

# Numerical and Functional Response of Predators to a Long Term Decline in Mammalian Prey At a Semi-Arid Neotropical Site

F. M. Jaksíé, J. E. Jiménez, S. A. Castro, P. Feinsinger

## Summary

Occurrence and diet of ten carnivorous predators (four falconiforms, four owls, and two foxes), and population levels of their mammalian prey, were monitored over 45 months at a semi-arid site in north-central Chile. Early in this period, small mammals irrupted and then declined markedly to a density 7% of that at peak. All four falconiforms (*Buteo polyosoma*, *Falco sparverius*, *Geranoaetus melanoleucus*, *Parabuteo unicinctus*) and one owl (*Tyto alba*) responded numerically to the decline in mammalian prey by virtually abandoning the study site. The three other owls (*Athene cunicularia*, *Bubo virginianus*, *Glaucidium nanum*) and the two foxes (*Pseudalopex culpaeus* and *P. griseus*) remained. With few exceptions, throughout the study predators maintained species-specific preferences among small mammal species regardless of the absolute and proportional abundance of these prey. At no time did the two prey species most responsible for the irruption (the rodents *Phyllotis darwini* and *Akodon olivaceus*) occur in predators' diets out of proportion to their estimated relative abundance in the field. Predators were clearly unable to prevent the irruption from occurring. Given the absence of a clear functional response to the most irruptive species, predators seemed unlikely to have been responsible for the observed crash. At present, however, predators may be prolonging the crash and delaying the return of small-mammal populations to typical densities.