus* and other abundant terrestrial vertebrates. We demonstrate that overall the biomass of *P. cinereus*, a secondary consumer, is of similar or greater magnitude to widespread primary consumers such as white-tailed deer (*Odocoileus virginianus*) and *Peromyscus* mice, and two to three orders of magnitude greater than common secondary consumer species. Our results add empirical evidence that *P. cinereus*, and amphibians in general, are an outsized component of terrestrial vertebrate communities in temperate ecosystems.

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