

Spatiotemporal Patterns of An Irruption and Decline of Small Mammals in North-Central Chile

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Abstract

During the austral winter of 1987 (June-August) at a semi-arid site in northcentral Chile, an outbreak of small mammals apparently was triggered by one episode of unusually high rainfall. From October 1987 to November 1990, we monitored the outbreak on a monthly basis on two equatorial- and two polar-facing slopes. Overall density on equatorial-facing slopes was 239 individuals/ha in spring 1987, increasing to a peak of 404/ha by summer 1988, and then steadily declining to a crash of 20/ha (5% of peak density) by spring 1990, with no signs of recovery. On polar-facing slopes, mammalian abundances were about one-half those of equatorial-facing slopes. There were 112 individuals/ha in spring 1987, increasing to a peak of 199/ha by summer 1988, and then steadily declining to a crash of 8/ha (4% of peak density) by spring 1989. Since then, mammal populations on polar-facing slopes have been slowly recovering, reaching 11% of their peak density by November 1990. Of the eight species monitored, only three irrupted: the granivorous cricetid *Phyllotis darwini*, the omnivorous cricetid *Akodon olivaceus*, and the insectivorous didelphid *Marmosa elegans*. These three irrupted and declined in phase, simultaneously on the two opposite-facing slopes, such that their relative frequencies did not shift markedly. Two of the three folivores (*Abrocoma bennettii*, *Octodon degus*, but not *Chinchilla lanigera*), one granivore (*Oryzomys longicaudatus*), and one insectivore (*Akodon longipilis*) disappeared from the site, persisting longer on equatorial-facing.

Keywords: spatiotemporal patterns, population density, Chile, Rodentia, *Marmosa*